Greenbriar Development Project
Sacramento, California

Final Environmental Impact Report

Responses to Comments and Additional Information

State Clearinghouse Number 2005062144

Prepared for:

City of Sacramento
Environmental Planning Services

and

Sacramento Local Agency Formation Commission

August 2007

EDAW

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Prepared for:

City of Sacramento
Environmental Planning Services
2101 Arena Boulevard, Second Floor
Sacramento, CA 95834

Contact:

Tom Buford
916/808-7931
FAX 916/808-3968

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

Contact:

Peter Brundage
916/874-6458

Prepared by:

EDAW
2022 J Street
Sacramento, CA 95814

Contact:

Amanda Olekszulin
916/414-5800

August 2007

EDAW

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1 INTRODUCTION

1.1 DRAFT AND FINAL ENVIRONMENTAL IMPACT REPORT BACKGROUND

The City of Sacramento (City) and Sacramento Local Area Formation Commission (LAFCo), as co-lead agencies, have prepared this document to be part of the Final Environmental Impact Report (FEIR) for the proposed Greenbriar Development Project (proposed project). It contains a list of persons, organizations, and public agencies submitting comments; the comments received on the Draft Environmental Impact Report (DEIR), Recirculated Draft Environmental Impact Report (RDEIR), and Second RDEIR; and responses to significant environmental points raised in those comments, as required by the California Environmental Quality Act (CEQA, Public Resources Code Section 21000 et seq.) and the State CEQA Guidelines (Title 14, California Code of Regulations, Section 15000 et seq.). In accordance with Section 15132 of the State CEQA Guidelines, this document, the DEIR, the RDEIR, and the Second RDEIR, together, constitute the FEIR.

The project site is located west of the City of Sacramento's (City) North Natomas community within the Natomas Basin. The project site consists of approximately 577 acres of fallow agricultural land (at the time the Notice of Preparation (NOP) for the project was circulated) bounded by Interstate 5 (I-5) to the south, State Routes 70 and 99 (SR 70/99) to the east, Elkhorn Boulevard to the north, and Lone Tree Canal to the west. The project site is immediately adjacent and west of the City's North Natomas Community Plan (NNCP) area and the City's jurisdictional boundary and sphere of influence (SOI). The recently approved Metro Air Park Special Planning Area (SPA) is located adjacent and west of the project site. An industrial business park is planned for development within this area.

The proposed project is a mixed-use development project that includes: (1) 3,473 low, medium, and high density residential units, (2) 48.4 acres (net) of commercial development, (3) a 10-acre (net) elementary school site, (4) 48.4 acres (net) of neighborhood parks, and (5) a 39-acre (net) lake/detention basin that encircles the central portion of the project site. The project also includes the construction of a new east-west roadway, Meister Way, through the center of the site. A new light rail station and rail alignment is proposed to be constructed by Sacramento Regional Transit (RT) along this roadway near the center of the site. The rail alignment would connect the project site to the Metro Airpark development to the west and the North Natomas Community to the east across SR 70/99 via a new proposed overpass at SR 70/99. Higher density (than other parts of the project), mixed-use development (residential and retail/office land uses on same parcel) is proposed along Meister Way near the proposed light rail station. The project also includes a linear open space/buffer area that extends along the western boundary of the site, adjacent to Lone Tree Canal, proposed to protect potentially sensitive biological habitat.

Because the project site is located outside the City's limits and its SOI, the project applicant would need to seek approval from the Sacramento LAFCo for amendment of its SOI and annexation of the site into the City. In addition, the project includes a request for service from the Sacramento Regional County Sanitation District (SRCSD) (wastewater) and County Sanitation District 1 (CSD-1) (sewer). Currently the project site is located outside SRCSD's SOI. As such, approval from LAFCo for amendment of SRCSD's SOI to encompass the project site would also be required. Further, amendment of CSD-1 SOI is also necessary. On November 1, 2005, the City and LAFCo entered into a Memorandum of Understanding (MOU) by which the two entities agreed to have a single EIR prepared to evaluate the environmental consequences of the proposed development. Under this MOU, the City and LAFCo established themselves as Co-Lead Agencies for the EIR and defined their respective roles and responsibilities relating to the oversight and management of the EIR to ensure that it would adequately address the environmental issues reviewed by both the City and LAFCo.

The City and LAFCo circulated a NOP for a DEIR for the Greenbriar Project on June 28, 2005 and July 13, 2005 for a 30-day review period. On July 18, 2006, the City and LAFCo distributed the DEIR to public agencies and

the general public and also submitted it to the State Clearinghouse for state agency review. Based on comments received on the DEIR, the City and LAFCo decided to recirculate certain sections of the DEIR. On November 14, 2006, the RDEIR was distributed for public agency and general public review and submitted to the State Clearinghouse. It included revisions to two issue areas previously presented in the DEIR: 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 emissions from Interstate 5 and SR 70/99.

Subsequent to the publication of the RDEIR, the City and LAFCo received new data to indicate that the project could result in new significant and unavoidable impacts to regional freeway ramp facilities. Therefore, in response to this information, the City and LAFCo decided to prepare a Second RDEIR and recirculated the transportation and circulation section of the DEIR. On April 10, 2007, the Second RDEIR was distributed for public agency and general public review and submitted to the State Clearinghouse.

The Final EIR consists of the following documents:

- Draft Environmental Impact Report for the Greenbriar Development Project, (including Appendices A through P), dated July 18, 2006;
- Recirculated Draft Environmental Impact Report for the Greenbriar Development Project, dated November 14, 2006;
- Second Recirculated Draft Environmental Impact Report for the Greenbriar Development Project, dated April 10, 2007; and
- Comments, Responses to Comments on the DEIR, RDEIR, and Second RDEIR, and revisions to those reports contained in this document.

Copies of this document are available for review at:

City of Sacramento
Development Services Department
915 I Street, 3rd Floor
Sacramento, CA 95814
http://www.cityofsacramento.org/dsd/about/planning/CurrentEnvironmentalImpactReportsProjects.cfm

Sacramento Local Agency Formation Commission
1112 I Street, Suite 100
Sacramento, CA 95814
http://www.SacLAFCo.org

1.2 ORGANIZATION OF THIS DOCUMENT

This document contains seven chapters, as described below.

Chapter 1, "Introduction," includes a discussion of the background of the environmental review of the proposed project and a description of the contents of this document.

Chapter 2, "List of Commenters," contains a list of all written comments received on the DEIR, RDEIR, and Second RDEIR, along with commenters who spoke at two public meetings held during the DEIR circulation period.

Chapter 3, "Master Responses," contains master responses to three environmental topics that were raised by a number of commenters (see Section 1.4, below).

Chapter 4, "Comments and Responses to Comments on the DEIR," Chapter 5, "Comments and Responses to Comments on the RDEIR," and Chapter 6, "Comments and Responses to Comments on the Second RDEIR," present both the verbatim comments and appropriate responses to significant environmental points, in accordance with Sections 15088(a) and (c) and 15132 of the State CEQA Guidelines. Some of the issues raised in comments on the DEIR, RDEIR, and Second RDEIR address the merits of the project or raise non-environmental topics. In these cases, the comments are noted but do not require detailed response, because they do not raise significant environmental issues or comments on the contents of the DEIR, RDEIR, or Second RDEIR. All comment letters and comments by speakers at public meetings are labeled to correspond with the list of comments table in Chapter 2 (Tables 2-1, 2-2, and 2-3). Each individual comment is assigned a number (e.g., 1-1) that corresponds with the response following the comment.

Chapter 7, "Revisions to the DEIR, RDEIR, and Second RDEIR," presents changes that were made to the text of the DEIR, RDEIR, and/or Second RDEIR in response to public and agency comments. If a comment results in a correction or revision to the DEIR or Recirculated DEIR, the text of the document is reproduced in the response and in Chapter 7 with deleted text struck-through (strikeout) and added text underlined (underline).

Chapter 7, "Report Preparation," identifies the preparers of this document.

1.3 DEIR, RDEIR, SECOND RDEIR, AND RESPONSE TO COMMENTS

As described above, the City and LAFCo circulated the DEIR and at the close of that public review period compiled and reviewed the comments received on the DEIR. The City and LAFCo decided to recirculate the DEIR for comments received in two issue areas: 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 emissions from Interstate 5 and State Route 70/99. Subsequent to publication of the RDEIR, the City and LAFCo received new information regarding the potential for a new significant and unavoidable traffic impact (freeway ramps). Therefore, the City and LAFCo decided to prepare a Second RDEIR to address this issue.

While other comments were received from commenters on multiple environmental issues, the RDEIR and Second RDEIR only addressed those issues that required recirculation consistent with the requirements of 15088.5 of the State CEQA Guidelines.

During the public review period of the RDEIR and Second RDEIR additional comments on the environmental analysis were received. The City reviewed these comments and determined that they did not raise significant new information, as defined by Section 15088.5 of the State CEQA Guidelines, so no further recirculation of the EIR is required.

Comments from agencies and the public address the content of the DEIR, RDEIR, and Second RDEIR. Many comments on the RDEIR and Second RDEIR repeated or expanded upon topics that were previously submitted in comments on the DEIR. The purpose of this document is to provide written responses to all significant environmental issues raised in comments on the DEIR, REDIR, and Second RDEIR, consistent with the requirements of CEQA and the State CEQA Guidelines. The responses rely on information from the whole of the environmental record, as applicable to the comment topic. In other words, responses take into account information contained in the DEIR, RDEIR, and Second RDEIR, along with clarifying or elaborating information added to this response to comment document.

1.4 MASTER RESPONSES TO COMMENTS

Because some topics were raised in multiple comments, this document contains three "master" responses. The master responses include comments related to the current state of flood protection in the Natomas Area, the reasons for recirculating the traffic and circulation section of the DEIR, and a discussion of the requirements of

CEQA when there is a disagreement among experts. The master responses are presented in Chapter 3 of this document. The intent of a master response is to provide a comprehensive response to an issue or set of interrelated issues, so that all aspects of the issue can be addressed in a coordinated, organized manner in one location. When an individual comment raises an issue discussed in a master response, the response to the individual comment includes a cross-reference to that appropriate master response.

1.5 PROJECT DECISION-MAKING PROCESS

This document was made available to the public on the City's and LAFCo's websites upon completion and distribution to the LAFCo Commission, City Planning Commission, and the City Council, public agencies that commented on the DEIR, RDEIR or Second RDEIR. A notice of the availability of the document was distributed to members of the public that commented on the DEIR, RDEIR, and/or Second RDEIR. As required by Section 15088(b) of the State CEQA Guidelines, the City and LAFCo are providing public agencies who commented on the DEIR, RDEIR, and/or Second RDEIR at least 10 days to review proposed responses prior to the date for consideration of the FEIR for certification.

At a scheduled public hearing following this 10-day review period, the LAFCo Commission will have the first action to consider the adequacy of the FEIR and the merits of the project as it relates to the SOI expansion and municipal services review. If the LAFCo Commission certifies the FEIR, it will make certain findings, including that the FEIR has been completed in compliance with CEQA; the Commission has reviewed and considered the information in the FEIR; and the FEIR reflects LAFCo's independent judgment and analysis. After certification of the FEIR by LAFCo, the Commission with then consider the merits of the project as it relates to issues of growth projections, rate of buildout, municipal service provision, and open space and prime agricultural resources.

Subsequent to the LAFCo Commission taking action on the Sphere of Influence and EIR, and if a favorable recommendation is made, the City Planning Commission will consider what recommendations to make to the City Council regarding the adequacy of FEIR for pre-zoning, amendment of the NNCP boundaries, and land use entitlements (e.g., general plan amendments, maps, and finance plan). The City Council will then decide whether to certify that the FEIR as being adequate under CEQA and will consider the merits of the project. If the City Council certifies the FEIR, it will make certain findings, including that the FEIR has been completed in compliance with CEQA; the City Council has reviewed and considered the information in the FEIR; and the FEIR reflects the City's independent judgment and analysis. After certification, the City Council may consider whether to approve the proposed project, approve it with conditions, or deny the project, in accordance with Section 15092 of the State CEQA Guidelines.

If a favorable recommendation is made by the City Council, the project would return to the LAFCo Commission for review of the proposed reorganization (annexation and detachment) of the project site to the City, CSD-1, and SRCSD.

If the City Council and LAFCo decide to approve the SOI expansion, proposed project, and reorganization, they must each adopt findings in accordance with Section 15091 of the State CEQA Guidelines. For each significant effect identified in the FEIR, these findings will describe whether it can be reduced to a less-than-significant level through feasible alternatives or imposition of feasible mitigation measures and if not, why there are no feasible mitigation measures or alternatives to reduce the impact to a less-than-significant level. If in approving the proposed project, the City and LAFCo adopts mitigation measures to reduce significant effects, they will adopt a mitigation monitoring and reporting program (MMRP), as required by Section 15097 of the State CEQA Guidelines. This MMRP describes how each of the mitigation measures will be implemented and provides a mechanism for monitoring and/or reporting on their implementation.

If the City and LAFCo approve the project with significant effects on the environment that cannot be feasibly avoided or reduced to less-than-significant levels, they must also adopt a statement of overriding considerations

that, in accordance with Section 15093 of the State CEQA Guidelines, explains the benefits that outweigh the unavoidable significant environmental effects.

The lead agencies would, upon taking an approval action, file a Notice of Determination (NOD) with the County Clerk and the California Governor's Office of Planning and Research (OPR), as directed by Section 15094 of the State CEQA Guidelines.

1.6 SUMMARY OF LAFCo ISSUES OF INTEREST AND LEVEL OF IMPACT

As a co-lead agency for the project, LAFCo is responsible for considering the proposed City of Sacramento Sphere of Influence Amendment (SOIA) for the project site and the SOIA for Sacramento Regional County Sanitation District (SRCSD) and CSD-1. LAFCo is also the responsible agency for consideration of the reorganization (annexation to the City of Sacramento, SRCSD, CSD-1and related detachments) proposed for the project site.

The Cortese-Knox Hertzberg Local Government Reorganization Act (Act) of 2000 (Government Code section 56000, et seq.) charges LAFCo with ensuring the timely and orderly formation of local government agencies and boundaries, preserving prime agricultural and open space resources, and discouraging urban sprawl. Pursuant to the Act, LAFCo is responsible for reviewing logical and timely changes in local government boundaries, including reorganizations such as the proposed Greenbriar SOIA and Annexation. On November 1, 2005, the City and LAFCo entered into a Memorandum of Understanding ("MOU") by which the two entities agreed to have a single EIR prepared to evaluate the environmental consequences of the proposed development. Under this MOU, the City and LAFCo established themselves as Co-Lead Agencies for the EIR and defined their respective roles and responsibilities relating to the oversight and management of the EIR to ensure that it would adequately address the environmental issues to be reviewed by both LAFCo and the City.

Under the Act, an essential tool for ensuring orderly growth is the annexation of land within an adopted SOI. The SOI is a policy tool used to provide guidance for consideration of annexation proposals and is intended to encourage efficient provision of municipal services and discourage duplication of service delivery. Land must be within a city's SOI to be annexed. The project site is located adjacent to the City of Sacramento's SOI on the south and east and the project applicant is requesting an amendment of the City's SOI to incorporate the project site. The SOI expansion and annexation request would be considered by LAFCo in a 2-step process: first, consideration of the SOIA amendment; second, if the SOIA is approved, consideration of reorganization for the project.

As a co-lead agency under CEQA, LAFCo must ensure that the environmental document prepared for the project adequately addresses LAFCo matters. As stated above, LAFCos were created to oversee local agency changes of organization and are authorized by the Act to consider preservation of open space and agricultural land, as well as the efficient provision of services in making their determinations regarding changes of organization. While LAFCo has the power to impose conditions on changes of organization, they may only act within the parameters of the powers granted by statute. (*Timberidge Enterprises, Inc. v. City of Santa Rosa* (1978) 86 Cal. App. 3d 873, 884; *City of Ceres v. City of Modesto* (1969) 274 Cal.App.2d 545, 550.) LAFCo may approve, disapprove, or approve with conditions an SOI or an annexation. (Gov. Code, §§ 56375(a), 56427.) However, no condition may directly regulate land use. (Gov. Code, § 56375.) LAFCo may reduce boundaries to lessen an impact, or may require the agency with land use authority to implement a mitigation measure to reduce an impact. As a consequence, LAFCo conditions are typically general in nature, leaving the means of implementation to the land use governing body, in this case, the City. Because the Greenbriar EIR involves many discretionary acts, some of which are LAFCo acts and some of which are City acts, the EIR proposed mitigation measures have been identified as either City measures or LAFCo measures.

Based on its review of the project and EIR, LAFCo will make specific findings of fact and may adopt mitigation measures accordingly. Where an impact is within the City's exclusive jurisdiction, in accordance with CEQA

Guidelines section 15091, subdivision (a)(2), LAFCo's findings will state that review of the impacts is within the jurisdiction of another public agency and any necessary mitigation measures have been, or will be, adopted by that agency. Such measures may be a condition of annexation. The following charts summarize the impacts for which both the City and LAFCo are responsible for adopting and implementing mitigation measures, and the impacts within the City's exclusive jurisdiction:

Environmental Issue	City	LAFCo
Utilities	Responsible to adopt and implement measure	Responsible to adopt and implement measure prior to annexation
Public Services	Responsible to adopt and implement measure	Responsible to adopt and implement measure prior to annexation
Parks and Open Space	Responsible to adopt and implement measure	Responsible to adopt and implement measure prior to annexation
Agriculture	Responsible to adopt and implement measure	Responsible to adopt and implement measure prior to annexation
Alternatives	Responsible to adopt and implement measure	Responsible to adopt and implement measure
Transportation and Circulation	Responsible to adopt and implement measure	May require City to adopt mitigation measure prior to annexation
Air Quality	Responsible to adopt and implement measure	May require City to adopt mitigation measure prior to annexation
Noise	Responsible to adopt and implement measure	May require City to adopt a mitigation measure prior to annexation
Aesthetics	Responsible to adopt and implement measure	May require City to adopt a mitigation measure prior to annexation
Public Health and Hazards	Responsible to adopt and implement measure	May require City to adopt a mitigation measure prior to annexation
Geology and Soils	Responsible to adopt and implement measure	May require City to adopt a mitigation measure prior to annexation
Hydrology, Drainage, and Water Quality	Responsible to adopt and implement measure	May require City to adopt a mitigation measure prior to annexation
Biological Resources	Responsible to adopt and implement measure	May require City to adopt a mitigation measure prior to annexation
Cultural Resources	Responsible to adopt and implement measure	May require City to adopt a mitigation measure prior to annexation

A summary of the EIR analysis of the impacts is included below.

SUMMARY OF IMPACTS

UTILITIES

The LAFCo Policies, Procedures, and Guidelines document includes the following standards related to the provision of urban services to annexed areas.

- The annexation must be consistent with the applicable Master Service Elements (Municipal Service Review). An annexation … shall be approved only if the services element of the Spheres of Influence Plan of the affected agency or agencies demonstrates that adequate services will be provided within the time frame needed by the inhabitants of the annexed … area. Proposed annexations for land areas that lie outside of the current and next five-year increments of projected service delivery in the services element are presumed not to comply with this standard unless the applicant clearly establishes that special and unique circumstances exist which ensure the provision of quality services during the applicable time frame for the affected area consistent with the other standards. (Section I, Standard Number 4)

- The annexation must provide the lowest cost and highest quality of urban services for the affected population. LAFCo will approve an annexation … only if the Commission determines that the annexing agency possesses the capability to provide the most efficient delivery of applicable urban services for the affected population. (Section I, Standard Number 5)

Increased Demand for Water Supply and Facilities. Water demands for the project would be met by the City of Sacramento through existing water supply entitlements available from the American River, Sacramento River, and the City's local groundwater well system. The City has sufficient water supplies to meet their existing and projected future demands, in addition to the proposed project, through 2030 under all water year types (e.g., normal, single-dry, and multiple-dry years). Further, other than construction of the necessary infrastructure to connect the project site to the City's existing water system, no additional water supply facilities would be needed to serve the project. Therefore, this would be a ***less-than-significant*** impact related to water supply. No mitigation is required.

Increased Demand for Water Conveyance. Water supply infrastructure is not currently available on the project site; therefore, water line extensions would be required to deliver water to the project site. Proposed water supply facilities would be sized to accommodate the project's water distribution and fire flow needs. Further, sufficient capacity is available within the city's off-site water distribution facilities to serve the project site. For these reasons, the provision of water to the project would result in ***less-than-significant*** water conveyance impacts. No mitigation is required

Increased Demand for Wastewater Collection and Conveyance. Sufficient capacity within the Sacramento Regional County Sanitation District (SRCSD) interceptor system would be available to accommodate the project's wastewater demand. This would be a ***less-than-significant*** impact. No mitigation is required.

Environmental Impacts Associated with SRWTP Expansion. The Sacramento Regional Wastewater Treatment Plant (SRWTP) would provide wastewater treatment services for the project. The SRWTP is currently undergoing expansion to accommodate wastewater treatment demands for future growth and development. As a result, the project would contribute to the need to expand the SRWTP. According to the EIR prepared for the SRWTP 2020 Master Plan Expansion, construction and operation of facility improvements could contribute to significant and unavoidable impacts related to construction-related air quality. Because the project would contribute to the need for expanding the SRWTP, and would contribute to the impacts assessed in the EIR for the SRWTP 2020 Master Plan Expansion, this would be a significant impact to wastewater facilities. The Draft EIR includes **Mitigation Measure 6.4-4** (City of Sacramento), which states that the environmental impacts of expanding the SRWTP were appropriately evaluated in the EIR for the SRWTP 2020 Master Plan Expansion Project. All available mitigation was recommended to reduce the environmental impacts of this project where feasible. However, the EIR concluded that even with recommended mitigation, the project would result in a significant and unavoidable impact related to construction-related air quality. Because all feasible mitigation has been recommended to reduce potentially significant impacts associated with the SRWTP expansion and no other feasible mitigation is available to reduce this impact, this impact would remain ***significant and unavoidable***.

Increased Demand for Storm Drainage. The project would increase the volume of stormwater generated at the project site. However, Reclamation District 1000's (RD 1000) plant #3 does not have sufficient pumping capacity

to pump stormwater generated from the project site. Therefore, development of the project would result in significant impact related to storm drainage. The Draft EIR includes **Mitigation Measure 6.4-5** (City of Sacramento and LAFCo), which requires the project applicant to fully fund the installation of a new pump that would increase pumping capacity at the RD 1000's plant #3 by 75 cubic feet per second. The Draft EIR concludes that, with implementation of Mitigation Measure 6.4-5, pumping capacity at RD 1000 plant #3 would be increased to sufficiently pump stormwater generated on the project site. Therefore, this storm drainage impact would be reduced to ***less than significant***.

Increased Demand for Electric and Natural Gas Services. The project area would be supplied with energy services by Pacific Gas &Electric (PG&E) (i.e., natural gas) and Sacramento Municipal Utility District (SMUD) (i.e., electricity). Energy services are currently being provided adjacent to the project site to the east and south and extension of these services to the site would not cause any physical disturbances beyond that already anticipated at the project site. For these reasons, the provision of energy services to the project site would result in ***less-than-significant*** impacts. No mitigation is required.

PUBLIC SERVICES

The LAFCo Policies, Procedures, and Guidelines document includes the following standards related to the provision of urban services to annexed areas.

- The annexation must be consistent with the applicable Master Service Elements. An annexation … shall be approved only if the services element of the Spheres of Influence Plan of the affected agency or agencies demonstrates that adequate services will be provided within the time frame needed by the inhabitants of the annexed … area. Proposed annexations for land areas that lie outside of the current and next five-year increments of projected service delivery in the services element are presumed not to comply with this standard unless the applicant clearly establishes that special and unique circumstances exist which ensure the provision of quality services during the applicable time frame for the affected area consistent with the other standards. (Section I, Standard Number 4)

- The annexation must provide the lowest cost and highest quality of urban services for the affected population. LAFCo will approve an annexation … only if the Commission determines that the annexing agency possesses the capability to provide the most efficient delivery of applicable urban services for the affected population. (Section I, Standard Number 5) 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 (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 the SRCSD and Sacramento Police Department. The project site is adjacent to and east of the 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.

Increased Demand for Fire and Emergency Medical Services. Although Sacramento Fire Department (SFD) is planning to construct a new fire station near the project site and with this facility SFD would provide services to the project site within acceptable standards, the timing of the construction of this facility is currently unknown. Because it is unknown whether adequate fire protection facilities would be in place at the time the first occupancy permit is issued, the project could result in residents living in an area where inadequate fire and emergency response services are provided. This would be a potentially significant impact. **Mitigation Measure 6.5-1** (City of Sacramento and LAFCo) requires the project applicant to coordinate with the City of Sacramento to determine the timing of construction of a new fire station and enter into an agreement with SFD to ensure that adequate fire protection services would be in place before the issuance of the project's first occupancy permit. Potential options

for adequate services could include construction of a new fire station or an agreement for temporary dedicated services to serve the project site. Further, the project's Finance Plan must identify necessary public facility improvements to serve the project, 100% of the costs required, and all the project's fair-share costs associated with provision of these facilities and services. The project applicant must pay into a fee program, as established by the Greenbriar Finance Plan, which identifies the funding necessary to construct needed public facilities (e.g., police, fire, water, wastewater, library, and schools). While the mitigation proposed could result in construction-related impacts, with implementation of the above mitigation, the project's impact to fire services would be reduced to a ***less-than-significant*** level.

Increased Demand for Law Enforcement Services. Although the project would increase demand for police personnel, the Sacramento Police Department (SPD) has indicated that it could serve the project site, without the need to construct any new law enforcement facilities (McCray, pers. comm., 2005). Therefore, the project would have a ***less-than-significant*** impact on police services. No mitigation measures are necessary.

Increased Demand for Solid Waste Disposal Services. Because existing solid waste facilities would have adequate capacity to serve the project into the foreseeable future, additional solid waste facilities would not be required. Therefore, the project would have a ***less-than-significant*** impact on solid waste services. No mitigation is required

Increased Demand for School Services. School facilities currently serving the Natomas area, including the proposed elementary school site at the project site, would provide adequate school services for the project. No additional facilities would be required. In addition, the project applicant would be required to pay development impact fees to Grant Union and Rio Linda Union school districts equal to $2.24 per square foot for residential development and $0.36 per square foot for commercial development. (Pollock, pers. comm., 2005) Payment of the development impact fees would provide the maximum legally required level of funding under State law, and would fully mitigate project-related school impacts. As a result, the project would result in ***less-than-significant*** impacts to school services. No mitigation is required.

Increased Demand for Library Services. The existing library located at 2500 New Market Drive would provide library services to the project. In addition, a new library is planned to be built next to Inderkum High School when funding is available. The project applicant would pay into a fee program that would contribute to the funding of this facility. No additional library facilities would be required to serve the project. Therefore, ***no impacts*** related to library services would occur. No mitigation is required.

PARKS AND OPEN SPACE

The Policies, Standards, and Procedures document (Sacramento LAFCo 1993) include standards regarding the Sacramento LAFCo's powers to conserve agricultural land. LAFCo will approve a proposed change of organization or reorganization (such as an annexation) that will result in the conversion to other uses of prime agricultural land in open space use only if it finds that the proposal will lead to the "planned, orderly, and efficient" development of an area. To be considered planned, orderly, and efficient, the proposal must meet the following criteria:

- The land to be reorganized must be contiguous to lands developed with an urban use or lands that have received all discretionary approvals for urban development.

- The proposed development must be consistent with the applicable jurisdiction's Spheres of Influence Plan, including the Master Services Element.

- Development of all or a substantial portion of the land in question is likely to occur within 5 years. Annexation should be phased if the development is very large.

- Insufficient vacant nonprime lands exist within the applicable Spheres of Influence that are planned, accessible, and developable for the same general type of use.

- The proposal will have no significant adverse effect on the physical and economic integrity of other agricultural lands. In determining whether there will be a significant adverse effect, LAFCo will consider the agricultural significance and use of the land in question, as well as adjacent areas; potential for public facilities associated with the proposal to facilitate the conversion of adjacent or nearby agricultural land; natural or artificial barriers between adjacent agricultural land and the proposed development; and applicable policies regarding open space, land use, and growth management.

Increased Demand for City Neighborhood and Community Parks. A prescribed formula in the City's Quimby Act land dedication ordinance is used to determine how much parkland must be provided by proposed developments to meet demand generated by new residents. Based on application of this formula, residential development under the proposed project would require 48.2 net acres of parks. The proposed project would provide approximately 48.4 net acres of neighborhood and community parks. Therefore, the proposed project would provide sufficient parkland to meet the City's standards for parkland dedication, and thus would provide sufficient park facilities to meet demand. This impact would be ***less than significant***. No mitigation is required.

Substantial Loss of Open Space Resources. The proposed project would result in the conversion of approximately 577 acres of agricultural land to nonagricultural use in an area that already is experiencing substantial development and loss of open space. The conversion of agricultural land to urban development would result in the permanent loss of open space resources. This impact would be significant. The Draft EIR includes **Mitigation Measure 6.6-2** (City of Sacramento and LAFCo), which requires that, consistent with the principles of the City/County Joint Vision Plan, the project applicant will coordinate with the City to identify appropriate lands to be set aside in a permanent conservation easements at a ratio of one open space acre converted to urban land uses to one-half open space acre preserved and at a ratio of one habitat acre converted to urban land uses to one-half habitat acre preserved. The total acres of land conserved will be based on final site maps indicating the total on-site open space and habitat converted. Conserved open space and habitat areas could include areas on the project site, lands secured for permanent habitat enhancement (e.g., giant garter snake, Swainson's hawk habitat), or additional land identified by the applicant in consultation with the City. All conserved open space and habitat land must be located in the North Natomas Joint Vision area. Should the City and County change adopted mitigation ratios before issuance of any grading permits, the project applicant shall comply with the revised policy. Further, the City must implement mitigation measure 6.6-2 prior to annexation.

Implementation of mitigation requiring preservation of open space and habitat land would substantially lessen significant impacts associated with the conversion of open space on the project site because conservation easements would assist the public and private sectors in protecting other open space from the pressures of development. However, preservation of existing open space resources would only partially offset conversions of open space associated with project impacts; no new open space would be made available. For these reasons, and because no other feasible mitigation is available to reduce the impact associated with loss of open space in North Natomas, the project's impacts to open space resources would remain ***significant and unavoidable*** after mitigation.

AGRICULTURE

LAFCo has adopted policies and standards related to agricultural land conversion. The following policies and standards are applicable to the project. The project's consistency with these policies and standards are evaluated in Chapter 5.0, "Project Consistency with Plans and Policies."

- LAFCo will approve a change of organization or reorganization that will result in the conversion of prime agricultural land in open space use to other uses only if the Commission finds that the proposal will lead to

the planned, orderly, and efficient development of an area. For purposes of this standard, a proposal leads to the planned, orderly, and efficient development of an area only if all of the following criteria are met:

- The land subject to the change of organization or reorganization is contiguous to either lands developed within an urban use or lands that have received all discretionary approvals for urban development.

- The proposed development of the subject lands is consistent with the Spheres of Influence Plan, including the Master Services Element of the affected agency or agencies.

- Development of all or a substantial portion of the subject land is likely to occur within 5 years. In the case of very large developments, annexation should be phased wherever feasible. If the Commission finds phasing infeasible for specific reasons, it may approve annexation if all or a substantial portion of the subject land is likely to develop within a reasonable period of time.

- Insufficient vacant nonprime lands exist within the applicable Spheres of Influence that are planned, accessible, and developable for the same general type of use.

- The proposal will have no significant adverse effect on the physical and economic integrity of other agricultural lands. In making this determination, LAFCo will consider the following factors: (1) the agricultural significance of the subject and adjacent areas relative to other agricultural lands in the region; (2) the use of the subject and adjacent areas; (3) whether public facilities related to the proposal would be sized or situated so as to facilitate the conversion of adjacent or nearby agricultural land, or will be extended through or adjacent to, any other agricultural lands that lie between the project site and existing facilities; (4) whether natural or human-made barriers serve to buffer adjacent or nearby agricultural land from the effects of the proposed development; (5) applicable provisions of the General Plan open space and land use elements, applicable growth-management policies, or other statutory provisions designated to protect agriculture (LAFCo Standards, pgs. IV-5 and IV-6).

Conversion of Important Farmlands. The project would result in the conversion of 518 acres of important farmlands to urban land uses. Conversion of important farmland to nonagricultural use would be a significant impact. The Draft EIR includes **Mitigation Measure 6.11-1**(City of Sacramento, LAFCo), which requires the project applicant to implement Mitigation Measure 6.6-2 described above prior to annexation.

Implementation of Mitigation Measure 6.11-1 would substantially lessen significant impacts associated with the conversion of farmland on the project site because LAFCo would only approve the conversion of agricultural land where it is consistent with its conservation policies. Further, the project would conserve open space and habitat lands some of which would be used for agricultural practices at a ratio consistent with the mitigation ratio identified in the City/County Joint Vision Plan MOU. Prior to annexation LAFCo will require that the City and County reach agreement on the open space mitigation lands for the Greenbriar project. However, because the conservation easements are purchased for land exhibiting benefits to wildlife, including a combination of habitat, open space, and agricultural lands, the mitigation would not be applied exclusively to agricultural lands. Therefore, this mitigation would only partially offset conversions of farmland associated with the project impacts. In addition, no new farmland would be made available, and the productivity of existing farmland would not be improved as a result of the habitat conservation plan (HCP) mitigation. . Therefore, full compensation for losses of farmland would not be achieved. Impact 6.11-1 would remain ***significant and unavoidable*** after mitigation.

In addition to Mitigation Measure 6.11-1, **Mitigation Measure 6.12-1** requires the project applicant to dedicate land to the Natomas Basin Conservancy (NBC) to mitigate for impacts to biological resources. The NBC serves as plan operator for the Natomas Basin Habitat Conservation Plan (NBHCP) and acquires and manages habitat land for the benefit of the 22 special-status species covered under the NBHCP, including Swainson's Hawk and giant garter snake. Habitat for these species includes agricultural land in rice production.

The project applicant will dedicate the Spangler property, which is located in northern Sacramento County along the Sutter County line, northeast of the Sacramento Airport and west of SR 70/99. The site is currently in irrigated rice and is surrounded by agriculture (primarily rice) on all sides. The North Natomas 130 site, which is adjacent to the NBC's Cummings preserve to the south, Fisherman's Lake to the east, rice land to the north, and the Sacramento River to the west, will also be dedicated to the NBC.

One of the NBC's key conservation strategies is to maintain at least 50% of its mitigation lands in rice production. Typically, the NBC puts up to 75% of the mitigation land in rice production and 25% as managed marsh. A majority of the lands that the project applicant is dedicating to the NBC for habitat management will therefore remain in agricultural use. While not included as a mitigation measure for impacts associated with the loss of agricultural land, this mitigation measure (Biological Resources Mitigation Measure 6.12-1) will keep additional lands in agricultural use.

Conflict with Agricultural Zoning and Williamson Act Contracts. The project site is currently not under a Williamson Act contract but the project site is currently zoned for agricultural land uses. The project would rezone the site from an agriculture designation to residential, commercial, and open space designations. Therefore, development of the project site as proposed would not result in any conflicts with Williamson Act contracts or agricultural zoning designations and ***no impacts*** would result. No mitigation is required.

Conflict with Off-site Agricultural Operations. The project site is located adjacent to agricultural operations to the north and development of the project could result in conflicts between adjacent agricultural activities and proposed residential land uses, which could lead to the abandonment of agricultural operations on lands to the north of the project site and could potentially result in the ultimate conversion of this land to non-agricultural land uses. This would be considered a significant impact. As noted in response to comment R9-30, the DEIR does not address potential conflicts between agricultural uses on the lands south of I-5 and proposed residential uses because of the relative separation between the two. The project's southern-most residential neighborhood is separated by: 1) a planned on-site freeway buffer; 2) the entirety of the Caltrans I-5 right-of-way; and 3) the entirety of the County of Sacramento Bayou Way right-of-way. The approximate distance of the closest planned residential unit to the agricultural lands south of I-5 is 500+ feet, and because of this separation – including an interstate freeway – potential conflicts do not require exhaustive analysis.

To mitigate for impacts associated with agricultural operations to the north, the Draft EIR includes **Mitigation Measure 6.11-3**, which requires the project applicant to notify all prospective residents and tenants located within 500 feet of existing agricultural uses north of Elkhorn Boulevard of the types of existing agricultural operations that could occur within close proximity of their homes or businesses. Notification provided to residents and tenants must include information on the types of land use conflicts that could occur (e.g., noise, dust) and the appropriate means by which to address these conflicts. The City shall approve the content of this notification and this notification shall be included in all residential deed and tenant agreements at the time of sale or lease.

Implementation of this mitigation measure would notify prospective residents of potential land use conflicts associated with agricultural activities that occur north of the project site; however, it would not remove or substantially reduce potential conflicts. Other than precluding development adjacent to agricultural lands, no other feasible mitigation is available to eliminate potential urban/agricultural land use conflicts. Further, because of the developing nature of the City and the fact that current plans for development to the north of the project site (e.g., North Natomas Joint Vision Plan) are under contemplation by the City, it is unknown whether lands to the north would remain in agricultural production indefinitely. It is reasonable to anticipate that these lands would likely convert to urban development within the next 10 to 20 years. As such, it would not be reasonable for the City for preclude development near these agricultural lands unless it knew that development would not occur. For these reasons, this impact would remain ***significant and unavoidable.***

ALTERNATIVES

No Project Alternative. The No Project Alternative assumes that development would not occur and the project site would remain designated for agricultural use. The No Project Alternative would be consistent with the designated land uses for the project site, but would not meet any of the project objectives.

Off-Site Alternative. This alternative has been rejected as infeasible because land suitable for development is not available. Importantly, there is no other land available off-site along the proposed Downtown-Natomas-Airport (DNA) rail line. The project objective of providing development and land for construction of a light rail stop along the proposed DNA line with densities to support feasibility of the line is key to both Regional Transit and SACOG support of the proposed project. Much of the available land in the North Natomas area is tied up by other landowners interested in development and none of the undeveloped low or medium density residential or residential/mixed use properties within the North Natomas Community Plan (NNCP) area are currently owned by the project applicant. Nonetheless, the Draft EIR includes a comparative analysis to describe the environmental effects assuming such an alternative were feasible. A key issue with 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 those boundaries. The Draft EIR assumes, 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 and the Greenbriar site would not 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.

Dispersed Development Alternative. Among the findings to be considered in deliberations over the project, LAFCo will need to determine whether the expansion of the City's 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 meets its long-term housing demands. 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 time eliminating some of the project's significant and unavoidable environmental impacts. Therefore, this alternative evaluates the comparative impacts of distributing the project's proposed housing units and commercial land uses in multiple locations on vacant or underdeveloped properties throughout the City's corporate limits and SOI boundary. Importantly, this Alternative would not include development along the proposed Downtown-Natomas-Airport rail line. As stated above, the project objective of providing development and land for construction of a light rail stop along the proposed DNA line with densities to support feasibility of the line is key to both Regional Transit and SACOG support of the proposed project.

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. The project would result in significant impacts in the areas of conversion of prime farmland and open space, visual character of the project site, transportation impacts on local roadways and intersections, operational air emissions, and noise. This alternative would constrain development at the project site to a development level that may be financially infeasible to implement but would achieve most if not all of the project's objectives. Development of this alternative would be approximately 80% of proposed project levels (20% reduction in proposed development at the site). 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 to agricultural resources, 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 general, this alternative would consist of a development project that would concentrate land uses in the north central portion of the site. An approximate 200–400 foot-wide buffer/open space/fallowed land area would be provided on the western, eastern, and southern boundaries of the project site.

Comparison of Impacts of Alternatives in Relation to Project				
Issue Area	No Project	Off-Site	Dispersed Development	Reduced Size
Utilities	Less	Less	Less	Similar
Public Services	Less	Less	Less	Similar
Parks and Open Space	Less	Less	Less	Similar
Agriculture	Less	Less	Less	Less

To further reduce the project impacts, LAFCo may also require that the City adopt the mitigation measures proposed in the EIR, or other feasible alternatives, prior to annexation. These mitigation measures include:

Transportation & Circulation

- **Impacts to Study Intersections**: Mitigation Measures 6.1-1a through 6.1-1 (DEIR, p. 6.1-50 to 6.1-58.)
- **Impacts to Study Area Roadway Segments**: Mitigation Measures 6.1-2a through 6.1-2c (DEIR, p. 6.1-58 to 6.1-59)
- **Cumulative Traffic Impacts to Study Area Intersections**: Mitigation Measures 6.1-5b, 5c, 5d, and 5g (DEIR, p. 6.1-67 to 6.1-72)
- **Cumulative Impacts to Study Area Roadway Segments**: Mitigation Measures 6.1-1a through 6.1-1i (DEIR, p. 6.1-72 to 6.1-74)
- **Pedestrian and Bicycle Circulation Impacts**: Mitigation Measure 6.1-9 (DEIR, p. 6.1-83 to 6.1-84)
- **Demand for Public Transportation**: Mitigation Measure 6.1-10 (DEIR, p. 6.1-84)
- **Construction-Related Impacts**: Mitigation Measure 6.1-11 (DEIR, p. 6.1-85 to 6.1-86)
- **Conformity with City Parking Requirements**: Mitigation Measure 6.1-12 (DEIR, p. 6.1-86 to 6.1-87)
- **Project Site Access Impacts**: Mitigation Measure 6.1-13 (DEIR, p. 6.1-87 to 6.1-88)
- **Impacts to Internal Circulation**: Mitigation Measure 6.1-14 (DEIR, p. 6.1-88 to 6.1-90)
- **Impacts to Emergency Vehicle Access:** Mitigation Measure 6.1-15 (DEIR, p. 6.1-90)
- **Cumulative Freeway Mainline Segment Impacts:** Mitigation Measures 6.1-8a, 8b, and 8c (DEIR, p. 6.1-80 to 6.1-82)
- **Cumulative Impacts to Study Area Freeway Ramps**: Mitigation Measures 6.1-7a, 7b, 7c, 7d, and 7e (RDEIR(2), p. 6.1-79.)
- **Cumulative Impacts to Study Area Roadway Segments**. Mitigation Measures 6.1-6a and 6b, (DEIR, p. 6.1-72 to 6.1-74) (DEIR, p. 6.1-74)

Air Quality

- **Exposure to Odor Emissions.** Mitigation Measure 6.2-5 (DEIR, p. 6.2-29 to 6.2-30)

Noise

- **Short-term Construction Noise**. Mitigation Measure 6.3-1 (DEIR, p. 6.3-21 to 6.3-22)
- **Land Use Compatibility of Proposed Residential and School Uses with On-site Daily and Hourly Average (L_{dn}/CNEL and L_{eq}) Noise Levels**. Mitigation Measure 6.3-4 (DEIR, p. 6.3-26 to 6.3-39)
- **Land Use Compatibility of Proposed Residences and School with On-site Aircraft SENL Noise Levels.** Mitigation Measure 6.3-5 (DEIR, p. 6.3-39 to 6.3-42)
- **Exposure of sensitive receptors or generation of excessive vibration levels.** Mitigation Measure 6.3-6 (DEIR, p. 6.3-43 to 6.3-44)

Aesthetics

- **Impacts from Lighting and Reflective Surfaces.** Mitigation Measure 6.7-4 (DEIR, p. 6.7-10 to 6.7-11)

Public Health & Hazards

- **Potential for Health Hazards from Soils Contaminated by Previously Unknown USTs or by Other Sources at Former Two Jakes Park Site.** Mitigation measure 6.8-2 (DEIR, p. 6.8-17 to 6.8-18)
- **Potential for Airspace Safety Hazards Associated with Project Water Feature**. Mitigation Measure 6.8-4 (DEIR, p. 6.8-20 to 6.8-24)
- **Potential for Public Health Hazards from Mosquitoes Associated with Project Water Feature**. Mitigation Measure 6.8-6 (DEIR, p. 6.8-24 to 6.8-26)

Geology & Soils

- **Risks to People and Structures Caused by Seismic Hazards, Including Strong Ground Shaking and Liquefaction.** Mitigation Measure 6.9-1 (DEIR, p. 6.9-11 to 6.9-12)
- **Construction-Related Erosion Hazards.** Mitigation Measure 6.9-2 (DEIR, p. 6.9-13)
- **Potential for Subsidence or Compression of Unstable Soils**. Mitigation Measure 6.9-3 (DEIR, p. 6.9-14)
- **Potential for Damage Associated with Expansive Soils**. Mitigation Measure 6.9-4 (DEIR, p. 6.9-14 to 6.9-15)

Hydrology, Drainage, and Water Quality

- **Construction-related and Operational Water Quality and Erosion Impacts.** Mitigation Measure 6.10-1 (DEIR, p. 6.10-17 to 6.10-19)
- **On-site Flooding Hazard.** Mitigation Measure 6.10-4 (RDEIR, p. 6.10-25 to 6.10-26)

Biological Resources

- **Effects to Giant Garter Snake**. Mitigation Measure 6.12-1 (DEIR, p. 6.12-22 to 6.12-30)
- **Effects to Swainson's Hawk**. Mitigation Measure 6.12-2 (DEIR, p. 6.12.-30 to 6.12-32)
- **Loss and Degradation of Wetlands and Waters of the United States**. Mitigation Measure 6.12-3 (DEIR, p. 6.12-32 to 6.12-34)
- **Disturbance or Removal of Special-status Plant Species.** Mitigation Measure 6.12-4 (DEIR, p. 6.12-34 to 6.12-35)
- **Modifications to Burrowing Owl Habitat**. Mitigation Measure 6.12-5 (DEIR, p. 6.12-35 to 6.12-36.)
- **Effects to Northwestern Pond Turtle.** Mitigation Measure 6.12-6 (DEIR, p. 6.12-36 to 6.12-37)
- **Potential Loss of Loggerhead Shrike Nests.** Mitigation Measure 6.12-8 (DEIR, p. 6.12-37 to 6.12-38)
- **Potential to Conflict with the Natomas Basin Habitat Conservation Plan**. Mitigation Measures 6.12-1, 6.12-2, 6.12-4, 6.12-5, 6.12-6, and 6.12-8 (DEIR, p. 6.12-38)

Cultural Resources

- **Potential Impacts to Undocumented Cultural Resources**. Mitigation Measure 6.13-2 (DEIR, p. 6.13-8 to 6.13-9)
- **Potential to Uncover Human Remains**. Mitigation Measure 6.13-3 (DEIR, p. 6.13-9 to 6.13-10)

LAFCo may also determine that the following significant and unavoidable impacts are outweighed by the benefits of the Sphere Amendment due to overriding considerations:

- **Freeway Mainline Segment Impacts**: (DEIR, p. 6.1-63 to 6.1-65)
- **Cumulative Impacts to Study Area Roadway Segments.** (DEIR, p. 6.1-72 to 6.1-74)
- **Impacts to Freeway Ramps**. Mitigation Measures 6.1-3a, 3b, and 3c (DEIR, p. 6.1-60)
- **Freeway Mainline Segment Impacts**. (DEIR, p. 6.1-63 to 6.1-67)
- **Cumulative Traffic Impacts to Study Area Intersections**. (DEIR, p. 6.1-67 to 6.1-72.)
- **Cumulative Freeway Mainline Segment Impacts**. (DEIR, p. 6.1-80 to 6.1-83)
- **Short Term Construction-Generated Emissions.** Mitigation Measure 6.2-1 (DEIR, p. 6.2-15 to 6.2-19.)
- **Generation of Long-Term Operational (Regional) Emissions ROG, NO_X, and PM_{10}.** Mitigation Measure 6.2-2 (DEIR, p. 6.2-19 to 6.2-22.)
- **Exposure of Sensitive Receptors to Toxic Air Contaminant Emissions**. Mitigation Measure 6.2-4 (DEIR, p. 6.2-24 to 6.2-29.)

- **Long-Term Operational Traffic Noise**. Mitigation Measure 6.3-2 (DEIR, p. 6.3-22 to 6.3-25.)
- **Degradation of Visual Character**. (DEIR, p. 6.7-9 to 6.7-10)
- **Potential for Safety Hazards from Proximity of Airport to Proposed Land Uses**. (DEIR, p. 6.8-18 to 6.8-20.)
- **On-Site Flooding Risk from Potential for Levee or Dam Failure.** (RDEIR, p. 6.10-22 to 6.10-25)

2 LIST OF COMMENTERS

2.1 LIST OF COMMENTERS

A total of 35 comment letters were received on the Draft Environmental Impact Report (DEIR) during the public review period. A list of commenters on the DEIR is found in Table 2-1. Comments were also provided by the public during public meetings held by the Sacramento Local Area Formation Commission. These comments were summarized in the approved commission meeting minutes, which are presented as comment letters 5 through 17, respectively.

A total of 9 comment letters were received on the Recirculated DEIR during the public comment period. No public meetings or hearings were conducted during the recirculation review period; therefore, no oral comments were received on the Recirculated DEIR. A list of commenters on the Recirculated DEIR is provided in Table 2-2.

A total of 4 comment letters were received on the Second Recirculated DEIR during the public comment period. No public meetings or hearings were conducted during the recirculation review period; therefore, no oral comments were received on the Second Recirculated DEIR. A list of commenters on the Second Recirculated DEIR is provided in Table 2-3.

Each letter and comment has a number/number designation assigned for cross-referencing purposes. This list represents all written and oral comments received during the review periods. The comment letters and responses to significant environmental points raised in comments on the DEIR are presented in Chapter 3.0. Comments submitted and responses to significant environmental points raised in comments on the Recirculated DEIR are presented in Chapter 4.0.

Table 2-1
Comment Letters Received on the DEIR

Comment Letter	Commenter	Date
1	U.S. Fish and Wildlife Service, Susan K. Moore, Field Supervisor; California Fish and Game, Sandra Morey, Region Manager	9/5/2006
2	State of California, Office of Planning and Research, Terry Roberts, Director	9/5/2006
3	California Department of Transportation, Office of Transportation Planning - South, Bruce De Terra, Chief	8/31/2006
4	California Reclamation Board, Jay Punia, General Manager	9/5/2006
5	Department of Water Resources, Mike Mirmazaheri, Chief, Floodway Protection Section	9/26/2006
6	LAFCo Public Hearing, Thomas Reavy	8/2/2006
7	LAFCo Public Hearing, Jim Pachl	8/2/2006
8	LAFCo Public Hearing, Jude Lamare	8/2/2006
9	LAFCo Public Hearing, Tom McDonagh	8/30/2006
10	LAFCo Public Hearing, Thomas Foley	8/30/2006
11	LAFCo Public Hearing, Joe Sullivan	8/30/2006
12	LAFCo Public Hearing, Thomas Reavey	8/30/2006
13	LAFCo Public Hearing, Alta Tura	8/30/2006

Table 2-1 Comment Letters Received on the DEIR		
Comment Letter	Commenter	Date
14	LAFCo Public Hearing, Jude Lamare	8/30/2006
15	LAFCo Public Hearing, Tara Hansen	8/30/2006
16	LAFCo Public Hearing, Jim Pachl	8/30/2006
17	LAFCo Public Hearing, Rose Trabalat	8/30/2006
18	LAFCo Public Hearing, Lin Hom	8/30/2006
19	Sacramento County Airport System, Robert Leonard, Airports Chief Operating Officer	8/30/2006
20	Sacramento County Airport System, Monica Newhouse, Airport Noise Program Manager	8/30/2006
21	Sacramento County Airport System, Greg Rowe, Senior Environmental Analyst - Planning and Development	8/29/2006
22	County of Sacramento Department of Transportation, Matthew Darrow, Senior Civil Engineer	7/24/2006
23	Sacramento Metropolitan Air Quality Management District, Jeane Borkenhagen	9/5/2006
24	County Sanitation District 1, Wendy Haggard, Department of Water Quality Development Services	8/18/2006
25	Reclamation District 1000, Paul Devereaux, General Manager/District Engineer	9/5/2006
26	Sacramento Regional Transit, Taiwo Jaiyeoba, Planning Director	9/5/2006
27	Sacramento Regional Community Services District, Wendell Kido	8/23/2006
28	Sacramento County Taxpayers League, Joe Sullivan	09/07/2006
29	James Pachl	9/5/2006
30	Swainson's Hawk Technical Advisory Committee, James Estep, Chair	9/5/2006
31	Save Our Sandhill Cranes, Tara Hansen, Board of Directors	8/8/2006
32	Save Our Sandhill Cranes, Tara Hansen and Sean Wirth, Board of Directors	9/5/2006
33	North Natomas Community Association, Thomas Reavy	9/5/2006
34	William Kopper, MRO Engineers	9/5/2006
35	Bill Farley	9/5/2006

Table 2-2
Comment Letters Received on the Recirculated DEIR

Comment Letter	Commenter	Date
R1	U.S. Fish and Wildlife Service and the California Department of Fish and Game, Susan K. Moore and Sandra Morey	01/17/2007
R2	State of California, Office of Planning and Research, Terry Roberts, Director	7/23/2007
R3	California Department of Transportation, Division of Aeronautics, Sandy Hesnard	12/07/2006
R4	California Department of Transportation, Office of Transportation Planning - South, Bruce De Terra, Chief	01/02/2007
R5	County Sanitation District 1, Department of Water Quality, Development Services; Wendy Haggard	12/11/2006
R6	County of Sacramento Department of Transportation, Matthew Darrow, Senior Civil Engineer	11/21/2006
R7	Sacramento Metropolitan Air Quality Management District, Jeane Borkenhagen	12/29/2006
R8	Sacramento Area Bicycle Association, Walt Seifert	12/27/2006
R9	James Pachl	01/02/2007
R10	Sutter County Community Services Department, Doug Libby, Senior Planner	01/02/2007

Table 2-3
Comment Letters Received on the Second Recirculated DEIR

Comment Letter	Commenter	Date
S1	State of California, Office of Planning and Research, Terry Roberts, Director	05/29/2007
S2	California Department of Transportation, Office of Transportation Planning - South, Bruce De Terra, Chief	05/25/2007
S3	William D. Kopper	05/23/2007
S4	County of Sacramento, Department of Transportation, Jaskamal Singh, Associate Transportation Engineer	07/11/2007

3 MASTER RESPONSES

The following section contains master responses to environmental comment issues raised by multiple commenters for three topics: flooding impacts (Master Response 1), revised traffic modeling (Master Response 2), and disagreement regarding the conclusions of the EIR (Master Response 3). The intent of a master response is to provide a comprehensive response to an issue or set of interrelated issues raised by multiple commenters, so that all aspects of the issue can be addressed in a coordinated, organized manner in one location. Where appropriate, responses to individual comments on these three topics are directed to the master responses. For example, if a comment addresses the flooding analysis addressed by a master response, the response will include the statement, "Please refer to Master Response 1."

3.1 FLOODING IMPACTS IN THE NATOMAS AREA

Several commenters expressed concern regarding the potential flood hazard impacts for the project site in light of developing and new information that became available after the publication of the DEIR (July 2006). Specifically, commenters were concerned that 100-year flood protection would not be available for the project site based on new information regarding the flood-protection status of the Natomas levee system, and that the City and LAFCo would be approving a project that would place housing within a flood hazard area. The response that follows describes the information that was publicly available at the time the DEIR was published, the new information that became available subsequent to its publication, the revisions that were made to the flood hazard evaluation as part of the Recirculated DEIR, the status of on-going flood control projects in the Natomas area, and the City's process for approving projects within the Natomas area.

3.1.1 SUMMARY OF FLOODING ANALYSIS IN DEIR

The DEIR (July 2006) provided a comprehensive evaluation of the project's hydrology and flooding impacts (see Section 4.10, "Hydrology, Drainage, and Water Quality"). The DEIR was prepared based on the most current information publicly available at that time. As described in the DEIR, the project is located in the North Natomas area of the City of Sacramento and is protected by the Natomas levee system including levees along the Sacramento River, American River, Natomas Cross Canal, Natomas East Main Drainage Canal, North Drainage Canal, and West Drainage Canal (see Exhibit 6-10 of the DEIR). The project's flooding impacts were evaluated in Impact 6.10-3 and were determined to be less than significant because the project site was not located in an area mapped by the Federal Emergency Management Agency (FEMA) as a 100-year floodplain. The DEIR did acknowledge that the Sacramento Area Flood Control Agency (SAFCA) had recently completed a draft report (Natomas Levee Evaluation Report, March 2006) that evaluated the stability and the flood protection level of the Natomas levee system in addition to other levee systems in the Sacramento area (see page 6.10-20 of the DEIR). This study concluded that certain portions of the Natomas levee system would be subject to underseepage and erosion hazards during a 100-year flood event; however, at the time of publication of the DEIR the draft report was awaiting review by the California Department of Water Resources (DWR) and the U.S. Army Corps of Engineers (USACE) and had not been finalized.

Because no formal direction had been issued by SAFCA, the USACE, or DWR regarding the certification status and flood protection level of the Natomas levee system at the time of publication of the DEIR, the DEIR concluded that the project would result in a less-than-significant flooding impact because the project site was not located in a 100-year flood plain and thus achieved FEMA standards described above. However, in light of recently available information in the Natomas Levee Evaluation Report, the applicants had agreed to provide mitigation in the event that the flood protection level of the Natomas levee system was changed (i.e., decertified) (see Mitigation Measure 6.10-3 of the DEIR). This mitigation would require the project applicants to implement design measures to raise the building pad elevations of the proposed residences and businesses outside the 100-year flood plain, as identified by FEMA, or participate in a funding mechanism to implement necessary

improvements to provide 100-year flood protection within the Natomas area. While no significant impact was identified, this mitigation measure would be in place in the event that levee decertification occurred.

Subsequent to the publication of the DEIR, SAFCA issued its Final Natomas Levee Evaluation Report on July 14, 2006. This report concluded that considerable improvements would be needed along the south levee of the Natomas Cross Canal, 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 protection and to redesignate the Natomas area to a "low" risk status. While the purpose of the study was to address needed improvements to provide 200-year flood protection, the Final Natomas Levee Evaluation Report also included an evaluation of the Natomas area levees' ability to withstand a 100-year flood event. Based on the results of this study, the USACE issued a letter to SAFCA (dated July 20, 2006) stating it "can no longer support its original position regarding the certification of the levees in the Natomas area." While no official proceedings to decertify the Natomas area levees had occurred by this time, the City and LAFCo decided based on the evidence contained in the Final Natomas Levee Evaluation Report and USACE's letter to SAFCA that there is evidence to suggest that the Natomas area levees did not meet USACE 100-year flood protection criteria. While the original DEIR had included mitigation to address this outcome, it became apparent that with this evidence, a new significant environmental impact would result that was not previously disclosed in the DEIR. Therefore, consistent with the requirements of Section 21083 of the Public Resources Code and CEQA Guidelines Section 15088.5, the City and LAFCo proceeded with the recirculation of the Hydrology, Drainage, and Water Quality Chapter of the DEIR to acknowledge the new significant flood hazard impact. On November 14, 2006 the City and LAFCo distributed the Recirculated DEIR for the Greenbriar Project to public agencies and the public for a 45-day review period.

3.1.2 SUMMARY OF FLOODING ANALYSIS IN THE RECIRCULATED DEIR

The Recirculated DEIR included a revised Section 6.10, "Hydrology, Drainage, and Water Quality." This section primarily addressed the new information that became available regarding the flood protection status of the Natomas levee system since publication of the DEIR and describes the efforts being undertaken by SAFCA to correct existing flood protection deficiencies. As described in the Final Natomas Levee Evaluation Report (July 2006), SAFCA was proceeding with evaluation of the environmental impacts associated with the Natomas Levee Improvement Project (NLIP). The NLIP identifies a program of improvements that would be implemented to correct existing deficiencies in the flood protection system to provide a 200-year level of flood protection. These improvements include raising and strengthening existing levees, controlling seepage through the banks, and stabilizing eroding banks. SAFCA circulated an EIR for the NLIP in November 2006. SAFCA anticipates that the necessary levee improvements would be constructed within the next 2-5 years should funding become available (SAFCA 2007).

Based on the new information contained in the Final Natomas Levee Evaluation Report, the City and LAFCo revised Impact 6.10-3 of the DEIR to address the new potentially significant flood hazard impact. The Recirculated DEIR acknowledged that SAFCA is proceeding with its NLIP and that funding to support implementation of the improvements through State Proposition 1E, Disaster Preparedness and Flood Prevention Bond Act of 2006, was passed in the November 2006 election. The DEIR acknowledged that with implementation of the improvements, superior flood protection (i.e., protection from 200-year storm events) would be provided at the Greenbriar site. However, the site and other Natomas areas would be threatened by potential levee failure associated with the 100-year flood event for an interim time period, until levee improvements are implemented. At the time of publication of the Recirculated DEIR, SAFCA had not formally established a funding program for the improvements (although an assessment district was proposed as part of the NLIP and evaluated in that project EIR). Therefore, because the timing of the improvements could not be assured with any certainty absent the funding program, the Recirculated DEIR concluded that flood hazard impacts would be potentially significant. Further, because the project would contribute to the need for levee improvements to provide 100-year flood protection, the project would also contribute to potentially significant construction-related impacts (e.g., biological and cultural resources impacts, construction-related air quality impacts, and land use

impacts) associated with implementation of the necessary levee improvements (see Impact 6.10-3 of the Recirculated DEIR).

Revised mitigation was recommended in the Recirculated DEIR to address this new potentially significant impact, which required the project applicant to participate in a funding mechanism established by SAFCA for the purpose of implementing levee improvements that would provide no less than 100-year flood protection for the project site. The Recirculated DEIR concluded that with implementation of the levee improvements planned by SAFCA and contributed to by the project applicant (see Mitigation Measure 6.10-3), the project's flood hazard impacts would be less than significant. However, because the timing of completion of the levee improvements could not be guaranteed, the impacts related to on-site flooding risks from potential levee failure would be considered a significant and unavoidable interim impact. Further, the project would contribute to the need for the proposed levee improvements and the potentially significant construction-related impacts associated with their implementation. While SAFCA would implement mitigation to reduce the environmental impacts associated with these improvements, it is unknown whether these impacts can be reduced to a less-than-significant level. Therefore, the project would result in a considerable contribution to the potentially significant and unavoidable impacts associated with construction of the levee improvement that would provide a minimum of 100-year flood protection.

3.1.3 STATUS OF ONGOING FLOOD CONTROL PROJECTS IN THE NATOMAS AREA

Since publication of the Recirculated DEIR, SAFCA certified the EIR for the improvements identified in the NLIP (EIR on Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area) and approved the project in February 2007. SAFCA adopted the plan to establish an assessment district fee program that would fund the necessary flood-control improvements, including the levee improvements identified for the Natomas area. The assessment district and fee program are subject to approval by property owners within the assessment area. In March 2007, SAFCA submitted the Consolidated Capitol Assessment District measure to local property owners for approval. On April 17, 2007, property owners voted to approve (81.8% in support) the measure, which would fund the necessary improvement to provide 200-year flood protection within the Natomas area. SAFCA has indicated that the cost of providing improvements as part of the Natomas Levee Improvement Project (NLIP), which would provide 200-year flood protection along the Natomas area levees would be approximately $414,000,000 (SAFCA 2006). The assessment district will raise $326 million over 30 years. Annual assessments collected from benefiting properties in the new assessment district will generate a maximum of about $18.1 million in fiscal year 2007-08. These assessments will fund SAFCA's share of the cost of the array of improvements to the Sacramento flood control system. SAFCA has applied for a grant from the State of California under the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006, and the Disaster Preparedness and Flood Prevention Bond Act of 2006 for the Natomas Levee Improvement Program. If awarded, this grant would fund the remaining increment needed to fully fund the proposed improvements. SAFCA is currently proceeding with implementation of levee improvements and is anticipated to complete these improvements for 100-year flood protection by 2010 and 200-year flood protection by 2012 (SAFCA 2007). As such, the Greenbriar project site would be expected to have 100-year flood protection by 2010.

3.1.4 CITY OF SACRAMENTO PROCEDURES FOR PROCESSING NEW DEVELOPMENTS IN THE NATOMAS AREA

Some commenters have questioned what, if any, changes would occur in the procedures by which the City of Sacramento would approve development in light of the pending flood-protection status of the Natomas levee system. The City has received a letter from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) indicating that it will be changing the flood status designation for the Natomas Basin and will be preparing a revised Flood Insurance Rate Map (FIRM). This change is a result of the State of California, Department of Water Resources (DWR) notification to FEMA that the Natomas levee system does not meet minimum federal flood insurance program standards for 100-year flood protection. FEMA has indicated

that when flood-control systems no longer meet adequate protection standards from a flood having a 1% chance of being equaled or exceeded in any give year (i.e., 100-year flood), FEMA must revise the FIRM (FEMA 2006).

FEMA intends to revise the FIRM through the Physical Map Revision (PMR) process and will place the Natomas Basin in the Special Flood Hazard Area (SFHA). A preliminary FIRM revision is expected to be issued by summer 2007 with a final FIRM effective date of fall 2007 or winter 2008. As of the publication of this document, FEMA has yet to publish the preliminary FIRM. However, it is expected that FEMA would likely select one of three SFHA designations as described below (FEMA 2007):

- *AE:* Zone AE is the flood insurance rate zone that corresponds to the 1-percent annual event floodplains that are determined through a Flood Insurance Study. Owners of structures within these designated areas are required to purchase flood insurance. New structures developed in these areas must be elevated at least one foot above the base flood elevation.

- *AR*: Zone AR is the flood insurance rate zone used to depict areas protected from flood hazards by flood control structures, such as a levee, that are being restored. FEMA designates these areas if the flood protection system has been determined to be "restorable by a federal agency in consultation with a local sponsor; a minimum level of flood protection is still provided to the community by the system; and restoration of the flood protection system is scheduled to begin within a designated time period. Owners of structures within these designated areas are required to purchase flood insurance. New structures can be developed within this zone as long as the development complies with the Zone AR floodplain management regulations, which requires that new structures in "infill development" areas be elevated at least three feet above the "highest adjacent grade." The highest adjacent grade is the highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

- *A99*: Zone A99 is the flood insurance rate zone that corresponds to areas with the 1-percent annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. Owners of structures within these designated areas are required to purchase flood insurance. There are no development restrictions within this zone.

Different development restrictions would apply depending on the SFHA designation selected. The City through its land use approvals intends to comply with all development restrictions associated with the SFHA designation assigned by FEMA and with its current Floodplain Management Ordinance. The City has also sent a letter to FEMA requesting an A99 flood zone designation (Appendix H of this document). A response from FEMA has not been received as of the publication of this document. With approval of the Greenbriar Project, construction activities could commence only upon receipt of all discretionary permits and approvals from trustee and responsible agencies including approval of the project's Habitat Conservation Plan from the U.S. Fish and Wildlife Service (USFWS). Based on the permits and approvals required for the project, the project applicants anticipate that building permits would not issued before 2010. Therefore, it is anticipated that FEMA will have issued the selected SFHA designation prior to the commencement of any construction activities and that new construction will be governed by the requirements of the designation.

To ensure that development at the project site would comply with the development restrictions associated the selected SFHA designation, the City has replaced the text Mitigation Measure 6.10-3 with the text provided below. This change does not alter the conclusions of the EIR as the mitigation measure provided below provides more effective mitigation to reduce the project's flood hazard impact. This change is also reflected in Chapter 7.0, Corrections and Revisions to the DEIR, Recirculated DEIR, and Second Recirculated DEIR.

PAGE 6.10-24, MITIGATION MEASURE 6.10-3 HAS BEEN REPLACED WITH THE FOLLOWING:

> The following mitigation shall apply in the event that FEMA revises the FIRM and issues a new SFHA designation that indicates the Natomas levees can no longer provide 100-year flood protection

(decertification). The City anticipates that after decertification, but before recertification, FEMA will likely remap the Natomas area (including the Greenbriar project site) as one of three potential SFHA designations: AE, AR, or A99 zone. Each designation prescribes specific building and design requirements for new, above-ground development.

If the Greenbriar project site is remapped by FEMA into an AE, AR, or A99 zone, then:

(1) the City will require development within the project site to comply with all applicable building and design regulations identified by FEMA and by the City of Sacramento's Floodplain Management Ordinance in existence at the date of issuance of building permits pertaining to the applicable remapped zone;

(2) the project applicant shall participate in a funding mechanism such as an assessment district established by SAFCA and/or the City for the purpose of implementing measures that would provide no less than 100-year flood protection for the Greenbriar project site, or for that portion of the Natomas Basin requiring recertification for 100-year flood protection including the Greenbriar project site provided that such funding mechanism is

    i. based on a nexus study;
    ii. is regional in nature;
    iii. is proportionate, fair, and equitable; and
    iv. complies with all applicable laws and ordinances.

(3) the requirements of the applicable FEMA zone and corresponding requirements under the City of Sacramento's Floodplain Management Ordinance shall be met prior to the issuance of building permits for the project. Homeowners within the floodzone shall maintain federal flood insurance, as required under the applicable FEMA and City of Sacramento Floodplain Management Ordinance regulations.

Mitigation measures (1) and (3) shall terminate upon the first recertification of the levees by the U.S. Army Corp of Engineers. Under any of the three SFHA designations (AE, AR, or A99), homebuilders within the floodzone area shall disclose to all prospective buyers, lenders, bondholders and insurers of property through written disclosure, prior to the sale of units, that the U.S. Army Corps of Engineers has determined that the levees protecting the Natomas Basin may not provide flood protection from a 100-year or greater storm event until the levees are recertified as providing 100-year flood protection.

Significance After Mitigation

Implementation of the above mitigation would ensure that all development that occurs at the project site prior to recertification of the Natomas levee system would comply with the development restrictions established for flood hazard areas and would result in a ***less-than-significant*** long-term flooding impact because 100-year flood protection would be provided at the project site. Although there is reasonable certainty that the levee improvements would be in place to provide 100-year flood protection by 2010, depending on the SFHA designation selected for the site, it is possible that some damageable structures and/or homes could be in place prior to implementation of all levee improvements that would provide 100-year flood protection. Should this occur, ***significant and unavoidable*** flood hazard impacts would occur for a short-term period of time. Because the construction of structures and homes would be allowable within FEMA's regulations, no other feasible mitigation would be available.

3.2 MASTER RESPONSE 2 – REVISED TRANSPORTATION AND CIRCULATION ANALYSIS

Several commenters provided comments on the transportation and circulation analysis of the EIR. In some comments, commenters requested that the modeling performed for the analysis include several regional projects. For other comments, specific questions or disagreements with the methodology of the analysis were raised and alternative conclusions drawn based on the commenter's evaluation of the impacts. The following master response describes the traffic analysis provided in the DEIR and the reasons for recirculating the analysis in the Second RDEIR. Where commenters provide specific comments or opinions on the analysis provided in the DEIR, responses are provided following those comments in Chapters 4.0, 5.0, and 6.0 of this document. Where disagreements with the conclusions of the EIR are expressed or alternate analyses offered, the commenter is referred to Master Response 3, "Disagreements with the Conclusions of the EIR."

3.2.1 PREPARATION OF THE SECOND RDEIR

The Transportation and Circulation analysis prepared for the Greenbriar Project provided a comprehensive evaluation the project and cumulative impacts that would occur along local intersections and roadways, freeway interchanges, and freeway mainline segments. This evaluation included the modeling of 4 traffic scenarios: Existing Conditions, Existing Plus Project, Cumulative (2025) Condition, and Cumulative (2025) Plus Project Condition.

Several comments were received on the traffic analysis included within the DEIR. Commenters requested the inclusion of several regional projects into the cumulative traffic modeling for the project. The City and LAFCo determined at that time that because the City's traffic model includes regional growth factors to account for growth outside the City's boundaries, the inclusion of the requested projects into the traffic model would not likely substantially affect the analysis provided in the DEIR. Therefore, the City and LAFCo decided not to recirculate the transportation and circulation section at the time the DEIR was recirculated to address flood hazard and air quality issues. The Recirculated DEIR (RDEIR) was made available to public agencies and the public on November 14, 2006 for a public review period of 45 days.

To confirm that the cumulative regional projects suggested by commenters would not result in any new significant cumulative traffic impacts, the City and LAFCo proceeded to modify the City's traffic model to include the specific traffic assumptions for each of the requested cumulative projects. The results of that analysis became available to the City and LAFCo in February 2007 and revealed that the cumulative traffic scenario would change and would result in the substantial worsening of 3 significant and unavoidable traffic impacts to freeway ramps from the conditions described in the DEIR. As such, in compliance with CEQA, the City and LAFCo decided to prepare a Second RDEIR, focusing on the transportation analysis. The Second RDEIR was made available to public agencies and the public on April 10, 2007 for a public review period of 45 days.

Section 6.1, Transportation and Circulation, of the Second RDEIR provides a detailed accounting of the changes that were made to the transportation analysis in response to comments.

3.3 MASTER RESPONSE 3 - DISAGREEMENT REGARDING THE CONCLUSIONS OF THE EIR

Several commenters expressed their disagreement with the conclusion that the project's impacts would be less than significant for several transportation facilities. The State CEQA Guidelines require that decisions regarding the significance of environmental effects addressed in an EIR be based on substantial evidence and recognize that other evidence suggesting a different conclusion may exist. The DEIR, RDEIR, and the Second RDEIR provide a comprehensive evaluation of the project's environmental impacts in compliance with CEQA and the State CEQA Guidelines and in accordance with professionally accepted methodology for the evaluation of environmental

resources. The DEIR, RDEIR, and Second RDEIR, and this Response to Comments document present substantial evidence to support the conclusions drawn within these documents regarding the significance of the project's environmental effects. When commenters disagree about environmental conclusions, the EIR can acknowledge that disagreement, but it need not resolve all debates. Section 15151 of the State CEQA Guidelines states that: "Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts." The lead agency will ultimately determine which conclusion is appropriate, based on the substantial evidence presented in the EIR and other documents in the whole of the record.

The comment letters and responses to them present summaries of the areas of disagreement. In some cases, there is no substantial evidence offered by commenters to support that a different conclusion should be drawn. As such, no further response to disagreements presented in the comment letters is necessary. If evidence is provided by the commenter to support the disagreement with the EIR's conclusion, the evidence is summarized and considered in reaching the EIR's conclusion. The City and LAFCo will review and consider all the substantial evidence in the whole of the record in making its decisions about the project and its environmental effects.

4 COMMENTS AND RESPONSES ON THE DEIR

The written and oral comments received on the DEIR and the responses to significant environmental points raised in those comments are provided in this section. Each comment letter and the public hearing transcript are reproduced in their entirety and are followed by responses to comments raised in them. Each individual comment is assigned a number (e.g., 1-1) that corresponds with the response following the comment.

1

US Fish & Wildlife Service
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, CA 95825
(916) 414-6600
FAX (916) 414-6712

Department of Fish and Game
Sacramento Valley-Central
Sierra Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670
FAX (916) 358-2912

Tom Buford, Senior Planner
City of Sacramento Environmental Planning Services
2101 Arena Boulevard, Second Floor
Sacramento, California 95834

Subject: Comments on the City of Sacramento's July 2006, Draft Environmental Impact Report for the Proposed Greenbriar Development Project, Sacramento County, California

Dear Mr. Buford:

The U.S. Fish and Wildlife Service (Service) and California Department of Fish and Game (DFG) (hereafter collectively referred to as the Wildlife Agencies) have reviewed the City of Sacramento's (City) July 2006, Greenbriar Development Project Draft Environmental Impact Report (DEIR). The DEIR has been prepared as part of the City's consideration of the Greenbriar proposal (proposed project), which would include the construction of 3,473 housing units (consisting of low, medium and high density housing), approximately 28 acres of retail and commercial development, a 10-acre elementary school, an approximately 39-acre common water feature, and eight neighborhood parks totaling approximately 49 acres. The proposed project area totals approximately 577 acres and is north of the existing City limits. The project area is located within the Natomas Basin Habitat Conservation Plan (NBHCP; City of Sacramento *et al.* 2003) Area; however, it is outside the City's Incidental Take Permit (ITP) area in northern unincorporated Sacramento County, approximately one mile east of the Sacramento International Airport. The project site is bounded by Interstate 5 to the south, Highway 99/70 to the east, the Metro Air Park (MAP) development to the west, and Elkhorn Boulevard to the north.

1-1

The project would result in impacts to up to 577 acres of giant garter snake (GGS) habitat, and direct and indirect impacts could include the loss of individuals, displacement of snakes, increased contamination of habitat, predation by domestic and feral animals, effects related to human encroachment, and road mortality. The DEIR discusses a proposed conservation strategy that includes preserving approximately 30.6 acres along the Lone Tree Canal (which would be a 2,650-foot-wide corridor that includes the canal and 200 feet of adjacent uplands), to be protected and managed in perpetuity as GGS habitat. Included in the proposed conservation strategy in the DEIR is a proposal to preserve, restore, and manage approximately 204.2 acres of GGS habitat at two off-site locations, including approximately 190 acres of managed marsh

1-2

habitat at the Spangler Property and approximately 14.2 acres of managed marsh habitat at the Natomas 130 Property. In addition to approximately 59.5 acres of upland associated with the managed marsh, an additional 47.3 acres of agricultural and riparian would be dedicated for Swainson's hawk (SWH) habitat. 1-2 Cont'd

The Effects Analysis and proposed conservation strategy in the DEIR were created with little input from the Wildlife Agencies and have not been evaluated by the Wildlife Agencies to determine their consistency with Federal and State Endangered Species Act requirements or their effects on the efficacy of the NBHCP. The Wildlife Agencies twice previously submitted to the City letters stating our concerns with the proposed project. The Wildlife Agencies met with the City on June 6, 2006, to further explain our concerns. A summary of these letters and meetings follows. 1-3

Background Summary

The Wildlife Agencies submitted a July 29, 2005, joint comment letter to the City in response to the Notice of Preparation (NOP) of a Draft Environmental Impact Report for the Greenbriar Project. The letter noted that if approved, the proposed project would result in a loss of up to 577 acres of habitat beyond that anticipated, analyzed and covered for take under the City's permit and would constitute a significant departure from the NBHCP's Operating Conservation Program. Additionally, in accordance with the NBHCP's Implementation Agreement, prior to approval of any rezoning or prezoning for the proposed project, the City is required to conduct a reevaluation of the NBHCP and ITPs, prepare a new effects analysis, revise or amend the NBHCP and ITPs, and develop an Environmental Impact Statement, or develop a separate conservation strategy and obtain separate ITPs to address such additional development. We noted that as part of the effects analysis, the full impact of such development on the efficacy of the NBHCP's carefully designed conservation strategy to minimize and mitigate the impacts of take of the Covered Species associated with a maximum of 17,500 acres of development within the Natomas Basin must be thoroughly analyzed and a conservation strategy that adequately addresses the increased impacts to the Covered Species resulting from additional loss of the limited habitat remaining in the basin is also required prior to authorization of any additional take. This effects analysis would need to evaluate if baseline conditions and assumptions used in the original analysis are still accurate. 1-4 1-5

On September 7, 2005 Judge Levi issued a decision in the Federal NBHCP litigation, which cautioned in footnote 13 of that decision that "the Service and those seeking an ITP in the future will face an uphill battle if they attempt to argue that additional development in the Basin beyond the 17,500 acres will not result in jeopardy" to GGS and SWH. Judge Levy's opinion considered the effects of the current trend of fallowing rice agriculture lands in the basin to facilitate potential further urban development.

On March 21, 2006, the Wildlife Agencies issued a second joint comment letter to the City in response to the City's December 2005, Analysis of Effects on the Natomas Basin Habitat Conservation Plan Report, which was prepared as part of the City's consideration of the proposed 1-6

Greenbrier development project. In this letter, the Wildlife Agencies discussed our concerns about the proposed project's effects on the GGS, SWH, and other Covered Species with regards to 1) connectivity among reserve lands and among the three major geographic areas in the Natomas Basin, and 2) the eroding baseline of agricultural lands, and rice farming, in particular, resulting both from current economic conditions and the cumulative effects of other reasonably foreseeable development in the basin. We specifically identified how the City's December 2005 document failed to adequately address the impacts of the proposed project on the NBHCP's Operating Conservation Program and also failed to analyze the proposed project in light of changes in land use since the approval of the NBHCP and reasonably foreseeable land use changes. 1-6 Cont'd

Finally, on June 6, 2006, the Wildlife Agencies met with representatives of the City to discuss the Greenbrier project. In this meeting, the Wildlife Agencies expressed concern and disappointment at the City's decision to release the DEIR without adequate input and review by the Wildlife Agencies. A July 7, 2006, telephone conference call between the representatives of the Wildlife Agencies and the City reviewed many of the topics from the June 6, 2006 meeting. 1-7

Conclusion

Based on our review of the DEIR, we reiterate our concerns, expressed previously in our letters and meetings with the City, that DEIR does not adequately address the impacts of the proposed project on the NBHCP's Operating Conservation Program. Please see our March 21, 2006, letter, enclosed. 1-8

Further, the Wildlife Agencies have not evaluated the Effects Analysis in the DEIR to determine its consistency with Federal and State Endangered Species Act requirements or its effects on the efficacy of the NBHCP. Such review will occur during the development of either a new HCP for Greenbrier, an amendment to the existing NBHCP, or a new HCP for the Natomas Basin. The City will be required to obtain a new ITP from the Wildlife Agencies, authorizing incidental take of State- and Federally-listed threatened and endangered species beyond what was permitted in the existing NBHCP. Until our review is completed, we are unable to determine the adequacy of the mitigation and conservation proposal reflected in the Effects Analysis. However, the Wildlife Agencies recognize that the proposal likely represents the minimum of mitigation and conservation measures that may be required for the development of the proposed project. 1-9

Pursuant to Public Resources Code Sections 21092 and 21092.2, the DFG requests written notification of proposed actions and pending decisions regarding this project. Written notifications should be directed to the DFG Sacramento Valley/Central Sierra Region, 1701 Nimbus Road, Suite A, Rancho Cordova, California 95670. The Service also requests written notification regarding any actions on the proposed project. Notification can be submitted to the Service at the letterhead address. 1-10

Thank you for the opportunity to review this project. As the Wildlife Agencies have repeatedly stated in correspondence and in person, we are concerned about the effects of the proposed project on the efficacy of the NBHCP and the City's existing ITPs. The DIER does not 1-11

adequately address the effects of the proposed project on the GGS, in particular, and more generally, on the NBHCP's Operating Conservation Program. Future development in the basin will require a new conservation strategy that is developed with input and review from the Wildlife Agencies, to address these impacts. We remain committed to working with the City to preserve the benefits of the NBHCP and to ensure that any future development in the basin adequately protects the GGS, SWH and other Covered Species. 1-11 Cont'd

Please contact Holly Herod, the Sacramento Valley Branch Chief, or Kelly Fitzgerald of the Service at (916) 414-6645, of the Service and Jenny Marr, Staff Environmental Scientist, at (530) 895-4267, or Kent Smith, Acting Assistant Regional Manager, at (916) 358-2382, of the DFG if you have any questions or concerns regarding this letter.

Sincerely,

Susan K. Moore
Field Supervisor
U.S. Fish and Wildlife Service

Sandra Morey
Region Manager
California Department of Fish and Game

Enclosure

cc:
Larry Combs, Administrator, County of Sutter
(Attn: Board of Supervisors), County of Sacramento
John Roberts, The Natomas Basin Conservancy
Kent Smith, Department of Fish and Game Region 2
Jenny Marr, Department of Fish and Game Region 2

Literature Cited

City of Sacramento, Sutter County, Natomas Basin Conservancy, Reclamation District No. 1000, and Natomas Mutual Water Company (NBHCP). 2003. Final Natomas Basin Habitat Conservation Plan. Sacramento, California: Prepared for the U. S. Fish and Wildlife Service and CDFG. April.

US Fish &Wildlife Service
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, CA 95825
(916) 414-6600
FAX (916) 414-6712

Department of Fish and Game
Sacramento Valley-
Central Sierra Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670
FAX (916) 358-2912

MAR 2 1 2006

Tom Buford, Associate Planner
City of Sacramento Planning Division
1231 I Street, Room 300
Sacramento, California 95814

Subject: Comments on the City of Sacramento's December 2005, Analysis of Effects on the Natomas Basin Habitat Conservation Plan Report

Dear Mr. Buford:

The U.S. Fish and Wildlife Service (Service) and California Department of Fish and Game (DFG) (hereafter collectively referred to as the Wildlife Agencies) have reviewed the City of Sacramento's (City) December 2005, Analysis of Effects on the Natomas Basin Habitat Conservation Plan Report (Report). The Report has been prepared as part of the City's consideration of the Greenbriar proposal (proposed project), which would include the construction of 3,723 housing units (consisting of low, medium and high density housing), approximately 30 acres of retail and commercial development, an 11.3 acre elementary school, an approximately 41 acre common water feature, and eight neighborhood parks totaling approximately 59 acres. The proposed project area totals approximately 577 acres north of the existing City limits. The project area is located within the Natomas Basin Habitat Conservation Plan (NBHCP) Area, and outside the City's Incidental Take Permit (ITP) area in northern unincorporated Sacramento County, approximately one mile east of the Sacramento International Airport. The project site is bounded by Interstate 5 to the south, Highway 99/70 to the east, the Metro Air Park (MAP) development to the west, and Elkhorn Boulevard to the north.

As our discussion below further explains, the Report does not adequately address the impacts of the proposed project on the NBHCP's operating conservation program. In particular, the Report does not include a comprehensive and meaningful analysis of the proposed project's effects on the giant garter snake (GGS), Swainson's hawk (SWH) and other Covered Species with regards to 1) connectivity among reserve lands and among the three major geographic areas in the Natomas Basin, and 2) the eroding baseline of agricultural lands, and rice farming, in particular, resulting both from current economic conditions and the cumulative effects of other reasonably foreseeable development in the basin.

Background

The Wildlife Agencies submitted a July 29, 2005, joint comment letter to the City in response to the Notice of Preparation (NOP) of a Draft Environmental Impact Report for the Greenbriar Project. The letter noted that if approved, the proposed project would result in a loss of up to 577 acres of habitat beyond that anticipated, analyzed and covered for take under the City's permit and would constitute a significant departure from the NBHCP's Operating Conservation Program. Additionally, in accordance with the NBHCP's Implementation Agreement, prior to approval of any rezoning or prezoning for the proposed project, the City is required to conduct a reevaluation of the NBHCP and ITPs, a new effects analysis, a potential amendment and/or revisions to the NBHCP and ITPs, or a separate conservation strategy and issuance of ITPs to the City to address such additional development. As part of the effects analysis, the full impact of such development on the efficacy of the NBHCP's carefully designed conservation strategy to minimize and mitigate the impacts of take of the Covered Species associated with a maximum of 17,500 acres of development within the Natomas Basin must be thoroughly analyzed. A conservation strategy that adequately addresses the increased impacts to the Covered Species resulting from additional loss of the limited habitat remaining in the basin is also required prior to authorization of any additional take. This effects analysis would need to evaluate whether baseline conditions and assumptions used in the original analysis are still accurate.

Further, on September 7, 2005 Judge Levi issued a decision in the federal NBHCP litigation, which cautioned in footnote 13 of that decision that "the Service and those seeking an ITP in the future will face an uphill battle if they attempt to argue that additional development in the Basin beyond the 17,500 acres will not result in jeopardy" to GGS and SWH. Judge Levy's opinion considered the effects of the current trend of fallowing rice agriculture lands in the basin to facilitate potential further urban development.

Potential Impacts of the Proposed Project on the Natomas Basin Habitat Conservation Plan

As previously noted, the effectiveness of the NBHCP's Operating Conservation Program is explicitly premised upon the City's commitment to limit total development to 8,050 acres within the City's Permit Area, and Sutter County's commitment to limit total development to 7,467 acres within Sutter County's Permit Area. These commitments are outlined in Sections I.B.2.a and I.B.2.b of the NBHCP and Section 3.1.1 of the NBHCP's Implementation Agreement. Section 3.1.1(a) provides that if either the City or Sutter County approves urban development beyond that considered in the NBHCP within the Natomas Basin or outside of their respective Permit Areas, the approval would constitute a significant departure from the NBHCP's Operating Conservation Program. The City and Sutter County agreed that in the event this future urban development should occur, then prior to approval of any related rezoning or prezoning, such future urban development shall trigger a reevaluation of the NBHCP and ITPs, a new effects analysis, potential amendments and/or revisions to the NBHCP and ITPs, a separate conservation strategy and issuance of ITPs to the City and/or Sutter County for that additional development, and/or possible suspension or revocation of the City's or Sutter County's ITPs in the event either jurisdiction violates such limitations. In addition to suspension or revocation of the City's and/or Sutter's permits, violation of the provisions limiting development, which is

the City's and/or Sutter's permits, violation of the provisions limiting development, which is incorporated by reference as a Term and Condition under Condition E of the jurisdictions' ITPs, would subject the offending jurisdiction to potential civil and criminal penalties under Section 11 of the Act. Additional penalties would apply under State law.

Potential Impacts of the Proposed Project on Connectivity in the Natomas Basin

The Natomas Basin is currently divided into three major areas relative to the movement of obligate wetland and aquatic species: a northwestern zone situated north of Interstate 5 and west of Highways 70 and 99; a southwestern zone situated south of Interstate 5 and west of Highways 70 and 99; and an eastern zone located east of Highways 70 and 99 (Brode and Hanson 1992). These roadways are effective barriers to the movements of aquatic species such as GGS; the movement of snakes between geographic areas has been reduced to a small number of culverts connecting those areas. These culverts, though not ideal, likely provide the only hydrologic connectivity between the Basin's three geographic areas. The western edge of the northwestern and southwestern zones is bordered by the Sacramento River, likely itself a barrier to GGS and other wetland dependent terrestrial species. The eastern zone is bordered on the east by the Natomas East Main Drainage Canal (Steelhead Creek) and farther east, by increasingly less-suitable (upland and higher gradient stream) habitat for GGS. Each of these areas contains important habitat for the giant garter snake, including Prichard Lake and the North Drainage Canal in the northwestern zone, Fisherman's Lake in the southwestern zone, and "Snake Alley" (North Main Canal and associated rice fields) in the eastern zone. The proposed Greenbriar site is located within the northwestern zone, at the intersection of all three zones.

The importance of maintaining connectivity corridors for the NBHCP's Covered Species is a key underlying theme of the April 2003, Final Natomas Basin Habitat Conservation Plan (City et al. 2003). The NBHCP's 0.5:1 mitigation ratio is, in part, justified by the plan's commitment to maintain connectivity between the Natomas Basin Conservancy's (TNBC) reserves and surrounding agricultural lands (NBHCP, p. IV-8), as well as connectivity between the three main geographic areas of the Natomas Basin. The plan repeatedly emphasizes the need to ensure connectivity between TNBC reserves in order to minimize habitat fragmentation and species isolation (NBHCP, p. I-16). For example, a primary goal of the NBHCP is to "ensure connectivity between individual reserves, and connectivity between reserves and surrounding agricultural lands", and the NBHCP's "conservation strategy emphasizes maintaining connectivity between TNBC reserves to allow giant garter snake movement within the Natomas Basin" (NBHCP, p. IV-8). Maintenance of connectivity corridors is extremely important for GGS to allow individuals of this species to access areas of suitable habitat and to sustain genetic interchange throughout the basin (NBHCP, p. II-15). Prior to acquisition of wetland reserves, TNBC must demonstrate that reserve lands to be acquired are hydrologically connected to suitable habitat and other reserve lands (NBHCP, p. IV-22). TNBC must reassess connectivity corridors within and between reserves annually (NBHCP, p. VI-16). Maintaining connectivity corridors is essential. If suitable habitat cannot be accessed by GGS or other covered species because of limited connectivity, then the overall baseline for the species in the Natomas Basin will decline.

Tom Buford, Associate Planner
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The primary opportunity for connectivity for the GGS in the Natomas Basin is the basin's system of irrigation and drainage canals and ditches (NBHCP, p. IV-8). The Lone Tree Canal, which is located along the western edge of the proposed project site, is a particularly significant connectivity corridor for GGS, and individuals of this species have been observed using the canal on numerous occasions. As indicated in Figure 17 of the NBHCP (City et al. 2003), the Lone Tree Canal represents one (and we believe the most significant) of only a few possible corridors to allow the movement of GGS between TNBC's managed marsh and rice reserves to the north and south of Interstate 5 (I-5). Of the other two possible movement corridors, the North Drain is surrounded on both sides by urban development (i.e., Sacramento International Airport and the approved MAP project) and the West Drainage Canal is disconnected from other hydrologic features north of I-5 (Natomas Basin Conservancy 2005). Based upon the above information, the effects analysis falls short of evaluating the potential impacts of the proposed project on the ability of GGS to move within and between TNBC's reserve lands and surrounding agricultural lands.

Annual biological monitoring of GGS in 2004 and 2005 (Jones and Stokes 2004, 2005), south of I-5 resulted in troublingly low numbers of this species, suggesting that further isolation through compromised connecting habitat may lead to a loss of this segment of the basin's population. This portion of the giant garter snake's population in the basin, faced with further isolation, is increasingly more important because of the potential for genetic isolation. If snakes are not able to move between this area and other areas of the basin, they may become genetically isolated, or, in the worst case, extirpated, in the southwestern geographic area.

The absence of an adequate buffer could severely limit the utility of the Lone Tree Canal as a major connectivity corridor in the basin. The 2004 NBHCP Giant Garter Snake Monitoring Report (Jones and Stokes 2005) identified the Lone Tree Canal as likely the most important connectivity corridor for GGS. The effects analysis should include an analysis of an alternative in which an increased upland buffer is provided between the proposed project and the Lone Tree Canal. The City's December 2005 Report contains conflicting language regarding the proposed width of the buffer, stating variously that development will occur within 250 feet of the canal (p. 4-6) and that the conservation easement will provide a 200 foot wide setback from the high water line of Lone Tree Canal and the development (p. 4-7). The NBHCP includes a land area buffer of at least 250 feet width between residential development and Fisherman's Lake (NBHCP, p. V-2). The Wildlife Agencies believe that 250 feet, extending from the edge of the canal outward, is the minimum acceptable size for a buffer between Lone Tree Canal and the proposed project site. Further analysis of the effects of the proposed project, the baseline of GGS, and other information may indicate the need for a buffer larger than 250 feet.

The Wildlife Agencies strongly recommend an analysis of designing the proposed project so that the storm water run-off detention basin is situated adjacent to the Lone Tree Canal at the edge of the proposed buffer. This site design would provide an additional buffer to protect GGS from the proposed project's human related disturbance effects.

Additionally, the Report proposes to record a 30.6 acre conservation easement along Lone Tree Canal (p. 4-7) as one of the measures that will "likely offset the project's effects on GGS movement". We request clarification regarding the language describing this mitigation. The

Report states that "[f]unding will be provided by the project applicant to cover the cost of inspections and maintenance in perpetuity"; and that the conservation lands will be transferred to TNBC reserve system for the management in perpetuity (p. 6-14). The acceptance of additional conservation lands by TNBC is at the discretion of their Board of Directors which must first determine that TNBC can effectively assume management of additional lands beyond the total calculated in their financial model and endowment securities. At minimum, the acceptance of lands and presumably a canal conservation easement would require a dedication of an endowment land management fee to be determined by the TNBC.

The Wildlife Agencies are concerned about the speculative language describing the potential conservation easement on the Lone Tree Canal. We understand that the management of the operation and maintenance of this canal is under the directive of the Natomas Mutual Water Company (NMWC) whose principle charge consists of maintenance of the structural efficiency of the water delivery canals throughout the basin. A conservation easement designed to provide for the conservation of GGS, as well as the Western pond turtle, another Covered Species, would likely conflict with current management mandates of the NMWC. Given that the proposed project would impinge on this canal and that findings in the 2004 NBHCP Monitoring Report (Jones and Stokes 2005) confirm the importance of this canal for GGS, additional measures may be necessary to protect this corridor for GGS. Although protecting Lone Tree Canal with a conservation easement may have merits conceptually, unless NMWC agrees to subordinate its management easement, the proposed vegetated Lone Tree Canal snake benches and supplemented water (from wells) may not produce high quality habitat in perpetuity, and, thus, this measure will not likely achieve the desired conservation benefits asserted.

Lastly, the proposed project notes that in the near future, Elkhorn Blvd, along the site's northern border, will be expanded from two lanes to a six lanes to accommodate traffic generated by MAP and other developments (p. 6-14). This expansion will result in a modification to the culvert drainage system under the roadbed which may result in a modification of flows into the Lone Tree Canal along the proposed project. Discussion as to whether this potential effect was analyzed in the Metro Air Park Habitat Conservation Plan (MAPHCP) as part of that project's infrastructure impacts is needed; however, the connectivity of canals in the basin is already restricted by high velocity flows in the culverts under the I-5 crossing of the Lone Tree Canal such that giant garter snakes may have difficulty moving north from the southernmost population unit. The additional effects of the Elkhorn road expansion on water flows and velocity and habitat connectivity may further negatively effect snake mobility and movement resulting in a significant adverse change in connectivity in the basin. Extension and widening of Elkhorn Boulevard may impede the movement of GGS from south to north (and vice versa) across Elkhorn Boulevard, because GGS will need to pass under Elkhorn Boulevard via a culvert. GGS may exhibit reluctance to use culverts in close proximity to urban development if inadequate minimization measures (*e.g.*, buffers, emergent vegetation near the culverts, larger culverts) are provided. Impinging connectivity at Elkhorn Boulevard could further reduce movement of snakes between the northwestern and southwestern geographic areas. Impacts to connectivity would result in increased impacts to the taking of GGS, thereby, necessitating a very different conservation strategy and additional conservation measures and mitigation.

Tom Buford, Associate Planner
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Failure to Analyze Proposed Project in Light of Changes in Land Use since Approval of NBHCP and Reasonably Foreseeable Future Land Use Changes

The effects analysis should consider potential changes in land use (*e.g.*, agricultural production) due to factors such as potential changes in operations of Sacramento International Airport Lands and costs of agricultural water. Changes in land use affects the species' baseline habitat, which in turn affects the impacts of the taking of the species and necessitates a very different conservation strategy. The greater the impact of the taking, the greater the likelihood that different and increased mitigation may be warranted. For example, a complete analysis of the change in baseline habitat may lead to a determination that the applicant needs to mitigate at a 2:1 or 3:1 or ever higher ratio to meet the conservation needs of the species affected. It may also result in requiring that preserves be established in very specific locations with the basin.

The analysis fails to consider the potential indirect and cumulative impacts on the NBHCP's Covered Species. In August 2005, Jenny Marr of DFG provided Ellen Berryman with a list of possible future projects in the basin to be considered for inclusion in the effects analysis and the proposed project EIR. The following is a list of possible future projects that may represent reasonably foreseeable cumulative development in the basin. The City should provide an update of the status of each of the below projects and any other projects in the Basin that are under active consideration, and assess whether or not the impacts of the projects may be considered cumulative to the proposed project. If they are deemed cumulative, the effects of the proposed project may be considerably greater in light of these potential land use changes, and result in increased conservation needs for the Covered Species in the basin.

Possible future projects in the Natomas Basin:

- Natomas Fish Screen Replacement Project
- Natomas Levee Setback Project
- Sacramento Area Flood Control Levee Upgrade Project
- Sacramento River Water Reliability Study Project
- Sacramento Metropolitan Airport Expansion Project
- Sacramento Metropolitan Airport Master Management Plan
- Joint Vision Project
- Downtown to Natomas Rail Light rail Transportation Project
- Sacramento Municipal Utility Substation Expansion Projects (numerous)

Finally, the Report does not adequately address the potential effects on GGS resulting from farming adjacent to urban or residential development. Rice farming typically involves the aerial application of seed and herbicides. This aerial application of materials may conflict with adjacent residential development. For example, farmers or their contractors could have difficulty obtaining insurance to cover their operations in close proximity to residential development. The proposed project has historically been and is currently bordered to the north by rice fields. Therefore, the City should analyze the potential effects of the proposed project on adjacent agricultural uses.

Conclusion

On December 10, 2002, the County and City each approved a Memorandum of Understanding (MOU) that outlined a vision for land use and revenue sharing principles for lands in the Natomas Basin. This "Joint Vision" MOU designated the City as the agent for development and the County as the agent of permanent open space protection in the Natomas Basin. Based upon our understanding of the "Joint Vision" MOU, the City and County intend to work collaboratively to affect further land use changes in the Natomas Basin. The Wildlife Agencies encourage the City and County to pursue an amendment to the NBHCP that focuses on the Joint Vision, rather than pursuing an amendment for Greenbriar, and then an amendment for the Joint Vision.

Pursuant to Public Resources Code Sections 21092 and 21092.2, the DFG requests written notification of proposed actions and pending decisions regarding this project. Written notifications should be directed to the DFG Sacramento Valley/Central Sierra Region, 1701 Nimbus Road, Suite A, Rancho Cordova, California 95670. The Service also requests being informed regarding any actions on the proposed project. Written notification can be submitted to the Service at the letterhead address.

Thank you for the opportunity to review this project. As the Wildlife Agencies have previously stated in correspondence and in person, we are concerned about the effects of the proposed project on the efficacy of the NBHCP and the City's existing ITPs. The Report does not adequately address the effects of the proposed project on the GGS, in particular, and more generally, on the NBHCP's operating conservation program. Future development in the basin will likely require a new conservation strategy to address these impacts, and will necessitate the preparation of an Environmental Impact Statement/Environmental Impact Report pursuant to the National Environmental Policy Act and California Environmental Quality Act, respectively. We remain committed to working with the City to preserve the benefits of the NBHCP and to ensure that any future development in the basin adequately protects the GGS, SH and other covered species.

Please contact Ken Sanchez, Assistant Field Supervisor, at (916) 414-6622 or Holly Herod, the Service's Sacramento Valley Branch Chief, at (916) 414-6645 and Jenny Marr, DFG Staff Environmental Scientist, at (530) 895-4267, or Kent Smith, DFG Acting Assistant Regional Manager, at (916) 358-2382 of the DFG if you have any questions or concerns regarding this letter.

Sincerely,

Susan K. Moore
Acting Field Supervisor
U.S. Fish and Wildlife Service

Sincerely,

Sandra Morey
Region Manager
California Department of Fish and Game

Literature Cited

Brode, J. and G. Hansen. 1992. Status and future management of the giant garter snake (*Thamnophis gigas*) within the southern American Basin, Sacramento and Sutter Counties, California. Rancho Cordova, California: California Department of Fish and Game, Inland Fisheries Division. 26 pp.

City of Sacramento, Sutter County, Natomas Basin Conservancy, Reclamation District No. 1000, and Natomas Mutual Water Company (NBHCP). 2003. Final Natomas Basin Habitat Conservation Plan. Sacramento, California: Prepared for the U. S. Fish and Wildlife Service and CDFG. April.

Jones and Stokes, Inc. 2004. Natomas Basin Habitat Conservation Plan Area, 2003 Annual Survey Results.

_____. 2005. Natomas Basin Habitat Conservation Plan Area, 2004 Annual Survey Results.

Natomas Basin Conservancy. 2005. Implementation Annual Report on pursuant to the Implementation Agreement for the 2003 Natomas Basin Habitat Conservation Plan. Appendix F: Biological effectiveness Monitoring Program. Sacramento, California: Prepared for the U. S. Fish and Wildlife Service and CDFG. May.

LETTER 1

US Fish and Wildlife Service
Susan K. Moore, Field Supervisor
California Fish and Game
Sandra Morey, Region Manager
September 5, 2006

1-1 The comment describes the project and does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

1-2 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

1-3 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

1-4 The City and LAFCo are in receipt of the joint comment letter from the US Fish and Wildlife Services (USFWS) and California Department of Fish and Game (DFG) on the Notice of Preparation for the DEIR (dated July 29, 2005). The City and LAFCo addressed the scoping requests provided in that letter through the preparation of the DEIR (dated July 2006) and the *Analysis of Effects on the Natomas Basin Habitat Conservation Plan* report (dated July 19, 2006) ("effects analysis"). The purpose of the effects analysis (included in Appendix P of the DEIR) was to provide an evaluation of the project's potential effects on each species covered by the Natomas Basin Habitat Conservation Plan (NBHCP), on specific conservation measures, and on the project's ability to attain the NBHCP's goals and objectives as a result of implementing the proposed project. The effects analysis concludes that the project, with the proposed mitigation for impacts to giant garter snake and Swainson's hawk, would not reduce the viability of populations of covered species using the Natomas Basin and would not reduce the effectiveness of the conservation strategy of the NBHCP. It also would have only minimal effects on the likelihood of attaining any of the goals and objectives of the NBHCP, and for most of these goals and objectives the overall effect would be neutral or beneficial.

1-5 The comment states that the City must revise or amend the NBHCP and ITPs and develop an Environmental Impact Statement prior to approval of any rezoning or prezoning for the proposed project. This is not the City's interpretation of the requirements set forth in the NBHCP. The City, LAFCo, and the applicant have met with staff of USFWS and the Department of Fish and Game consistently since February 2007 to attempt to resolve this issue. The agencies and the applicant have agreed to a process wherein a new HCP will be prepared and ITPs secured prior to any ground-disturbing activities occurring at the project site. See City's letter to USFWS and DFG date March 19, 2007 included in Appendix A of this document.

Development of the Greenbriar site was not analyzed in the NBHCP and therefore is not covered by the NBHCP incidental take permits ("ITPs") issued to the City by the USFWS or by the DFG (jointly referred to as the "Agencies"). The Agencies entered into an implementation agreement (IA) with the City, Sutter County, and the Natomas Basin Conservancy to effectuate the NBHCP.

The language in the IA establishing the prerequisites for City approval of development not covered by the NBHCP, such as Greenbriar, are as follows:

> Because the effectiveness of NBHCP's Operating Conservation Program is based upon CITY limiting total development to 8,050 acres within the CITY's Permit Area, and SUTTER limiting total development to 7,467 acres within SUTTER's Permit Area, approval by either the CITY or SUTTER of future urban development within the Plan Area or outside of their respective Permit Areas would constitute a significant departure from the Plan's Operating Conservation Program. Thus, CITY and SUTTER further agree that in the event this future urban development should occur, prior to approval of any related rezoning or prezoning, such future urban development shall *trigger* a reevaluation of the Plan and Permits, a new effects analysis, potential amendments and/or revisions to the Plan and Permits, a separate conservation strategy and issuance of Incidental Take Permits to the permittee for that additional development, and/or possible suspension or revocation of CITY's or SUTTER's Permits in the event the CITY or SUTTER violate such limitations. (NBHCP IA § 3.1.1(a)(emphasis added.).)

Similar language appears throughout the NBHCP. (*See e.g.*, I-3, I-12 and I-27.)

The project applicant has prepared a conservation strategy, has assisted the City in completing an effects analysis, and is seeking project-specific ITPs from the Service based on a stand-alone HCP. The *Analysis of Effects on the Natomas Basin Conservation Plan Report* ("Effects Analysis") was completed as part of the CEQA review process. Among its conclusions are: (1) that Greenbriar, as mitigated, is consistent with the existing NBHCP conservation strategy; (2) that Greenbriar is not an appropriate reserve location and is not needed to achieve applicable conservation goals; and (3) that development of Greenbriar will not jeopardize the continued existence of any species covered by the NBHCP.

Under subsection 3.1.1(a), the City must delay prezoning of new development until enumerated activities have been triggered. "Trigger" is defined as and is synonymous with "initiate," "activate," or "set off." Merriam-Webster Online, http://www.m-w.com. It does not include the concept of "completion of that which has been triggered." Prezoning of Greenbriar can proceed prior to completion of the activities triggered in subsection 3.1.1(a).

To date, the City or the Applicant has initiated all of the activities "triggered" by subsection 3.1.1(a) in a fairly substantial manner. The biological analysis was conducted to identify the potential impacts of development and conservation strategies for avoiding, minimizing and mitigating those impacts. This information has been integral to development of an appropriate conservation strategy. Based on the results of the biological analysis, no amendment to the NBHCP is needed. The Greenbriar HCP, a stand-alone HCP for the project, now in the development stage but substantially drafted, will be submitted to the Service in order to obtain a project-specific ITP. Consultation meetings with the USFWS and DFG have been initiated as part of the HCP preparation process. The Greenbriar HCP will be consistent with the prior analysis and the mitigation set out in the DEIR report for the project, and will include any additional mitigation, if additional mitigation is required, resulting from the completion and approval of the HCP. Coordination with TNBC will further reinforce the compatibility of the applicant's mitigation strategy with the NBHCP model.

The project applicants are preparing a separate HCP for the project, which will be subject to review and approval by the USFWS and DFG. The preparation of the HCP is proceeding independently of the EIR. However, the EIR has fully evaluated the project’s potential

impacts to sensitive biological resources as documented in Section 6.12, "Biological Resources," of the DEIR.

The City and LAFCo have complied with the requirements of the NBHCP's implementation agreement. This process has been discussed with the USFWS and DFG, in response to this comment and as part of the HCP consultation, and both agencies concur that the interpretation included herein is correct (see letter from City of Sacramento to USFWS and DFG dated March 19, 2007 in Appendix A). Further, both agencies concur that the approval process can more forward without full completion of the HCP, so long as the final approval that entitles development to proceed on the site is not granted until after approval of the HCP. This final approval has been interpreted to be a grading permit, or any other permit that would be the final approval prior to modification of site habitat.

Although incidental take would not occur until grading of the site occurs, issuance of the ITPs/amendments will be required prior to final map approval by the City of Sacramento to ensure that any adjustments to the subdivision map approvals (e.g., changes in site design) resulting from the HCP/ITP process occur prior to recordation of a final map (see Mitigation Measure 6.12-1 of the DEIR).

It is important to note that the project has certain unique attributes that will minimize its effects in ways not considered by the NBHCP. For example, the project applicant has proposed a preservation and conservation strategy for habitat along Lone Tree Canal, and has submitted those plans to USFWS and CDFG for consideration. As described therein and summarized in Impact 6.12-1 and 6.12-9, the proposed buffer would meet habitat and species requirements to maintain connectivity for species along the canal to the north and south of the project site. The 250 foot buffer provides an aquatic connection not previously contemplated by the NBHCP.

Further, the project has been designed to be consistent with the principals of the Sacramento Area Council of Governments (SACOG) Preferred Blueprint plan, which is a vision for growth in the Sacramento region that promotes compact, mixed-use development and more transit choices as an alternative to low density development. The objectives of the project have been established to "create a transit-oriented, pedestrian-friendly development" and "develop the project site in a manner consistent with and supportive of SACOG's Blueprint plan."

In addition, the Greenbriar project will support development of the Downtown-Natomas-Airport (DNA) light rail line, which would expand transit service from downtown Sacramento and the airport and promote patterns of smart growth while minimizing environmental impacts. According to Dr. Beverly Scott, the Greenbriar station's 1,162 boardings would put the station within RT's top quarter in terms of transit utilization.

Because of these unique advantages of the project, the City has allowed the applicants to proceed with the process for obtaining entitlements ahead of other potential development in the North Natomas Joint Vision area.

1-6 The commenter re-summarizes comments provided on an earlier draft of the effects analysis prepared for the project. The City and LAFCo submitted to USFWS a draft of the *Analysis of Effects on the Natomas Basin Habitat Conservation Plan* report (dated December 2005) for review and comment. Comments were received from USFWS and responses to those comments were incorporated into a revised effects analysis (dated July 19, 2006), which was incorporated into the DEIR. Each of USFWS's comments regarding connectivity, baseline,

and conservation were adequately addressed in the July, 2006, effects analysis. Comments based on the earlier effects analysis are no longer applicable and, therefore, no further response to this comment can be provided.

The effects analysis was revised in response to the Wildlife Agencies' comments on the City's October 2005 document. In particular, additional analysis was conducted and text summarizing the analysis was added to the effects analysis regarding effects on the NBHCP's Operating Conservation Program (5.0 Potential effects on the Conservation Strategy of the NBHCP, pages 5-1 to 5-5), cumulative effects (7.0 Cumulative effects, pages 7-1 to 7-9), and changes from the NBHCP's baseline conditions that have occurred in the Natomas Basin (Appendix B, pages B-1 to B-4).

1-7 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

1-8 The comment does not raise any issues related to the environmental analysis conducted in the DEIR; therefore, no further response is necessary.

1-9 Under the proposed conservation strategy, Greenbriar will provide on-site and off-site habitat for the federally and state-listed Giant garter snake. In addition, Greenbriar will preserve and enhance habitat for the state-listed Swainson's hawk at off-site locations in order to mitigate the effects of the proposed development. Mitigation for Greenbriar will be coordinated through TNBC using a financial model similar to that for the NBHCP. Once prepared, the project-specific HCP will be reviewed by TNBC and the City prior to submission to the Service for ITPs. All properties proposed for preservation will be identified prior to prezoning. The agencies maintain the discretion to increase the amount of the proposed mitigation; however, mitigation lands identified in the DEIR would adequately mitigate project impacts consistent with the requirements of CEQA.

The City and LAFCo acknowledge that the USFWS and DFG have not completed their review of the effects analysis that was included in the DEIR, and that the agencies will conduct a comprehensive review of the project's proposed mitigation program at the time the HCP for the project is submitted, and that USFWS and DFG view the effects analysis as the minimum mitigation and conservation measures required for the HCP (see also response to comment 1-5).

1-10 Written notification regarding proposed actions and pending decisions related to the Greenbriar project will be provided to the DFG and USFWS.

1-11 Please refer to response to comments 1-5, 1-6, and 1-7. The project's effects on Giant garter snake habitat are thoroughly analyzed in Impact 6.12-1 (please refer to Section 6.12, "Biological Resources" of the DEIR"). Further Reevaluation of the NBHCP is provided in Appendix P, "Analysis of Effects on the Natomas Basin Habitat Conservation Plan Report," of the DEIR. See also response to comment 1-4.

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Sean
Dir

2

September 5, 2006

Tom Buford
City of Sacramento
North Permit Center, 2101 Arena Blvd., Second Floor
Sacramento, CA 95834

Subject: Greenbriar Development Project
SCH#: 2005062144

Dear Tom Buford:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. The review period closed on September 1, 2006, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. 2-1

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2005062144
Project Title Greenbriar Development Project
Lead Agency Sacramento, City of

Type EIR Draft EIR

Description The proposed project would amend the City's sphere of influence to include the 577-acre project site, annex the site to the City and result in detachment from other districts, and would construct a residential and commercial mixed use development on the site.

Lead Agency Contact

Name Tom Buford
Agency City of Sacramento
Phone (916) 808-7931 **Fax**
email
Address North Permit Center, 2101 Arena Blvd., Second Floor
City Sacramento **State** CA **Zip** 95834

Project Location

County Sacramento
City
Region
Cross Streets Elkhorn Boulevard and Highway 99
Parcel No. 225-0800-002,-003,-004,-015to-018,-021to-038
Township **Range** **Section** **Base**

Proximity to:

Highways SR 99, I-5
Airports Sacramento Int'l
Railways
Waterways
Schools
Land Use Agriculture (AG-80)

Project Issues Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Flood Plain/Flooding; Geologic/Seismic; Minerals; Noise; Population/Housing Balance; Public Services; Schools/Universities; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife; Growth Inducing; Cumulative Effects; Landuse; Aesthetic/Visual

Reviewing Agencies California Highway Patrol; Department of Water Resources; Department of Fish and Game, Region 2; Department of Health Services; Department of Housing and Community Development; Native American Heritage Commission; Office of Emergency Services; Department of Parks and Recreation; Regional Water Quality Control Bd., Region 5 (Sacramento); Resources Agency; Caltrans, Division of Aeronautics; Caltrans, District 3; Department of Toxic Substances Control; Office of Historic Preservation

Date Received 07/19/2006 **Start of Review** 07/19/2006 **End of Review** 09/01/2006

LETTER 2

State of California
Office of Planning and Research
Terry Roberts
September 5, 2006

2-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

DEPARTMENT OF TRANSPORTATION
DISTRICT 3 – SACRAMENTO AREA OFFICE
VENTURE OAKS – MS 15
P.O. BOX 942874
SACRAMENTO, CA 94274-0001
PHONE (916) 274-0614
FAX (916) 274-0648
TTY (530) 741-4509

3

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August 31, 2006

06SAC0113
03-SAC-99 PM 33.180
Greenbriar Annexation
Draft Environmental Impact Report
SCH#2005062144

Mr. Tom Buford
City of Sacramento
2101 Arena Boulevard, Second Floor
Sacramento, CA 95834

Mr. Don Lockhart
Sacramento Local Agency Formation Commission (LAFCO)
1112 I Street, Suite 100
Sacramento, CA 95814

Dear Mr. Buford and Mr. Lockhart:

Thank you for the opportunity to review and comment on the Draft Environmental Impact Report (DEIR) for the Greenbriar Annexation project. The proposed project includes a request for a Sphere of Influence amendment for the City of Sacramento. Resulting development within the 577 acre project area is anticipated to include 3,473 housing units, approximately 28 net acres of retail and commercial space, one 10-acre elementary school site, eight neighborhood parks, and an overpass over State Route (SR) 99. The project is immediately adjacent to the Interstate 5 (I-5)/SR 99 interchange. Our comments are as follows: 3-1

- It is noted that mitigation measures 6.1-3b, 6.1-3c, 6.1-3d are provided to reduce impacts to freeway ramps to a less than significant level. 3-2

- It is noted that significant impacts to the mainline State Highway System are considered unavoidable because "no feasible mitigation is available". The Department disagrees with these findings and requests a meeting to discuss potential mitigation measures. 3-3

- The Department requests a meeting to discuss the Traffic Impact Study's assumptions and findings, specifically the mainline volumes, ramp volumes, and Trip Table 6.1-20. We believe that there are significant discrepancies in the data. 3-4

- It is noted that mitigation measure 6.10-1 is provided to reduce hydrologic impacts to a less than significant level. 3-5

- The Department is planning to widen I-5 and SR 99 and reconstruct the interchange of those highways. Additional through lanes and auxiliary lanes will be added. It is likely that the highways will be widened so as to create new freeway lanes closer to the proposed project. We would like to meet with the City and Sacramento LAFCO to discuss the potential footprint of the new highway facilities. 3-6

- The Department is concerned with the location of the proposed elementary school because of its close proximity to I-5, SR 99, and the interchange of these two highways. The school site runs contrary to the California Department of Educations School Site Selection Criteria and Approval Guide, specifically the section relating to Proximity to Major Roadways, since it should be assumed that explosives, gasoline, chlorine, and other hazardous materials are transported by truck on both I-5 and SR 99. Additionally, the school site appears to breach the recommended roadway setback of 1,500 ft (when gasoline, etc. is transported) or 2,500 ft (when explosives are transported). 3-7

If you have any questions about these comments or to schedule the requested meeting please contact Alyssa Begley at (916) 274-0635.

Sincerely,

BRUCE DE TERRA, Chief
Office of Transportation Planning—South

cc: Jim Calkins
Sandy Hesnard
Wayne Lewis
Tom Neumann
Terri Pencovic
Jim Philipp
Jeff Pulverman

LETTER 3

California Department of Transportation
Office of Transportation Planning - South
Bruce De Terra, Chief
August 31, 2006

3-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

3-2 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

3-3 The commenter requested to meet with the City and LAFCo regarding the conclusions of the DEIR. A meeting between the staff of the City, and LAFCo, Caltrans, and the project applicant was held on October 13, 2006. The meeting centered on the issue of mitigation, noting that there is currently no fee program in place to mitigate impacts to freeways in the City of Sacramento. Though Caltrans staff did not agree with all of the assumptions and data used in conducting the traffic study for the EIR analysis, Caltrans accepted the traffic study.

Subsequent to that meeting, the City and LAFCo issued the Second RDEIR (see Master Response 2), which included some changes to the traffic analysis. In response to the Second RDEIR, Caltrans again requested a meeting to discuss feasible mitigation options for the project's impacts to regional highway facilities. A meeting between the staff of the City, LAFCo, and Caltrans was held July 27, 2007. At that meeting, Caltrans acknowledged (1) it does not have a mitigation fee program established for the specific mitigation identified for I-5 and SR 70/99 in the EIR and clarified that it is not the responsibility of Caltrans to establish such a fee program; (2) it (or Caltrans) has identified costs for improvements to certain facilities along these highways (such as costs for certain on/off ramps and interchanges), and (3) that detailed cost estimates to improve the main lines of these highways have not been prepared because the projects have not yet entered the project development phase. In response, the applicant has agreed to pay the project's fair-share contribution for improvements to on-/off-ramps and other similar facilities. This agreement to pay its fair share is discussed in separate responses below and in responses to other Caltrans comments (see, particularly, response to comment letter S2). The appropriate mitigation measures have been amended to include this fair share contribution obligation.

It is important to note that the mainlines of I-5 and SR 70/99 would be affected primarily by traffic originating not from Greenbriar but from other projects in the City and County of Sacramento, Placer County, and Sutter County, as well as pass through traffic from increased development throughout California and interstate travel and commerce. While no overall regional fee program has been established to collect fees from these various jurisdictions and apply them to needed I-5 and SR 70/99 mainline improvements, individual projects are providing mitigation for their impacts to this facility and discussions are underway with Sutter and Placer Counties regarding comprehensive mitigation programs for developments in those areas. Though it is not feasible for Greenbriar to completely resolve an intra regional, multi-jurisdictional traffic level of service (See CEQA Guidelines, Section 15126.4, subd. (a)(4)(A) [stating there must be an essential nexus between the mitigation measure and a legitimate governmental interest] and subd. (a)(4)(B) [stating the mitigation measure must be "roughly proportional" to the impacts of the project]), Greenbriar will contribute its proportional share to needed projects. Therefore, it is essential that all development projects in the region

participate in providing transportation system mitigations for local roads, bicycle and pedestrian facilities, transit, and highways and that the Sacramento Region use these mitigation contributions to leverage other state and federal funding sources to fully fund needed transportation projects. Prior to constructing a facility, Caltrans must first complete engineering and environmental review. Based on the cumulative traffic impact analysis prepared for the EIR, it is clear the proposed project would contribute some trips to the total 2025 traffic that would use these facilities.

Total fair share costs of the mainline improvements would clearly be insufficient to fund the identified improvements in the absence of an overall program and funding strategy on the part of the State agency. The City confirmed with Caltrans, however, that the City would identify and implement mitigation to the extent feasible that would help improve congestion on these main lines of travel. The City has, for example, worked in cooperation with Regional Transit in implementing planning and construction of the Downtown-Natomas-Airport Light Rail Transit line (DNA line) by providing right-of-way for the line and ridership that would help fund the line, and funding for the construction of the transit station. These contributions for construction of the DNA line and project ridership that would help fund its operation would facilitate implementation of the alternative transportation system. Regional Transit would ultimately be responsible for securing federal, state, and local funding and constructing the line and Regional Transit has publicly supported the proposed project through issuance of three letters (see Appendix B of this document)**.** If the DNA line is built, it would remove traffic from I-5, SR 70/99, and additionally from I-80. As described in the Greenbriar DEIR, the DNA line would be expected to reduce traffic originating from Greenbriar, including trips on I-5 and SR 70/99, by an estimated 11%, which is approximately 1,985 weekday trips (see DEIR Table 6.1-20). While this assumption was revised in the subsequent analysis (Second RDEIR), the City's commitment to development of the DNA Line is based on substantial evidence that the availability of public transit would remove trips from Caltrans facilities, an assumption that Caltrans shares.

The DNA line would also reduce congestion from other non Greenbriar sources on I-5 (primarily), SR 70/99, and I-80. According to the DNA Draft Alternatives Analysis Report (2003), the DNA line is expected to transport as many as 1,200 persons per hour during its peak hour of operation and will reduce weekday peak period auto travel to Downtown Sacramento by 4,700 daily trips. By comparison, traffic volumes on I-5 in 2025 will range upwards to around 19,000 peak hour trips (both directions). The large number of people traveling during peak hour in this corridor to access jobs in Downtown demonstrates the need to have a variety of transportation mode choices, including the DNA line, highway improvements and express bus services. Given that the DNA line will parallel I-5, it would likely reduce congestion on I-5, as well as reducing traffic on SR 70/99. A funding mechanism for a portion of the DNA line construction costs has been established by the City, including the collection of fees from development in the North Natomas Community Plan area and land dedications for the light rail alignment and stations.

Recognizing the importance of the DNA line in reducing traffic congestion and improving mobility and air quality by providing alternative transit opportunities, the City of Sacramento, as co-lead agency for the Greenbriar project, has directed developers in the North Natomas area to focus mitigation efforts on projects that would result in regional congestion relief and incentives for reduction of trips. One of the regional congestion relief projects that the City is supporting is the funding of the DNA line. Other projects could include contribution to freeway ramps, interchange facilities, bus/carpool lanes to Sacramento International Airport,

parallel roads, and overpass connections that act as "relievers" to the mixed flow lanes on I-5 within the Natomas area.

At the July, 27, 2007 meeting, the City, LAFCo, the project applicants, and Caltrans discussed the project's impacts to regional freeway facilities, the possible improvements that would be needed to address regional congestion along these facilities as set out in the DEIR and Second RDEIR, and the project's fair-share contribution toward funding such potential improvements along the mainline freeway segments that would serve the project area. A summary of the project's fair-share contribution to these improvements is provided in Appendix C of this document. In total, the project's fair-share contribution would be $1,135,904 (see Exhibit D of Appendix C) for funding of potential mainline improvements. Although the City has not conducted a formal nexus study to support collection of fees for the Traffic Congestion Relief Program, the applicant is willing to pay such fair share contribution voluntarily pursuant to the terms of the development agreement. While Caltrans has administrative processes in place that enable Caltrans to receive and hold such funds for the future highway mitigation projects, the City will establish a "Traffic Congestion Relief Fund" to collect monies to fund projects that would reduce mainline freeway congestion to provide flexibility to fund a variety of transportation improvements. The City, in consultation with Caltrans and other transportation agencies including Regional Transit, will allocate the monies for appropriate congestion relief projects. At the July 27, 2007 meeting and through subsequent correspondence (see Appendix B of this document), Caltrans concurred with this approach for the mitigation program established for the project, as long as the highway projects remain eligible for consideration in choosing the projects that will actually be implemented.

Caltrans has acknowledged that alternative transit modes, including the DNA line, serve to reduce traffic on main line freeways (see comment S2-13). Caltrans suggested that with increased alternative transit modes (e.g., bus, light rail), the number of trips on freeways in the project area could be reduced, thereby reducing congestion. Based on discussions with Caltrans, it was agreed that a fair-share contribution towards the Traffic Congestion Relief Program to be established by the City, in addition to the foregoing description of project contributions, would provide the applicant's "fair share" towards mitigation to reduce freeway congestion and offset the project's impacts to regional highway facilities. However, because the Traffic Congestion Relief Program projects have not been identified, it was recognized that this mitigation would not reduce the project's impacts to regional freeway facilities to a less-than-significant level because 100 % funding for the DNA line and possible other freeway congestion relief programs have not yet been fully identified. Therefore the impact remains significant and unavoidable as described in the Second RDEIR.

Several traffic mitigation measures within the Second RDEIR have been rewritten to reflect that the City will establish a Traffic Congestion Relief Fund and the project applicant will contribute to the fund in order to reduce the project's impacts to mainline freeway congestion The text provided below has been modified from that presented in the Second RDEIR. These changes are also presented in Chapter 7, "Corrections and Revisions to the DEIR, RDEIR, and Second RDEIR." These changes would not alter the conclusions of the EIR.

Project Traffic Impacts, Page 6.1-65 of the Second DEIR has been modified as follows:

Mitigation Measure 6.1-3c: I-5 Northbound to SR 70/99 Northbound off-ramp: Fair-Share Contribution to the City's Traffic Congestion Relief Fund (City of Sacramento and Caltrans)

a. Prior to issuance of any building permits, the City will establish a Traffic Congestion Relief Fund to fund over all congestion relief projects.

b. Upon the City's issuance of any building permit for the project, the project applicant shall pay its fair-share contribution to the City's Traffic Congestion Relief Fund. Monies collected within the City's fund will be used by the City in the time and manner as required by the City of Sacramento, in coordination with Caltrans and other transportation agencies including Regional Transit, to fund improvements that would relieve freeway congestion. As determined in consultation with Caltrans and RT, the project's fair-share contribution for all feasible (project and cumulative) mainline freeway improvements would be $1,135,904.

The project applicant shall contribute its fair share amount in the City's Traffic Congestion Relief Fund. The City's Traffic Congestion Relief Fund will be used to implement projects that would reduce mainline freeway congestion. However, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and funding for such improvements has not been identified. Therefore, for purposes of CEQA, this impact would remain ***significant and unavoidable***.

~~Widening I-5 Northbound to SR 70/99 Northbound off-ramp to provide an additional lane is required to mitigate this impact. With implementation of this mitigation measure, this freeway ramp would operate at LOS D. Caltrans District 3 Draft DSMP does not include adding a lane to the existing two-lane on-ramp for SR 70/99 southbound to I-5 southbound by the year 2010. To implement this mitigation measure, additional right-of-way would be required and is not currently available. Additionally, this improvement is not included in any of Caltrans' funding mechanisms. Because this mitigation measure is beyond the control of the project applicant, outside the jurisdiction of the City, and there is no established funding mechanism available for contribution, this mitigation measure is considered infeasible and the impact is considered ***significant and unavoidable***.~~

Page 6.1-65 of the Second RDEIR has been modified as follows:

Significance After Mitigation

With implementation of the above mitigation measures, 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 Caltrans jurisdiction).~~ While the project would contribute funds to implement measures that would fully mitigate impact to this ramp to a less-than-significant level, it is unknown whether these measures would be implemented prior to buildout of the project because they are not subject to the exclusive control of the City. As a result, for purposes of CEQA impact to SR 70/99 Northbound to Elkhorn Boulevard off-ramp (Impact 6.1-3b) would remain ***significant and unavoidable.***

For the I-5 Northbound to the SR 70/99 Northbound off-ramp, the project applicant would contribute to the City's Traffic Congestion Relief Fund. While mitigation is recommended that would require the project applicant to contribute to the City's Traffic Congestion Relief

Fund, this mitigation (the Fund) does not provide quantifiable actual reduction in the number of project-related trips on the I-5 Northbound to the SR 70/99 Northbound off-ramp. Therefore, impacts to the I-5 Northbound to SR 70/99 Northbound off-ramp would remain ***significant and unavoidable.***

~~Further, no feasible mitigation is available to reduce the project's impacts to 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 to these ramps are considered ***significant and unavoidable***.~~

Project Traffic Impacts, Page 6.1-65 of the Second RDEIR has been modified as follows:

Mitigation Measure 6.1-4b: I-5 North of Del Paso Road (City of Sacramento and Caltrans)

a. The project applicant shall implement Mitigation Measure 6.1-3c.

b. Upon the City's issuance of any building permit for the project, the project applicant shall pay its fair-share contribution to the City's Traffic Congestion Relief Fund. This contribution has been previously identified within the fair-share funds calculated for Mitigation Measure 6.1-3c. Monies collected within the City's fund will be used by the City in the time and manner as required by the City of Sacramento, in coordination with Caltrans and other transportation agencies including Regional Transit. The City's Traffic Congestion Relief Fund will be used to implement projects that would reduce mainline freeway congestion. However, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and funding for such improvements has not been identified. Therefore, for purposes of CEQA, this impact would remain ***significant and unavoidable***.

~~Because this mainline segment of I-5 currently operates unacceptably, the only mitigation that could improve the operating conditions of this segment during peak conditions would be the widening of this segment of I-5 mainline to eight lanes (currently six lanes). While widening of I-5 would improve the operating conditions of this mainline segment to acceptable conditions, Caltrans currently has no plans to expand this segment of I-5 beyond its current capacity nor are any funding mechanisms established to collect monies to fund improvements such as this. Further, because of the developing nature of properties to the east and west of I-5, additional right-of-way is not available for the expansion of this freeway segment. Because no feasible mitigation is available to reduce the project's impacts to this mainline segment, this impact would remain ***significant and unavoidable***.~~

Mitigation Measure 6.1-4c: I-5 north of I-5/I-80 Interchange between I-80 and Arena Boulevard Exit (City of Sacramento and Caltrans)

a. The project applicant shall implement Mitigation Measure 6.1-3c.

b. Upon the City's issuance of any building permit for the project, the project applicant shall pay its fair-share contribution to the City's Traffic Congestion Relief Fund. This contribution has been previously identified within the fair-share funds calculated for Mitigation Measure 6.1-3c. Monies will be deposited within the City's fund in the time and manner as required by the City of Sacramento, in coordination with Caltrans and other transportation agencies including Regional Transit. The City's Traffic Congestion Relief Fund will be used to implement projects that would reduce mainline freeway

congestion. However, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and funding for such improvements has not been identified. Therefore, for purposes of CEQA, this impact would remain ***significant and unavoidable***.

~~Because this mainline segment of I-5 currently operates unacceptably, the only mitigation that could improve the operating conditions of this segment during peak conditions would be the widening of this segment of I-5 mainline to eight lanes (currently six lanes). While widening of I-5 would improve the operating conditions of this mainline segment to acceptable conditions, Caltrans currently has no plans to expand this segment of I-5 beyond its current capacity nor are any funding mechanisms established to collect monies to fund improvements such as this. Further, because of the developing nature of properties to the east and west of I-5, additional right-of-way is not available for the expansion of this freeway segment. Because no feasible mitigation is available to reduce the project's impacts to this mainline segment, this impact would remain ***significant and unavoidable***.~~

Project Traffic Impacts, Page 6.1-67 of the Second RDEIR has been modified as follows:

Mitigation Measure 6.1-4e: SR 70/99 between Elkhorn Boulevard and I-5/SR 70/99 Interchange (City of Sacramento)

a. The project applicant shall implement Mitigation Measure 6.1-3c.

b. Upon the City's issuance of any building permit for the project, the project applicant shall pay its fair-share contribution to the City's Traffic Congestion Relief Fund. This contribution has been previously identified within the fair-share funds calculated for Mitigation Measure 6.1-3c. Monies will be deposited within the City's fund in the time and manner as required by the City of Sacramento, in coordination with Caltrans and other transportation agencies including Regional Transit. The City's Traffic Congestion Relief Fund will be used to implement projects that would reduce mainline freeway congestion. However, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and funding for such improvements have not been identified. Therefore, for purposes of CEQA, this impact would remain ***significant and unavoidable***.

~~Because this mainline segment of SR 70/99 currently operates unacceptably, the only mitigation that could improve the operating conditions of this segment during peak conditions would be the widening of this segment of SR 70/99 mainline to six lanes (currently 4 lanes) between Elkhorn Boulevard and Elverta Road. While widening of SR 70/99 would improve the operating conditions of this mainline segment to acceptable conditions, Caltrans currently has no plans to expand this segment of SR 70/99 beyond its current capacity nor are any funding mechanisms established to collect monies to fund improvements such as this. Because no feasible mitigation is available to reduce the project's impacts to this mainline segment, this impact would remain ***significant and unavoidable***.~~

Significance After Mitigation

While mitigation may become available in the future to reduce the project's impacts to freeway mainline segments, this project would not have sole responsibility for implementing these improvements. The project applicant shall contribute its fair share amount in the City's

Traffic Congestion Relief Fund. Monies will be deposited within the City's fund in the time and manner as required by the City of Sacramento. This contribution has been previously identified within the fair-share funds calculated for Mitigation Measure 6.1-3c. The City's Traffic Congestion Relief Fund will be used to implement projects that would reduce mainline freeway congestion. However, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and funding for such improvements has not been identified. Therefore, impacts to the freeway mainline segments (I-5 north of Del Paso Road, I-5 north of I-5/I-80 Interchange between I-80 and Arena Boulevard Exit and SR 70/99 between Elkhorn Boulevard and I-5/SR 70/99 Interchange) would remain ***significant and unavoidable***.

~~Because no feasible mitigation is available to reduce the project's impacts to study area freeway segments, impacts to I-5 north of Del Paso Road, I-5 north of I-5/I-80 Interchange between I-80 and Arena Boulevard Exit and SR 70/99 between Elkhorn Boulevard and I-5/SR 70/99 Interchange freeway segments would remain ***significant and unavoidable***.~~

Cumulative Traffic Impacts, Page 6.1-78 of the Second RDEIR has been modified as follows:

Mitigation Measure 6.1-7b: I-5 Northbound to SR 70/99 Northbound off-ramp (City of Sacramento and Caltrans)

a. The project applicant shall implement Mitigation Measure 6.1-3c.

b. Upon the City's issuance of any building permit for the project, the project applicant shall pay its fair-share contribution to the City's Traffic Congestion Relief Fund. This contribution has been previously identified within the fair-share funds calculated for Mitigation Measure 6.1-3c. Monies will be deposited within the City's fund in the time and manner as required by the City of Sacramento, in coordination with Caltrans and other transportation agencies including Regional Transit. The City's Traffic Congestion Relief Fund will be used to implement projects that would reduce mainline freeway congestion. However, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and funding for such improvements has not been identified. Therefore, for purposes of CEQA, this impact would remain ***significant and unavoidable***.

~~The project applicant shall coordinate with Caltrans to pay its fair share toward widening the off-ramp to provide an additional lane. This measure would be subject to Caltrans' requirements and Caltrans determining through a feasibility evaluation that this measure could be implemented. It is unknown at this time whether sufficient right-of-way is available to accommodate this improvement. Further, widening of the off ramp is not included in Caltrans' District 3 Draft District System Management Plan (DSMP) and Caltrans does not have any funding mechanisms in place to implement this improvement. Furthermore, widening the off ramp would require additional right-of-way that is not is not subject to the control of the City or the project applicant. It is unknown at this time whether this mitigation would be feasible and, if feasible, whether Caltrans would be able to secure sufficient right-of-way and funding to implement this improvement. Therefore, for purposes of CEQA, this impact would remain ***significant and unavoidable.***~~

Cumulative Traffic Impacts, Page 6.1-78 of the Second RDEIR has been modified as follows:

Significance After Mitigation

While mitigation recommended would require the project applicant to contribute its fair share amount toward the City's Traffic Congestion Relief Fund, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and full funding for such improvements have not been identified. As a result, for purposes of CEQA, cumulative impacts to these ramps would be considered ***significant and unavoidable***.

~~With implementation of the above mitigation measures, SR 70/99 Northbound to Elkhorn Boulevard off-ramp and the I-5 Northbound to SR 70/99 Northbound off- 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 to 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 to these ramps would be considered ***significant and unavoidable***.~~

While mitigation may be feasible for the I-5 Northbound to Metro Air Parkway off-ramp and the Metro Air Parkway to I-5 Southbound loop on-ramp, this mitigation would not be able to reduce the impact of the project to a less-than-significant level. These ramps would continue to operate at LOS F and no other feasible mitigation is available. Therefore, cumulative impacts to this ramp would remain ***significant and unavoidable.***

Cumulative Traffic Impacts, Pages 6.1-81 and 6.1-82 of the Second RDEIR have been modified as follows:

Mitigation Measure 6.1-8a: I-5 east of Power Line Road to the MAP Interchange (City of Sacramento and Caltrans)

a. The project applicant shall implement Mitigation Measure 6.1-3c.

b. Upon the City's issuance of any building permit for the project, the project applicant shall contribute its fair share toward ~~Because this mainline segment of I-5 would operate unacceptably under Cumulative No Project conditions,~~ widening this segment to six ~~eight~~ lanes (currently four lanes). This mitigation would improve the operating conditions of this segment during peak conditions to an acceptable LOS. The Caltrans' District 3 DSMP includes adding an HOV lane to I-5 by the year 2020 and according to the Metro Air Park Finance Plan, this segment of I-5 would be upgraded to six lanes with buildout of the Metro Air Park project. Therefore, before recordation of the first map, the project applicant shall, in coordination with the City, prepare a City Council-approved Finance Plan. This funding mechanism shall be in conformance with the Draft Greenbriar Finance Plan presented in Appendix C of the DEIR. This funding mechanism shall ensure that the project applicant will pay their fair-share costs, determined in consultation with the City and in coordination with the Metro Air Park Finance Plan, toward the widening of I-5 to six lanes. ~~No other right-of-way is available to widen this segment to eight lanes. The Draft Greenbriar Finance Plan identifies 100% of the funding needed to construct this improvement. Additional right-of-way to accommodate the expansion of this freeway segment~~

~~beyond six lanes is not available because of the developing nature of properties to the east and west of I-5.~~ While expansion of this freeway segment would reduce the project's cumulative traffic impacts to this freeway segment, it would not reduce the project's cumulative impact to a less-than-significant level because ~~widening to eight lanes is not feasible~~ 100% funding has not been identified. ~~No other feasible mitigation is available to reduce this impact.~~ Therefore, while reduced, this impact would remain ***significant and unavoidable***.

Mitigation Measure 6.1-8b: I-5 north of Del Paso Road (City of Sacramento and Caltrans)

a. The project applicant shall implement Mitigation Measure 6.1-3c.

b. Upon the City's issuance of any building permit for the project, the project applicant shall contribute its fair share amount in the City's Traffic Congestion Relief Fund. This contribution has been previously identified within the fair-share funds calculated for Mitigation Measure 6.1-3c. Monies will be deposited within the City's fund in the time and manner as required by the City of Sacramento, in coordination with Caltrans and other transportation agencies including Regional Transit. The City's Traffic Congestion Relief Fund will be used to implement projects that would reduce mainline freeway congestion. However, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and funding for such improvements have not been identified. Therefore, for purposes of CEQA, this impact would remain ***significant and unavoidable***.

~~Widening this segment of I-5 mainline to twelve lanes (currently six lanes) would improve the operating conditions of this segment during peak conditions to an acceptable LOS. The Caltrans District 3 DSMP includes adding an HOV lane to I-5 by the year 2020 but no funding mechanism for this project is defined. No other freeway expansion projects are planned for this segment of I-5. Further, because of the developing nature of properties to the east and west of I-5, additional right-of-way is not available for the expansion of this freeway segment. Because no feasible mitigation is available to reduce the project's impacts to this mainline segment, this impact would remain ***significant and unavoidable***.~~

Mitigation Measure 6.1-8c*:* I-5 north of I-5/I-80 Interchange between I-80 and Arena Boulevard Exit (City of Sacramento and Caltrans)

a. The project applicant shall implement Mitigation Measure 6.1-3c.

b. Upon the City's issuance of any building permit for the project, the project applicant shall contribute its fair share amount in the City's Traffic Congestion Relief Fund. This contribution has been previously identified within the fair-share funds calculated for Mitigation Measure 6.1-3c. Monies will be deposited within the City's fund in the time and manner as required by the City of Sacramento, in coordination with Caltrans and other transportation agencies including Regional Transit. The City's Traffic Congestion Relief Fund will be used to implement projects that would reduce mainline freeway congestion. However, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and funding for such improvements have not been identified. Therefore, for purposes of CEQA, this impact would remain ***significant and unavoidable***.

~~Because this mainline segment of I-5 would operate unacceptably under Cumulative No Project conditions, widening this segment of I-5 mainline to twelve lanes (currently six lanes) would improve the operating conditions of this segment during peak conditions to an acceptable LOS. The Caltrans District 3 DSMP includes adding an HOV lane to I-5 by the year 2020 but no funding mechanism for this project is available. No other freeway expansion projects are planned for this segment of I-5. Further, because of the developing nature of properties to the east and west of I-5, additional right-of-way is not available for the expansion of this freeway segment. Because no feasible mitigation is available to reduce the project's impacts to this mainline segment, this impact would remain ***significant and unavoidable***.~~

Significance After Mitigation

While mitigation recommended would require the project applicant to contribute its fair share amount in the City's Traffic Congestion Relief Fund, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and full funding for such improvements have not been identified. Therefore, cumulative impacts to the freeway mainline segments (I-5 east of Power Line Road to the MAP Interchange, I-5 north of Del Paso Road, I-5 north of I-5/I-80 Interchange between I-80 and Arena Boulevard Exit) would remain ***significant and unavoidable***.

~~No feasible mitigation is available to reduce the project's cumulative mainline freeway segment impacts to a less-than-significant level. Therefore, the project's cumulative impacts to these mainline freeway segments are considered ***significant and unavoidable***.~~

3-4 A meeting between the staff of the City, and LAFCo, Caltrans, and the project applicant was held on October 13, 2006. Based on discussions held in that meeting, it was concluded that the transportation and circulation analysis presented in the DEIR adequately evaluated the project's potential impacts. The project applicant also agreed to pay fair share costs associated with recommended freeway improvements (the Traffic Congestion Relief Fund) even though such fair share contribution is not required by the EIR. This agreement to pay fair share costs has been included in revised mitigation measures (See Mitigation Measures 6.1-3c, 6.1-3c, 6.1-4e,6.1-7b, 6.1-8a, 6.1-8b, 6.1-8c) A subsequent meeting with Caltrans was held on July 27, 2007 with the City and LAFCo staff. Caltrans concurred with the payment of fair share costs associated with the project.

3-5 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

3-6 The City, LAFCo and applicant met with Caltrans on July 27, 2007. It was discussed that various freeway expansions that were planned could most likely be contained within the existing right-of-way. The applicant agreed to coordinate with Caltrans to identify appropriate right-of-way for the Southbound Elkhorn Blvd on-ramp to SR 70/99. Please also refer to response to comment 3-3.

3-7 The California Department of Education's (CDE) *School Site Selection Criteria and Approval Guide* (see http://www.cde.ca.gov/ls/fa/sf/schoolsiteguide.asp) provides advisory guidance on factors that should be considered when making school siting decisions. The factors that should be considered include the following:

- What is the distance from the near edge of the roadway right-of-way to the site?
- How heavy is the traffic flow?
- How many trucks carrying freight use the roadway during the time students and staff is present?
- Is a safety or sound barrier necessary?
- How will students coming across the highway get to school safely?

The nearest edge of the proposed elementary school to the nearest freeway (SR 70/99) is sited approximately 550 feet. While the CDE has advisory guidance that suggests a setback of up to 2,500 feet from highways carrying explosives or up to 1,500 feet for highways carrying hazardous materials, the CDE acknowledges that there is no legal minimum distance that all schools should be setback from freeways. CDE evaluates each proposed school site on a case-by-case basis based on the specific conditions present at and nearby each site. The local school district has engaged in preliminary consultation with CDE regarding the proposed school site location. Subsequently, the school district has corresponded with the project applicant indicating that while the CDE may have some initial concerns about the proposed school location, the school district does not believe any of the issues raised by CDE will require consideration of an alternative site for the elementary school (Appendix D of this document). If an alternative site is necessary, the school district has the existing capacity to provide school instruction until an alternate location is selected.

For projects located near airports, the CDE's school site selection criteria require that CDE, the school district and the California Department of Transportation, Aeronautics Program, Office of Airports (Division of Aeronautics) consult to review the proposed site location for potential safety hazards prior to the school district taking title to the property. Through the consultation process, the Division of Aeronautics will issue a recommendation on whether title to the site should be secured by the school district. If an unfavorable recommendation is made, no State or local funds can be apportioned for the acquisition or construction of the school.

The City and project applicants have coordinated with the local school district and CDE in determining the final location for the proposed elementary school. Further, the local school district will consult with the Division of Aeronautics prior to acquiring title to the site.

STATE OF CALIFORNIA – THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, GO

THE RECLAMATION BOARD
3310 El Camino Ave., Rm. LL40
SACRAMENTO, CA 95821
(916) 574-0609 FAX: (916) 574-0682
PERMITS: (916) 574-0653 FAX: (916) 574-0682

September 5, 2006

Mr. Tom Buford
City of Sacramento
Environmental Planning Services
2101 Arena Boulevard, Second Floor
Sacramento, CA 95834

Mr. Don Lockhart
Assistant Executive Officer
Sacramento Local Agency Formation Commission
1121 "I" Street, Suite 100
Sacramento, CA 95814

Re: Greenbriar Development Project
State Clearinghouse (SCH) Number: 2005062144

Dear Mr. Buford and Mr. Lockhart:

Thank you for the opportunity to review and comment on the Draft Environmental Impact Report (EIR) for the subject project. California Reclamation Board (Board) and Department of Water Resources (DWR) staff has reviewed the environmental document and provide the following comments. 4-1

General Comments

The area described in the Project Description is protected by federal levees that have been incorporated into the State plan of flood control. The effective operation of federal flood control levees along the Sacramento River system is essential for the protection of public safety and property located in the floodplain protected by those levees. In California, The Board is responsible for operations and maintenance of the Federal Flood Control Project Levees in the Central Valley. DWR manages the State plan of flood control and coordinates its activities with the Federal Emergency Management Agency (FEMA) in administrating the federal Flood Insurance Program. 4-2

A Board permit is required for any plan of work that encroaches on an adopted plan of flood control. A permit is also required for activities outside of the adopted flood control plan if those activities could be injurious to, or interfere with, the successful execution, functioning or operation of any facilities of an adopted plan of flood control. The enclosed Fact Sheet (see Attachment I) provides information on the permitting process. 4-3

The EIR should describe in appropriate detail how the regulatory concerns of the Board will be addressed. The regulations of the Board are found in the California Code of Regulations (CCR) Title 23, Division 1. These regulations are designed to protect the integrity and function of the flood control system. Any activity that interferes with the operation, integrity, and function of the adopted plan of flood control is of concern to the Board. 4-4

The consequences of urban development in a floodplain protected by levees can be significant in terms of not only public safety and protection of property but to the State in terms of financial resources. When it accepts a federal flood control project, the State agrees to indemnify the federal government. Flooding that result from a failure of a portion of the State plan of flood control exposes both the State and the local maintaining agency to significant liability. 4-5

Specific Comments

Impact 6.10-3 On-site Flooding Risk From Potential Levee or Dam Failure

As was noted in the subject document, the Sacramento Area Flood Control Agency (SAFCA) has completed a draft report entitled Natomas Levee Evaluation Program (March 2006). Data was collected and analyzed based on U. S. Army Corp of Engineers (USACOE) guidelines developed for evaluating under seepage and its threat to levee stability. Among the findings were the following:

- At some locations, the calculated exit gradients, based on water surface elevations approximately representing the 100-year flood event, exceeded the guidelines and demonstrated a potential for subsurface permeability that could threaten levee stability;
- Inadequate freeboard (less than 3 feet) in large areas of the east levee of the Sacramento River and the south levee of the Natomas Cross Canal at the 200-year flood event water surface level; 4-6
- The east levee of the Sacramento River and the south levee of the Natomas Cross Canal is susceptible to deep under seepage at the 200-year water surface elevation;
- The north levee of the American River is susceptible to through-levee seepage at the 200-year water surface elevation;
- The east levee of the Sacramento River contains ten sites of erosion risk totaling approximately 11,100 feet in length;

The USACOE guidelines used in evaluating levee conditions were adopted in 2004 and were based on observations of levee performance during the 1997 high water events. The knowledge base has increased dramatically since that time with respect to the role of erosion, waterside instability, and deep under seepage. These factors were not taken into consideration in earlier determinations by the USACOE of the Natomas basin level of protection or in FEMA's designation of Zone X in the Flood Insurance Rate maps (FIRM). 4-7

The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data [California Code of Regulations (CCR) Title 14 Section 15064(b)]. Furthermore, in evaluating the significance of the environmental effect of a project, the Lead Agency is to consider reasonably foreseeable indirect physical changes in the environment which may be 4-8

caused by the project [CCR Title 14 Section 15064(d)] and the decision as to whether a project may have one or more significant effects is to be based on substantial evidence in the record of the lead agency [CCR Title 14 Section 15064(f)]. 4-8 Cont'd

In the Draft EIR, exposing people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of failure of a levee has been identified as one of the "thresholds of significance" from which to evaluate significant impacts from the project. In the draft EIR it is concluded that because the project site lies in an area designated as Zone X in the FIRM, it is protected from a 100-year flood event. 4-9

The scientific and factual data based on the Natomas Levee Evaluation Report and the USACOE November 2005 report do not support the conclusion of DEIR of "less than significant" impact to on-site flooding risk from potential levee or dam failure. Data developed in recent years demonstrate a significant risk to failure of the levee system from erosion, overtopping, and under seepage. While the FEMA determination may remain in place, it is a regulatory designation, not a technical evaluation, and certainly does not reflect an analysis of the current data. In fact, the Natomas Levee Evaluation Report concludes that "the data indicates that the risk of levee failure is greater than was previously thought and underscores the urgency of continuing public education efforts to communicate this risk, reinforcing the importance of flood insurance as a key risk management tool for property owners in the Natomas area." This risk is not just at the 200-year flood level but also at the 100-year level. 4-10

It should be noted that USACOE, based on the foregoing information, has retracted its certification of levees in the Natomas area (see Attachment II). Likewise, DWR has requested that FEMA revise the FIRM for the Natomas area "to accurately reflect the flood risk" of continued residential development in a deep flood basin. 4-11

As for the use of a regulatory designation to assess the significance of an impact, the Appellate Court (*Citizens for a Better Environment et al. v. the California Resources Agency,* 126 Cal. Rptr. 2d 441) invalidated former CEQA Guideline Section 15064(h) which allowed finding of no significant impact based on compliance with environmental standards. Again, the current FIRM designation is an outdated regulatory designation, which is not supported by the present best available information regarding the integrity of the Natomas levee system. 4-12

Since the conclusion of "no significant impact" to flooding from a levee failure is not supported by the available information then the corollary that there is a significant impact must be adopted. In this case, you should analyze the significant environmental effects the project might cause by bringing development and people into the area affected (14 CCR s 15126.2). Your analysis should specifically explain how you will mitigate for these impacts and provide an appropriate level of flood protection to the area and provide adequate protection to your citizens. Furthermore, you need to discuss what is an acceptable level of protection (e.g. 100-year, 200-year, 500-year storm event), which if exceeded does not constitute a significant risk. 4-13

Thank you once again for the opportunity to comment on the Draft EIR. If you have any questions or need additional information, please contact Mr. Stephen Bradley, Chief Engineer for the Board at (916) 574-0680. 4-14

Sincerely,

Jay S. Punia

Jay S. Punia
General Manager

cc: Governor's Office of Planning and Research
State Clearinghouse
P. O. Box 3044
Sacramento, CA 95812-3044

Ms. Nadell Gayou
Department of Water Resources
901 "P" Street, Second Floor
Sacramento, CA 95814

Stein Buer, Executive Director
Sacramento Area Flood Control Agency
1007 Seventh Street, Seventh Floor
Sacramento, CA 95814-3407

Attachments:
Attachment I Encroachment Permit Fact Sheet
Attachment II USACOE letter of July 20, 2006 to Mr. Stein Buer, SAFCA
Attachment III DWR letter of July 31, 2006 to Sally Ziolkowski, FEMA Region IX

JSP:jap

Fact Sheet

Reclamation Board Encroachment Permit Application Process

Authority
State law (Water Code Sections 8534, 8608, 8609, and 8710 – 8723) tasks the Reclamation Board with enforcing appropriate standards for the construction, maintenance, and protection of adopted flood control plans. Regulations implementing these directives are found in California Code of Regulations (CCR) Title 23, Division 1.

Reclamation Board Jurisdiction
The adopted plan of flood control under the jurisdiction and authority of the Reclamation Board includes the Sacramento and San Joaquin Rivers and their tributaries and distributaries and the designated floodways.

Streams regulated by the Reclamation Board can be found in Title 23 Section 112. Information on designated floodways can be found on the Reclamation Board's website at http://recbd.ca.gov/designated_floodway/ and CCR Title 23 Sections 101 - 107.

Regulatory Process
The Reclamation Board ensures the integrity of the flood control system through a permit process (Water Code Section 8710). A permit must be obtained prior to initiating any activity, including excavation and construction, removal or planting of landscaping within floodways, levees, and 10 feet landward of the landside levee toes. Additionally, activities located outside of the adopted plan of flood control but which may foreseeable interfere with the functioning or operation of the plan of flood control is also subject to a permit of the Reclamation Board [CCR Title 23 Section 6(c)].

Details regarding the permitting process and the regulations can be found on the Reclamation Board's website at http://recbd.ca.gov/ under "Frequently Asked Questions" and "Regulations," respectively. The application form and the accompanying environmental questionnaire can be found on the Reclamation Board's website at http://recbd.ca.gov/forms.cfm.

Application Review Process
Applications when deemed complete will undergo technical and environmental review by Reclamation Board and/or Department of Water Resources staff.

Technical Review
A technical review is conducted of the application to ensure consistency with the regulatory standards designed to ensure the function and structural integrity of the adopted plan of flood control for the protection of public welfare and safety. Standards and permitted uses of designated floodways are found in CCR Title 23 Sections 107 and Article 8 (Sections 111 to 137). The permit contains 12 standard conditions and additional special conditions may be placed on the permit as the situation warrants. Special conditions, for example, may include mitigation for the hydraulic impacts of the project by reducing or eliminating the

additional flood risk to third parties that may caused by the project.

Additional information may be requested in support of the technical review of your application pursuant to CCR Title 23 Section 8(b)(4). This information may include but not limited to geotechnical exploration, soil testing, hydraulic or sediment transport studies, and other analyses may be required at any time prior to a determination on the application.

Environmental Review
A determination on an encroachment application is a discretionary action by the Reclamation Board and its staff and subject to the provisions of the California Environmental Quality Act (CEQA) (Public Resources Code 21000 et seq.). Additional environmental considerations are placed on the issuance of the encroachment permit by Water Code Section 8608 and the corresponding implementing regulations (California Code of Regulations – CCR Title 23 Sections 10 and 16).

In most cases, the Reclamation Board will be assuming the role of a "responsible agency" within the meaning of CEQA. In these situations, the application must include a certified CEQA document by the "lead agency" [CCR Title 23 Section 8(b)(2)]. We emphasize that such a document must include within its project description and environmental assessment the activities for which are being considered under the permit.

Encroachment applications will also undergo a review by an interagency Environmental Review Committee (ERC) pursuant to CCR Title 23 Section 10. Review of your application will be facilitated by providing as much additional environmental information as pertinent and available to the applicant at the time of submission of the encroachment application.

These additional documentations may include the following documentation:

- California Department of Fish and Game Streambed Alteration Notification (http://www.dfg.ca.gov/1600/),
- Clean Water Act Section 404 applications, and Rivers and Harbors Section 10 application (US Army Corp of Engineers),
- Clean Water Act Section 401 Water Quality Certification, and
- corresponding determinations by the respective regulatory agencies to the aforementioned applications, including Biological Opinions, if available at the time of submission of your application.

The submission of this information, if pertinent to your application, will expedite review and prevent overlapping requirements. This information should be made available as a supplement to your application as it becomes available. Transmittal information should reference the application number provided by the Reclamation Board.

In some limited situations, such as for minor projects, there may be no other agency with approval authority over the project, other than the encroachment permit by Reclamation Board. In these limited instances, the Reclamation Board may choose to serve as the "lead agency" within the meaning of CEQA and in most cases the projects are of such a nature that a categorical or statutory exemption will apply. The Reclamation Board cannot invest staff resources to prepare complex environmental documentation.

Additional information may be requested in support of the environmental review of your application pursuant to CCR Title 23 Section 8(b)(4). This information may include biological surveys or other environmental surveys and may be required at anytime prior to a determination on the application.

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO ATTENTION OF

July 20, 2006

Hydraulic Design Section

Mr. Stein Buer
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814-3407

Dear Mr. Buer:

In letters to SAFCA dated February 11, 1998 and February 28, 1998, the Corps of Engineers Sacramento District (Corps), based on technical information available at the time, provided its position that the levee system surrounding the Natomas area and levees protecting portions of North Sacramento were designed and constructed to withstand the FEMA base flood event.

Subsequent to the 1997-1998 flood event, the Corps completed additional analysis that has led to a broader understanding of levee failure attributable to deep under seepage. The Corps convened a Levee Seepage Task Force (LSTF) in February 2003 to better understand levee seepage and developed standards to apply to levees to determine their integrity. The LSTF completed its report in June 2003. The Corps then adopted standard operating procedures (SOP) for levee seepage analysis in August of 2004. The guidance in these reports formed the basis for the findings included in the Corps' "Final Geotechnical Report For Sacramento River East Levee and Natomas Cross Canal South Levee" dated November 29, 2005. Information developed in SAFCA's report titled "Natomas Levee Evaluation Report," dated March 13, 2006, and its associated appendices also confirms the presence of physical conditions that are conducive to deep levee under seepage in the Natomas area.

Based on this information we can no longer support our original position regarding certification of the levee system surrounding the Natomas area. This determination does not apply to those levees previously certified that provide protection for portions of the North Sacramento area.

It is important to note that the Corps was authorized to modify a portion of the Natomas Basin Levees in both WRDA 1996 and WRDA 1999 as part of the American River Watershed, California (Common Features) project. The Corps is currently working with you to design and construct the appropriate levee modifications necessary to meet the requirements of the authorizations. Based on the findings of the reports described above, a Post Authorization Change Report is in progress to include measures to deal with the deep under seepage issues.

In addition to the Corps' authorized projects and SAFCA's existing levee improvements, the Corps recognizes and fully supports SAFCA's proposed additional efforts to construct remedial actions in the Natomas area which are aimed at achieving 200-year level of protection. We understand that these actions will take approximately five years to complete. We will do everything we can to facilitate expedited decision-making and approvals of Federally authorized work and SAFCA's proposed efforts for this work.

In view of our findings described above, the information contained in your report regarding 100-year level of protection issues in the Natomas area, and the length of time required for the Corps and SAFCA to complete the recommended actions, we, by copy of this letter, are informing FEMA of the current risk in the Natomas area.

We are anxious to work with you to prioritize, for design and construction, those areas identified in your report that will remediate where the greatest risk exists in the Natomas area for the FEMA base flood event. Once these areas are remediated and analysis shows the levee system can safely convey the FEMA base flood event, we will recommend to FEMA that the area be certified to that level.

We look forward to continued cooperation between our agencies in improving flood protection for the greater Sacramento area.

Sincerely,

Thomas E. Trainer

Thomas E. Trainer, P.E.
Chief, Engineering Division

Copies Furnished:

Mr. Les Sakumoto
Federal Emergency Management Agency, Region IX
1111 Broadway, Suite 12
Oakland, CA 94607-4052

Mr. Les Harder
Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO ATTENTION OF

February 11, 1998

Central Valley Section

Mr. F.I. Hodgkins
Executive Director
Sacramento Area Flood Control Agency (SAFCA)
1007 7th Street, 5th Floor
Sacramento, California 95814

Dear Mr. Hodgkins:

This is in response to your January 28, 1998 letter requesting the Corps to provide FEMA certification of the levee system and appurtenances around Natomas and portions of North Sacramento. Based on our technical review of as-constructed drawings and associated information, we have determined that the levee system and appurtenances around Natomas and portions of North Sacramento constructed by SAFCA were adequately designed and constructed to withstand the FEMA 100-year base flood. By this letter, the Corps of Engineers is providing our certification for the following features:

a. East Levee of Sacramento River from approximately River Miles (R.M.) 60.0 to R.M. 79.0
b. North Levee of American River from approximately R.M. 0.0 to R.M. 1.7
c. East and West levees of Natomas East Main Drainage Canal (NEMDC) from American River upstream to the SAFCA constructed pump station north of Dry Creek
d. NEMDC Pump Station
e. South Levee of Natomas Cross Canal from R.M. 0.0 to R.M. 5.5
f. Pleasant Grove Canal levee upstream of pump station to Sankey Road
g. North and South levees along the Arcade Creek from R.M. 0.0 to R.M. 2.15
h. North and Phase I of South levees along the Dry/Robla Creek from R.M. 0.0 to R.M. 2.25
i. Main Avenue Bridge
j. Structural stability and acceptability of closure structures at locations where road or railroad cross at an elevation below the constructed top of levee. Closure structures were constructed at the following locations:

-2-

(1) NEMDC east levee near Del Paso Boulevard at UPRR/SPRR
(2) NEMDC east and west levees at West El Camino Avenue
(3) NEMDC east and west levees at Main Avenue
(4) Dry Creek north levee at UPRR/SPRR and south levee at UPRR/SPRR and at Rio Linda Boulevard
(5) Arcade Creek north and south levees at UPRR/SPRR
(6) Arcade Creek north and south levees at Norwood Avenue

Our technical review has confirmed that closure structures originally proposed along Arcade Creek, north and south levees at Rio Linda Boulevard and along Arcade Creek, north and south levees at Marysville Boulevard were replaced with floodwalls. We have determined that the floodwalls at these locations are adequately constructed to withstand the FEMA 100-year flood.

As stated in our April 17, 1997 letter to you, it is our understanding that SAFCA shall independently coordinate with FEMA in preparing an acceptable operation plan to ensure closure structures are properly installed in a timely manner during flood events. SAFCA shall also independently reach agreement with FEMA regarding the complete certification package, with specific responsibility for designation of the residual floodplains that will remain upon completion of the Natomas Local Area Project. The residual floodplains include:

a. Interior floodplain within Natomas basin
b. Magpie Creek floodplain along I-80 east of the NEMDC
c. Floodplain north of the NEMDC pump station
d. American River floodplain south of Arcade Creek
e. Floodplain at the east end of the existing Robla Creek levee (Phase I) south of Claire Avenue

If you have any questions regarding the FEMA certification of this levee system, please contact our Project Manager, Mr. Bob Childs, at (916) 557-7831 or our Chief, Civil Design Branch, Mr. John Mack at (916) 557-7201.

Sincerely,

Dorothy F. Klasse
Colonel, Corps of Engineers
District Engineer

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO ATTENTION OF

RECEIVED SAFCA

February 26, 1998

Central Valley Section

Mr. F.I. Hodgkins
Executive Director
Sacramento Area Flood Control Agency (SAFCA)
1007 7th Street, 5th Floor,
Sacramento, California 95814

Dear Mr. Hodgkins:

As telephonically requested by Mr. Paul Devereux of your staff, this letter serves to clarify our prior letter to you dated February 11, 1998 which provided FEMA certification of the levee system and appurtenances around Natomas and portions of North Sacramento. The flood control features requiring clarification are those addressed in items c and f of our February 11, 1998 letter. The revised descriptions for these items are as follows:

c. East and West levees of Natomas East Main Drainage Canal (NEMDC) from the American River upstream to the SAFCA constructed NEMDC pump station north of Dry Creek, and the existing West levee from the NEMDC pump station to Sankey Road.

f. Pleasant Grove Creek Canal levee from Sankey Road upstream to the south levee of the Natomas Cross Canal, and the reinforced levee openings at Howsely Road, Fifield Road, and Sankey Road.

If you have any questions, please contact our Project Manager, Mr. Bob Childs, at (916) 557-7831 or our Chief, Civil Design Branch, Mr. John Mack at (916) 557-7201.

Sincerely,

for Brian W. Doyle
Chief, Engineering Division

Stein Buer

STATE OF CALIFORNIA – THE RESOURCES AGENCY
ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

SAFCA '06 AUG 4 AM 10:04

JUL 31 2006

Ms. Sally M. Ziolkowski
Mitigation Division Director
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, California 94607-4052

Dear Ms. Ziolkowski:

The Department of Water Resources (DWR) has just recently reviewed the Natomas Levee Evaluation Report, Public Review Draft, dated March 13, 2006, that was prepared for the Sacramento Area Flood Control Agency (SAFCA). Based on the information presented in the SAFCA report, it is clear that portions of the levees protecting the Natomas Basin do not meet the Federal Emergency Management Agency's (FEMA) levee certification requirements. As a result of this new information, the U.S. Army Corps of Engineers (Corps) issued a letter to SAFCA on July 20, 2006, stating that it no longer can support its 1998 certification of the Natomas levee system for the FEMA-Base Flood Event (see attached letter). Since over 12,000 homes have been constructed in this deep flood basin, and more development is planned, we believe that it is necessary that FEMA revise the Flood Insurance Rate Maps for the Natomas Basin to accurately reflect the level of flood risk. Accurate maps are a primary mechanism for disclosing flood risks to local government, home owners and potential home buyers.

The Natomas Levee Evaluation Report provides a comprehensive summary of the region's construction improvement projects that have been completed to date, and clearly defines the need to improve the levees protecting the Natomas Basin. While the report focuses primarily on the steps required to achieve a 200-year level of flood protection, the report also includes strong geotechnical and hydraulic evidence that the Natomas levees do not meet current Corps criteria for providing 100-year flood protection as mandated by FEMA. Prior to this 1998 certification by the Corps, the Natomas Basin had been mapped into the FEMA 100-year floodplain, and mandatory flood insurance was required by FEMA for homes with federally-backed mortgages.

The Reclamation Board of the State of California has been partnering with SAFCA and the Corps since 1996 to improve the levees protecting the Natomas Basin under the American River Common Features Project. DWR strongly supports expedited levee improvements for the Natomas Basin and will continue to support The Reclamation Board in constructing the American River Common Features Project in partnership with the Corps and SAFCA. We understand that additional analyses are underway to develop a strategy for providing FEMA 100-year flood protection. However, even under the best scenario, it will take several years to make the necessary improvements.

Ms. Sally M. Ziolkowski
JUL 31 2006
Page 2

Over the next few years, we will make it a very high priority to work closely with SAFCA and the Corps to remediate the Natomas levees and upgrade them to the 200-year level of protection. Meanwhile, we will work closely with your staff to incorporate this new information into your floodplain mapping efforts and to determine the appropriate Special Flood Hazard Area zoning for the basin.

If you have any immediate questions regarding this letter, please call me at (916) 653-9502. We look forward to your reply regarding your intentions for incorporating this new information into your floodplain mapping efforts.

Sincerely,

LES HARDER

Leslie F. Harder, Jr.
Deputy Director

Attachment

cc: Honorable Doris Matsui
Representative, U.S. Congress
2310 Rayburn House Office Building
Washington, DC 20515

Colonel Ronald N. Light
District Commander
Sacramento District
U.S. Army Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

Mr. Stein Buer ✓
Sacramento Area Flood Control Agency
1007 Seventh Street, 7th Floor
Sacramento, California 95814

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO ATTENTION OF

July 20, 2006

Hydraulic Design Section

Mr. Stein Buer
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814-3407

Dear Mr. Buer:

In letters to SAFCA dated February 11, 1998 and February 26, 1998, the Corps of Engineers Sacramento District (Corps), based on technical information available at the time, provided its position that the levee system surrounding the Natomas area and levees protecting portions of North Sacramento were designed and constructed to withstand the FEMA base flood event.

Subsequent to the 1997-1998 flood event, the Corps completed additional analysis that has led to a broader understanding of levee failure attributable to deep under seepage. The Corps convened a Levee Seepage Task Force (LSTF) in February 2003 to better understand levee seepage and developed standards to apply to levees to determine their integrity. The LSTF completed its report in June 2003. The Corps then adopted standard operating procedures (SOP) for levee seepage analysis in August of 2004. The guidance in these reports formed the basis for the findings included in the Corps' "Final Geotechnical Report For Sacramento River East Levee and Natomas Cross Canal South Levee" dated November 29, 2005. Information developed in SAFCA's report titled "Natomas Levee Evaluation Report," dated March 13, 2006, and its associated appendices also confirms the presence of physical conditions that are conducive to deep levee under seepage in the Natomas area.

Based on this information we can no longer support our original position regarding certification of the levee system surrounding the Natomas area. This determination does not apply to those levees previously certified that provide protection for portions of the North Sacramento area.

It is important to note that the Corps was authorized to modify a portion of the Natomas Basin Levees in both WRDA 1996 and WRDA 1999 as part of the American River Watershed, California (Common Features) project. The Corps is currently working with you to design and construct the appropriate levee modifications necessary to meet the requirements of the authorizations. Based on the findings of the reports described above, a Post Authorization Change Report is in progress to include measures to deal with the deep under seepage issues.

In addition to the Corps' authorized projects and SAFCA's existing levee improvements, the Corps recognizes and fully supports SAFCA's proposed additional efforts to construct remedial actions in the Natomas area which are aimed at achieving 200-year level of protection. We understand that these actions will take approximately five years to complete. We will do everything we can to facilitate expedited decision-making and approvals of Federally authorized work and SAFCA's proposed efforts for this work.

In view of our findings described above, the information contained in your report regarding 100-year level of protection issues in the Natomas area, and the length of time required for the Corps and SAFCA to complete the recommended actions, we, by copy of this letter, are informing FEMA of the current risk in the Natomas area.

We are anxious to work with you to prioritize, for design and construction, those areas identified in your report that will remediate where the greatest risk exists in the Natomas area for the FEMA base flood event. Once these areas are remediated and analysis shows the levee system can safely convey the FEMA base flood event, we will recommend to FEMA that the area be certified to that level.

We look forward to continued cooperation between our agencies in improving flood protection for the greater Sacramento area.

Sincerely,

Thomas E. Trainer

Thomas E. Trainer, P.E.
Chief, Engineering Division

Copies Furnished:

Mr. Les Sakumoto
Federal Emergency Management Agency, Region IX
1111 Broadway, Suite 12
Oakland, CA 94607-4052

Mr. Les Harder
Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

LETTER 4

California Reclamation Board
Jay Punia
General Manager
September 5, 2006

4-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

4-2 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

4-3 The project site is not located within an Adopted Plan of Flood Control. As such, an encroachment permit from the Reclamation Board is not required.

4-4 The California Code of Regulations (CCR), Title 23, Division 1, specifies the standards of review for projects located within an Adopted Plan of Flood Control. As described in response to comment 4-3, the project is not located within an Adopted Plan of Flood Control and the project would not result in the alteration of any levees that are under the jurisdiction of the California Reclamation Board. The DEIR and RDEIR provide a comprehensive description of the regulatory environment as it relates to hydrology and flooding; please see Section 6.10, "Hydrology, Drainage, and Flooding," of the DEIR and R DEIR. In addition, Master Response 1 provides a comprehensive description of the current state of flood certification and the ongoing actions to improve flood safety within the Natomas area. The comment is not specific on the regulatory analysis that should be provided in the DEIR, therefore no further response can be offered.

4-5 Regarding the project's flooding impacts please refer to Master Response 1.

4-6 Regarding the project's flooding impacts and the current state of flood certification and the ongoing actions to improve flood safety in the Natomas area please refer to Master Response 1.

4-7 Regarding the project's flooding impacts and the current state of flood certification and the ongoing actions to improve flood safety in the Natomas area please refer to Master Response 1.

4-8 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

4-9 The commenter correctly summarizes the information provided in the DEIR. Master Response 1 provides an update to the current state of flood certification and the ongoing actions to improve flood safety in the Natomas area.

4-10 Regarding the project's flooding impacts and the current state of flood certification and the ongoing actions to improve flood safety in the Natomas area please refer to Master Response 1.

4-11 Regarding the project's flooding impacts and the current state of flood certification and the ongoing actions to improve flood safety in the Natomas area please refer to Master Response 1. To clarify, the U.S. Army Corps of Engineers (USACE) has issued a letter indicating that it "can no longer support its original position regarding the certification of the levees in the Natomas area." As of the date of this report, no official proceedings to decertify the levees in the Natomas area have occurred. While several agencies such as the California Department of Water Resources (DWR) and the Federal Emergency Management Agency (FEMA) have offered opinions on the information contained within the Sacramento Area Flood Control Agency's (SAFCA) Natomas Levee Evaluation Report (March 2006), the final decertification and re-mapping of the flood designation for the Natomas Area has not occurred. FEMA indicated in its letter to the Mayor of the City of Sacramento that it plans to revise the Natomas community's Flood Insurance Rate Map (FIRM) through the Physical Map Revision Process (PMR) and intends to do so by fall 2007. As of the date of publication of this document, no revision to the FIRM has been issued by FEMA.

4-12 Regarding the project's flooding impacts please refer to Master Response 1.

4-13 Regarding the project's flooding impacts and the current state of flood certification and the ongoing actions to improve flood safety in the Natomas area please refer to Master Response 1.

4-14 Because the comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

STATE OF CALIFORNIA – THE RESOURCES AGENCY

ARNOLD SCHWARZENEGG

DEPARTMENT OF WATER RESOURCES

1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 942360001
(916) 653-5791

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September 20, 2006

Tom Buford, Senior Planner
City of Sacramento, Development Services Department
Environmental Planning Services
North Permit Center
2101 Arena Boulevard, Second Floor
Sacramento, California 95834

Draft Environmental Impact Report for the Greenbriar Project (P05-069)
State Clearinghouse (SCH) Number: 2005062144

The project corresponding to the subject SCH identification number has come to our attention. The limited project description suggests a potential encroachment on an Adopted Plan of Flood Control. If indeed your project encroaches on an adopted food control plan, you will need to obtain an encroachment permit from the Reclamation Board prior to initiating any activities. The attached Fact Sheet explains the permitting process. Please note that the permitting process may take as much as 45 to 60 days to process. Also note that a condition of the permit requires the securing all of the appropriate additional permits before initiating work. This information is provided so that you may plan accordingly. 5-1

If after careful evaluation, it is your assessment that your project is not within the authority of the Reclamation Board, you may disregard this notice. For further information, please contact Sam Brandon of my staff at (916) 574-0651.

Sincerely,

Mike Mirmazaheri, Chief
Floodway Protection Section

cc: Governor's Office of Planning and Research
State Clearinghouse
1400 Tenth Street, Room 121
Sacramento, CA 95814

Encroachment Permits Fact Sheet

Basis for Authority

State law (Water Code Sections 8534, 8608, 8609, and 8710 – 8723) tasks the Reclamation Board with enforcing appropriate standards for the construction, maintenance, and protection of adopted flood control plans. Regulations implementing these directives are found in California Code of Regulations (CCR) Title 23, Division 1.

Area of Reclamation Board Jurisdiction

The adopted plan of flood control under the jurisdiction and authority of the Reclamation Board includes the Sacramento and San Joaquin Rivers and their tributaries and distributaries and the designated floodways.

Streams regulated by the Reclamation Board can be found in Title 23 Section 112. Information on designated floodways can be found on the Reclamation Board's website at http://recbd.ca.gov/designated_floodway/ and CCR Title 23 Sections 101 - 107.

Regulatory Process

The Reclamation Board ensures the integrity of the flood control system through a permit process (Water Code Section 8710). A permit must be obtained prior to initiating any activity, including excavation and construction, removal or planting of landscaping within floodways, levees, and 10 feet landward of the landside levee toes. Additionally, activities located outside of the adopted plan of flood control but which may foreseeable interfere with the functioning or operation of the plan of flood control is also subject to a permit of the Reclamation Board.

Details regarding the permitting process and the regulations can be found on the Reclamation Board's website at http://recbd.ca.gov/ under "Frequently Asked Questions" and "Regulations," respectively. The application form and the accompanying environmental questionnaire can be found on the Reclamation Board's website at http://recbd.ca.gov/forms.cfm.

Application Review Process

Applications when deemed complete will undergo technical and environmental review by Reclamation Board and/or Department of Water Resources staff.

Technical Review

A technical review is conducted of the application to ensure consistency with the regulatory standards designed to ensure the function and structural integrity of the adopted plan of flood control for the protection of public welfare and safety. Standards and permitted uses of designated floodways are found in CCR Title 23 Sections 107 and Article 8 (Sections 111 to 137). The permit contains 12 standard conditions and additional special conditions may be placed on the permit as the situation warrants. Special conditions, for example, may include mitigation for the hydraulic impacts of the project by reducing or eliminating the additional flood risk to third parties that may caused by the project.

Additional information may be requested in support of the technical review of

your application pursuant to CCR Title 23 Section 8(b)(4). This information may include but not limited to geotechnical exploration, soil testing, hydraulic or sediment transport studies, and other analyses may be required at any time prior to a determination on the application.

Environmental Review

A determination on an encroachment application is a discretionary action by the Reclamation Board and its staff and subject to the provisions of the California Environmental Quality Act (CEQA) (Public Resources Code 21000 et seq.). Additional environmental considerations are placed on the issuance of the encroachment permit by Water Code Section 8608 and the corresponding implementing regulations (California Code of Regulations – CCR Title 23 Sections 10 and 16).

In most cases, the Reclamation Board will be assuming the role of a "responsible agency" within the meaning of CEQA. In these situations, the application must include a certified CEQA document by the "lead agency" [CCR Title 23 Section 8(b)(2)]. We emphasize that such a document must include within its project description and environmental assessment of the activities for which are being considered under the permit.

Encroachment applications will also undergo a review by an interagency Environmental Review Committee (ERC) pursuant to CCR Title 23 Section 10. Review of your application will be facilitated by providing as much additional environmental information as pertinent and available to the applicant at the time of submission of the encroachment application.

These additional documentations may include the following documentation:

- California Department of Fish and Game Streambed Alteration Notification (http://www.dfg.ca.gov/1600/),
- Clean Water Act Section 404 applications, and Rivers and Harbors Section 10 application (US Army Corp of Engineers),
- Clean Water Act Section 401 Water Quality Certification, and
- corresponding determinations by the respective regulatory agencies to the aforementioned applications, including Biological Opinions, if available at the time of submission of your application.

The submission of this information, if pertinent to your application, will expedite review and prevent overlapping requirements. This information should be made available as a supplement to your application as it becomes available. Transmittal information should reference the application number provided by the Reclamation Board.

In some limited situations, such as for minor projects, there may be no other agency with approval authority over the project, other than the encroachment permit by Reclamation Board. In these limited instances, the Reclamation Board

may choose to serve as the "lead agency" within the meaning of CEQA and in most cases the projects are of such a nature that a categorical or statutory exemption will apply. The Reclamation Board cannot invest staff resources to prepare complex environmental documentation.

Additional information may be requested in support of the environmental review of your application pursuant to CCR Title 23 Section 8(b)(4). This information may include biological surveys or other environmental surveys and may be required at anytime prior to a determination on the application.

LETTER 5

California Department of Water Resources
Mike Mirmazaheri
Chief, Floodway Protection Section
September 26, 2006

5-1 The project is not located within an Adopted Plan of Flood Control. As such, an encroachment permit from the Reclamation Board is not required.

6-18

SACRAMENTO LOCAL AGENCY FORMATION COMMISSION

PUBLIC HEARING

CITY OF SACRAMENTO SPHERE OF INFLUENCE

AMENDMENT AND REORGANIZATION OF

GREENBRIAR PROPERTY

PRESENTATION OF DRAFT ENVIRONMENTAL IMPACT REPORT

BOARD CHAMBERS

700 H STREET

SACRAMENTO, CALIFORNIA

WEDNESDAY, AUGUST 2, 2006

6:00 P.M.

REPORTED BY: SANDRA VON HAENEL
CSR NO. 11407

ATTENDEES

SACRAMENTO LOCAL AGENCY FORMATION COMMISSION:

CHRISTOPHER TOOKER, CHAIR
CHARLES ROSE, VICE CHAIR
ILLA COLLIN
SOPHIA SCHERMAN
SUSAN PETERS
ROBERT KING FONG
ELLIOT MULBERG

MARILYN FLEMMER, Commission Clerk

PETER BRUNDAGE, Executive Officer, Sacramento LAFCo
DONALD LOCKHART, Assistant Executive Officer, LAFCo
NANCY MILLER, Legal Counsel to LAFCo
TOM BUFORD, Associate Planner - City of Sacramento
ALICIA GUERRO, Morrison & Forrester
Representing City of Sacramento

EIR CONSULTING FIRM:

GARY JAKOBS, EDAW INC
AMANDA OLEKSZULIN, Senior Project Manager

TINA THOMAS, Remy, Thomas, Moose and Manley, LLP

INTERESTED PERSONS:

THOMAS REAVY, Natomas Community Association
JIM PACHL, Lawyer, Friends of the Swainson's Hawk
JUDE LA MAR, ECOS

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SACRAMENTO, CALIFORNIA, WEDNESDAY, AUGUST 2, 2006

6:00 P.M.

---oOo---

CHAIR TOOKER: Item 5, City of Sacramento Sphere Of Influence Amendment and Reorganization of Greenbriar Property for the CEQA Environmental Impact Report (a) Presentation of Draft Environmental Impact Report.

MR. BRUNDAGE: Tonight's workshop is on the Draft Environmental Impact Report. This project, you may recall, the process was developed last August to develop a Memorandum Of Understanding between the City of Sacramento and Sacramento LAFCo to act as co-lead agencies.

Your policies require the public workshop. The City's does not have that. The City of Sacramento does not have that within their procedures. As co-lead agency you will be acting first in time. You will be acting from the consideration of the sphere of influence. And prior to taking that action, you would have to certify this document.

Comments are to be received tonight, and they will be reflected and responded to, and the final Environmental Impact Report is prepared.

We do have staff of the City of Sacramento available to respond to any questions you may have, and Gary Jakobs from

24 EDAW, who has been retained through contract, again pursuant

25 to the MOU, has a brief PowerPoint that he's prepared to

abbreviate even more so to inform the Commission.

CHAIR TOOKER: We have, I believe, some requests for continuance of this item. Perhaps it would be best for us to take those and address that before we have the presentation.

MR. BRUNDAGE: I think it would be appropriate. I think there is enough interest. The intent tonight was to give the Commission an overview, start to refresh your memories about the project, start to do the community outreach aspect of this process. Again, what we have said in the Memo is that theoretically there is a 45-day comment period. That comment period ends on September 5. That can be continued.

We could have, as I laid out, several options to the Commission. We can continue, have another public hearing, take public testimony this evening, go over the project, and then continue to October 4th; continue to a special meeting sometime in September; or just direct staff to have an outreach community kind of workshop without the Commission.

So it's the pleasure of the Commission, I think, to give staff direction this evening as to what you prefer.

CHAIR TOOKER: So are you recommending, then, that we go ahead with the presentation first before taking comments? Is that your plan?

MS. MILLER: I just want to interject that, you know, we've noticed this as a public hearing on the draft EIR,

which has a legal connotation and -- not a connotation. It's actually a proceeding under law. So I think it might be good for us to hear from the City and the underlying developer on the issue of the continuance, because it will require us to potentially issue additional notices. And talking about our next meeting date, we would extend beyond the public comment period that we have actually noticed.

So, not to say that we shouldn't do that, but we might want to hear the presentation, hear the comments of the public on the issue of continuance, as well as their comments, before you take an action.

CHAIR TOOKER: Thank you.

MS. COLLIN: I have a question also.

And if we hear some of this tonight so we have an overview, do we have the ability, are we supposed to make a motion to hold open the public comments and let the public hearing continue to October 4th?

MS. MILLER: That's an option that you have.

CHAIR TOOKER: Thank you. Then proceed with the presentation.

MR. BRUNDAGE: Gary Jakobs from EDAW will give the presentation.

MR. JAKOBS: Good evening, members of the Commission.

I am Gary Jakobs, and I'm a principal with EDAW. And I just wanted to introduce back in the audience Amanda Olekszulin.

She's the person who really did the hard work of putting together the document.

I am going to give a fairly brief presentation. It's about a 20-minute one that I'm going to cut down to five minutes or so. So if it goes a little bit fast, you'll understand.

The basic concept, we are going to hear the project description, the process, a very brief summary of the EIR, and then the most important part of the evening which is turning it over to the public and to you for input.

The project is 577 acres -- and I'm just going to advance to the next slide so you can see where it's located.

It's 577 acres. It's located -- Greenbriar is located at the northwest corner of I-5 and State Route 70 and 99. The proposed project is mixed use -- so we go back -- 3400, nearly 3500 mixed use or residential units; a corridor for the proposed RT rail line, the Downtown-Natomas-Airport line, and a station; 48 acres of commercial; 48 acres of parks; an elementary school site; an open space habitat corridor along the western edge of the site. And also proposed by the applicant, off-site biological mitigation; two sites, one is the Spangler site, about 245 acres, and the Natomas 130 site which is about 20 acres or so.

24 Entitlements: LAFCo is the agency that will act first.

25 The basic entitlements are amendment of the City of

6

Sacramento Sphere Of Influence and Sacramento Regional County Sanitation District Sphere of Influence line, and annexation of the project site to the City and to the District.

The City will act after LAFCo on annexation related items, General Plan amendments, and other dual items.

Airport Land Use Commission will need to issue and determine a finding of consistency with the Comprehensive Land Use Plan.

This project is located within the Natomas Basin Habitat Conservation Plan Boundaries, but it is not within the area covered by the Standard Take Permit issued with the Habit Conservation Plan.

So either a new HCP will be required, and that is what is proposed by the applicant, or an amendment to the Natomas Basin HCP. But one would be required for the project to proceed forward.

MS. COLLIN: I have a question. Is there a process for annexation to an existing one, or is that -- or do you have to do an amendment to it?

MR. JAKOBS: As I understand the Natomas Basin HCP, it has got very prescribed procedures for changes to it. The processes that I understand -- and the City's staff is here, Alicia Guerro, I know is an expert on the process -- is to

either amend the existing HCP -- there are processes for

doing that -- or to just prepare one by the applicant as a

project-specific, stand-alone HCP.

MS. COLLIN: When she comes forward, she can -- is she planning to come forward anyway to speak at some point?

Okay. Then she can answer that.

MR. JAKOBS: Okay. The project started with a Notice of Preparation which was issued in June and reissued in July. And we are right now in the middle of the Draft EIR public review period. The 45-day public review period will end September 5th, and then we will prepare a Final EIR responding to all comments on the environmental issues received.

And following that, we will be able to consider certification of the EIR by the Commission, by the City of Sacramento.

MS. COLLIN: And I'll go back to the same question I asked of legal counsel.

You would prepare the responses; correct?

MR. JAKOBS: That is correct.

MS. COLLIN: Can we continue the comment period as well as the hearing period to run concurrently with October 4th? We would still be taking those comments and responding?

MR. JAKOBS: I believe if we do hold the public hearing open, then the answer is yes.

24 MS. COLLIN: Okay.

25 MR. JAKOBS: Some brief context. Beside it's in

agricultural uses, it's surrounded by Metro Airpark on the west, the Natomas, North Natomas community on the east and south, I-5 and State Route 70/99 on the east and south, and then agriculture to the north.

It's approximately one mile from the runways at Sacramento International Airport, and it's within the basin -- within the boundaries of the Natomas Basin HCP.

The EIR is full scope. We didn't scope any significant issues out. We didn't look at landslides because the site is flat, subjugate buildings because sewers are proposed and public water is proposed. So we didn't look at groundwater, but everything else we did examine in detail.

The EIR also examines --

MS. COLLIN: Can I ask a question about why flood control was not overlooked.

MR. JAKOBS: Flood Control actually was looked at in detail in "Hydrology," to answer your question.

MS. COLLIN: Okay. You did it in the Hydrology section. Thank you.

MR. JAKOBS: The EIR also focused on issues important to LAFCo, and there is a separate summary discussion of those issues in the Environmental Impact Report.

The Natomas Basin HCP has a lot of attention in the

24 Environmental Impact Report, primarily because this project

25 is not covered by the HCP. We did an extensive analysis on

the effects of Greenbriar on the conservation strategy, the goals and objectives of the HCP, and the effects on endangered and threatened species.

The yellow outline shows the boundaries of Natomas Basin HCP. Greenbriar is shown right about in the center -- if you can point that out, Don.

A little bit north of Greenbriar is one of the mitigation sites. That's the Spangler site. And to the south is the Natomas 130 site, which is right next to Fisherman Lake. Those are two of the mitigation sites that are proposed by the applicant.

Now I'm just going to jump into the basic findings of the EIR and not spend much time here except to just highlight what issues were found to be significant.

So traffic and circulation and air quality were found to be significant impacts, and these are the intersections that were evaluated. Noise, utilities, were found to be significant. Public services, primarily because it's unknown about the timing of a fire and medical -- a fire/emergency medical facility, when that will be constructed.

Parks and open space, aesthetics, public health, and hazards, geotechnical hazards, hydrology, and water quality was found to be significant. In that analysis, we did

24 examine the issue of flooding.

25 Agricultural conversion and conflicts. Certainly

biological resources. And with regard to the HCP that will be prepared, it's going to require extensive consultation with the U.S. Fish & Wildlife Service and with the California Department of Fish & Game. It's going to be focused on the giant garter snake. There is also extensive mitigation proposed for Swainson's hawk in the EIR.

Another issue that was evaluated and significant impacts were found were cultural resources.

Now it's time for public input unless you have any questions of me.

MR. ROSE: When they did the flood analysis, did they look at the levees in that section?

MR. JAKOBS: We didn't go and examine them, but we certainly looked at the issue of levees and the issue that is revolving now around the possibility that they may be decertified. And that was evaluated in the EIR, and mitigation is included to address those issues.

CHAIR TOOKER: Any other questions?

MR. ROSE: The sewer service, the line that they were going to use, do you know where that alignment is? Where would they connect into it?

MR. JAKOBS: Amanda, if you could come up here.

MS. OLEKSZULIN: Looking at that gray circle east of

24 the project site, right in that area it would connect into

25 the site.

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MR. ROSE: Is there currently capacity in that line?

MS. OLEKSZULIN: There is. We did evaluate -- we did an extensive analysis of the capacity. We had extensive consultation with the District to determine whether there would be any capacity constraints. And as of the publication of the Draft EIR, the District indicated that there is available capacity to not only convey but to treat wastewater generated by the project.

MR. ROSE: Does that take into consideration the area that is already in the city and already under zoning and is not built out yes?

MS. OLEKSZULIN: Correct.

MR. ROSE: So it's in excess of that?

MS. OLEKSZULIN: Yes, there is capacity to accommodate build-out of the proposed treatment plant boundaries, their District area as well as this project.

MR. ROSE: Okay.

CHAIR TOOKER: Any other questions?

MR. JAKOBS: That finding was confirmed by Sac Regional.

CHAIR TOOKER: Thank you.

Our next speaker is Tina Thomas.

MS. MILLER: Did you want to hear from Alicia?

CHAIR TOOKER: I thought she said she was going to be -- I only have two sheets here.

Was this to answer a question that was raised?

MS. MILLER: Right, for Commissioner Collin.

CHAIR TOOKER: Okay.

MR. BUFORD: Excuse me. I'm Tom Buford. I'm a senior planner with the City of Sacramento. I thought maybe I could clarify for the Chair and the Commission.

We do have representatives from the City here, and there was discussion of the possible continuation of the hearing. Clearly, from the City's standpoint, with the hearing scheduled for public comment tonight -- I understand the time constraints and the like -- but as you're co-lead agency, we are very interested in hearing public comments to the extent possible tonight, the time being so short.

If we can't hear them, we understand that we might have to continue over. But certainly we've been in the process, as you have, for a long time. We are very interested in public comments.

We are available to answer questions that the Commission has. I will also indicate that when this comes back to the Commission, having had the comments that we will receive on the Draft EIR, and the Final EIR before you, that we will also be coming back at that time with staff to be prepared to make full presentations to the Commission,

24 hopefully on a night when our time in the chambers isn't

25 short.

So we are ready to cooperate with you. If you'd like to talk to Alicia, you're certainly welcome to any other questions we can answer. We would also like to hear the public comment.

CHAIR TOOKER: Thank you.

Would Alicia come forward, then, and identify yourself.

MS. GUERRO: Yes. Chair Tooker, members of the Commission, I'm Alicia Guerro with Morrison & Forrester, outside counsel to the City of Sacramento.

We were involved in the preparation of the Natomas Basin HCP, both in defense of the litigation and actually in the preparation of the revised HCP, and so we have that background as well as we've been advising the City with respect to the ongoing implementation of the HCP process.

To address Commissioner Collin's comments and question about the procedure for annexation to an HCP, there really isn't a procedure called "annexation," much like in the LAFCo context, but there are procedures and there is a process for amending the HCP or for revising the HCP.

And in this case, this particular project is outside of the City's permit area that was covered by the Natomas HCP, so there is a formal process, both under the regulations and the statute, as well as just by the terms of the HCP, and the

24 City's obligations under the Implementation Agreement that

25 lays out the steps for proceeding with the Service and with

Fish & Game.

And all of those steps are described in the effects Analysis in Volume III to your EIR. And basically what will happen is this EIR will circulate for public comment, and you'll proceed with your process, and concurrently this effects analysis that's included in your EIR is going to be used as a foundation for discussions with Fish & Wildlife Service and Fish & Game and the applicant and the City for how they're going to proceed, and either amending or doing a new HCP to address this particular project.

And the reason that it wasn't originally included in the HCP was that the HCP covered the development in the Natomas community planned area and some other areas that were planned for development as well as Sutter County, and this wasn't one of the areas identified because it wasn't within the City of Sacramento city limits at the time. So there is a process that will go forward.

Does that answer your question?

MS. COLLIN: Yes, that begins to get at the concerns.

I know that certainly the City and the County have been in conversation over when we're looking at the Natomas visioning process, and there are a lot of issues involved in that process. But I think we would want to be apprised of

24 what is proceeding also about how that HCP is being handled.

25 MS. GUERRO: Your comment is noted,

Commissioner Collin, and there will be -- that process is going to go forward with its own public review process through the NEPA review that the federal agencies do.

MS. COLLIN: But that is all done at the City; correct?

MS. GUERRO: That's actually done with the federal and state agencies, but the City will be participating as well as the applicant in going forward. That's going to happen at some point when the HCP amendment or new HCP is actually developed. But even before that, there is this sort of informal discussion consultation process with the agencies, and some of that information, to the extent it's available, could be included in the Final EIR to kind of keep you abreast of what's happening.

But at this point, all of the documentation, all of the comments that have been received by the agencies, by Fish & Wildlife Service and Fish & Game have been actually used and incorporated into the preparation of this EIR in the Impacts Analysis so that everybody has the same set of information and the same starting point for going forward.

MS. COLLIN: I was just trying to figure out the timing on when you would expect LAFCo to move, and is that going to be before or after we see what the HCP is going to look like for this property.

MS. GUERRO: For this property, the idea is -- and this is outlined in the Impacts Analysis in Section 1.3 of that

particular -- you might want to look at that section. It talks about the intended use of the document. But the intent is to start that process with the agencies based on the effects analysis in this EIR to proceed through the LAFCo process and the City's approval process concurrently as the HCP is being developed. Because, as a matter of state and federal regulations, the requirement to obtain and sell take authorizations from the federal and state agencies doesn't arise until you actually start to do something that changes the habitat or causes the conversion to urban uses from, you know, the native habitat.

And so the goal is to start that process now as this is going forward as you're going forward with your review, and to complete the process with the agencies prior to approval of the final map from the City of Sacramento, and certainly prior to initiating any grading or commencement of falcon activities.

And that process is very similar. It's the same, same process in effect as what occurred as part of the original Natomas HCP process with the North Natomas planned development. The only difference here is that we are starting the discussions with the wildlife agencies sooner in the process rather than later, and we are using that process

24 with the agencies to inform the actual approvals that will

25 ultimately be granted, the final map with the City of

Sacramento.

MR. LOCKHART: I would like to clarify for the benefit of the Commission, there are going to be proposed mitigation measures within the Draft EIR that include both the City of Sacramento and LAFCo being engaged in that process. So that would keep your commission apprised.

MS. COLLIN: I would hope so, because those are -- the document references it.

MR. LOCKHART: Sure.

MS. GUERRO: Commissioner Collin, I would also note that the City of Sacramento and the applicant have been in discussions with Fish & Wildlife Service and Fish & Game to try to get their input early in the process, too, so that the project that's before you for annexation purposes is going to be, you know, hopefully close to what ultimately gets approved.

And that's the reason, in addition to what's required under the Natomas HCP itself, for starting the impacts analysis and starting that process with the wildlife agencies now rather than later after LAFCo makes its decision.

Does that help answer your question?

MS. COLLIN: It does. I think there might be some legal issues involved.

24 MS. MILLER: I think it would be fair to say that there

25 is a little bit of dispute about the timing of when the HCP

amendment or stand-alone HCP needs to be done --

MS. COLLIN: Right.

MS. MILLER: -- for some of the public entities involved, and we are trying to work on that, which consensus, which we may or may not do that's a process Alicia is talking about.

But there is some difference of opinion as to whether or not that needs to be done, say, before rezoning as opposed to prior to final map approval. Is that fair?

MS. GUERRO: I think that's where we were a couple of months ago, but in trying to put together the effects analysis and the EIR, we worked with Fish & Wildlife Service and Fish & Game about what the intended use of these documents would be and what the process would be. And I think we're certainly a lot closer, and I think they understand that this is a cooperative process that's going to occur concurrently as the local approvals occur.

So I probably wouldn't call it a dispute at this point, but maybe that's me.

MS. MILLER: You may be right, because we did meet with them, and they might have some dispute about --

MS. GUERRO: Right.

MS. MILLER: -- their language. We have our language

24 in the EIR, and have received a comment from them.

25 MS. GUERRO: Actually -- I'm sorry, Nancy.

They actually did review this, and their comments were incorporated into the final version.

MS. MILLER: Very good.

MR. BRUNDAGE: What I will do, too, is attempt to put together an outline of what I think, and with Nancy's review, of what these processes are, because in this particular case with the federal and state government involved in the HCP, it is a very complicated, obviously, morass and there are different roads you can go down and different options.

And if I can at least lay them out so the Commission sees what those potential options are, I think you can better maybe understand, you know, how we will fit into this process, because it is going to be a very interesting process.

MS. COLLIN: Yeah. I think -- and I'm just telling you as one commissioner, I think there is going to be an issue here. And, you know, the County itself struggled with the idea of an HCP in Natomas, and floundered, was not able ever to come to any agreement. Much of the land is still unincorporated. And so the County itself, let alone LAFCo, is going to be interested in what happens with that HCP and the timing. So if you can do something about making that clearer to us, I'd appreciate it very much.

24 MR. BRUNDAGE: Okay. We'll do what we can.

25 MS. GUERRO: The only other thing I would note here is

that this HCP or HCP amendment is Greenbriar specific, and we've talked to the agencies about that, making it just specific to this project. That said, you'll find in your EIR that there is an evaluation of the cumulative effects of the joint vision effort and other things that may happen in Sacramento County.

So I agree, Sacramento County is going to be very interested, but the intent is not to cover the entire basin as part of this HCP amendment. That's left for another process with the agencies that hasn't started.

MS. COLLIN: Okay.

MS. GUERRO: Thank you.

CHAIR TOOKER: Thank you very much.

Our next speaker is Tina Thomas.

MS. THOMAS: Good evening, Chairman Tooker and members of the Commission. Just to follow up, I am Tina Thomas, and I'm here today representing the Greenbriar Partnership which consists of AKT and Woodside Homes.

Just to follow up on Alicia's comment with regard to the HCP, the process that we are proposing for Greenbriar is a little different than the process that the County is using for the Metro Airpark, which is immediately adjacent to and is more of a stand-alone approach.

I just want to very quickly address the request for continuance. We are supportive of Option No. 4 that

Mr. Brundage laid out in the staff report, that would allow people who are here this evening to testify, but then allow the staff to hold a subsequent workshop where they would take additional comments, and would provide a court reporter so that there would be a verbatim transcript that the environmental consultant could use so that they could respond to comments. We believe that that would maximize the public comment in this process. So we are supportive of No. 4, and hope there isn't a continuance to October 4th, because there is not a September LAFCo meeting, and October 4th would be a two-month delay to ask.

We are also mindful of the fact that we are trying to get through this process where we get local entitlement, and RT can then use that density that's around the light rail station in a way to move the DNA line up the priority list.

So those are some of the competing issues that are going on with regard on our request for continuance. We believe that by adopting Approach No. 4, we avoid the delay yet we maximize public comment. That's kind of what we're after here.

MS. COLLIN: Now, I don't know whether anyone from the Natomas community is here to speak, but we did receive --

MS. THOMAS: Correct.

24 MS. COLLIN: Okay. Because we received e-mails that

25 they felt that was a very different process from being heard

in front of the Commission, and having their comments heard by the Commission instead of having to rely on a separate hearing, separate community meeting.

So they'll speak for themselves.

MS. THOMAS: Sure. Clearly, they are going to get a crack at the Commission in terms of the context of the hearing on the sphere and then the hearing on the annexation. So there are plenty of times for them to have their testimony in front of the Commissioners. And the whole approach on an EIR is just to get comments, and then the responses to comments start to crystallize the issues. So I hope that it's not a decision-making process, it's just a hearing process, informational process so to speak.

Thank you.

CHAIR TOOKER: Questions?

MR. FONG: Just a statement at this time.

And while I'm kind of thinking about something Mr. Buford said, I mean -- I'm going to put my City of Sacramento hat on for a second and tell you that as a co-lead agency representative, you know, we would really like to see this process go forward tonight. And certainly, if the applicant is willing to entertain Option 4, I suppose we are fine with that.

But I do want to emphasize to my fellow Commissioners that one of the reasons why the City of Sacramento staff is

out here in force tonight is because it's a very important project for us here in the City. And, frankly, we have dealt with the Greenbriar issue getting out in front of the City level and the LAFCo level previously. It might do some good for Peter or someone to take us down memory lane and remind us how we got to this point. But it's been a while, and the whole point initially, to my recall, was that, you know, if we could do this in a different fashion, which I thought we agreed to, that the whole purpose behind it was to try to accelerate this process for Greenbriar, given its location and given the strategic importance to the City of Sacramento as well as the RT.

But also really to use it, you know, wisely in a way to see how we might be able to pilot some programs that might work for us when we start to talk about the general vision. So I just wanted to -- I do think it would be helpful if staff reminded us how we got to this point and so we have some context for what it is about.

MR. BRUNDAGE: Well, basically, I mean -- I forget how long ago it was -- we came to the Commission approximately a year ago to -- the request was that we, you know, work collaboratively with the City of Sacramento to become a -- well, it worked out, actually the staff report was, I think,

24 modified, I would say, through the hearing process. The

25 Commission agreed that we could become a co-lead agency with

the City and try to work collaboratively to expedite the process for this particular project.

And since that time we have been, you know, been working as hard as we can to make that sort of occur. And that's, again, why we sort of scheduled the hearing tonight as soon as the Draft EIR was available to the public, which, again, as I mentioned in the staff report, normally we try to wait toward the middle or the end of the process and do community outreach prior to the public hearing in front of the Commission.

So I think, you know, we're game here. We're caught in the middle of trying to satisfy the needs of everybody and yet sort of still have a good public process and not a rushed one. And in this case, because of the issues, there are several issues here that actually, unfortunately, throughout the process -- one of the moving targets is going to be the flood issue, which was sort of just briefly discussed this evening.

Now, you know, we do need some time, I think, to look at these issues since they are big, but I think we can still kind of keep the process going. So I think, you know, again, it's the Commission's alternatives, there are some options that you have. You can direct us to do a separate outreach

24 without a hearing process, schedule a special meeting, or, if

25 you choose, continue to October 4th. But we're here willing

to try to work and assist and expedite as much as we can within, I think, the limits and constraints that we're going to be faced with, the challenges. I mean, this is not going to be any easier than the City of Folsom Sphere Of Influence, and I would think it's probably much more detail oriented and has, in a sense, many more complicated issues, especially with the HCP and the flood issue that I think are going to be, in a sense, challenges.

I think there are solutions. I think, though, the crafted -- the mitigations are going to be, you know, we are going to have to take a lot of time and patience and work on some good mitigation measures in order to move this forward.

So these processes, as I mentioned, the flood issue, that SAFCA came out with a new study right in the middle of this and threw everybody a curveball. I think that obviously the more information that becomes available, this is going to take a little bit of additional time to address those issues fairly.

MR. MULBERG: I have a question. With Option 4, when we have a public hearing with a court reporter, when might that happen?

MR. BRUNDAGE: We would like probably, I want to say, mid-September.

MR. LOCKHART: If you want to stay with Option 4, within the 45-day review period, it would probably be two or

three weeks of the -- within -- before the end of August. Conversely, the Commission can extend, keeping in mind you are co-lead agency, the option as laid out in the report. You can have a 60-day review period or you can extend it as you see fit.

If you want to direct us to go to the community and have a meeting in the community, we'd recommend -- or actually, that's within the 45-day period.

CHAIR TOOKER: Thank you.

Our next speaker is Thomas Reavy, I believe.

MR. REAVY: Good evening, members of the Commission. My name is Thomas Reavy, and I'm here representing the Natomas Community Association, NCA. We are here to request a continuation of this item because our community association and others have not been given adequate time to comment, review, and testify on this matter. 6-1

We further request that we do not want to be shunted into community workshops. We do want to request that we get the opportunity to address your whole Commission. 6-2

Furthermore, preliminary analysis reveals that this EIR fails to address the serious flood-control issue that exists in the Natomas Basin. Natomas Basin was recently de-certified by the U.S. Army Corps of Engineers, so the EIR 6-3

24 is disingenuous in proposing that all flood-control measures

25 have been taken and have been addressed.

6-3
Cont'd

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Finally, we also want to say Natomas Community Association opposes any annexations outside of the City of Sacramento until these serious flood-control issues can be addressed and taken care of.

6-4

We would therefore call for a moratorium on this and any other proposal of this nature.

Thank you all very much for your consideration.

CHAIR TOOKER: I have a question. Our next meeting is October 4th. If this were to be continued to that time for public testimony, is that consistent with your request?

6-5

MR. REAVY: Yes, that would be consistent with our request.

CHAIR TOOKER: Thank you.

Any other questions of the speaker?

MR. ROSE: Do you have any other major --

MR. FONG: I have several questions.

I'm sorry. Go ahead.

MR. ROSE: Do you have any other major concerns other than the flood?

MR. REAVY: Well, we haven't had a chance to review and comment on the item yet, hence we are asking for a continuance.

6-6

So our preliminary analysis only, I just wanted to

24 throw that one comment out tonight and the issue about the

25 moratorium on any annexation.

6-6
Cont'd

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But, no, we haven't had a chance to review the document yet. There is going to be a lot of concerns that we have.

6-6
Cont'd

MR. ROSE: Thank you.

MR. FONG: This is a question of both the applicant as well as the speaker, and I'm just asking the question.

In Alternative 1, it speaks about a special meeting. What would be your respective positions on a special meeting that was convened within the 45-day comment period?

And I'll take the answers off the air.

MS. THOMAS: We're fine with that. That would be a very good solution.

CHAIR TOOKER: I have a clarification question for you.

Do you mean a special meeting of this Commission?

MR. FONG: That's correct. I mean, again, we haven't gotten to this point yet, but, you know, to me, I'm certainly willing to entertain, you know, a special meeting or some accommodation to take us through the balance of the 45-day comment period. But I am absolutely unwilling to extend the hearing time beyond that, frankly, because of our own calendars.

I think that this is an important item. You know, I agree with Peter, I think that we have got to balance the public process but also the public interest. And we have

been dealing with this now for about a year, and we haven't gotten very far. And, frankly, you know, if people are

concerned about not having enough time to comment in front of all or some of the Commission inside the 45-day time period for comment, then I certainly would make myself available to attend a special meeting inside that time.

If we as a commission are not willing to do that, then I don't think that we should hold this process up, and we should look at ways to the get the public comment heard.

Frankly, this is a draft EIR. It's not the final word. And, you know, I think we need to keep the process moving, at the same time recognizing that we do want to hear from our public.

MS. COLLIN: I have one.

When is the date of the 45 days up?

MR. LOCKHART: September 5th, it's the Tuesday after the Labor Day weekend.

MS. COLLIN: And I guess I am going to give -- I don't mind a special meeting, but it's going to be beyond the public comment period. Number one, this is the summertime. This draft's been on the street for what, two weeks?

MR. LOCKHART: Three weeks.

MS. COLLIN: Three weeks. People have summer vacations, they have a lot of other things, and they'll have the Labor Day. They're not going to be back into their

24 regular routine, or their community associations and whoever

25 else they have go over each section of the EIR has a chance

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to go over it and make their comments.

So, you know, I'm willing to look at whether we can accommodate some time in September. Our Board of Supervisors sits in meetings, in budget hearings, back in September again. And so it would have to be after -- towards the middle of September.

MS. PETERS: Although, the end of August, most people are back, the kids are back. My niece goes back August 15th or something. We have to come in and have Admissions Day, but I think most people are back in the middle of August.

Are you thinking something like the third or fourth week in August, Rob?

MR. FONG: Yeah. My feeling is that, you know, I want to be sensitive to people's vacation schedules, but I'm not willing to hold our process hostage because it's the summertime. And maybe I need a vacation.

MS. PETERS: Always a possibility.

MR. FONG: But I just think that there, you know, there is a way to accommodate everyone's interests here if we are willing to make the special effort, frankly, to convene a special meeting inside the comment period.

CHAIR TOOKER: I would say that I think we have other people in the public that want to speak to this continuance

24 issue, and I would like to recommend, before we continue our

25 dialogue --

MS. PETERS: Although I think the question that you or Mr. Fong asked was of one of the applicants, not the speaker, if a special meeting would meet their purposes.

MR. REAVY: As I've stated in my testimony, a special meeting does not meet our purposes. We want the opportunity to address the whole Commission.

MS. PETERS: A special meeting of the whole commission would be appropriate.

MR. FONG: Certainly.

MS. SCHERMAN: It will be the full commission.

MR. FONG: Certainly.

MS. SCHERMAN: I want to be there.

CHAIR TOOKER: Thank you.

MR. REAVY: Thank you for your consideration.

CHAIR TOOKER: I don't have any additional cards, but I think there are some people --

MR. PACHL: Jim Pachl, representing Friends of the Swainson's Hawk here, but ECOS, I also submitted a request for continuance, not so much for myself. I'm a lawyer. I'll write out my comments and get them in in time.

But because this is a controversial project, there are members of the public who are quite concerned about it. This may be actually probably one of the more controversial ones

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7-1

you have had for a while, and certainly the appearance of trying to rush this through before the -- during the vacation

7-1 Cont'd

season where the public has maybe two weeks to look at a very complex EIR, it doesn't look good. Public does deserve time to read the EIR and have face time with the Commission.

Again, a hearing in front of staff, I don't think -- in this instance does not do it. I would say the first week of September, second week of September, people are back from vacation. A couple more weeks of extension of time on the comment period -- that's what we are talking about -- is not going to make any difference.

7-1 Cont'd

It's going to be a while before this gets -- the EIR process -- approved in any way. There is already one significant problem with the analysis of flood. I did briefly look at the EIR. It assumes that there is hundred-year flood protection because of FEMA's hundred-year flood certification. In fact, on July 20, the Corps issued a formal letter saying that it is withdrawing its determination that the levees have hundred-year flood standards. And that was the whole basis for FEMA's determination.

7-2

The Corps chief of public affairs says we agree the levees today do not meet certain certification criteria. There is no way that FEMA hundred-year criteria as to assume hundred-year flood protection is going to meet the requirements of CEQA. It will be necessary for the preparers

of the EIR to do a recirculated EIR, or partially

recirculated, that seriously addresses that the basin no

7-2
Cont'd

longer has hundred-year protection, propose serious mitigation measures if this project is to go forward, and also discusses how, if the project does go forward, how it is going to meet FEMA's requirements so that the area, that community, is still eligible for FEMA flood insurance. It's a serious issue.

7-2 Cont'd

CHAIR TOOKER: Would you please sum up.

MR. PACHL: I will simply say the issue has come up as to what the HCP requires. The Implementation Agreement that the old HCP says that in the event of further urban development, prior to approval -- and I said prior to approval -- of any related rezoning or pre-zoning, such further urban development shall trigger re-evaluation of the plan, new effects analysis, potential amendments, and issuance of incidental take permits for that permitting of additional development.

7-3

Seems to be fairly clear that this has to be done prior to pre-zoning. It cannot be postponed to sometime prior to the final map.

Maybe we can debate it. I would suggest that LAFCo, not really having a dog in the fight, should take the more conservative approach and insist that the HCP process be done and completed prior to approval of pre-zoning.

24 Thank you very much.

25 MR. ROSE: I have one question if you could answer it.

MR. PACHL: Sure.

MR. ROSE: Do you know if the letter from the Corps was specific with regard to the levees that are along the Sacramento River in this area, or was it just the general area?

MR. PACHL: (Reading.) It is no longer -- can no longer support our original position regarding certification of the levee system surrounding the Natomas area.

7-4

MR. ROSE: Just Natomas. So it is the specific levee.

MR. PACHL: Yes. I can give you the letter.

MR. ROSE: Thank you.

MR. BRUNDAGE: I think -- are there copies to the Commission of that letter?

MR. PACHL: This is also a copy of the relevant language.

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CHAIR TOOKER: Our next speaker, we have a request from Jude La Mar.

MS. LA MAR: Good evening, Commissioners. Jude La Mar. I'm an ECOS board member.

Watching the hearing tonight, I wanted to say something about the specific regional impacts of this project and the fact that LAFCo is the body that looks at regional impacts of new annexations, and so I think it's more than public comment

8-1

that you would want to do with the Draft EIR. 8-1 Cont'd

First of all, you know, each commissioner, the City 8-2

commissioners excepted, has jurisdictions and people that you're responsible for who can be affected by this proposal, even though it is ostensibly a City of Sacramento project. This project has already been described as somehow integral to our regional transportation system.

As part of the environmental community, we have done some investigation into the light rail line. And this proposal, how likely is it? Tonight Tina Thomas said, well, we need this land use to justify this light rail line. Last year we were here and we heard, well, we need this land use to make the light rail line feasible in terms of the federal funding criteria.

8-2 Cont'd

I don't think it does make this light rail line feasible. Everything I've read about the light rail line proposal is simply too expensive for this region in terms of what it produces in terms of transportation benefits. It will draw resources away from transportation to other parts of our community that are already built and desperately need transit.

That's one major issue that LAFCo should seriously think about, is that it has impacts on the whole county.

Second is our regional airport. We have a regional airport serving our region, but mainly serving our county's

8-3

24 population, and this project will affect the major egress and

25 ingress of people and goods to that airport.

8-3
Cont'd

So I strongly urge this Commission to take the time to look at those issues very carefully, read the EIR on the transportation impacts, and clarify how this project can be mitigated to not have an impact on everyone else in the county trying to get to and from the airport.

8-3 Cont'd

Thank you.

CHAIR TOOKER: Thank you very much.

Any other members of the public who wish to make comments?

Thank you.

MR. JAKOBS: Mr. Tooker, Gary Jakobs with EDAW.

I just wanted to briefly point out that this flood-control issue I thought would be at least raised to this Commission, that in the EIR we did express awareness that the levees may become decertified, and there is an extensive mitigation process in the EIR that addresses how to provide 100-year flood protection in the event that the levees are decertified.

This is not an opportunity to respond to comments, but I thought it would be important tonight to at least make you aware that the EIR does address this issue extensively.

CHAIR TOOKER: Thank you.

Now we can re-engage in our dialogue about the proposal

24 before us.

25 MS. SCHERMAN: Mr. Chair, if I may, please.

I support the idea of having a special meeting. We can have it, you know, the last three or four days of August, which would still be in the time frame.

If we hold it off, like if we say because of vacations and stuff, then we are running into Labor Day, people are going to be taking off for that three-day weekend. So there is always going to be a reason why, you know, something isn't going to be able to be scheduled.

I know the EIR has been out for two weeks. It is seven inches. It's really a lot of stuff to go through and read. But folks that read those EIRs, I can guarantee you, they know what they're looking for and specific, so they're not going to go page by page, paragraph by paragraph. They know exactly what to look for and what they're really concerned about.

Same thing for us. We read, you know, we scan through it the first time, sure, and then we go back and then start, you know, more detail. But I, too, would like to hear from the public. And in order for that to happen would be to go ahead and ask for a special meeting so that they do have the opportunity to be before all of us.

I don't like the idea that they would meet with two or three commissioners two or three different times. I don't

think that's fair to them and it's not fair to us, because I like to hear what's going on as a whole, and I like to hear

what my colleagues are saying as well.

So my recommendation at this point in time, and I'll just wait till everyone has finished their comment, is to ask for a special Commission meeting at the end of August. And I have looked at my calendar, and I'm available August 29th, 30, and 31 in the evening -- in the daytime, if we have to -- but those are the evenings that we generally would be meeting.

CHAIR TOOKER: Thank you.

MS. SCHERMAN: Thank you.

MS. COLLIN: Do you just want to go down? Okay.

We have a time-honored kind of a legacy where my City Council member and I -- no matter who is my City Council member -- disagree on some issues, and this is definitely, again, one of those times, because I definitely like to err on the side of accommodating as much as possible the fact that the public is not paid to be involved. They are not paid to read EIRs, they're not paid to review those. So they have to take time from their work, as well as their vacation schedules, to get themselves ready to appear before any body.

And so I try to be sensitive to that because, long before I ever ran for public office, I was a community activist and had my own issues with various issues that would

come before either the Board of Supervisors or the City of Sacramento. And I live in the city where Roger Fong is my

representative.

MR. FONG: Rob.

MS. COLLIN: Did I say Roger?

MR. FONG: Yes, you did.

MS. COLLIN: Sorry to do that.

So, you know, I'm trying to be accommodating. I do favor the special meeting and getting the comments on the record. I think it makes a lot of difference when people are testifying in front of a body, because sometimes it sparks interest and further questions on the part of electeds and makes them think about issues that they haven't thought of before.

That being said, I would be more than happy to accommodate some times, even if it meant extending the 45-day period beyond Labor Day. My experience has been, with my own family and grandkids, that things settled down after Labor Day and people are really back into a routine.

So I don't have any problem, and I would try to work out and make sure I can attend the meeting. But I think most of us are aware of Board of Supervisors meetings on Tuesdays, Wednesdays, and Joint Powers Thursdays. We have very full schedules, and we have night meetings on some Wednesdays.

CHAIR TOOKER: Thank you.

MS. COLLIN: I'd have to look at the schedule, and I don't care when.

MS. PETERS: August 30, 31 --

CHAIR TOOKER: Do you want to make a comment, Ms. Peters?

MS. PETERS: I was just commenting to Ms. Collin's comment about our calendar. There is no Board of Supervisors meeting on August 30th.

MS. COLLIN: Not that we know of. We didn't expect one at 7:30 tonight either.

MS. PETERS: That is true. But this is on more of an unexpected kind of situation.

CHAIR TOOKER: You don't have any additional comment on the issue of scheduling?

MS. PETERS: Well, I feel like we should defer to the City who has been managing this process. And I am more than willing to meet again in a public session to accommodate the City. It seems everyone has been at it for more than a year.

CHAIR TOOKER: Mr. Rose?

MR. ROSE: I think I would propose a 15-day extension on the EIR, allowing the public more time to go ahead and respond, but not more than 15 days. So that would take it from 45 to 60 days, which could get us to the end of September or close to the end, I believe, like the 20th, the 5th to the 20th. And I think in doing that, if we had to

24 have another meeting, we could have that meeting, we could

25 have some further discussion.

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I do think we want to move it along. I think it is an important project for the City and for the County. But I do think it's also the first time we have jumped outside the sphere of influence, zoned, and gone through a process as quickly as we are trying to do this. So I'd like to give the people as much time, along with the professionals, as much time as they need to review this "tiny" document that we are trying to review.

And, you know, it says an awful lot in it, and I think it's an important move for us to continue the process and move it on. And I think it is -- 15 days I don't think would kill us. I think it may help us, in fact, if we can analyze it a little bit better, get all the comments we want, and make sure that the mitigation is something that everybody can live with.

CHAIR TOOKER: Thank you.

Mr. Mulberg.

MR. MULBERG: Actually, Commissioner Rose and I haven't really talked about this, but I tend to agree with him. I think, first of all, if you're going to have a meeting, a public meeting with a court reporter there, I don't see any difference in having the rest of us there, too. So I think there should be a special meeting of the Commission. I also

think it's really important that we allow the public as much opportunity to comment.

42

Just from hearing some of the discussion tonight, some of the issues are rather complex, and I don't feel like I'd like to be rushed through some complex issue, and give everybody an opportunity to express their opinion.

So I would tend to agree with Commissioner Rose that maybe we extend it another 15 days.

CHAIR TOOKER: Thank you.

I'd just like to say that I think we have already come a long way in trying to accommodate this process, between having a consolidated sphere and annexation process on a very, very complex project in a very, very complex region with a lot of unresolved issues that will have regional effects. And I think it would be imperative that we as a commission evaluate those issues fully, notwithstanding that we have already consolidated the process in a way that looks at the long-time regional effects and benefits of such a decision.

And I would remind everybody that in the most recent update to our legislation, the Cortese-Knox-Hertzberg Act, that one of the changes was the reminder from the State Legislature that we do more to involve the public in our process. And we all know as commissioners here that it's sometimes very difficult to get the public involved. And I

24 think, especially when we have members of the public coming

25 forward who want to be part of the process and given the

opportunity to participate effectively, we need to take that opportunity, and we'd be shirking our responsibility if we didn't.

So I would -- I would choose an option whereby we would meet at the end of August, some sufficient time that the public here believes is sufficient for them to review the document and provide input, and that we do that as a commission so that we can have that dialogue and listen to each other's questions and to the input from the public.

So it's not clear to me whether the 15-day is different than the end of August.

MS. SCHERMAN: Mr. Chairman, I just have a question. If we have the special meeting like we were all talking about the past six months at the end of August, and we find, when we have that meeting, that we need additional time because in that forum there are a number who say they want to be heard, at that point can you entertain legally another meeting, or would that be our action meeting?

MR. BRUNDAGE: I would think you could continue it.

MS. MILLER: You can continue it. There are statutory requirements about when you have to complete the process. And I need to go back and review those, because I don't think we are beyond those yet.

But I don't think you can continue it for an extended length of time. It would be potentially only until your next

meeting.

MS. SCHERMAN: I am sure that question would come up, and I just wanted to see if it could be extended.

Thank you.

MR. ROSE: The 15-day extension means the comment period would be over before our October meeting, and we would have our final, you know, information at that time, and that's when we would be making our decision.

We aren't supposed to have a meeting in September but, should it be required, we can do a special meeting in September also, later in the month, either before the comment period is over or sometime before --

MR. BRUNDAGE: Nancy would have to verify this.

MS. MILLER: Yes. You can't have your public hearing and say the comment period is closed. The whole point of the public hearing is to have you take public comment. So we want to try to have this hearing --

MR. ROSE: So if we extend it 15 days, that takes us to the 20th. That allows us time in September, if we have to, to have public comment during that period of time. But our next meeting isn't until October, except for the special meeting which is going to be for hearings.

MS. MILLER: Well, as I understand what's before you,

it could either be the last week in August, which would be within the comment period so there is no need to extend it,

or an extension, or we just move to October.

MS. SCHERMAN: No. I wasn't asking for extension. I was saying that let's -- my recommendation personally is to go to the last week in August. My question was, if at that point in time the public comes forward and say they needed more time, what would we be able to do?

MS. MILLER: We would still have the same discussion. There would be people that would be opposed to that, wanting --

MS. SCHERMAN: Right. Right.

MS. MILLER: Okay.

MR. ROSE: So if we had to extend the meeting comment -- if we have the next meeting, which is going to be late in August --

MS. MILLER: Yes.

MR. ROSE: -- and we haven't heard all the comments, and we're here at midnight, could we extend it at that time 15 days?

MS. SCHERMAN: That's what he's really asking.

MS. MILLER: Oh, I see. I'm sorry.

Yes, you could at that time extend it to 15 days.

MR. ROSE: Okay.

MR. BRUNDAGE: But the law, we looked it up -- Nancy

would have to verify it -- but in the staff report it says

if -- the meeting may be extended up to 60 days or more in

the event of unusual circumstances.

So it sounds like there would be enough discretion there to continue if you need that second, another meeting.

CHAIR TOOKER: Commissioner Fong.

MR. FONG: Yes. What I'd like to do, since I know that we are struggling with the continuance issue, is to make a motion to convene a special meeting of the LAFCo commission for the purposes of hearing public comments on the Draft EIR within the 45-day comment period for August 30th, assuming that's a date that works for everyone.

MS. SCHERMAN: I second the motion.

MR. FONG: And that, you know, certainly we would just reserve the right at the end of that hearing to see, you know, if that was an appropriate hearing for us or if there are exigent circumstances that would cause us to at that time take up, you know, any sort of other action.

CHAIR TOOKER: Is there a second?

MS. SCHERMAN: I will second that.

CHAIR TOOKER: It's been moved and seconded that we set a special meeting on August 30th to take comments on the Draft EIR.

MR. FONG: And I was suggesting that -- I don't know what day of the week that is, but that we start at 5:30.

MS. SCHERMAN: It's a Wednesday.

CHAIR TOOKER: Okay. Roll call.

MS. FLEMMER: Mulberg?

MR. MULBERG: It's a Wednesday?

Yes.

MS. FLEMMER: Rose?

MR. ROSE: Aye.

MS. FLEMMER: Peters?

MS. PETERS: Aye.

MS. FLEMMER: Fong?

MR. FONG: Yes.

MS. FLEMMER: Collin?

MS. COLLIN: I'm not going to vote no, because I reserve the right to push harder on the 30th, depending on the comments. I still think it's going to be difficult.

So I will vote yes for it now.

MS. FLEMMER: You will vote yes for it now?

MS. COLLIN: Yes. But I might change my mind.

MR. FONG: Duly noted.

MS. FLEMMER: Scherman?

MS. SCHERMAN: Yes.

MS. FLEMMER: Tooker?

CHAIR TOOKER: Yes.

MS. FLEMMER: I will try to find you a room.

CHAIR TOOKER: Thank you all for coming.

(At 7:07 p.m. the meeting is adjourned.)

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REPORTER'S CERTIFICATE

STATE OF CALIFORNIA)
) ss.
COUNTY OF SACRAMENTO)

I, SANDRA VON HAENEL, certify that I was the official Court Reporter for the proceedings named herein, and that as such reporter, I reported in verbatim shorthand writing the named proceedings;

That I thereafter caused my shorthand writing to be reduced to typewriting, and the pages numbered 1 through 48, inclusive, constitute a complete, true, and correct record of said proceedings:

IN WITNESS WHEREOF, I have subscribed this certificate at Sacramento, California, on the 10th day of August, 2006 .

_____
SANDRA VON HAENEL
CSR No. 11407

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SACRAMENTO LOCAL AGENCY FORMATION COMMISSION

PUBLIC HEARING

CITY OF SACRAMENTO SPHERE OF INFLUENCE

AMENDMENT AND REORGANIZATION OF

GREENBRIAR PROPERTY

PRESENTATION OF DRAFT ENVIRONMENTAL IMPACT REPORT

BOARD CHAMBERS

700 H STREET

SACRAMENTO, CALIFORNIA

WEDNESDAY, AUGUST 30, 2006

5:30 P.M.

REPORTED BY: SANDRA VON HAENEL

CSR NO. 11407

ATTENDEES

SACRAMENTO LOCAL AGENCY FORMATION COMMISSION:

CHRISTOPHER TOOKER, CHAIR
CHARLES ROSE, VICE CHAIR
ROBERTA MacGLASHAN
SOPHIA SCHERMAN
SUSAN PETERS
ROBERT KING FONG
ELLIOT MULBERG

MARILYN FLEMMER, Commission Clerk

PETER BRUNDAGE, Executive Officer, Sacramento LAFCo
DONALD LOCKHART, Assistant Executive Officer, LAFCo
NANCY MILLER, Legal Counsel to LAFCo
TOM BUFORD, Associate Planner, City of Sacramento

EIR CONSULTING FIRM:

GARY JAKOBS, EDAW INC

APPLICANT:

PHIL SERNA, North Natomas 575 Investors

INTERESTED PERSONS:

TOM McDONAGH, Westlake Resident
THOMAS FOLEY, CCRG
JOE SULLIVAN, Sacramento County Tax Payers League
THOMAS REAVY, Natomas Community Association
ALTA TURA, Sacramento Urban Creeks Council
JUDE LAMARE, Friends of the Swainson's Hawk, ECOS
TARA HANSEN, SOS Cranes
JIM PACHL, Sierra Club, ECOS
ROSE TRABALAT, South Natomas citizen

LIN HOM, Save Truxel

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25 ---oOo---

SACRAMENTO, CALIFORNIA, WEDNESDAY, AUGUST 30, 2006

5:30 P.M.

---oOo---

COMMISSION CLERK: City of Sacramento and Sacramento Regional County Sanitation District Sphere Of Influence Amendments and Reorganization of Greenbriar Property, Public Testimony on Draft Environmental Impact Report.

CHAIR TOOKER: Let me clarify. This item tonight is an item to take comment. It's not a decision item for the Commission; correct?

MR. BRUNDAGE: That is correct.

MS. MILLER: That is correct. It's the continuation of the public hearing on the Draft EIR. We're here to hear comments on that Draft EIR from the members of the public.

MR. BRUNDAGE: That comment period, by the way, closes on September 5th at 5 o'clock.

And this evening I think we're going to start off with Tom Buford of the City of Sacramento who will have a few just quick remarks and introduce Gary Jakobs, with EDAW, who is going to then quickly go through the project, and then we'll open it up for public comments.

MR. BUFORD: Thank you.

Good evening, Chair Tooker and members of the

Commission. I'm Tom Buford, senior planner for the City of Sacramento. Thank you for meeting again on this item. We

appreciate the time you're taking.

The City doesn't hold hearings on environmental documents as a matter of course, so we're, of course, interested in the comments you take this evening.

The Notice of Availability, as Peter indicated, has a closing date for comments of September 5, and we brought extra copies of the Notice of Availability that are available at the rear of the room.

I'm the environmental manager for the project. Scott Mende, who is the project manager for the City, is here to answer any questions, and we're ready to go.

At this point, as Peter indicated, I'd like to briefly introduce Gary Jakobs from EDAW who has a few brief comments.

Thank you.

MR. BRUNDAGE: If we can get the screen down, the screen for the PowerPoint. There are copies available at the back table for members of the public.

MR. JAKOBS: Good evening, Chairman Tooker and members of the Commission. I'm Gary Jakobs with EDAW, and I will give a very brief presentation.

I was here on August 2nd and gave a presentation, so this is a summary of a summary tonight. Then we're going to sit down and listen to the comments. Briefly talk about the

project description, the process of the EIR, what the EIR addressed, and then public input.

4

The project is a 577-acre development project on the northwest corner of I-5 and State Route 99. It's a mixed use development, approximately 3500 dwelling units and a variety of other uses, including an elementary school and biological habitat corridor. And also it will provide for a corridor for the proposed RT Downtown-Natomas-Airport line. And also as part of the project, the applicant is proposing off-site biology mitigation at two separate sites.

The location of the site is shown on this map up here (indicating). As you can see, it's near the airport, and it is surrounded -- here's a land use map of the site. And the primary entitlements involve LAFCo annexation, amendment of the Sphere Of Influence, and Sacramento Regional County Sanitation District Sphere Of Influence that would change annexation to the City. And the City of Sacramento will be required to go through its own actions to consider and approve the project site.

It will also require a Habitat Conservation Plan from the U.S. Fish & Wildlife Service. The project site is within the Natomas Basin Habitat Conservation Plan boundaries, but is not covered by the permit for development within the habitat conservation site.

As far as the EIR process, Notice of Preparation was

24 issued in June of last year. The Draft EIR was published on

25 July 19, 2006, for a 45-day review period which closes

September 5th. There was a hearing on August 2nd, and, of course, the hearing tonight, to receive comments. And then any written comments that are received by September 5th will be considered for responses in the final EIR. And the final EIR will be used to consider the various actions needed for project consideration.

As far as the context of the site, the site is in agricultural uses. The surrounding uses include Metro AirPark to the west, the North Natomas community to the south and east, I-5 and State Route 99 along the southern and eastern boundaries of the site, and then agriculture uses to the north.

The site is also near the Sacramento International Airport and, again, is within the Habitat Conservation Plan boundaries, but not within the area covered by the permit.

The issues addressed in the EIR are full scope. They are listed up on the screen here. No issues that were of any significance were scoped out of the EIR.

The primary LAFCo issues are utilities, public services, hydrology, drainage, and water quality, parks and open space, agriculture, and alternates to a Sphere Of Influence amendment.

That is a very brief summary. If there are any

24 questions, I can answer them. Otherwise, I will take my seat

25 and listen to the comments.

CHAIR TOOKER: Thank you.

Any questions?

COMMISSIONER ROSE: Is this site in the Urban Boundary now? Or is there a special action needed to bring it into the Urban Boundary before we annex it into the City?

MR. LOCKHART: It's not within the County Urban Service Boundary and policies of the County's General Plan. And this is an annexation to the City, so the Urban Service Boundary does not need to be amended. That's what the Sphere Of Influence amendment is and the subsequent Annexation.

COMMISSIONER ROSE: Thank you.

Do either of you have an any other spokesmen?

MR. BRUNDAGE: No, we're done. So it's public comment at this point.

9

CHAIR TOOKER: Okay. I have a number of cards here.

First, Tom McDonagh.

MR. McDONAGH: Good evening, LAFCo commissioners. My name is Tom McDonagh. I live in the Westlake area of Natomas. As a member of the Westlake group, I urge you to deny the appeal for annexation as contained in the Draft EIR. 9-1

We oppose this annexation because of its negative impact to the City's infrastructure and services. The City of Sacramento needs to direct its efforts to supplying City

services and flood protection still needed by Westlake residents. Flood protection and services such as police and

9-1
Cont'd

fire are currently lacking in Natomas. 9-1 Cont'd

I'd like to talk about some of the benefits the Greenbriar folk are promoting. First is the 40,000 jobs adjacent to Greenbriar at Metro AirPark and the airport.

The Metro AirPark is not close to providing any permanent jobs. In fact, I don't think the developers of the AirPark themselves have any idea when the first significant building will begin or, more importantly, end. And when 9-2 these jobs are finally created, the North Natomas area within the City needs these jobs to help our extremely low and underperforming jobs-to-housing ratio as called for in the North Natomas Community Plan.

To add Greenbriar at this time would just worsen this ratio. We don't want a bedroom community.

Light rail: Greenbriar supporters state that it will significantly expedite the implementation of the rail line to the airport.

What does this mean? We need specifics.

Are we talking about 20 years instead of 30 years? 9-3

Dr. Scott has testified before LAFCo saying that this project will enhance RT's chances to qualify for federal funding. Of course it will. So will any project in Natomas near the future rail line. We haven't been given any

specifics because my guess is they just simply do not know.

Let's remind ourselves that light rail is 12 miles and

9-3
Cont'd

12 stations away from Greenbriar. It has to cross the American River and two freeways just to get to Greenbriar. Not one station has been built.

Is this smart growth?

9-3 Cont'd

Furthermore, they estimate that Greenbriar will generate 1,162 daily riders. What will these future riders do for the next 20 to 30 years? Supporters say Greenbriar will provide shuttles long in advance of RT bus and rail services. How will they do this for so many riders?

9-4

North Natomas has been building out since 1999, but has yet received very few RT bus options and lines. I think there is two right now to North Natomas.

Will Greenbriar get RT bus and shuttle services sooner than North Natomas? I can't imagine so. Therefore, Greenbriar will have significant impacts to already crowded freeways that will crowd further with the continued developments already approved in the North Natomas Community Plan.

9-5

I realize that this project conforms to the SACOG Blueprint, but the preferred blueprint is for the year 2050 in literature that I've seen, not 2006.

So in light of all of this, someone please tell me why Greenbriar makes sense right now. At some point, yes, but

9-6

not now. 9-6 Cont'd

I urge you to deny this annexation proposal as crafted 9-7

9-7
Cont'd

in the Draft EIR.

Thank you.

CHAIR TOOKER: Thank you.

I'd just like to repeat that the item before us tonight is the Draft Environmental Impact Report. And I understand people are here to speak to their views on the project, but if you could make your comments in the context of whether you think your concerns are adequately addressed in the EIR, that would be helpful to us and would be helpful to the preparers of the EIR. They will respond to those.

Thank you.

MR. McDONAGH: But the light rail, though, won't that -- that's going to impact the freeways. We're not going to have light rail, so that does impact the Draft EIR. And as far as providing police and fire services that we are lacking in Natomas, also affects --

CHAIR TOOKER: I understand. I'm just trying to point out, to make this more efficient, that people can comment on the EIR in a way that it has handled the issue or not, which is the phase that we are at now in trying to evaluate the accuracy of that document.

MR. McDONAGH: Thank you.

CHAIR TOOKER: The next speaker, Thomas Fotel? It's

not very clear handwriting. Lives at 1840 Sanborn Road -- I think -- Yuba City.

10

MR. FOLEY: Good afternoon. Thomas Foley. I'm the director of a nonprofit, small nonprofit in Yuba County, and we are concerned with flood risk, wondering whether the levees -- the protection is there. So I'd like to comment on this Draft EIR that the known flood risks are not adequately addressed. 10-1

The City and County officials have received a letter from the Army Corps, communicating to them that there is not hundred-year flood protection. And I do not believe the Draft EIR addresses that new information.

Thank you.

COMMISSIONER ROSE: I'm sorry. What was your last name again?

MR. FOLEY: Foley, F-o-l-e-y.

11

COMMISSIONER ROSE: Thank you.

CHAIR TOOKER: Next speaker is Joe Sullivan.

MR. SULLIVAN: I'm Joe Sullivan, executive director with the Sacramento County Taxpayers League, and we spent five hours yesterday dealing with a subject very similar to this. 11-1

The Taxpayers League is becoming concerned with the Natomas area for a very large number of reasons. Now, when we discuss the EIR, actually that's not our venue. In other

words, what we watch is money, the application of money, the transfer of money, and the impact on the taxpayers.

11-1 Cont'd

11

You're going to get a letter from us, not within the aspects of the response to the EIR, but you will get a letter from us addressing some of the tax issues in that particular area and some of the actions taken by the City that we don't particularly agree with.

Basically, if I were a citizen in the county of Sacramento and I had to move into the City, I'd think twice. The City has taxes that are three times the taxes, for example, the utilities taxes that the people in the city pay.

They also have a strange tax. They have what they call the "Enterprise Fund Tax." I believe this particular building is inside the City limits and probably uses City water. The City charges 11 percent on every drop of water that passes through its system. They have others of a similar nature at 11 percent.

11-2

We challenged it once when they put out their documentation on the application of the tax. It used to be in their budget, listed on the tax table along with other taxes like the tax on utilities. However, it mysteriously disappeared and suddenly appeared in another column which was called the "Enterprise Fund Tax."

Now, it's an interesting aspect of taxing. What they do is take all the money from all the enterprise funds --

there are four that the City controls -- and then they tax

that entire fund 11 percent. And the way they collect the

11-2
Cont'd

money is to make sure that they build it into the rate when they charge it.

This is just an example, but there are many other issues involving money out there that we are really concerned about. One that we are looking at is the use of tax money, particularly the heavier development. If what we find is true in Natomas, it will expand statewide because it involves the same law. And instead of it involving millions of dollars in transfers or possible misuse of funding, it may become hundreds of millions of dollars if we look at it statewide.

11-2 Cont'd

Thank you.

CHAIR TOOKER: I'd like to ask clarification from counsel to explain. Is it true that although financially this is not directly subject to CEQA that, in fact, some public services are?

MS. MILLER: Yes. Impacts on public services are examined in the CEQA process.

CHAIR TOOKER: So, to the extent that revenues are redirected or something that would impact public services, is that relevant in discussing the project?

MS. MILLER: I think that is. But I think the gentleman's comments were more of a criticism of the way that

24 taxation is handled by the City, rather than this particular

25 project.

12

MR. SULLIVAN: That's correct.

CHAIR TOOKER: Thank you.

Our next speaker is Thomas Reavey from the Natomas Community Association.

MR. REAVEY: Good evening, Chairman Tooker and members of the LAFCo Commission. Thanks for the opportunity to address you tonight.

My name is Thomas Reavey, and I'm here on behalf of the Natomas Community Association to urge you to deny the City's Sphere Of Influence and Annexation proposal for the Greenbriar project as contained in the Draft Environmental Impact Report. 12-1

As members of the Commission, you have the primary responsibility to consider whether the annexation applicant can deliver the needed level of various services before an annexation can be approved.

The Natomas Community Association and I argue that the Greenbriar applicant and the City cannot deliver an adequate level of services to the project such as flood protection, sewer systems, police and fire services, emergency services, and necessary transportation improvements. The annexation should therefore be denied because the DEIR does not adequately address these very serious concerns. 12-2

Please consider, the project is in an Army Corps of Engineers' effectively decertified flood plain. To build

12-3

there would needlessly expose thousands of potential residents to serious harm and potential loss of life.

12-3 Cont'd

The regional sewer system as currently constructed and planned does not include the ability to handle the outflows that Greenbriar will be creating. The DEIR fails to properly address this serious issue.

12-4

The City of Sacramento is currently out of compliance with the police, fire, and emergency services and staffing ratios required by the North Natomas Community Plan -- I have a copy of it here -- the governing document for the development of North Natomas. Given the City of Sacramento's dismal track record for the delivery of police, fire, and emergency services in North Natomas, it's extremely doubtful that the City could provide any more of these service to Greenbriar. The EIR also fails to properly address these police and fire issues.

12-5

The project's DEIR describes serious unmitigatable traffic congestion to I-5, 99, and surrounding roads from the Greenbriar project, and notes that I-5 and 99 would have to be widened to six lanes. Because the applicant and the City do not propose to widen these roads, nor is land available, they note, serious unmitigatable traffic congestion will result, likely hampering necessary commerce and business to

12-6

and from our regional airport and preventing the delivery of a necessary level of transportation services to Greenbriar.

12-6
Cont'd

The EIR does not adequately address this item here.

Secondarily, in your role as a key element in the planning process, you have the duty to ensure that such planning is orderly, rational, and fair. My community association and I argue that the Greenbriar applicant and the City are proposing a sphere of influence that undermines the existing North Natomas Community Plan by creating a new stand-alone development area with different rules and requirements and thus creates an inequitable and unfair situation for other developers who must still comply with the North Natomas Community Plan. 12-7

The annexation should therefore also be denied and the DEIR rejected because it creates a new planning process that is unfair to the other area developers.

So, members of the Commission, because the applicant and the City of Sacramento cannot deliver the needed flood protection, sewer, police and fire and transportation services to the Greenbriar project, and because Greenbriar creates an unfair situation to other developers who must comply with the existing plan, my community association and I urge you to deny the City's Sphere Of Influence and Annexation proposal for the Greenbriar project as contained in the DEIR. 12-8

Thank you very much for your thoughtful consideration of this critical matter. If you have any questions, I am

12-8
Cont'd

available for questions.

CHAIR TOOKER: Questions?

Thank you very much.

MR. REAVEY: Thank you.

CHAIR TOOKER: Our next speaker is Alta Tura, representing the Sacramento Urban Creeks Council.

MS. TURA: Good evening. I'm Alta Tura, and I'm speaking for Sacramento Urban Creeks Council. We are opposed to the Greenbriar project, and we will be submitting a letter that details our concerns.

Tonight I just wanted to bring up a couple of things. The EIR does not sufficiently address the impacts of any levee improvements and other flood protection projects anticipated to be constructed within the next two to five years.

The EIR does not analyze the impacts of making an exception for this particular project, what kind of impact does this have on the possible future development in the basin.

The EIR does not analyze and discuss how to avoid impacts to Fisherman Lake and other waterways that will result from the growth-inducing impacts of this particular project. And we will list in more detail our concerns in our letter.

12-8 Cont'd

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CHAIR TOOKER: Thank you very much.

Any questions?

Thank you.

The next speaker is Jude Lamare, representing Friends of the Swainson's Hawk.

MS. LAMARE: Good evening, Mr. Chairman, members of the Commission, I'm Jude Lamare representing Friends of the Swainson's Hawk, and I would just say for, I think, for everyone who has spoken is that what we're asking you in terms of the EIR is that you instruct the consultants not to come back with the Final EIR until these issues that have been raised tonight are addressed in the Final EIR. 14-1

So that's the idea of the comments and the questions is to be sure that the Final EIR is very comprehensive in dealing with these issues.

As you know, I have objected in the past to processing this project independently of the City General Plan. The DNA RT EIR is on a totally separate track, and joint vision is something that people are actively talking about and working on in the City but are not included in this EIR. We bring that up because there are a lot of unanswered questions in the DEIR that are a result of having this project be on a special fast track that's moving ahead of everything else, so these related impacts cannot be addressed. 14-2

And compared with waiting a year or two, I think you'll

24 find in our written comments that waiting a year or two

25 greatly increases the potential for impacts and mitigating

14-2
Cont'd

them because a lot more is known of the specific.

The EIR identifies air quality impacts that are significant and unavoidable, but next year we are adopting new ozone and PM plans for our region that will outline how we are going to meet those standards under federal law. And those plans will include mitigation measures that will likely be required of future projects and that would be appropriate for this project that today are known. So by pushing ahead before the air quality plan is adopted next year, we sort of rob the decision makers of the ability to bring forward feasible mitigation measures.

Most troubling is this relationship with the DNA line. The synergistic relationship that policy makers have said exists between the DNA line, the light rail line, and this project are really very poorly addressed in the DEIR. I have two pages of comments and questions and issues that were raised about that.

People are really worried about a location where two freeways come together. Those freeways are serving goods movement. Our heavy-duty traffic is going up. The diesel emissions are greater than estimated last year from each individual entity to begin with.

So, on one side you've got an industrial project at the

14-2 Cont'd

14-3

14-4

14-5

24 airport, and to the south you have sensitive habitat lands,

25 agriculture, and to the north, the same thing. So this is

14-5
Cont'd

not an easy location to do an Environmental Impact Report. We have a lot of written questions that will go to the consultants for this response.

14-5 Cont'd

Thank you.

CHAIR TOOKER: Questions of the speaker?

Thank you.

15

Our next speaker Tara Hansen representing SOS Cranes.

MS. HANSEN: Good evening, Chairman and LAFCo commissioners. My name is Tara Hansen. I'm a Sacramento resident and member of Save Our Sandhill Cranes, a local private entity committed to preserving Sandhill cranes and other indigenous wildlife in the Central Valley.

15-1

Thank you for the opportunity to speak on the proposed Greenbriar project and DEIR. Our concerns about the project and the DEIR are summarized in the following points:

One, Greenbriar would have unacceptable impacts on traffic congestion on our freeways. These impacts will seriously impact air quality and commute times for existing residents living in the Natomas Basin, residents commuting to the north and east end of the county, and traveling to and from the Sacramento County airport. No feasible mitigation for the mainline freeway has been proposed.

15-2

The property in question lies outside of the County

15-3

24 Urban Services boundary and the City's current sphere of

25 influence. This project will push the limits of this

15-3
Cont'd

boundary and move urban sprawl further into open spaces of the county.

15-3 Cont'd

Three, there are flood concerns in the Natomas Basin that have not been adequately addressed in the DEIR. Additional housing in this area should not be built, given the cost of providing additional flood protection as well as the potential human cost should a major flood event occur. At the very least, there should be no new annexations for development until the levees are certified.

15-4

The EIR also does not contain the 1 acre of mitigation land to 1 acre of developed land as set forth in the Memorandum Of Understanding between the City and County for development in the Natomas Basin.

15-5

The project also contains permission for a lake in the airport flight zone. The airport has air-safety concerns about bird strikes in the flight zone. The EIR measures proposed for keeping these birds off the lake are somewhat unnatural, and attempting to maintain a birdless flight zone is, at best, difficult.

15-6

Smart growth is more than just building an urban center. It incorporates the values of open space, and improves upon those values while increasing density within the Interstate urban core and along existing transportation

15-7

routes, rather than pushing them further and further out.

Thank you for the opportunity to speak.

15-7
Cont'd

16

CHAIR TOOKER: Thank you.

Questions?

Our next speaker is Jim Pachl, representing the Sierra Club, ECOS.

MR. PACHL: Good evening, commissioners. And I would like to thank you for postponing the hearing from August 2 to today because, as you see, that it's gotten a good deal more participation, and it's certainly a very wise and considerate thing for you to do. 16-1

There has been some discussion about DNA and traffic. Some of the traffic reports in your EIR for projected 2025 cumulative impacts and presently approved projects assume that there will be a DNA line, assume that 11 percent of the traffic generated by Greenbriar will ride DNA and, therefore, the vehicle traffic numbers are smaller. If you're going to make that assumption, then there needs to be evidence in the EIR showing a substantial probability that the DNA will actually exist, in particular, evidence of the reasonable probability of funding. 16-2

If, as I strongly suspect, there is no evidence showing a reasonable probability of funding or even a remote probability of funding, then there should be no assumptions at all made about the existence of the DNA, and any portion

of the EIR that relies upon the DNA line pursuant to its existence should be rewritten otherwise.

16-2 Cont'd

Going over the flood hazard issue, the EIR says that the levees protecting Natomas area were found to meet the criteria for hundred-year flood protection under a levee evaluation conducted by the U.S. Army Corps of Engineers in 1998. You have -- I passed out at the last meeting -- and I see up in the back, a copy of a letter from the Corps of Engineers to staff, stating that "...we can no longer support our original position regarding certification of the levees," then "...informing FEMA of the current risk. We will help you remediate the areas where the greatest risks exist for the FEMA base flood event. Once these areas are remedied and analysis shows the system can safely convey the FEMA base flood event, we will recommend to FEMA that the area be certified to that level," meaning the base flood event.

16-3

The bottom line is that if you approve this annexation, you will be approving annexation for a square mile of residential development that has less than 100-year flood protection.

Your EIR says, oh, well, FEMA has not yet pulled their certification, so we have got a hundred year protection; no significant impacts.

I respectfully submit that, if you approve an EIR like that that assumes hundred-year flood protection because it's

16-4

24 got a hundred-year FEMA certification, even though the Corps

25 and SAFCA, it's own studies say it doesn't, then you will

16-4
Cont'd

basically be committing fraud on the public, which I really don't think any of you want to do, and if I'm blunt, you will be sitting there wide open for a CEQA challenge.

I can talk a little more about that issue as well as a whole raft of other issues, but I will be submitting comments on behalf of my clients on September 5.

Thank you very much.

CHAIR TOOKER: Thank you.

Any questions of the speaker?

Our next speaker is Rose Trabalat.

Sorry if I didn't pronounce it correctly.

MS. TRABALAT: Good evening. My name is Rose Trabalat. I'm a 16-year resident of South Natomas, and I'm here on behalf of myself and dozens of neighbors in opposition of the proposed Greenbriar annexation because of the potential for flooding in the Natomas Basin.

It has been reported that Sacramento has the potential to become another Katrina disaster. Sacramento has a higher flood risk than New Orleans and is now this country's most flood vulnerable city. And I do not see that fact as something to boast about. In fact, we all need to take this very seriously before disaster happens, not after.

My concern is this: In July, the Army Corps of

16-4 Cont'd

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24 Engineers withdraw its 1998 endorsement of levee protection

25 for some parts of Sacramento. Imagine the surprise of

17-3
Cont'd

24

residents in my area when they learned that we, in Natomas, are among those who may not have a hundred-year protection, let alone two-hundred year.

In the event of a levee break or if the levee is compromised, Natomas would be under 15 feet of water -- and all flooding has a 1 in a hundred chance of happening in any given year -- it would create an estimated $28 billion in regional damage.

17-3 Cont'd

CHAIR TOOKER: Is that 28 million or billion?

MS. TRABALAT: Billion.

It's difficult to imagine what it would take to secure that kind of money to rebuild. It seems we are having a tough enough time getting the approximate $350 million we need just to repair the local levees, let alone having to rebuild them.

Therefore, on behalf of myself and my neighbors and the Sacramento community as a whole, I ask that you support taking care of our city and our levees first. Don't expose thousands of people to potential flooding, property destruction, and possible loss of life.

17-4

I urge you to deny the City's Sphere Of Influence and Annexation proposal of the Greenbriar project as contained in the DEIR.

24 Thank you for letting me speak tonight.

25 CHAIR TOOKER: Thank you very much.

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Any questions?

One more speaker's request. Lin Ham from Save Truxel Group.

MS. HOM: It's Lin Hom, H-o-m.

CHAIR TOOKER: Hom, I'm sorry. Lin Hom.

MS. HOM: Thank you.

Good evening, members of LAFCo Commission. My name is Lin Hom, and I'm here on behalf of the Save Truxel organization to urge you to deny the City's Sphere Of Influence and Annexation proposal for the Greenbriar project that's contained in the EIR. 18-1

The Save Truxel organization would oppose the light rail on Truxel because it would destroy our community, and we continue to seek lower cost and more workable alternatives to light rail such as bus rapid transit or alternative siting of light rail such as I-5 Freeway or Northgate Boulevard. 18-2

Because the Greenbriar project seeks to use light rail as an excuse to justify the project, we therefore must oppose it. The light rail line from downtown Sacramento through Truxel Road and then on to Greenbriar would be wildly expensive to build, maintain, would probably require a sales tax increase to fund, it would increase traffic congestion on Truxel Road, and destroy our community by requiring 18-3

condensing of potentially hundreds of homes being built and

mature trees being replaced.

18-3
Cont'd

It would be far better for the City to direct its efforts to supply bus rapid transit for Truxel Road, rather than chasing after the distant, smog-creating projects such as Greenbriar that will be very expensive to provide any type of transportation service to. 18-4

Therefore, on behalf of the Save Truxel organization, I urge you to deny the City's Sphere Of Influence and Annexation proposal for the Greenbriar project as contained in the DEIR.

Thank you for your consideration.

CHAIR TOOKER: Thank you very much.

That's the end of requests we have from speakers.

I would like to invite the applicant to come forward and speak to the EIR if they have some comments.

MR. SERNA: Good afternoon, members of the Commission. Phil Serna on behalf of North Natomas 575 Investors, the partnership, the applicant that is proposing the Greenbriar project.

I simply wanted to -- I want to be very brief. First of all, this is an opportunity this evening obviously to hear from the public. It's not an opportunity necessarily to spend a lot of time on the merits of the project. There will be other opportunities to do that, and we look forward to

24 that opportunity.

25 You are in receipt of a letter in which we basically

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outlined what we thought the action is tonight that was referenced at the beginning of the meeting. So we do appreciate that. I just wanted to make sure that all the commissioners and staff know that we do have members from our consulting team here if there are any subsequent questions from the commissioners this evening.

CHAIR TOOKER: Thank you very much.

MR. SERNA: Thank you.

CHAIR TOOKER: Any question from the Commission?

Staff, do we have any other activities?

MR. BRUNDAGE: No, not on this item. Just to close the --

MS. MILLER: Yes, just to close the public hearing.

CHAIR TOOKER: Is there a motion to close the public hearing?

COMMISSIONER SCHERMAN: So moved.

COMMISSIONER ROSE: So moved.

CHAIR TOOKER: And second?

COMMISSIONER FONG: Seconded.

CHAIR TOOKER: It's been moved and seconded to close the public hearing.

All those in favor say aye.

THE COMMISSIONERS: Aye.

24 Opposed?

25 Abstentions?

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Thank you.

(Public hearing on the item is adjourned.)

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REPORTER'S CERTIFICATE

STATE OF CALIFORNIA)
) ss.
COUNTY OF SACRAMENTO)

I, SANDRA VON HAENEL, certify that I was the official Court Reporter for the proceedings named herein, and that as such reporter, I reported in verbatim shorthand writing the named proceedings;

That I thereafter caused my shorthand writing to be reduced to typewriting, and the pages numbered 1 through 29, inclusive, constitute a complete, true, and correct record of said proceedings:

IN WITNESS WHEREOF, I have subscribed this certificate at Sacramento, California, on the 4th day of September, 2006.

_____
SANDRA VON HAENEL
CSR No. 11407

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LETTER 6

LAFCo Public Hearing
Thomas Reavy
August 2, 2006

6-1 At the request of several commenters, the LAFCo Commission scheduled a second public hearing to receive public comments on the DEIR. The second public hearing was held on August 30, 2006.

6-2 Please refer to response to comment 6-1.

6-3 Regarding the project's flooding impacts, please refer to Master Response 1.

6-4 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

6-5 The comment does not raise any issues related to the environmental analysis conducted in the DEIR; therefore, no further response is necessary.

6-6 Please refer to response to comment 6-1.

LETTER 7

LAFCo Public Hearing
Jim Pachl
August 2, 2006

7-1 Please refer to response to comment 6-1.

7-2 Please refer to Master Response 1.

7-3 Please refer to response to comment 1-5.

7-4 Please refer to Master Response 1.

LETTER 8

LAFCo Public Hearing
Jude Lamare
August 2, 2006

8-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

8-2 Sacramento Regional Transit (RT) submitted a letter on the DEIR supporting the statement that the project, through its potential for increased ridership, will help to justify earlier federal funding of the Downtown-Natomas-Airport (DNA) light rail line. Please refer comment letter 26. Moreover, at the August 3, 2005, LAFCo meeting, Dr. Beverly Scott, CEO/general manager of Sacramento RT, testified to RT's "strong support" of the annexation of the Greenbriar project into the City of Sacramento. Dr. Scott testified that the "project is not just an assemblage of a lot of good elements. [RT] think[s] that [the project] . . . really tries to create an overall environment that is transit supportive." Videotape copies of this testimony are available for review at the LAFCo offices at 1112 I Street, Sacramento, CA 95814. Further, RT has submitted three letters to the City and LAFCo expressing their support for the project (see Appendix B of this document).

RT has identified the DNA light rail line on its 20-year project map and is in the process of preparing an EIR that evaluates the impacts of implementation of the DNA light rail line project. RT anticipates circulating the public DEIR for the DNA project by spring/summer 2007 (Jaiyeoba, pers.comm., 2007). Sacramento Regional Transit is also pursuing a variety of funding sources to fund the construction of the DNA light rail line. Construction of the DNA would occur in 3 segments (minimum operable segments [MOS]): MOS 1 would start at 7th Street and would end at Richards Boulevard; MOS 2 would continue from Richards Boulevard to the Natomas Town Center; and MOS 3 would continue from the Natomas Town Center through the Greenbriar project site to the Sacramento International Airport. RT estimates that MOS 1 would be fully operable by 2014 with the remainder of DNA line operable by 2027 (Jaiyeoba, pers.comm., 2007). While 2027 is RT's reasonable estimate of when the DNA would be operable, RT is tracking a variety of upcoming federal, state, and local funding sources and is pursuing a more aggressive implementation schedule (Jaiyeoba, pers.comm., 2007). The DNA line would expand transit service from downtown Sacramento and the airport and promote patterns of smart growth while minimizing environmental impacts, but the process of obtaining federal funding for light rail transit (LRT) projects is extremely competitive. The higher the ridership, the more cost effective, and therefore competitive, the LRT project. Greenbriar will generate an estimated 1,162 daily riders, thereby making the DNA significantly more viable for federal funding. According to Dr. Beverly Scott, the Greenbriar station's 1,162 boardings would put the station within RT's top quarter in terms of transit utilization. Please also refer to response to comments 29-35 and 29-48.

8-3 The DEIR thoroughly evaluates the project's transportation impacts in Section 6.1, "Transportation and Circulation." This analysis included an evaluation of the project's impacts to freeway mainline segments (i.e., I-5, SR 70/99) under existing plus project and cumulative plus project conditions. Please refer to Section 6.1 of the DEIR for additional discussion of the project's transportation impacts, as well as the responses to comments in this document. Please also refer to response to comment 3-3.

LETTER 9

LAFCo Public Hearing
Tom McDonagh
August 30, 2006

9-1 Regarding flood protection, please refer to Master Response 1. Regarding fire protection services, the DEIR thoroughly evaluated the project's impacts to fire protection services (see Impact 6.5-1, "Public Services," of the DEIR). As described therein, while the City has plans to construct a new fire station that would serve the project site, it is unknown when this station would be constructed and if it would be operational prior to issuance of the first occupancy permit. As a result, the DEIR concluded that the project would result a potentially significant impact to fire protection services. Mitigation recommended in the DEIR requires the project applicant to coordinate with the City of Sacramento to ensure that adequate fire protection services would be provided to the project site prior to issuance of the first occupancy permit. In addition, the project would be required to pay its fair share of the costs required to construct a new fire station that would serve the project site. These costs have been included in the project's Revised Draft Finance Plan (see Appendix E of this document). With implementation of this mitigation, the DEIR concluded that the project's fire service impacts would be reduced to a less-than-significant level. Please also refer to response to comment 33-6. Regarding police protection, Impact 6.5-2, concluded that the project's impacts on police services would be less than significant.

9-2 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

9-3 Please refer to response to comment 8-2.

9-4 Sacramento Regional Transit currently operates 3 bus routes in North Natomas (Routes 11, 13, 14); however, none of these routes would serve the project site. As described in the DEIR (see Impact 6.1-10, "Transportation and Circulation," of the DEIR), the specific number of public transit riders that would be generated by the project can not be known. However, the DEIR concluded that because the project would generate new demand for public transit services and none are currently provided to the site, the project would result in a significant impact to public transit services. Mitigation in the DEIR requires the project applicant to fund and operate a peak commute hour shuttle/bus transportation service for residents of the project site. The applicant shall develop this service in consultation with the City of Sacramento and RT. The applicant shall begin to provide shuttle services once demand for public transit services reaches 50 service requests, and shall increase those services in proportion to the development levels and increased rider ship levels occurring on the project site. The project applicants will continue to provide shuttle services until such time that Sacramento Regional Transit is operating a bus or light rail line that would serve the project site. The timing of when these services would be provided by Sacramento Regional Transit District is unknown.

9-5 Please refer to response to comments 3-3 and 8-3.

9-6 The SACOG Blueprint is a plan that is intended to guide development in the region from now through 2050. The Blueprint is a long-term plan that will take many years to achieve. Development in 2006 (or any time between now and 2050) that is consistent with the Blueprint would advance the Blueprint's concepts.

9-7 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

LETTER 10

LAFCo Public Hearing
Thomas Foley
August 30, 2006

10-1 Regarding flooding, please refer to Master Response 1.

LETTER 11

LAFCo Public Hearing
Joe Sullivan
August 30, 2006

11-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

11-2 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

LETTER 12

LAFCo Public Hearing
Thomas Reavey
August 30, 2006

12-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

12-2 While the commenter indicates the DEIR did not adequately address the issues of flood protection, police and fire services, emergency services, sewer services, and transportation, the commenter does not provide any specifics on how the analysis is inadequate. The DEIR thoroughly evaluated the project's impacts to public services (e.g., police, fire protection, emergency services) in Section 6.5, "Public Services," transportation in Section 6.1, "Transportation and Circulation," and utilities (e.g., sewer) in Section 6.4, "Utilities." See also response to comment 33-6. Regarding flooding, the Section 6.10, "Hydrology and Water Quality," was recirculated in a RDEIR in November 2006 to address new information regarding the surrounding levee system that became available after the circulation of the DEIR. Please refer to Master Response 1 for additional details.

12-3 Please refer to Response to Master Response 1.

12-4 As described in Impact 6.4-3 (see Section 6.4, "Utilities", of the DEIR), staff at SRCSD confirmed the North Natomas interceptor and downstream facilities currently have adequate capacity to the serve the project. Because adequate capacity is available to serve the project, the project would result in a less-than-significant impact to regional sewer facilities. See also, response to comment 33-4.

12-5 Please refer to response to comment 9-1. The project is not located within the NNCP area and is not subject to the policies of the NNCP. The commenter offers no information to support the statement that the analysis presented in the DEIR is inadequate. Therefore, no further response can be provided.

12-6 Please refer to response to comments 3-3 and 8-3. The commenter offers no information to support the statement that the analysis presented in the DEIR is inadequate. Therefore, no further response can be provided.

12-7 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

12-8 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary. Please refer to response to comment 12-2 through 12-7.

LETTER 13

Alta Tura
August 30, 2006

13-1 The comment does not raise any issues related to the environmental analysis conducted in the DEIR, no further response is necessary.

13-2 Regarding the project's impacts on levees, please refer to Master Response 1. The commenter offers no evidence that the analysis in the EIR is inadequate; therefore, no further response can be provided.

13-3 The comment does not raise any issues related to the environmental analysis conducted in the DEIR, no further response is necessary.

13-4 The project's impacts to local waterways and drainages were evaluated in Section 6.10, "Hydrology, Drainage, and Water Quality." As described therein, impacts to local waterways were evaluated in Impact 6.10-1 and impacts to the capacity of local drainage systems were evaluated in Impact 6.10-2. With implementation of recommended mitigation the project would not result in any residual significant water quality or drainage system impacts. Regarding the project's growth-inducing impacts, please refer to Section 7.1, "Growth Inducing Impacts," of the DEIR.

LETTER 14

LAFCo Public Hearing
Jude Lamare
August 30, 2006

14-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

14-2 The City of Sacramento is the co- lead agency (with LAFCo) responsible for preparation of the EIR for the Greenbriar project.

The City of Sacramento and County of Sacramento have entered into a Memorandum of Understanding (MOU) that identified the guiding principles for development of the Natomas Joint Vision area. The City and County are currently proceeding with development of an open space program for the area, along with a Municipal Services Review. The City presented its initial program considerations at a series of workshops in April 2007. It is anticipated that the planning process for the Joint Vision area will take 3 years for development of general concepts for the area, and between 3 and 10 years for annexation and the various environmental and other processes to be completed.

Regarding consideration of the Natomas Joint Vision plan in the Greenbriar DEIR, the DEIR describes the Natomas Joint Vision MOU in Section 2.6, "Summary," and Sections 3.7.2 and 3.7.4, "Project Description." In addition, the DEIR includes an evaluation of the cumulative impacts of the project in combination with the development of the Natomas Joint Vision area in Section 7.2, "Other CEQA-Required Analyses."

The Sacramento Regional Transit District is the agency responsible for proposing, evaluating, and approving the proposed Downtown-Natomas-Airport (DNA) Light Rail Line. Please refer to response to comment 8-2 for a discussion of the current status of that project. The Greenbriar DEIR evaluated the environmental impacts of dedicating an easement for the DNA line through the Greenbriar site along Meister Way. No specifics regarding the operation of the DNA are available. As such, the DEIR can not provide any additional evaluation of this project.

Regarding the request to delay the project until information regarding the DNA project and Natomas Joint Vision project is better defined, CEQA does not require lead agencies to delay the preparation of environmental analyses until all information regarding other cumulative projects is known. Rather, CEQA requires that the impacts of the project be determined based on the conditions present at the site and in the project area at the time of publication of the Notice of Preparation (NOP) for the DEIR. (State CEQA Guidelines Section 15125[a]). An EIR is an informational document that is used to inform the lead agency and other responsible agencies of the environmental impacts of a proposed project (State CEQA Guidelines Section 15121[a]). An EIR should be based on the information available at the time of its preparation and a lead agency should not speculate as to the environmental impacts that would occur with future and unspecified development (State CEQA Guidelines Section 15145). Because specifics regarding the DNA line are not available an evaluation of the DNA light rail in the Greenbriar DEIR is not feasible, nor is it required by CEQA.

14-3 While the commenter suggests that new air ozone and particulate matter air quality plans may be adopted next year, it would be speculative for the EIR to rely on information contained in those unadopted plans. CEQA does not require lead agencies to rely upon draft reports, plans, or other documents. Further, CEQA does not require lead agencies to delay the preparation of an environmental document to wait for new information to become available. Rather, an EIR should be based on the conditions present at the site and information available to the public at the time of publication of the NOP (please refer to response to comment 14-2). The air quality analysis provided in the DEIR (see Section 6.2, "Air Quality") evaluates the impacts of the project against currently adopted and enforceable air quality plans. More importantly, it provides an extensive set of mitigation measures aimed at reducing impacts to the degree feasible. There is no reason to expect that additional mitigation, or other means to reduce air quality impacts, would result from any new air quality plans, and no comments have been provided to suggest otherwise.

14-4 It is unclear what the commenter is stating regarding the project's relationship to the proposed DNA light rail line. Please refer to response to comment 8-2 for a discussion of the current status of the DNA line and response to comment 14-2 for a discussion of how the Greenbriar EIR addresses the DNA light rail line.

14-5 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

LETTER 15

LAFCo Public Hearing
Tara Hansen
August 30, 2006

15-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

15-2 While the commenter describes environmental impacts associated with the project, and which are addressed in the EIR, the commenter offers no specifics on the analysis provided in the DEIR. Therefore, no further response can be provided. Please also refer to response to comment 3-3 and 8-3.

15-3 Please refer to Section 7.1, "Growth Inducing Impacts," of the DEIR for a discussion of the project's growth-related impacts. No specifics on the analysis in the DEIR were raised, therefore no further response can be provided.

15-4 Regarding addressing the project's flood-related impacts, please refer to Master Response 1.

15-5 The DEIR adequately evaluates the project's impacts to farmland and open space resources in Section 6.6, "Parks and Open Space," and Section 6.11, "Agriculture." Impact 6.6-2, "Parks and Open Space," describes the project's impacts to open space resources and addresses the Natomas Joint Vision MOU policy requiring the provision of permanent open space in the Natomas area through conservation easements at a 1:1 mitigation ratio (comprised of half-to-one ratio for habitat and half-to-one-for open space). Mitigation Measure 6.6-2 requires the project applicant to coordinate with the City of Sacramento to identify appropriate lands to set aside in permanent conservation easements for open space in accordance with the Natomas Joint Vision open space policy. These lands will be identified prior to prezoning. No additional mitigation would be required. Further, prior to annexation, an open space agreement consistent with the Joint Vision will be entered into between the City of Sacramento and Sacramento County.

15-6 The DEIR contains comprehensive mitigation (see Mitigation Measure 6.8-6, page 6.8-25 of the DEIR) to address potential aircraft safety hazard impacts associated with the proposed on-site lake/detention basin. The City and the project applicants consulted with staff of the Sacramento County Airport System (SCAS) in identification of this mitigation plan. As described in comment 21-3, SCAS concurs with the DEIR's conclusion that with implementation of Mitigation Measure 6.8-6 the project's aircraft safety hazard impacts associated with the on-site lake/detention basin would be less than significant.

15-7 The comment expresses an opinion of what constitutes the concept of smart growth. Because the comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

LETTER 16

LAFCo Public Hearing
Jim Pachl
August 30, 2006

16-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

16-2 Regarding the status of the Downtown-Natomas-Airport (DNA) light rail line, please refer to response to comment 8-2. Regarding the 11% trip reduction associated with the DNA line, please refer to response to comment 29-35.

16-3 Regarding the project's flooding impacts please refer to Master Response 1.

16-4 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

LETTER 17

LAFCo Public Hearing
Rose Trabalat
August 30, 2006

17-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

17-2 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

17-3 Regarding flooding, see Master Response 1.

17-4 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

LETTER 18

LAFCo Public Hearing
Lin Hom
August 30, 2006

18-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

18-2 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

18-3 Please refer to response to comment 8-2. Because the comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

18-4 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

Sacramento County Airport System
G. Hardy Acree, Director of Airports

County Executive
Ter

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County of Sacramento

August 30, 2006

Tom Buford
Senior Planner
City of Sacramento
Development Services Department – Environmental Planning Services
North Permit Center
2101 Arena Boulevard, Second Floor
Sacramento, CA 95834

RE: Comments on Draft Environmental Impact Report (DEIR) - Proposed Greenbriar Development Project – July 2006, State Clearinghouse Number 2005062144

Dear Mr. Buford:

The Sacramento County Airport System (County Airport System) has prepared the enclosed comments for consideration by the City of Sacramento, the Local Agency Formation Commission (LAFCo) and the project proponent (applicant). Issues of concern are addressed in two technical memorandums: (1) commentary on the DEIR's noise analysis; and (2) commentary on the proposed habitat preserve and other subjects that the County Airport System believes warrant further analysis. 19-1

The County Airport System has expressed reservations about development in the proposed project area for a number of years.[1] Most recently, letters to the City of Sacramento (dated January 27, 2005, September 14, 2005, and May 10, 2006), conveyed the County Airport System's concerns regarding noise and potential wildlife attractants hazardous to aircraft operations at the development site itself. 19-2

Noise Considerations

The proposed Greenbriar Project (Greenbriar) is located approximately one mile east of Sacramento International Airport ("Airport"), ranked 40th nationally in annual passengers. Because passenger growth is expected to average 3.4 percent annually through the 2020 timeframe of the draft Airport Master Plan, the potential impact of aircraft noise on proposed development should be adequately analyzed. 19-3

The County Airport System is concerned that the DEIR for the proposed Greenbriar Development Project does not adequately address the potential noise environment for the project site. The critical issues which need additional analysis or documentation in- 19-4

[1] County Airport System comments on previous projects include: (a) North Natomas Community Plan, meeting among Airport System staff, City Planning and SACOG staff, April 19, 1991; (b) Airport System comment letter on proposed Greenbriar Farms development, May 22, 2000.

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clude the project's location directly underneath a flight pattern and the aircraft altitudes of the pattern, the inadequate application of the City of Sacramento and County of Sacramento Noise Control Codes, inaccurate hourly noise assessment for the school site, the lack of cumulative noise assessment, and the project's location within the Sacramento International Airport Planning Policy Area. Details related to these concerns can be found in the enclosed noise memorandum. 19-4 Cont'd

Habitat Considerations

The County Airport System is also concerned about the proposed "Spangler" habitat mitigation preserve on the east side of Power Line Road. The preserve would include both giant garter snake (GGS) managed marsh/upland and foraging habitat for the Swainson's hawk. The southeast corner of the Spangler property is approximately 5,212 feet from the north end of the Airport's east runway (16L), and adjacent to the runway's approach and departure zone. The proposed preserve will be even closer to the runway after one of the runway extension alternatives summarized in the habitat memo is constructed, pursuant to the draft Airport Master Plan. 19-5

As articulated in the enclosed habitat memorandum, the proposed foraging preserve is likely to attract raptors that will pose an extreme hazard to commercial aircraft operations, and the GGS habitat could attract waterfowl unless properly designed and constructed. The applicant is strongly encouraged to identify an alternate habitat preserve site further than 10,000 feet from the airfield runways and which conforms to Federal Aviation Administration (FAA) guidance documents. 19-6

Thank you for considering the County Airport System's comments and requested changes in project's noise analysis and habitat mitigation strategies. It is our desire to resolve the hazardous wildlife issues resulting from the proposed Spangler mitigation preserve in the same positive manner as those associated with the water feature/detention basin. Noise related questions may be directed to Monica Newhouse, Noise Manager, at 874-0704. Questions regarding the habitat memorandum may be directed to Greg Rowe, Senior Environmental Analyst at (916) 874-0698. 19-7

Sincerely,

Robert B. Leonard
Airports Chief Operating Officer

Enclosures:

- Technical Memorandum, "Comments on Potential Noise Impacts and Related Issues"
- Technical Memorandum, "Proposed Habitat Mitigation and Related Issues."

C:

Ashle T. Crocker, Attorney at Law – Remy, Thomas, Moose and Manley, LLP
Don Lockhart, Assistant Executive Officer - Sacramento LAFCo
Scot Mende, New Growth Manager – Development Services, City of Sacramento
Amanda Olekszulin, Project Manager – EDAW, Inc.
Leonard H. Takayama, Deputy Director – Planning and Development
Greg Rowe, Senior Environmental Analyst – Planning and Development
Diane E. McElhern, Deputy County Counsel

LETTER 19

Sacramento County Airport System
Robert Leonard
Airports Chief Operating Officer
August 30, 2006

19-1 The comment does not raise any issues related to the environmental analysis conducted in the DEIR, no further response is necessary.

19-2 The comment does not raise any issues related to the environmental analysis conducted in the DEIR, no further response is necessary.

19-3 The commenter does not specify how the DEIR does not adequately analyze noise impacts from aircraft. No further response can be provided.

19-4 The commenter identifies issues that need additional analysis in the DEIR of which details are provided in a separate memorandum. Please refer to Responses to Comments 19-1 through 19-12.

19-5 Because the comment does not raise any issues related to the environmental analysis conducted in the DEIR, no further response is necessary.

19-6 The Spangler site is currently in irrigated rice. Rice fields receive high use by birds considered hazardous to aircraft, especially shorebirds, wading birds, and waterfowl, which use rice fields for food, shelter and breeding habitat. A recent study by Berryman Ecological, which focuses on the relative bird attractant value of rice fields as compared to man-made lakes, supports the conclusion that rice fields serve as the greater attractant to hazardous wildlife. (See Appendix M of DEIR). The NBHCP states that the use of managed marsh, such as wetlands, is unlikely to pose bird strike hazards because marshes are not designed to attract migratory waterfowl (please refer to the NBHCP, page III-11). Therefore, whether the Spangler site were to remain in its current condition (irrigated rice) or be utilized for biological mitigation lands (managed marsh or other mitigation), the risk of bird strikes at the airport would be similar to existing conditions.

Notwithstanding the above, the applicant has agreed to an alternative plan for mitigation to further reduce the risk of bird strikes. Rather than create habitat on the Spangler site, the applicant would dedicate the Spangler property to the Natomas Basin Conservancy (NBC). The NBC serves as plan operator for the NBHCP and acquires and manages habitat land for the benefit of the 22 special-status species covered under the NBHCP, including Swainson's Hawk and giant garter snake. After acquisition and dedication, the NBC would choose appropriate land within its land pool for creating the project's required acreage of managed marsh and Swainson's hawk habitat. The NBC would have the option to use the Spangler property for mitigation land that is most appropriate for NBHCP mitigation as a whole, which may include use as managed marsh or other uses, at the discretion of the NBC.

Related to concerns with airport safety, this approach to mitigating project-related biological resource impacts requires the NBC to submit its mitigation plans to the County Airport System for review and comment prior to converting any land to habitat uses in accordance with the NBHCP. The NHBCP requires all mitigation lands established for the NBHCP reserve system to be located and managed for avoidance of potential safety conflicts relating

to collisions between aircraft and birds and to be consistent with the Federal Aviation Administration Advisory Circular (May 1997) concerning wildlife attractants in the vicinity of airports. (Please refer to the NBHCP, page IV-40).

All reserve lands in the vicinity of the Sacramento International Airport would be managed to reduce the potential for bird strikes and other potential conflicts with airport operations. Draft management plans for reserve lands in the vicinity of the Sacramento International Airport would be submitted to the Airport Facilities Manager to provide a reasonable opportunity for review and comment prior to approval by the NBC, USFWS, or DFG (please refer to the NBHCP, page IV-34). According to John Roberts, Executive Director of the NBC, the NBC has on record numerous letters from the Sacramento County Airport System (SCAS), as well as other documentation of successful coordination with SCAS, to further ensure that the NBHCP mitigation actions do not compromise airport safety.

19-7 Because the comment does not raise any issues related to the environmental analysis conducted in the DEIR, no further response is necessary.

20

SACRAMENTO COUNTY AIRPORT SYSTEM

Technical Memorandum

August 30, 2006

TO: Tom Buford, Senior Planner – City of Sacramento, Development Services
Don Lockhart, Assistant Executive Officer - Sacramento LAFCo

FROM: Monica Newhouse, Airport Noise Program Manager

SUBJECT: Comments on Potential Noise Impacts and Related Issues
Draft Environmental Impact Report (DEIR) - Proposed Greenbriar Development Project – July 2006, State Clearinghouse 2005062144

The Sacramento County Airport System (County Airport System) has concerns related to the noise analysis conducted for the proposed Greenbriar Development Project. Our concerns are summarized below.

I. Flight Patterns (page 6.3-7)

The DEIR states that Sacramento International Airport operates two runways. Though this is correct, the Master Plan of the airport does plan for a third runway to the west of the airport. The EIR should include this information to ensure that documented long term plans for airport expansion is included in the analysis. 20-1

The DEIR does not mention that the commercial traffic overflying the subject property is routinely at altitudes of less than 3,000 feet above ground level. Please refer to the attached graphics. Figure 1 provides a location map of the proposed Greenbriar development. Figure 2 depicts a single day of flight tracks (November 17, 2004) when the Airport operates in a "south flow" configuration. Figure 3 depicts Airport "north flow" for a day (September 15, 2004). 20-2

The DEIR does not mention that the subject property lies directly underneath the east aircraft training pattern. This pattern is typically used by military aircraft. Military aircraft are often larger than commercial aircraft and are not required to meet the same noise reduction standards as commercial aircraft. Military aircraft are also often typified by lower flight patterns than commercial aircraft. Over the subject property, large military aircraft can overfly the property at altitudes as low as 500 feet above ground level. The FAA has total control over aircraft flight routes. The Airport System is unaware of any FAA plans to alter the current landing and departure routes, and it is highly speculative that the FAA would alter these routes in the future. Any modification to the flight pattern would likely impact the overall efficiency of Sacramento International Airport. Figure 4 depicts the flight tracks associated with training activity for the fourth quarter of 2004 at 20-3

Sacramento International Airport. Although all types of aircraft train at SMF, the large military aircraft are of greatest concern. These transport-size aircraft, such as the C-5A, KC-10, and KC-135, train several times each week. Fighter-type aircraft also utilize the Airport. All public use airports are obligated to make their airfield available to military aircraft for training purposes and these aircraft may be in the flight pattern for up to an hour. 20-3 Cont'd

II. Table 6.3-8 (page 6.3-16)

This table erroneously refers to Sacramento International Airport as Metro Airport in the School section. 20-4

III. City of Sacramento Noise Control Code and County of Sacramento Noise Control Code (page 6.3-17)

The last paragraph on page 6.3-18 states that "...the noise control standards of the City Municipal Code and the County of Sacramento Code were created to regulate noise generated by stationary sources and for the handling of noise disputes." This statement is inaccurate. The noise ordinance applies to a wide range of noise sources (with specific exceptions) well beyond stationary sources. In addition, the ordinance specifically states that it is intended to ". . .contain sound levels in the city at their present levels with the ultimate goal of reducing such levels. . ." A primary purpose of the maximum permissible noise levels is to ". . .further the public, health, safety, welfare and peace and quiet of county inhabitants." The ordinance further states that "Every person in the city is entitled to live in an environment free from excessive, unnecessary, offensive noise levels. . ." In other words, the purpose of the ordinance is to protect city residents from excessive noise levels. Therefore, the maximum permissible noise levels in the City's Noise Ordinance should be used in the environmental assessment process to determine if existing noise levels at the proposed project site will result in significant noise impacts on the future residents and students inhabiting the project. 20-5

The remainder of the DEIR text on page 6.3-26 implies that the weight of the noise impact analysis should be based on the City of Sacramento General Plan Land Use Compatibility Noise Levels and the City of Sacramento Maximum Acceptable Interior and Exterior Noise Level Standards for New Development. Although these are important criteria upon which to assess noise impacts, they do not trump the use of the maximum permissible noise levels in the City's Noise Ordinance to assess noise impacts under CEQA. 20-6

All noise sources impacting the project should be evaluated equally in the context of the City of Sacramento Noise Ordinance. The text of the EIR should clearly indicate that aircraft noise measurements taken on or near the property indicate that maximum permissible daytime and nighttime noise levels in the City of Sacramento Noise Ordinance will be regularly exceeded and, therefore, residents and students inhabiting the project 20-7

will be regularly exposed to noise levels exceeding the maximum permissible levels in the City's Noise Ordinance. 20-7 Cont'd

IV. Aircraft Noise (page 6.3-35)

The "Aircraft Noise" paragraph on page 6.3-35 should state that many of the maximum noise level measurements in Tables 6.3-3 and 6.3-4 exceed the "Never to exceed" both the daytime and nighttime exterior noise standards provided in Table 6.3-9. Since the project proponent does not have the ability to affect the exterior aircraft noise levels over the site, the aircraft noise exposure on the project is a significant and unavoidable impact. 20-8

V. Proposed School (page 6.3-37)

The discussion of the aircraft noise exposure at the proposed school site should state that the measured noise levels in Tables 6.3-3 and 6.3-4 indicate that the interior noise levels in the school from aircraft overflights would range from 33 to 77 dBA L_{eq}. The EIR should state that the school will experience hourly L_{eqs} exceeding the 40 dBA limit in the City of Sacramento Maximum Acceptable Interior Noise Level Standards for New Development and the American National Standard Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools which would result in a significant and unavoidable impact. Please refer to interior Leq calculation in Table 1 using measurements from the DEIR Table 6.3-4.

Table 1 - Greenbriar Hourly Leq (Military)

Ops.	Avg. SEL	Hourly Leq	Interior Leq
7	105.8318	78.71972858	**53.72**

Time	Op. #	SEL	Energy	Aircraft Type
14:30:21	1	108.3	67608297539	C5
14:30:28	1	110.8	1.20226E+11	C5
14:46:02	1	76.3	42657951.88	KC10
14:46:06	1	67.4	5495408.739	KC10
14:46:13	1	68.0	6309573.445	KC10
14:52:26	1	108.3	67608297539	C5
14:52:33	1	101.0	12589254118	C5
	Energy Sum		2.68087E+11	
Total	**7**	**105.8318**	**38298107942**	

Source: Table 6.3-4

20-9

VI. Cumulative Noise Analysis

There are multiple high-level transportation noise sources impacting the site, which requires a cumulative noise impact analysis under CEQA. Aircraft, highway, and light rail noise exposure level over the site should be combined to quantify the total exposure on the property. A graphic depicting the cumulative noise exposure would benefit the reviewers of the EIR. This is particularly an issue with relation to the school location and should be analyzed to determine the cumulative interior noise level in any given school hour. 20-10

VII. Location within the Airport Planning Policy Area for Sacramento International Airport

On April 19, 2006, the Sacramento County Board of Supervisors adopted the definition of the Sacramento International, Mather and McClellan Airport Planning Policy Areas via Approved Resolution No. 2006-0490. The Airport Planning Policy Area for each airport defines the area where large aircraft (over 75,000 lbs.) typically operate below 3,000 feet above ground level. Residential development within this area within Sacramento County's jurisdiction requires the execution of an avigation easement to Sacramento County. The proposed Greenbriar project falls within the Sacramento International Airport Planning Policy Area and would therefore require the execution of such an avigation easement. The Airport Planning Policy Areas and their associated policies are being incorporated into the Noise Element of the Sacramento County General Plan Update. 20-11

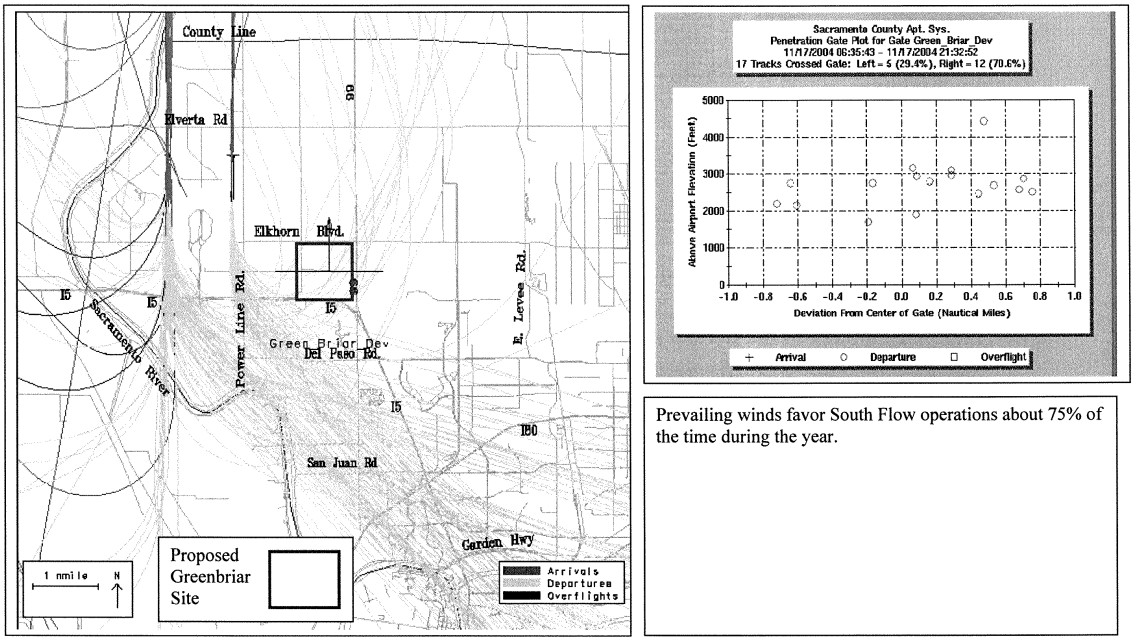
VIII. Existing Noise-Sensitive Land Uses (page 6.3-5)

The DEIR states that a neighborhood of single family homes is currently being constructed immediately to the north of the location. As can be seen from Figures 6 and 7, there are no homes being built to the north of the project site. The parcel to the north is zoned for only agricultural use. 20-12

G:\Environmental\Temp Review Documents\Natomas Basin Issues\Greenbriar Project_August 2006\Greenbriar_DEIR Tech Memo_Noise_082806.doc

FIGURE 2

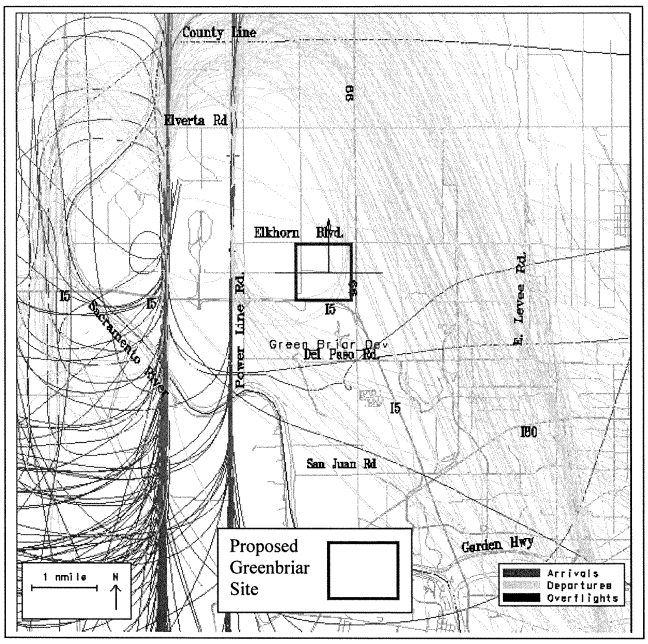
Sacramento County Airport System
Aircraft Noise Information Office
SMF Typical South Flow Operations and Proximity to Proposed Greenbriar Project Site
Flight Track Analysis and Gate Analysis

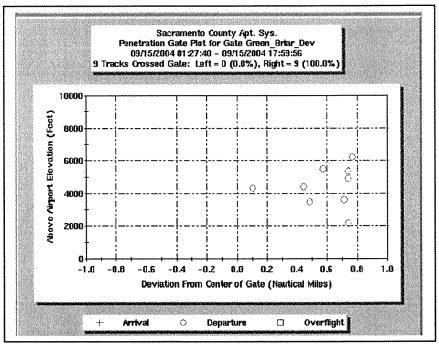


Prevailing winds favor South Flow operations about 75% of the time during the year.

FIGURE 3

Sacramento County Airport System
Aircraft Noise Information Office
SMF Typical North Flow Operations and Proximity to Proposed Greenbriar Project Site
Flight Track Analysis and Gate Analysis

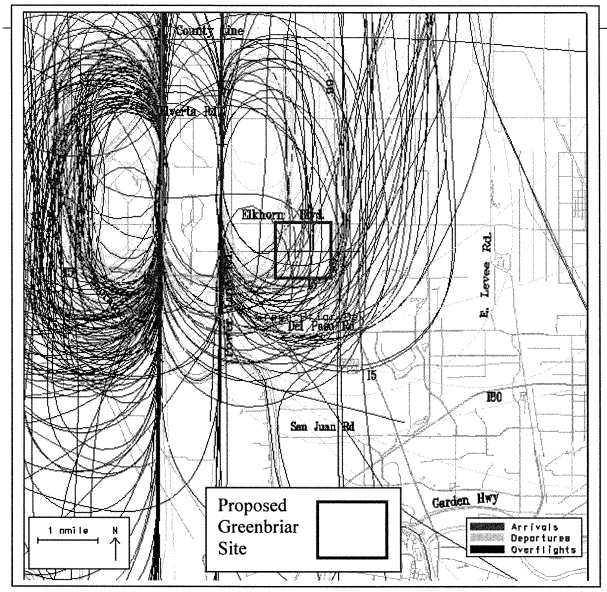


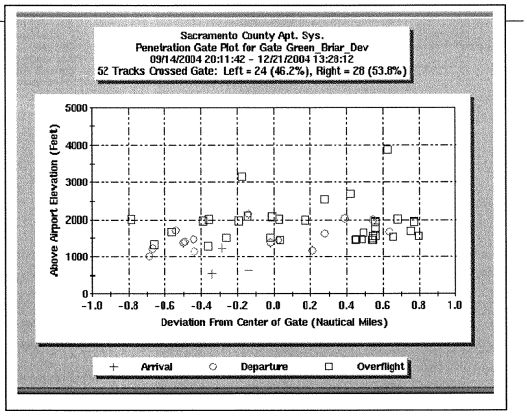


Prevailing winds favor North Flow operations about 25% of the time during the year.

FIGURE 4

Sacramento County Airport System
Aircraft Noise Information Office
SMF Fourth Quarter 2004 Military Operations and Proximity to Proposed Greenbriar Project Site
Flight Track Analysis and Gate Analysis





Military aircraft regularly conduct traiing flights at SMF. Though sporadic, such flights will often be noticeably lower than typical commercial aircraft operating at SMF. Due to both the lower altitudes and to the unique design characteristics of military aircraft, many will also be noticeably louder than most commercial aircraft.

Figure 5

GreenBriar Development Project Parcels and Sacramento International (SMF) Airport Policy Planning Area (APPA)

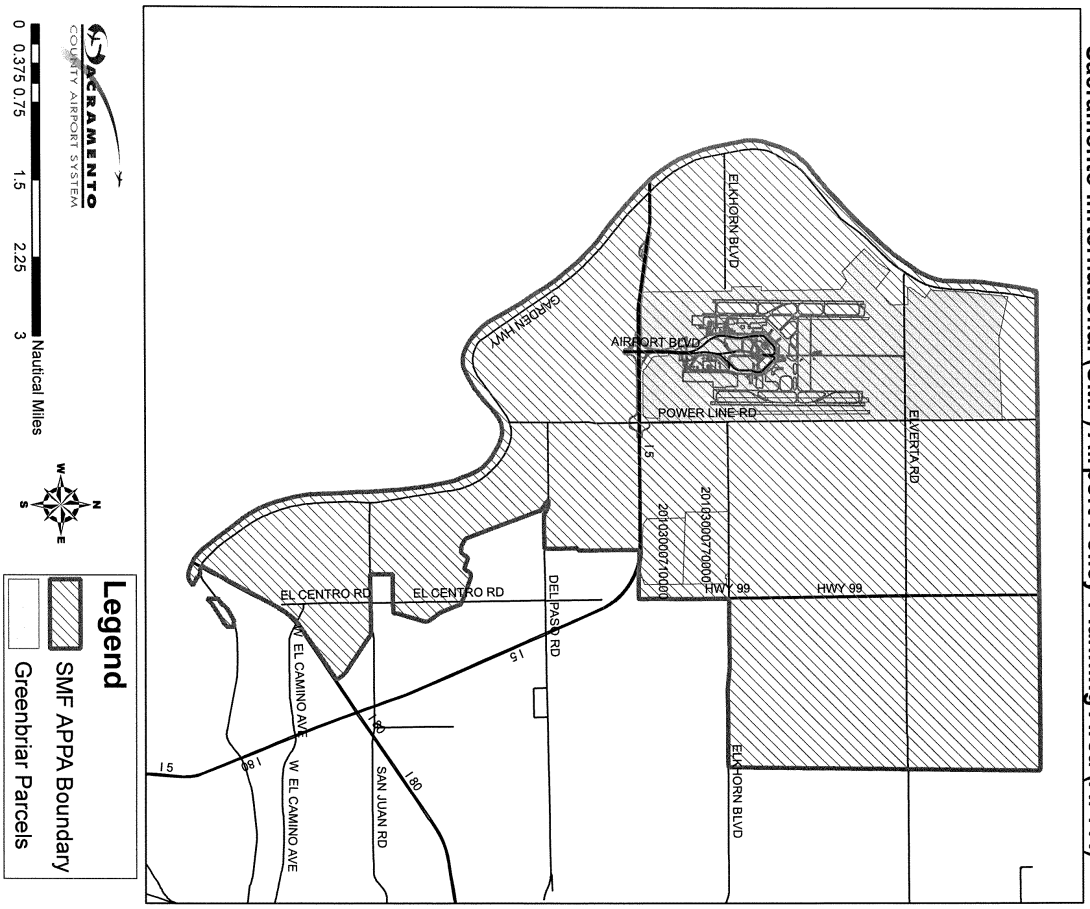


Figure 6

Vacant Parcels immediately North of Elkhorn Blvd. And Greenbriar Development Project Parcels

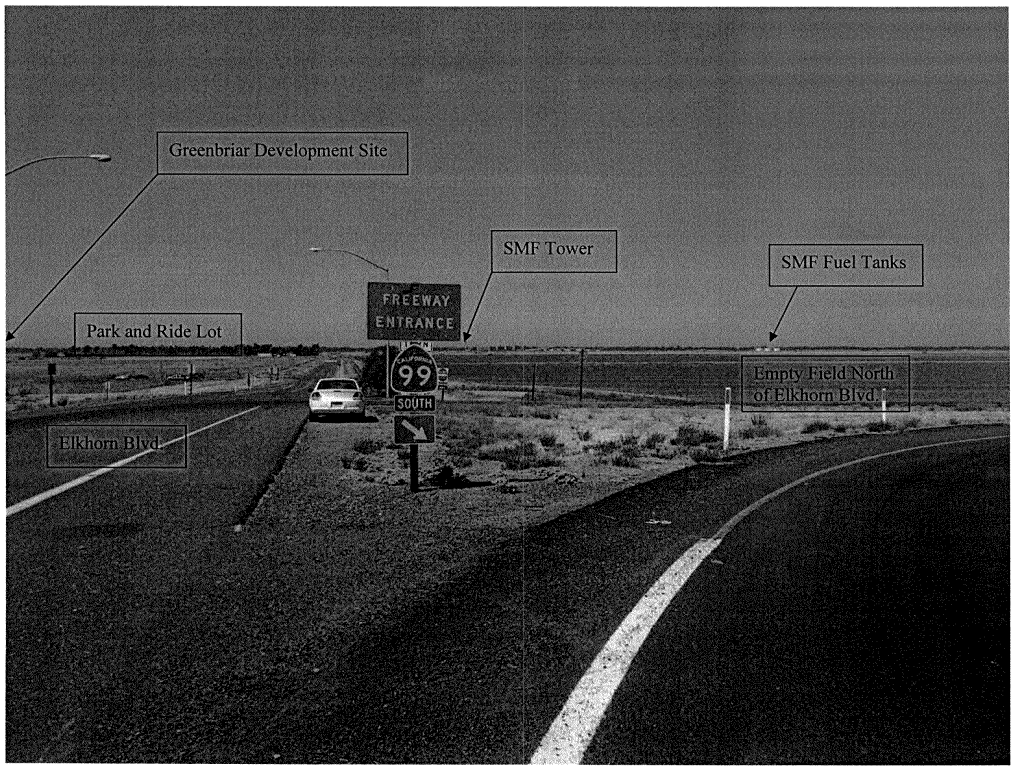
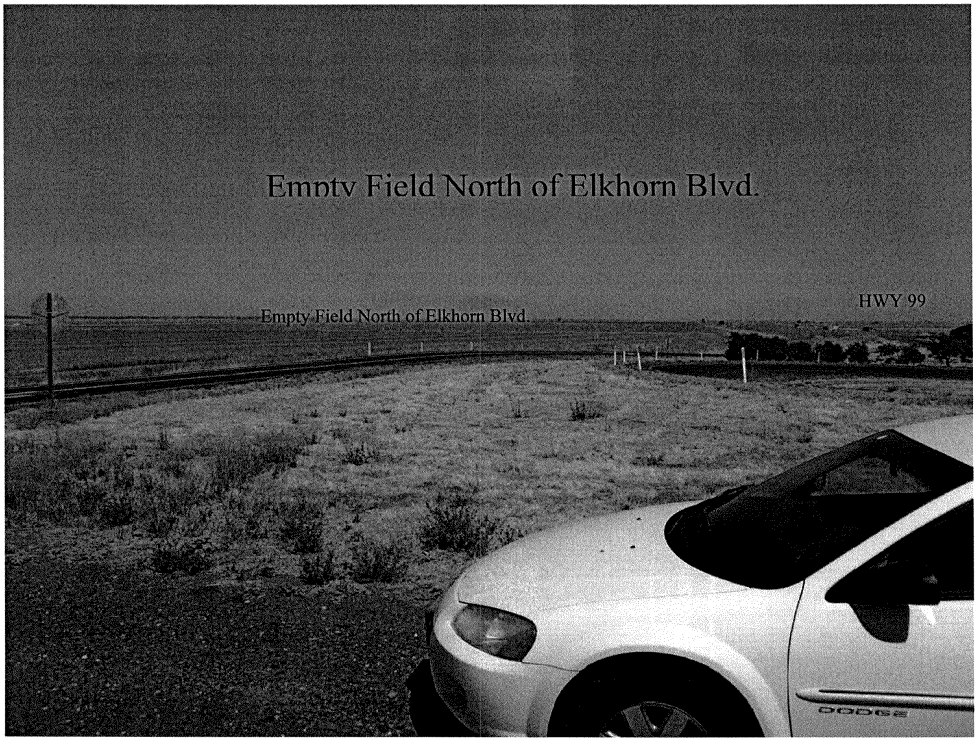


Figure 7

Vacant Parcels immediately North of Elkhorn Blvd. And Greenbriar Development Project Parcels



LETTER 20

Sacramento County Airport System
Monica Newhouse
Airport Noise Program Manager
August 30, 2006

20-1 The DEIR includes analysis of noise from existing airport operations, as well as those associated with maximum use of the airport under its proposed master plan. The plans for a third runway are listed on page 6.8-12 of the DEIR. Exhibit 6.3-3 depicts noise contours (draft, prepared by the County Department of Airports) for the maximum use condition, with the third runway. As shown, noise at the project site would be less than 60 dBA CNEL (the noise level considered significant in the EIR), even at maximum use conditions with a third runway.

20-2 The altitude at which commercial aircraft overfly the project site is relevant to the issues of noise generation and safety. Both issues are fully addressed in the DEIR, including reporting of noise from single event (SENL) overflights recorded by EDAW during preparation of the EIR (see Section 6.3.3, "Noise" of the DEIR; potential impacts are analyzed in Impact 6.3-5). The issue of aircraft safety is addressed in Section 6.8 (Public Health and Hazards; see Impact 6.8-3). The overflights place 75% of the site within an overflight zone. This issue is addressed on pages 6.8-18 and 6.8-19 of the DEIR.

20-3 Please refer to response to comment 20-2 regarding overflight issues. Noise measurements conducted by EDAW as part of the DEIR disclose SENL events associated with military aircraft that overfly the project site (see Section 6.3.3, "Noise" of the DEIR), and potential impacts are analyzed in Impact 6.3-5 of the DEIR. Overflights by C5, C130 and KC10 aircraft were recorded by EDAW as part of the noise measurements conducted on March 17, 2005. No overflights by KC 135 were observed, but given the relative size of aircraft (it is around 60% the size of a C5, the largest aircraft measured over flying the site), sound levels would be expected to be within the same range as the other military aircraft.

20-4 Metro Airport, the former name of Sacramento International Airport, is identified in the City of Sacramento General Plan (please refer to Table 1, Page 22 of the 1988 City of Sacramento General Plan). Nevertheless, the correct reference should be to Sacramento International Airport. The text to Table 6.3-8 (page 6.3-16) of the DEIR is hereby revised to correct the reference to the Sacramento International Airport. This change has been incorporated into Chapter 7, "Revisions to the DEIR, RDEIR, and Second RDEIR." This change does not alter the conclusions presented in the DEIR.

20-5 Use of noise ordinances for determination of all impacts is impractical and does not necessarily relate to the incidents of environmental impacts. For instance, the ordinance lists as "never to exceed" an exterior noise level of 75 dBA during the day and 70 dBA at night. Lawn mowers, some cars and trucks, some aircraft over flights (particularly military aircraft and small aircraft near local airports such as Executive Airport), and other common noise generators regularly exceed these levels in areas throughout Sacramento. While they may result in annoyance, they do not necessarily result in significant environmental impacts. However, the noise ordinance does provide an enforcement mechanism that allows for the control of nuisance noise, such as late night public disturbances, inappropriate placement of noise-generating infrastructure such as rooftop air conditioning units in shopping centers, and construction activities that could occur during times when people are otherwise asleep.

Noise impacts generally occur when receptors are repeatedly exposed to noise that causes sleep disruption, speech interference, and other disruption, and the best indicator of such noise, particularly associated with mobile sources, is the community noise equivalent level, CNEL, which accounts for all noise sources, considers the time of day when they occur, and bases land use compatibility on the sensitivity of the land use to the noise levels. (See page 6.3-4 of the DEIR for a discussion of the different noise descriptors, including CNEL). The Sacramento General Plan uses the CNEL standard to assess land use compatibility, and the Sacramento International Airport Master Plan includes CNEL noise contours for aircraft activity.

Thus the EIR bases analysis of mobile sources on common descriptors for mobile sources, such as CNEL, and bases impacts from stationary sources on the ordinances. To capture the impacts from certain aircraft operations, the EIR also includes an analysis of impacts from exposure to single event aircraft overflights that could produce substantial noise at the site.

20-6 Please refer to response to comment 20-5. It is appropriate to base the analysis of environmental impacts of noise on general plan policies intended to protect the environment, for which the referenced noise policy qualifies. As discussed in response to comment 20-5, the EIR is based on comparing noise impacts to the standards applicable to the noise source and type.

20-7 The City respectfully disagrees that impacts from mobile sources should be compared to the noise ordinance, which is intended to address nuisance noise issues and not necessarily environmental impacts. Please refer to response to comment 20-5. As described, if the noise ordinance was used as the indicator of impacts, cars driving on residential streets, regular aircraft overflights throughout Sacramento, use of lawn mowing equipment, and similar activities would be in violation of the ordinance. The City believes that the noise ordinance can, under certain circumstances, be used to indicate the potential for environmental impacts to occur, but the City also uses other tools, such as the General Plan and the CNEL standard, where appropriate. The comments (20-5, 20-6 and 20-7), while respectfully considered, do not explain why the noise ordinance should be used as the basis for exposure to impacts from mobile source noise instead of using the more commonly used and accepted CNEL and General Plan standards.

20-8 The referenced paragraph addresses the impacts of noise based on the common CNEL metric. CNEL is not only the commonly recognized metric for evaluating aircraft noise, it is also the noise metric used by the County Airport System to report noise from aircraft. However, the DEIR does not limit its analysis to impacts based on CNEL. Impact 6.3-5 evaluates potential noise impacts based on single event noise levels (SENL), which accounts for the noise levels measured for commercial and military aircraft, as provided in Tables 6.3-3 and 6.3-4.

The *City of Sacramento Maximum Allowable Acceptable Interior and Exterior Noise Level Standards for New Development without Mitigation* (see Table 6.3-8 of the DEIR) are based primarily on the CNEL. The City, as lead agency, has determined that so long as the CNEL from Sacramento International Airport is less than 60 dBA, the impact on new residential and school land uses would not be significant. As determined in Impact 6.3-4 of the DEIR, the project site is located greater than 1,900 feet from the future projected 60 dBA CNEL noise contour for the Sacramento International Airport and the project is defined as compatible with overall aircraft noise exposures.

With regard to single-event noise levels, or SENL, Impact 6.3-5 fully discloses the relationship between SENL that would be expected at the site and such issues as sleep disruption and speech interference. The impact to residents is concluded to be less than significant, for the

reasons described in that impact discussion and impacts to schools that could be constructed on site was concluded to be significant. The impact can be mitigated through design features that reduce interior school noise levels.

Regarding Table 6.3-9, this refers to the City's noise ordinance, which the City does not believe is the appropriate metric for evaluating mobile source noise exposure; please refer to response to comments 20-5.

20-9 The DEIR analysis of school impact is based, largely, on the relationship between automobile noise and aircraft CNEL and interior school noise. The conclusion in Impact 6.3-4 states that the impact is less than significant because the interior school noise level would not exceed 40 dBA L_{eq}. The 40 dBA L_{eq} as applied for schools is the average of noise energy exposure over a 1-hour period. However, Impact 6.3-5 concludes that the impact to schools would be significant based on exposure to the SENL. In consideration of the comment, the analysis of the maximum potential hourly noise exposure was re-evaluated. Based on the calculations shown in comment 20-9, it appears that the interior noise levels at schools could exceed 40 DBA L_{eq} during the noisiest hour as a result of SENL from aircraft over flights.

Mitigation Measure 6.3-5 (page 6.3-42) is, therefore, revised to read as shown below. This change has been incorporated into Chapter 7, "Revisions to the DEIR, RDEIR, and Second RDEIR." This change does not alter the conclusions presented in the DEIR.

"Mitigation Measure 6.3-5: (City of Sacramento and LAFCo)

a. Upon the issuance of building permits, site-specific acoustical analyses shall be conducted once construction plans are available for the proposed school to ensure satisfaction with the City of Sacramento interior noise level standards. This site-specific acoustical analysis shall include site-specific design requirements to reduce noise exposure of proposed on-site receptors and all feasible design requirements shall be implemented into the final site design. Noise reduction measures and design features may include, but are not limited to the use of increased noise-attenuation measures in building construction (e.g., dual-pane, sound-rated windows; mechanical air systems; and exterior wall insulation). Implementation of these design measures would ensure interior noise levels meet the City's noise standards and ANSI standard, including the ANSI standard that the interior of schools shall not exceed 40 dBA L_{eq} and measured during the peak hour of noise during school operations.

This would result in mitigation of this impact to a less-than-significant level because the interior of school classrooms would be insulated from noise to the degree that speech disruption would not occur."

20-10 Because noise is calculated logarithmically, based on noise energy, even the combination of 2 substantial and equal noise sources would only cumulatively increase the noise level at that point by 3 dBA CNEL. Although the project site would be subject to various noise sources, traffic noise would be the predominant noise source and would result in the extension of the 60 dB CNEL (or L_{dn}, which is essentially the same) substantially onto the site. Light rail noise, which would be highly confined, would occur along Meister Way (the 60 dB CNEL would be expected to be within 50 feet of the track), and could, in combination with traffic noise, cumulatively move the location of the 60 dBA CNEL line by a few feet at the location where Meister Way is within the 60 dBA contour. It would not change the location of the contour as shown in Exhibit 6.3-5; the cumulative increase would be within the width of the line shown in the exhibit.

As to aircraft noise, the site is 1,900 feet away from the future 60dBA CNEL, based on maximum potential use of the airport. The cumulative effect of aircraft noise, when added to traffic and light rail noise, would not be sufficient to substantively change the location of the 60 dBA CNEL on the site.

Thus, the combination of all noise sources to which the site would be exposed would not alter the physical extent to which adverse noise would encroach on project site uses. Most importantly for the issue of exposure to noise at school sites, Mitigation Measure 6.3-5, as revised in response to comment 20-9, requires that schools are designed to ensure an interior noise level of 40 dBA L_{eq}, based on site-specific acoustical analysis. This analysis would consider actual noise events at each school site, which would be the cumulative combination of all noise that could affect the schools.

20-11 As identified in Impact 6.3-5 of the DEIR, the project includes that:

> *…the applicant is proposing to dedicate an overflight easement over the entire project site. The exact wording of the easement is proposed to be agreed to by the applicant and SCAS. At a minimum, the overflight easement will grant a right-of-way for free and unobstructed passage of aircraft through the airspace over the property at any altitude above an imaginary surface specified in the easement (usually set in accordance with Federal Aviation Regulation Part 77 criteria). The overflight easement will also grant a right to subject the property to noise and vibration associated with normal airport activity.*
>
> *In addition, recorded deed notices are proposed to be required to ensure that initial and subsequent prospective buyers, lessees, and renters of property on the project site, particularly residential property, are informed that the project site is subject to routine overflights and associated noise by aircraft from Sacramento International Airport, that the frequency of aircraft overflights is routine and expected to increase through the year 2020 and beyond in accordance with the Sacramento International Airport Master Plan, and that such overflights could cause occasional speech interference, sleep disruption that could affect more than 10 percent of all residents at any one time, and other annoyances associated with exposure to aircraft noise. The wording of the easement will also be agreed upon by the applicant and the SCAS. Furthermore, the applicant is proposing to require the posting of signs on all on-site real estate sales office and/or at key locations on the project site that alert the initial purchases about the overflight easement and the required deed notices.*

This would meet Sacramento County's requirement for the execution of an avigation agreement for residential development.

20-12 As correctly stated by the commenter, residential development is not currently being constructed immediately to the north, but is actually occurring immediately to the east (across SR99/70). This error does not affect the analysis of noise impacts conducted in the DEIR. The text has been revised, and is added to the EIR in Chapter 7.0, "Revisions to the DEIR, RDEIR, and Second RDEIR."

21

SACRAMENTO COUNTY AIRPORT SYSTEM

Technical Memorandum

August 29, 2006

TO: Tom Buford, Senior Planner – City of Sacramento, Development Services
Don Lockhart, Assistant Executive Officer - Sacramento LAFCo

FROM: Greg Rowe, Senior Environmental Analyst – Planning and Development

SUBJECT: Comments on Proposed Habitat Mitigation and Related Issues
Draft Environmental Impact Report (DEIR) - Proposed Greenbriar Development Project – July 2006, State Clearinghouse 2005062144

The Sacramento County Airport System (County Airport System) is greatly concerned about prospective designation of raptor foraging habitat and a giant garter snake (GGS) managed marsh/upland preserve at the proposed location on the east side of Power Line Road, bordered on the north of the Sacramento-Sutter County line. The foraging preserve is likely to attract raptors that will pose an extreme hazard to commercial aircraft operations, as articulated below. The proposed marsh will attract waterfowl that would endanger aircraft to an even greater degree than the proposed 100 acres of raptor foraging habitat, unless the site is properly designed, managed and constructed. The project applicant is strongly encouraged to identify an alternate habitat preserve site further than 10,000 feet from the airfield runways and which conforms to Federal Aviation Administration (FAA) guidance documents. The risk of aircraft wildlife strikes at the Airport is summarized in the attached report, *Wildlife Strikes at Sacramento International Airport* (revised July 26, 2006). 21-1

I. PROPOSED PROJECT WATER FEATURE/DETENTION POND

Earlier versions of the development proposal included an on-site water feature/detention basin of approximately 39 surface acres, surrounded by homes and parks. The County Airport System vigorously expressed apprehension about the potential of the detention basin to attract waterfowl and other birds hazardous to nearby aircraft operations. These concerns and suggested project modifications were conveyed during discussions with the applicant and in our letter of May 10, 2006, and are not reiterated herein. 21-2

The DEIR summarizes the relevant issues in Impact 6.8-4: "Potential for Airspace Safety Hazards Associated with Project Water Feature."[1] These potential impacts were considered significant before mitigation, but are now deemed "Less Than Significant" (LTS) in the DEIR. We have examined the proposed mitigation measures for Impact 21-3

[1] Pages 2-63 through 28 and pages 6.8-20 through 24.

6.8-4, and concur that the potential impacts now meet the LTS criteria pursuant to the California Environmental Quality Act (CEQA). The County Airport System is satisfied that the potential wildlife hazards associated with the water feature have been adequately addressed, and congratulates the applicant for incorporating all of the corrective measures recommended in our previous communications. 21-3 Cont'd

II. OFF-SITE MITIGATION, PRESERVATION, RESTORATION, AND CREATION

The DEIR states in Mitigation Measure 6.12-1 that the applicant shall prepare a Habitat Conservation Plan (HCP) pursuant to Section 10(a) of the federal Endangered Species Act (FESA) to mitigate impacts to the giant garter snake (GGS), listed as "threatened" pursuant to the FESA.[2] The DEIR also describes measures to mitigate effects on the Swainson's hawk, a species protected pursuant to the California Endangered Species Act (CESA). The applicant proposes that these effects be mitigated by creating two habitat preserves, the 130-acre "Natomas 130" site near Fisherman's Lake, and the Sacramento County portion of the "Spangler Site" located on the east side of Power Line Road. The County Airport System has no reservations regarding the Natomas 130 site, but has significant concerns regarding the proposed Spangler habitat preserve. In summary, the applicant proposes a preserve that would put both commercial airline passengers and Swainson's hawks at risk because reaching the proposed preserve would require hawks nesting along the Sacramento River to fly directly across the path of aircraft arriving at and departing from the Airport. 21-4

A. **Location of Spangler Preserve.** The northern boundary of the "Spangler Site" is the Sacramento – Sutter County line, and the southern boundary abuts a 120-acre property owned by the County of Sacramento. The proposed Spangler preserve is comprised of three parcels totaling about 225 acres, and has approximately 5,125 frontage feet (0.97 mile) on Power Line Road. 21-5

B. **Preserve Habitat Allocation.** The DEIR states the allocation of habitat uses would be as follows, with about 100 acres designated for hawk foraging. 21-6

- 190.00 acres — GGS managed marsh, including 55.20 acres of moderate-quality Swainson's hawk foraging habitat.
- 45.40 acres — High-quality Swainson's hawk foraging habitat.
- 49.00 acres — Additional hawk foraging habitat to be acquired later. [3]

C. **Swainson's hawk nesting and foraging characteristics.** The hawk typically nests in trees such as oaks, cottonwoods and willows, particularly abutting the Sacramento River. A number of nesting sites have been identified near the Airport (see attached exhibit, "Swainson's Hawk Nest Sites"). Although the hawk may travel up to 18 miles in seek of prey, it prefers to conserve energy by foraging near the nest. Based on published reports, Central Valley Swainson's hawks 21-7

[2] Pages 2-79 through 85 and pages 6.12-21 through 35, and Exhibit 6.12-4, page 6.12-11.
[3] The 49 acres would be acquired within one mile of the Swainson's hawk zone or an existing preserve managed by the Natomas Basin Conservancy, with concurrence of state and federal agencies (P. 2-89).

almost exclusively search for prey at low altitudes (30 – 90 meters, or 98 to 295 feet above ground level), and attack by swooping toward the ground.[4] It can therefore be reasonably assumed that hawks in transit between nesting trees near the river and the proposed foraging preserve would typically fly at this altitude, where they may be struck by both ascending and descending aircraft. The susceptibility of raptors to fatal interactions with aircraft was evidenced by the discovery of two dead Swainson's hawks on the northern end of the Airport's west runway (16R) in late April 2006. 21-7 Cont'd

D. **Aircraft Precision Approach Surfaces and Draft Airport Master Plan**. Please see the attached exhibit, "Spangler Habitat Preserve – Runway Precision Approach Surface." The exhibit shows the proposed Spangler preserve, the Airport's existing 8,600-foot parallel runways, and two alternatives under consideration for extending the northern end of the east runway (16L) pursuant to the draft Airport Master Plan accepted by the Sacramento County Board of Supervisors in February 2004. The property shaded in grey comprises the Airport. Most of the area between Elverta Road on the north and I-5 on the south is included within the Airport Operations Area (AOA), while the property outside these limits functions as a land use compatibility buffer for aviation activity. [5] 21-8

1. Planned Runway Extension. The County Airport System intends to extend the east runway by an additional 2,400 feet (to 11,000 feet) to accommodate long-range aircraft departing on intercontinental flights. The blue segment at the end of 16L shown on the exhibit depicts the addition of 1,000 feet to the north end of the runway (which assumes that 1,400 feet would also be added to the south end, e.g. 34R). The green section shows the outline of the runway if the entire 2,400-foot extension were added to the north end of the runway. Environmental review of the draft Master Plan began in 2005. Evaluation of the proposed light rail line extension during this process led the FAA to recently indicate that lengthening the south end of the runway may be inadvisable because of potential rail line electromagnetic interference with the runway's Instrument Landing System (ILS). It therefore appears reasonable to assume at this time that the entire 2,400 foot extension would occur on the north end of the runway, e.g. runway 16L. 21-9

2. Approach/Departure Zones and Hawk Habitat. FAA guidelines prescribe aircraft landing and departure procedures, including angle of approach (glide slope). Regardless of whether a pilot uses instrument procedures or conducts visual approach, the glide slope is roughly a descent of 300 feet per mile, ac- 21-10

[4] Estep, J.A. 1989. *Biology, movements, and habitat relationships of the Swainson's Hawk in the Central Valley of California, 1986-1987*. CA. Dep. Fish and Game, Nongame Bird and Mammal Sec. Rep., 52 pp.
[5] The airport is comprised of approximately 5,901 acres, of which 2,940 acres (49.8%) is devoted to day-to-day airport operations. Most of the remaining 2,961 acres is devoted to aviation land use compatibility purposes.

cording to the manager of the Air Traffic Control Tower (ATCT) at the Airport.[6] The current FAA prescribed "Runway Precision Approach Surface" angle is 1:50, but this will change to 1:62.5 in January 2008. As shown on the exhibit, both the current and future approach surfaces extend over the Spangler property. A table on the bottom of the exhibit shows the altitude of descending aircraft for each of the approach surface requirements at the northern boundary of the Spangler property, as well as the geographic center and southern boundary, under each of the three runway length scenarios described above. In summary, aircraft approaching runway 16L are typically at altitudes ranging from 52 feet to 211 feet as they pass the nearly one-mile Power Line Road frontage of the proposed Spangler hawk mitigation preserve.

21-10 Cont'd

Based on the average foraging height of Swainson's hawks (98 to 295 feet), establishment of this preserve is very likely to cause even more collisions between aircraft and hawks, thus destroying birds and potentially causing costly damage to aircraft and loss of human life. Consequently, the County Airport System vigorously opposes the establishment of raptor foraging habitat on this site, and strongly encourages the applicant to find suitable habitat that conforms to FAA Advisory Circular (AC) 150/5200-33A, *Wildlife Hazard Management On or Near Airports (Wildlife Hazard AC)*, July 27, 2004.

21-11

a. Critical Zone: The FAA *Wildlife Hazard AC* recommends that airports serving turbine-powered ("jet") aircraft maintain a separation distance of 10,000 feet between the AOA and potential hazardous wildlife attractants, including artificial marshes and wetlands. The Airport *Wildlife Hazard Management Plan* defines this 10,000 separation distance as the "Critical Zone" (exhibit attached). Most of the proposed Spangler managed marsh and hawk foraging habitat is within the current Critical Zone.

21-12

b. Flight Track Analysis: the attached exhibit titled "Flight Track Analysis" shows the proximity of arriving aircraft and overflights relative to the proposed Spangler mitigation preserve for a typical week, August 1 – 7, 2006. The implications for aircraft safety can be deduced.

21-13

3. Waterfowl Attraction. The Spangler property is currently cultivated in rice. Managed marsh GGS habitat is somewhat less attractive to waterfowl and other birds hazardous to aircraft movement than open-water rice fields. Nonetheless, such marsh habitat must be properly designed, constructed and managed to discourage birds. Plant species and densities, seasonal water levels and other factors must be specifically designed to exclude ducks, geese, and other birds hazardous to nearby aircraft operations. If a mitigation

21-14

[6] Personal Communication, Roman B. Miszkewycz, FAA Air Traffic Manager – Sacramento International Airport, August 24, 2006.

preserve is ultimately established on the Spangler property, the County Airport System requests the following minimum mitigation measures.

a. Independent Review of Conceptual Plan: conceptual plans for the preserve shall be submitted to the County Airport System for a 60-day evaluation period. The plans shall be examined by a consultant selected by the County Airport System, and the consultant shall issue a written report evaluating the site's potential for hazardous wildlife attraction. The applicant shall be responsible for the cost of this evaluation.
b. Review of Construction Plans and Specifications: 90% construction drawings and plans shall be submitted to the County Airport System for 60-day independent consultant review, at the applicant's expense.
c. Construction Monitoring: The County Airport System will engage the services of an independent consultant to monitor the preserve construction to ensure adherence to the plans and specifications, at the applicant's expense.

21-14 Cont'd

4. Active Preserve Maintenance for Hazardous Wildlife Minimization. The Final Supplemental EIR for the Metro Air Park (MAP) development project includes mitigation measures that should be required of any Greenbriar project mitigation preserve located within the Critical Zone[7], and should be particularly required of the proposed Spangler habitat preserve. In summary, if the County Airport System determines that adequate measures are not being implemented to control hazardous wildlife at the habitat preserve, the County Airport System will have authority to engage in the following actions:
   a. Notify the property owner and/or preserve manager that the hazardous wildlife control measures are out of compliance;
   b. The County Airport System may, at its option, initiate control measures at the site, with the costs of such measures billed to the owner; and
   c. In the event of an immediate threat to aircraft safety, County Airport System personnel will take immediate action to remedy the air hazard emergency, including entering the preserve to conduct control measures, including lethal measures if necessary in accordance with the terms and conditions of the Airport's federal depredation permit.

21-15

III. OTHER HABITAT CONCERNS

A. **Draft Airport Master Plan.** The DEIR does not adequately evaluate the potential impacts of the development project and proposed habitat mitigation measures because it does not acknowledge the development projects included in the draft Airport Master Plan (particularly the 2,400-foot runway ex-

21-16

[7] *Final Supplemental Environmental Impact Report, Metro Air Park*. State Clearinghouse No. 92032074, August, 1997, Sacramento County Department of Environmental Review and Assessment (DERA); pages 32 – 35.

tension), and the third parallel runway proposed for construction between the years 2020 and 2030. Section 3.7[8] of the DEIR describes a number of other projects in the Natomas Basin, such as Metro Air Park and North Natomas Joint Vision Area, but is remiss in not recognizing the expansion plans for the Airport, one of the single largest "economic engines" in Sacramento County. This deficiency should be rectified in the Final EIR (FEIR). 21-16 Cont'd

B. **Regulatory Setting, Section 6.8.3.** This section[9] and the noise section (6.3.3) are the only places in the DEIR that mention the key components of the draft Airport Master Plan, and do so only in a cursory fashion. The DEIR does not analyze the potential impact of the proposed Spangler habitat mitigation preserve on the Airport Master Plan projects. 21-17

C. **Projects Contributing to Cumulative Impacts.** The draft Airport Master Plan is also briefly summarized in Appendix III, Section 7.1.2, page 7-3. It states that 500 acres of development will occur north of the AOA, but does not mention the potential northward runway extension and its implications for the proposed Spangler habitat preserve. 21-18

D. **Depiction of Airport.** The Greenbriar Location Map (Exhibit 6.12, page 6.12-11) does not accurately portray airport lands. It essentially only shows the rough outline of the AOA, which could lead the reader to conclude that the County-owned land north and south of the Airport is available for non-airport related development, including future habitat mitigation by private parties. This exhibit should be revised to show existing land owned and maintained by the County for land use compatibility purposes. The area designated "Airport" on Exhibit 6.12 should include all parcels owned by the County, including those located in Sutter County south of Riego Road. See attached Airport property map exhibit. 21-19

IV. OTHER CONCERNS

A. **Traffic Congestion.** The DEIR states that the development will result Level of Service (LOS) F on I-5 northbound east of Power Line road in the A.M. peak hour, and southbound in the P.M.[10] The environmental analysis does not acknowledge the potential impact of such congestion on airline passengers and Airport employees. 21-20

B. **Elverta Road ("Local Access, page 6.1-3).** Depending on the alternative ultimately selected, the proposed runway extensions previously described will require a northward relocation of Elverta Road west of its intersection with Power Line Road, in order to comply with FAA airport design and safety re- 21-21

[8] Pages 3-19 through 3-21.
[9] Page 6.8-12.
[10] Page 2-7

quirements. The DEIR should be revised to acknowledge the potential realignment of Elverta Road. 21-21 Cont'd

C. **Effects Analysis.** The Biological Resources section of the DEIR relied upon the 2001 Natomas Basin Land Cover map, consistent with the Natomas Basin Habitat Conservation Plan (NBHCP) adopted by the City in 2003. While using the 2001 map may have merits, doing so excludes from consideration the proposed development projects contained in the draft Airport Master Plan accepted by the Board of Supervisors in February 2004. Those projects will increase the developed land in the Natomas Basin, albeit small in terms relative to residential and commercial development within the current and proposed boundaries of the City of Sacramento and the County of Sutter. Nonetheless, an accurate analysis should include consideration of the draft Airport Master Plan. 21-22

Attachments:

- "Wildlife Strikes at Sacramento International Airport," USDA Wildlife Services, Revised July 26, 2006.
- Exhibit: Swainson's hawks Nesting Sites and Spangler Preserve
- Exhibit: Spangler Habitat Preserve – Runway Precision Approach Surface
- Exhibit Critical Zone - Sacramento International Airport
- Exhibit: Flight Track Analysis
- Exhibit: Airport Property

Attachment 1

Current Operations and Future Growth at Sacramento International Airport

Typical Airport Operations

Wind and weather conditions dictate the direction of aircraft departures at the Airport. Aircraft take off and land into the wind. Because south winds predominate at the Airport, aircraft arrive and depart in a southerly direction about 75 percent of the time. Landings and takeoffs in a northward direction primarily occur when the winds are from the north or when other weather conditions dictate. The proposed Spangler habitat mitigation project is located approximately one mile from the current northern arrival end of Runway 16L/34R (east runway). If 16L is extended by 1,000 feet, the southwest corner of the Spangler property will be approximately 4,484 feet from the end of the runway, and will be only 3,134 feet distant if the runway is extended by 2,400 feet.

Military aircraft also utilize the Airport, typically for "touch and go" exercises. Many of the military aircraft are larger than commercial aircraft, and are typified by lower flight

patterns than commercial aircraft. The FAA has total control over aircraft departure routes. The Airport System is unaware of any FAA plans to alter the current landing and departure routes, and it is highly speculative that the FAA would alter these routes in the future.

Growth Of Sacramento International Airport

In February 2004, the Sacramento County Board of Supervisors directed the initiation of environmental review for the draft Airport Master Plan for Sacramento International Airport, which includes forecasts of future aircraft operations through the year 2020. The Master Plan estimates that total passengers served by the Airport will approximately double between the year 2000 and 2020, and that flight operations will grow by more than two percent annually during that period.

In recent years passenger growth has in fact exceeded the Master Plan forecasts. For example, during the 12 months ending December 2005, the number of Airport passengers increased from 9,580,722 to 10,203,066, a growth rate of 6.5 percent. During this same period aircraft operations increased from 164,211 to 168,305 (average of 461/day), or an increase of 2.5 percent.[11] (An operation is a landing or departure.) The 2005 increase in passengers followed an almost seven percent increase in 2004 compared to 2003.

As an origination-destination Airport, the Airport did not experience the post 9-11 decline in passengers common among many "hub" Airports in the United States. Moreover, air traffic is increasing steadily throughout the country. The Airport's recent passenger increases were stimulated by more airlines offering Sacramento service (Aloha, Hawaiian, JetBlue, Mexicana), coupled with an increase in daily flights. It is anticipated that increased operations by at least four airlines will result in an additional ten flights per day at the Airport during the summer of 2006.

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[11] *Airmail*, March 10, 2006 – Sacramento County Airport System

Wildlife Strikes at Sacramento International Airport

Erica McDonald, Wildlife Biologist
California Wildlife Services - United States Department of Agriculture (USDA)
Animal and Plant Health Inspection Service

Revised July 26, 2006
By Chris Martin, Wildlife Coordinator
Sacramento County Airport System

Introduction

This report was originally published on April 11, 2006. A review of airport wildlife strike data revealed several errors, which have corrected in this revision. The revised report was reviewed by USDA Wildlife Biologist Anthony J. Novak, who was assigned to work with the Sacramento County Airport System in July 2006.

Wildlife Management at Sacramento International Airport (SMF) is an integral part of efforts by the Sacramento County Airport System to ensure the safety of travelers. Wildlife-aircraft strikes are not a new problem. Oliver Wright recorded the first bird strike to his aircraft as he flew over a corn field in Ohio. Sadly, the first man to fly across the US, Calbraith Rodgers, was also the first to die as the result of a bird strike when his plane hit a gull off the coast of California. Between 1960 and 2004, 122 civil aircraft in the United States were destroyed and 255 civilian lives were lost to due to wildlife strikes to aircraft. During the same time frame, 333 military aircraft and 150 military personnel were lost to aircraft-wildlife strikes.

One of the landmark aviation accidents that increased wildlife awareness occurred in Alaska. Upon take-off, a military aircraft with 24 crew members on board ingested just four Canada geese. The plane was destroyed and all 24 crew members were killed. In Alabama, a Learjet struck two white-tailed deer, destroying the plane and seriously injuring the pilot and first officer. Even small birds, such as blackbirds or pigeons, can cause substantial damage when they form flocks. In Kentucky, a Boeing 757 had to make an emergency landing after hitting a flock of starlings. Over 400 dead starlings were found on the runway. In Los Angeles, a Boeing 757 aborted take-off after ingesting several pigeons. Both engines were damaged.

Today's pilots are well versed in emergency procedures and the threat of wildlife strikes, and a majority of bird strikes occur with no effect on flight. Still, the costs and risks cannot be ignored. Annually, the U.S. aviation community sustains costs of at least $500 million and over 500,000 hours of aircraft downtime due to wildlife strikes. These costs are translated into higher ticket prices to the consumer. Further, each time an aircraft has to abort a take-off or make an emergency landing passengers are delayed or must be rebooked onto later flights often resulting in missed connections. Further background information on wildlife strikes in the United States can be found in several publications of the Federal Aviation Administration (FAA).[1]

[1] (a) *Memorandum of Agreement Between the Federal Aviation Administration, the U.S. Air Force, the U.S. Army, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture to Address Aircraft-Wildlife Strikes.* July 29, 2003. (b) *Wildlife Management at Airports – A Manual for Air-*

The FAA recognizes the political, operational, and economic costs of wildlife strikes, and has established a database for strike reporting, and published Advisory Circulars (AC) to provide guidance to airports on managing the risks associated with wildlife on airports. This guidance extends beyond on-airport features and attractants to include the area surrounding the airfield because wildlife are transient and the threat to aircraft does not stop at the airfield perimeter fence. Compliance with the ACs is encouraged to meet airport certification criteria, and airports that receive grant-in-aid money are required to use these standards. The pertinent advisory circulars referenced in this memo and summarized below include:

AC 150/5200-32A	Reporting Wildlife Aircraft Strikes
AC 150/5200-33A	Hazardous Wildlife Attractants on or Near Airports (7-27-04).
AC 150/5200-34	Construction or Establishment of Landfills near Public Airports
AC 150/5300-13	Airport Design Appendix 19. Minimum Distances between Certain Airport features and Any On-Airport Agricultural Crops

Reporting Wildlife Aircraft Strikes

To establish baseline data, the FAA manages a database for airports, airlines, and pilots to report strikes. Strike reporting is strongly encouraged, but is still a voluntary activity. From 1990 to 2004, over 63,000 wildlife strikes were reported to the database. The FAA estimates that only 20 percent of strikes are reported.

The data shows that reports of wildlife strikes are rising, and that several factors can be attributed to this increase. First is the increased awareness and new emphasis on strike reporting. Other factors that contribute to climbing strike rates are: 1) increase in air traffic, 2) increase in almost all wildlife populations, and 3) an increase in faster, quieter commercial aircraft.

When bird strikes occur, there is often very little left of the carcass. Still, if the maintenance team or wildlife staff can get a small downy feather from the plane, it can be identified by species. There are still gaps in data and almost 70 percent of strikes reported at SMF are accredited to "UNKNOWN" species because neither carcasses nor feathers can be recovered (the aircraft may be hundreds or thousands of miles away before the pilot files the strike report).

Hazardous Wildlife Attractants on or Near Airports

This AC provides guidelines for construction or removal of hazards located on or within 5 miles of an airport. Airports, including SMF, work with local developers to ensure public safety by providing commentary on proposed projects that may increase hazardous wildlife in the area. The AC provides a list of facilities that would increase the risk of a wildlife strike. This list includes but is not limited to: agriculture, water treatment facilities, land fills, waste transfer stations, and artificial wetlands. Some of these features can be modified to reduce wildlife attraction to a negligible level. For example, a waste transfer station can be completely en-

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port Personnel. Edward C. Cleary, FAA; and Richard A. Dolbeer, USDA Animal & Plant Health Inspection Service – Wildlife Services. July 2005.

closed, thereby restricting bird access. Water treatment facilities can be covered with netting if they are far enough from the airfield, but should be covered completely if they are too close.

Construction and Establishment of Landfills

The inherent nature of landfills attracts many kinds of wildlife scavenging for consumable leftovers. The AC outlines several laws and regulations concerning this issue.

FAA Appendix on Distances Between Airport Features and Agriculture

Appendix 19 of the FAA airport design advisory circular (AC 150/5300-13) summarizes the appropriate distances between runway features and crops. Agriculture is a major wildlife attractant that should be converted to more compatible land uses when hazardous wildlife species are attracted to the airfield vicinity. The appendix is Attachment 1 at the end of this document.

National Strike Analysis

The FAA, in cooperation with the USDA Animal and Plant Health Inspection Service – Wildlife Services (APHIS/WS), publishes a yearly analysis of wildlife strikes titled *Wildlife Strikes to Civil Aircraft in the United States*. Updates to the strike database usually run four months behind; this allows time for all strikes to be reported, gather damage information, and duplicate reports to be identified. The annual report is published during the summer, so data for 2005 will not be available until summer 2006. The most current report encompasses data from 1990-2004. This data can be accessed at http://wildlife-mitigation.tc.faa.gov.

For the 15 years covered by the report, there have been 59,196 strikes reported, with 19.5 percent being attributed to birds. Annually, the number of bird strikes has tripled from, 1,739 to 6,002 strikes per year. This increase is attributed to better reporting and awareness, increase in air operations, increasing wildlife populations, as well as increasing strikes. Other trends include:

- 51 percent of strikes occur between July and October
- 63 percent occur during the day
- 54 percent occur on landing
- 8 percent are caused by terrestrial mammals
- 74 percent occur at or below 500 feet above ground level (AGL)
- 93 percent occur at or below 3000 feet AGL

Damage estimates are included on bird strike reports, but not all strikes cause damage. This data has also been analyzed, with aircraft engines being damaged most frequently. The nose/radome, windshield, wings, and fuselage are the other aircraft components most commonly struck by birds. Terrestrial mammals tend to strike/damage landing gear, propellers, and wings/rotors, but can be propelled into an engine as the result of striking another part of the plane.

Wildlife strikes not only are a concern for human safety and species protection; they also cause environmental impacts. In the 15 year reporting period, 31 bird-strike events resulted in releases of fuel to lighten the load for an emergency landing. The mean quantity of fuel dumped per incident was 11,579 gallons. This was unburned jet fuel released into the atmosphere.

Species identification after a bird strike can be difficult, but trained biologists can often identify remains. Unidentifiable remains can be sent to the Smithsonian Feather Lab for identification. Of a total of 57,702 bird strikes between 1990 and 2004, only 23 percent were identified to the species level. In total, 309 species have been identified, with 141 species identified as having caused damage. In the analysis, waterfowl were responsible for 32 percent of all damaging strikes while gulls were responsible for 28per cent of damaging strikes.

Mammals are also struck by aircraft and are far more likely to cause damage. Of all mammal strikes, 53 percent are deer and 28 percent are coyotes. Ninety-four percent of strikes with damage involved deer, a species commonly observed outside the perimeter fence at SMF.

Species-specific damage reports are used to determine which species pose the most threat to aviation. The airport uses this list to evaluate potential hazards posed by species. **The frequency with which a species is struck at a particular airport is not a complete or adequate projector of the risk associated with the presence of that species.** The complete ranking can be found in the AC on *Hazardous Wildlife Attractants on or Near Airports.* Deer are by far the most hazardous to aviation, with the most damage and major damage and the greatest instances of effecting flight. The rankings also rank waterfowl as 7, hawks as 11, coyotes as 16, and blackbirds being 20.

Sacramento Strike Information

As of 2004, the FAA database has 965 strikes recorded for Sacramento International since 1990 with a current average exceeding 100 a year over the past three years. This number is a conservative estimate, as the FAA estimates that only 20 percent of strikes are reported. Strikes may go unreported if there is no damage, if there are untrained individuals collecting remains, or if there are no remains and damage is attributed to other causes. As of the April 2006 initial publication of this report, the FAA database was only updated through Oct 31, 2005. To provide analysis on one year of data, the time frame between November 1, 2004 and October 31, 2005, has been used to describe the current situation at SMF. Analyzing a year-round set of data is crucial to providing a full picture of seasonal habitat changes, migration, and habitat use by wildlife species.

According to the FAA's database for this time period, 107 wildlife strikes occurred at SMF. Of those, 62 percent of the strikes at SMF have been associated with unknown species. These are strikes that resulted in damage or produced enough of an impact for the pilot to report it, but there were no remains present when the plane landed. SMF employs a fulltime Wildlife Coordinator and contracts with the USDA for a full-time wildlife biologist to monitor strike rates, catalog data and ensure proper species identification. Pilots are also able to report strikes and can enter the approximate size of the birds and numbers hit, but perception can be subjective.

Of the total strikes where bird species was accurately identified, 38 percent were due to waterfowl and eight percent from raptors.

A bird strike that occurred on November 24, 2005 (Thanksgiving Day) resulted in a report on the local television evening news. During takeoff from Runway 16R, a United Airlines Airbus 320 struck a group of large birds at approximately 6:08 AM between 1,500 and 2,000 AGL. The aircraft returned to SMF as a precaution, whereupon it was found that birds had been ingested by one of the engines. Damage was sustained to the nose, radome, fuselage, and the number 2 engine. The pilot reported a "...strong thud noise, vibration, light smoke in cabin".

Selected Species of Concern at SMF

The following species are those that are present at SMF in large numbers, have the potential to cause considerable damage, or require special management because of state or federal protection.

Geese, Mallards, Northern Pintail, and other Waterfowl

Sacramento International Airport is located in the middle of the Pacific Flyway, and at the intersection of several major and minor flyways. The number of waterfowl that move through the Sacramento Valley is estimated at 4.2 million annually. There are several waterfowl attractors in the area, including the Yolo Causeway, the large acreage dedicated to rice production, various managed wetlands, and the Sacramento River. There are smaller attractors that increase waterfowl movement through the area, including golf course water features and lakes in housing developments. The synergy created by these multiple attractants increases the threat of a waterfowl strikes by increasing movement of waterfowl though the airspace. For example, a Canada Goose loafing on a housing development lake may move to rice fields to feed during the day, and then move to another location to sleep for the night. The more attractants in the area, the more possibility of waterfowl movement, and a correspondingly greater threat to aviation.

Red-tailed Hawk, Swainson's Hawk, and Other Raptors

While only eight percent of the strikes in which the species was accurately identified were attributed to raptors during the selected time frame, these species are ranked 11 in the FAA AC. The potential for raptors to cause substantial damage is significant. Overall, 9 confirmed Red-tailed hawks have been reported struck since 1990 at SMF, two of which caused substantial damage. In the year of data from November 2004 to Oct 2005, 23 red-tailed hawks were removed from the airfield. In that same year, 355 raptors were either observed utilizing the airfield or hazed (scared) away. That number hazed or observed includes 205 instances of Swainson's hawks, a threatened species in California. Allowing Swainson's hawks to breed and live around the airfield only puts the species in further jeopardy, as demonstrated by the four strikes since 2002 involving that species. (The most recent Swainson's hawk mortalities occurred on Runway 16R, on the dates of April 26 and April 30, 2006). The death of these specimens could have been prevented by encouraging the species to breed and forage elsewhere through the removal of hawk habitat surrounding the airport.

Blackbirds and European Starlings

There are several species of blackbirds that use SMF regularly, including Brewer's blackbirds, red-winged blackbirds, and brown-headed cowbirds. Additionally, although European starlings are not in the same family as blackbirds, starlings are included in this discussion because their behavior patterns and basic biology make their management very similar to blackbirds. While these species are small, their tendency to form large flocks makes them extremely dangerous to aviation. These birds become "flying bullets" as they flock around feeding areas. Thousands of blackbirds are harassed from the airfield every winter in an effort to change their behavior patterns so they feed and loaf off the airfield. Visual observations and necropsies of dead blackbirds indicate that at certain times of the year they feed heavily on rice in the fields surrounding the airport.

Pigeons

Pigeons frequent the agricultural fields around SMF to feed, and then move onto water sources where they can drink and gather grit to aid in digestion. Pigeons have been responsible for numerous wildlife strikes resulting in damage to aircraft. The bodies of pigeons are relatively dense, and the birds do form flocks. Pigeons adapt well to urban areas and will most likely continue to thrive as urbanization moves toward the airport.

Coyote and Deer

Mammals consist of only a small percentage of total wildlife strikes nationwide, but 94 percent result in damage to aircraft, and collisions with deer have resulted in human fatalities. While there are no deer-aircraft strikes on record at SMF, the presence of deer immediately outside the airfield constitutes a real and present threat. As urban development continues in the Natomas Basin, deer habitat is lost. The agricultural areas and crop around the airfield, specifically fruit orchards, provide excellent cover and feeding areas. Numerous deer have been observed immediately outside the northwest corner of the airfield in a pear orchard directly adjacent to the perimeter fence, about 1,000 feet from the runway. Nationwide, since 1990, there have been 653 aircraft-deer strikes, resulting in one human fatality and 23 injuries. Coyotes have been involved in 174 wildlife strikes throughout the country, resulting in 9,675 hours of aircraft downtime.

Coyotes have also been identified as a substantial threat to aviation at SMF, and there have been three coyote strikes recorded at SMF. In the time between November 2004 and October 2005, 15 coyotes were removed from the airfield. The number of coyotes observed seems to be on the rise, possibly due to human encroachment on surrounding habitat and the lack of activity on parts of the airfield. Surrounding agricultural fields and orchards increase foraging habitat and cover, providing the synergistic effect of increasing coyote movement between attractants with the airfield acting as a natural pathway or shortcut for the animal.

Giant Garter Snake

The Giant Garter Snake (GGS) is a federally listed Threatened species found in the Natomas Basin. Although GGS trapping has been conducted on the airfield by GGS experts during the past three years (2004-06), only one snake has been captured during that time.[2] The airfield ditches nonetheless remain potential habitat for GGS and are therefore protected. This protected GGS wetland and the 200-foot "upland habitat buffer" on either side of these ditches also makes excellent feeding and loafing habitat for waterfowl, wading birds, coyotes, and other hazardous species. Unfortunately, this 200 foot "buffer" encroaches into both runway safety areas (an area that must remain clear of obstacles and safety hazards). This requires extra attention and creativity to discourage wildlife from using the habitat.

Wildlife Management at Sacramento International Airport

Managing for wildlife hazards on and near airports is neither quick nor easy. Wildlife management begins at the habitat level. Removal of habitat discourages wildlife from using the area, and is the essential non-lethal control technique. Keeping wildlife from using areas where they may jeopardize aviation also prevents wildlife species from endangering their own lives. Removing habitat from areas around the airfield encourages any listed species to find a home safer for themselves and aviation. The management of public lands is highly controversial and requires due diligence in assuring proper land stewardship.

Direct control is the practice of harassing birds away from the airfield. There are many methods employed at Sacramento International, including pyrotechnics, bird distress calls, visual deterrents, perch deterrents, vehicle harassment, and the use of firearms to harass wildlife. All wildlife staff and operations officers are trained in identification and equipment safety to safely and effectively use the tools. Overuse or misuse of a tool can reduce its effectiveness. For example, a scarecrow or effigy may be very effective until the birds realize that no harm is going to come to them and that the effigy does not move the desired effect is even shorter lived. To combat this, many modern effigies have been made with moving parts, reflective eyes, and motion activated water sprinklers. These modifications, along with moving the effigy frequently will help preserve its effectiveness.

The use of other animals to chase or deter wildlife has been avoided at SMF, due to the contradiction it would cause between the airport's policy of not allowing free ranging animals on the airport. The use of falconry, while somewhat effective, is not used because of the potential for the falconer's bird to be hit by a plane, or inadvertently scare wildlife into the path of oncoming air traffic. The same concern exists with regard to using dogs to harass wildlife. Nationwide, domestic dogs have been involved in at least 21 aircraft strikes since 1990, resulting in two injuries and 15 instances of damage to the aircraft. Humans can provide the same deterrence without the risk of releasing another animal onto the airfield. The Sacramento County Airport

[2] Eric Hansen, "Results of Giant Garter Snake Surveys Conducted During 2005 within Sacramento International Airport (SMF) Property Boundaries, Sacramento and Sutter Counties," March 26, 2006; and a preliminary 2006 report issued by Eric Hansen on June 26, 2006.

System is dedicated to public safety, and every effort is made to reduce risk, in this case, by not introducing another species onto the airfield.

Conclusion

Sacramento International Airport is faced with several challenges when protecting passengers from wildlife related accidents. The location in the middle of the Pacific Flyway, surrounded by rice and agriculture, and adjacent to protected species habitat makes the management of wildlife more complicated. The management goals at SMF are dictated by the presence of species potentially hazardous to aircraft operations, whether or not they have been involved in aviation accidents at SMF in the past. National data and trends help identify and inform mangers about risks associated with all species and support airport policies nationwide of "No Tolerance" for wildlife on airfields, in support of the primary goal of protecting pubic safety in the air and on the ground.

Attachment 1

AC 150/5300-13 Airport Design. Appendix 19. Minimum Distances Between Certain Airport Features And Any On-Airport Agriculture Crops.

Aircraft Approach Category And Design Group [1]	Distance In Feet From Runway Centerline To Crop		Distance In Feet From Runway End To Crop		Distance In Feet from Centerline Of Taxiway To Crop	Distance In Feet from Edge Of Apron To Crop
	Visual &≥ ¾ mile	< ¾ mile	Visual &≥ ¾ mile	< ¾ mile		
Category A & B Aircraft						
Group I	200 [2]	400	300[3]	600	45	40
Group II	250	400	400[3]	600	66	53
Group III	400	400	600	300	93	31
Group IV	400	400	1,000	1,000	130	113
Category C, D & E Aircraft						
Group I	530[3]	575[3]	1,000	1,000	45	40
Group II	530[3]	5753	1,000	1,000	66	53
Group III	530[3]	5753	1,000	1,000	93	31
Group IV	530[3]	5753	1,000	1,000	130	113
Group V	530[3]	5753	1,000	1,000	160	133
Group VI	530[3]	5753	1,000	1,000	193	167

[1] Design Groups are based on wing span, and Category depends on approach speed of the aircraft.

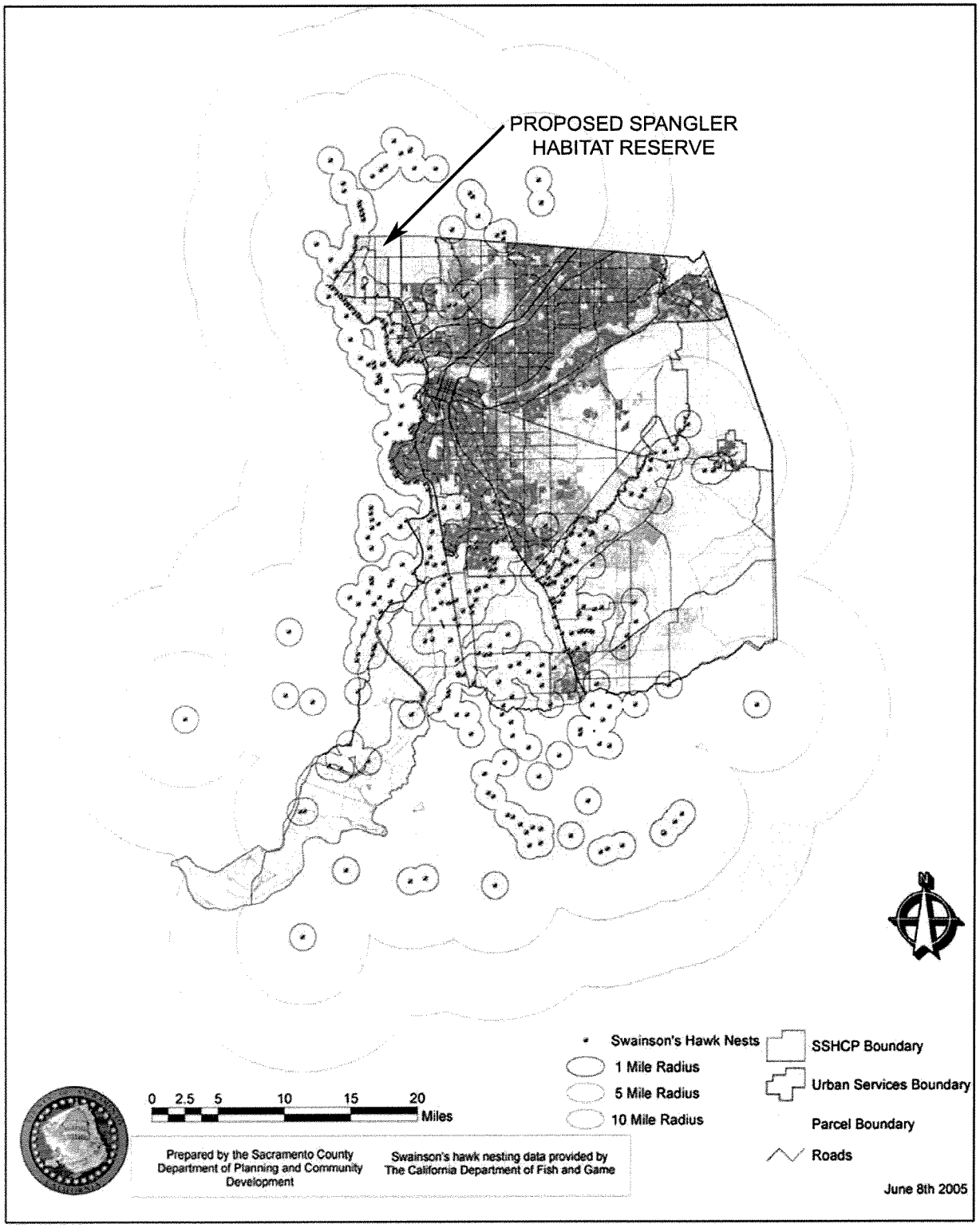
Group I: Wing span up to 49 ft.	Category A:	Speed less than 91 knots
Group II Wing span 49ft. up to 73 ft.	Category B:	Speed 91 knots up to 120 knots
Group III: Wing span 79 ft. up to 117 ft.	Category C:	Speed 121 knots up to 140 knots
Group IV: Wing span 113 ft. up to 170 ft.	Category D:	Speed 141 knots up to 165 knots
Group V: Wing span 171 ft. up to 213 ft.	Category E:	Speed 166 knots or more
Group VI: Wing span 214 ft. up to 261 ft.		

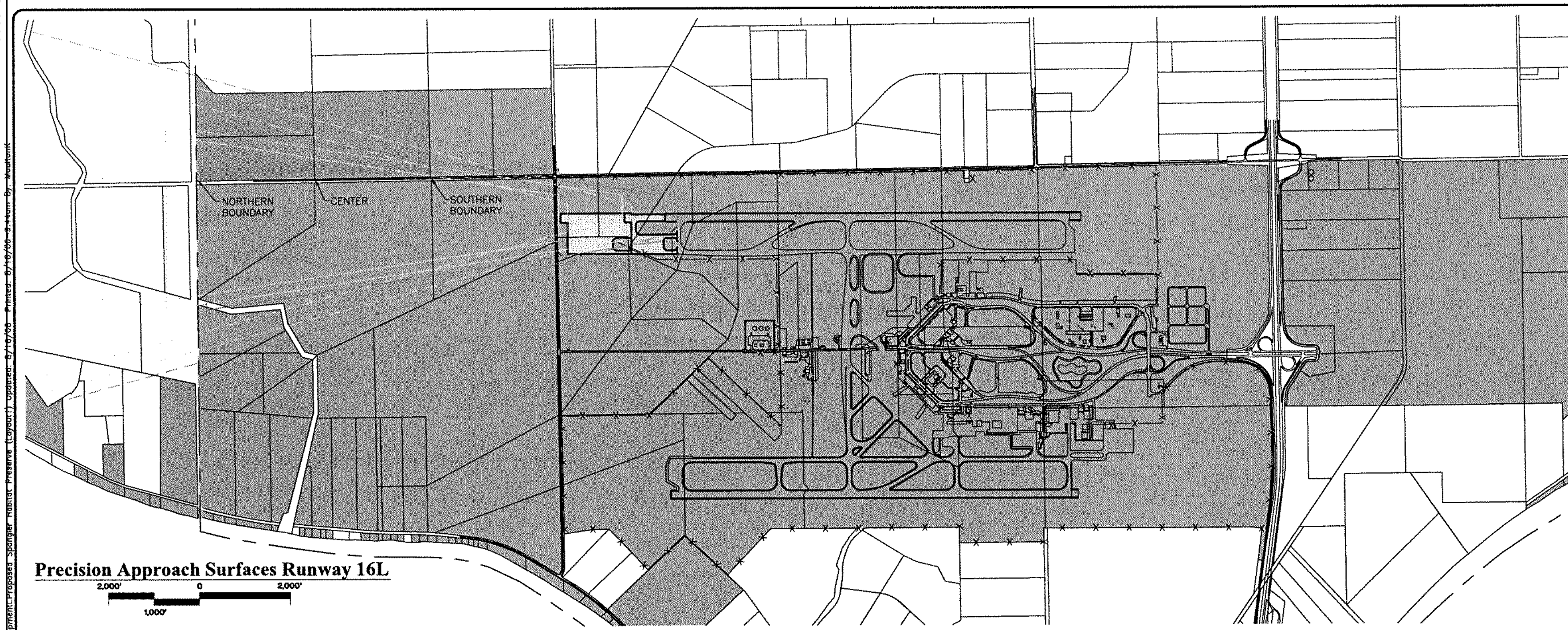
[2] If the runway will only serve small airplanes (12,500 lb. And under) in Design Group I, this dimension may be reduced to 125 feet; however, this dimension should be increased where necessary to accommodate visual navigational aids that may be installed. For example farming operations should not be allowed within 25 feet of a Precision Approach Path Indicator (PAPI) light box.

[3] These dimensions reflect the TSS as defined in AC 150/5300-13, Appendix 2. The TSS cannot be penetrated by any object. Under these conditions, the TSS is more restrictive than the OFA, and the dimensions shown here are to prevent penetration of the TSS by crops and farm machinery.

W:\PLANNING\ENVIRONMENTAL\Wildlife Hazard Management\BirdStrike_Data\SMF\SMF Strike Info_Revised_080106(10)_KD_ 082506.doc

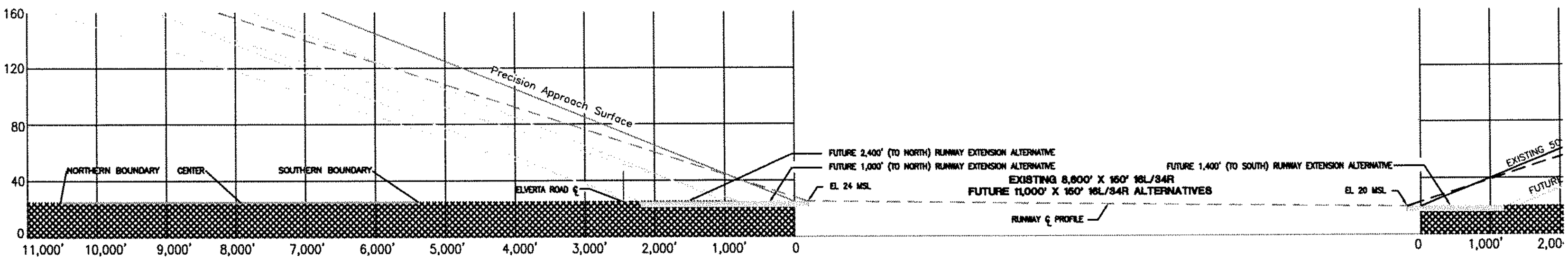
Swainson's Hawk Nest Sites





Precision Approach Surfaces Runway 16L

2,000' 0 2,000'
1,000'



Precision Approach Surfaces Runway 16L - Profile View

VERTICAL 50' 25' 0 50'
HORIZONTAL 1000' 500' 0 1000'

Height of Runway Precision Approach Surface (Above Ground)						
Location	2,400' to North		1,000 to North		Existing	
	1:50 (ft.)	1:62.5 (ft)	1:50 (ft.)	1:62.5 (ft.)	1:50 (ft.)	1:62.5 (ft.)
Northern Boundary	163.5	134.2	191.5	156.6	211.5	172.6
Center	111.7	92.8	139.7	115.2	159.7	131.2
Southern Boundary	60.9	52.1	88.9	74.5	108.9	90.5

DATA/LEGEND

- Airport Property
- Proposed Spangler Habitat Preserve
- 1:50 Runway Precision Approach Surface
- 1:62.5 Runway Precision Approach Surface (in effect January 1, 2008)
- Existing 8,600' Runway
- Future Alternative Runway 1000' Extension to North 1400' to South
- Future Alternative Runway 2400' to North

SACRAMENTO COUNTY AIRPORT SYSTEM
6900 AIRPORT BLVD.
SACRAMENTO, CA 95837

REVISIONS

NO.	DATE	BY	DESCRIPTION	APP'D

SACRAMENTO INTERNATIONAL AIRPORT

Proposed Greenbriar Development Project
Spangler Habitat Preserve
Runway Precision Approach Surface

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)
FILE NAME: Proposed Spangler Preserve
DRAWN BY: KLM
DATE: 8/9/2006
DESIGNED BY:
CHECKED BY:
DRAWING NO. 1
SCALE: AS SHOWN
SHEET NO. 1 OF 1

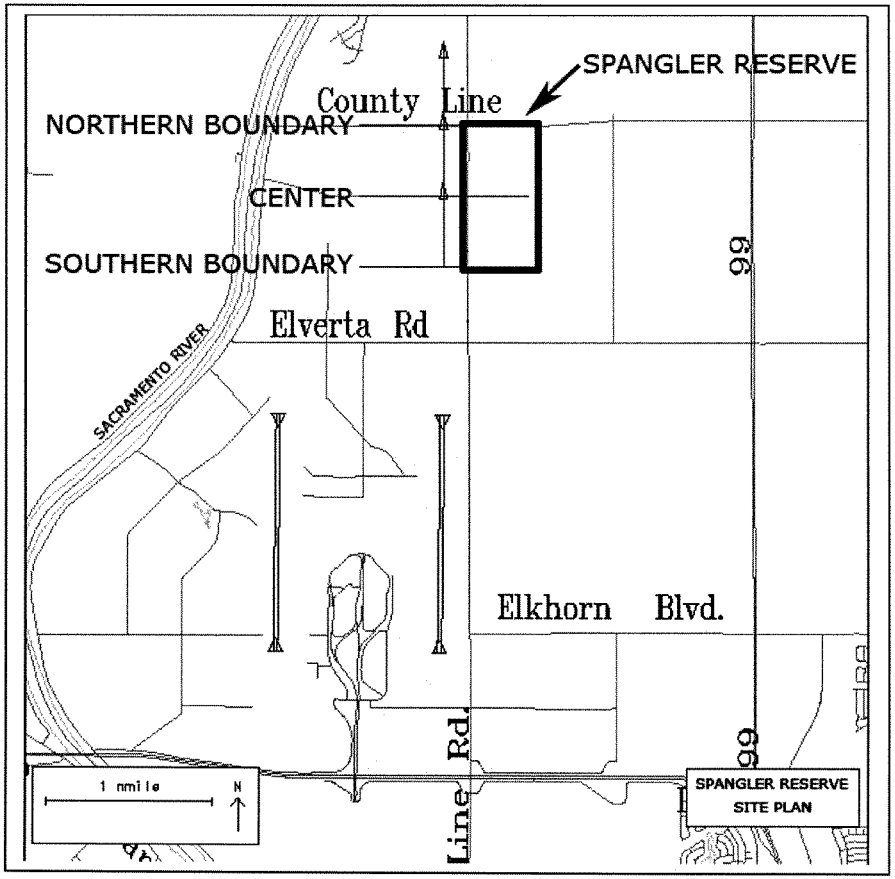
ritical Zone* - Sacramento International Airport

)000 ft radius from the centerline of the runways

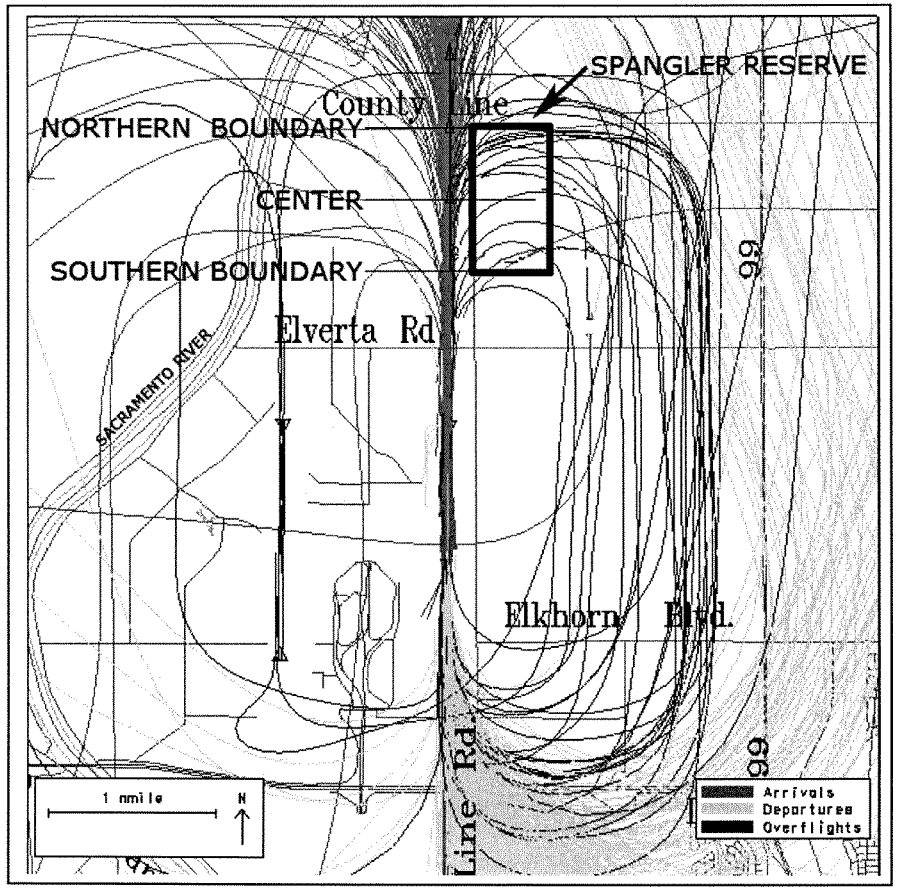
Sacramento County Airport System
Aircraft Noise Information Office
08/01/2006 – 08/07/2006
Flight Track Analysis – Proposed Greenbriar Development Project Spangler Habitat Preserve

08/01/2006 – 08/07/2006

Spangler Reserve North, Center, and South Swanson Hawk Locations



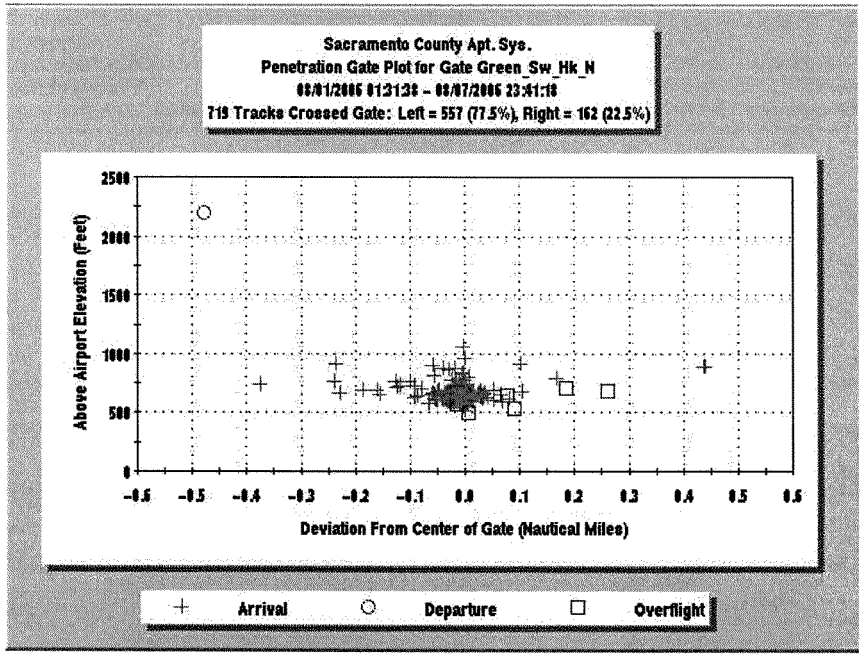
Spangler North, Center, and South Swanson Hawk Locations
With one week of flight tracks for the Sacramento International East runway. The blue tracks are Touch and Go operations.



Sacramento County Airport System
Aircraft Noise Information Office
08/01/2006 – 08/07/2006
Aircraft Elevation Analysis

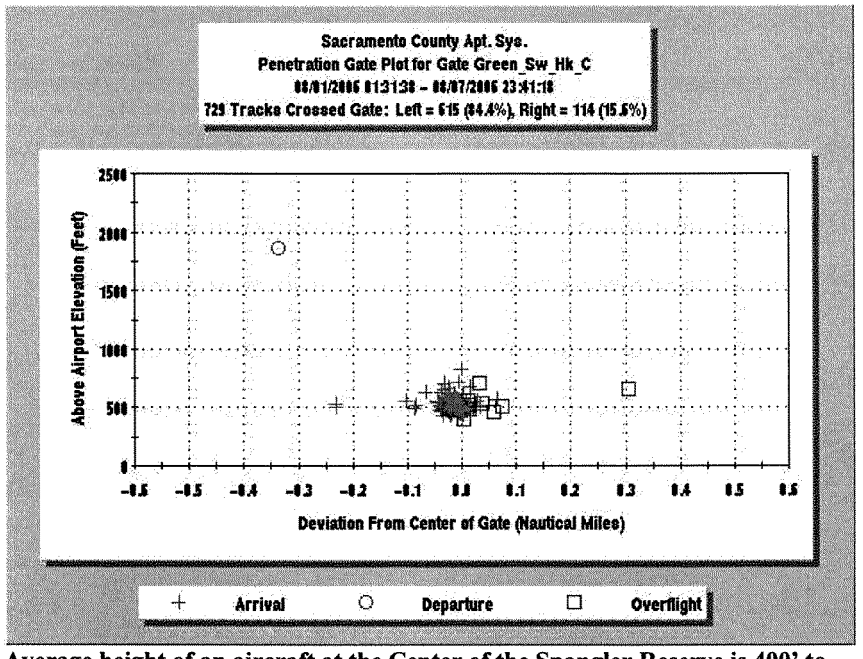
08/01/2006 – 08/07/2006

Proposed Spangler Reserve Northern Swanson Hawk Mitigation Location, with one week of flight tracks for the Sacramento International East runway. The blue tracks are Touch and Go operations.



Average height of an aircraft at the Northern Boundary of the Spangler Reserve is 500' to 800'. (Note: The term "Gate" refers to the intersection of the runway centerline and the Northern Boundary of the Spangler Reserve.)

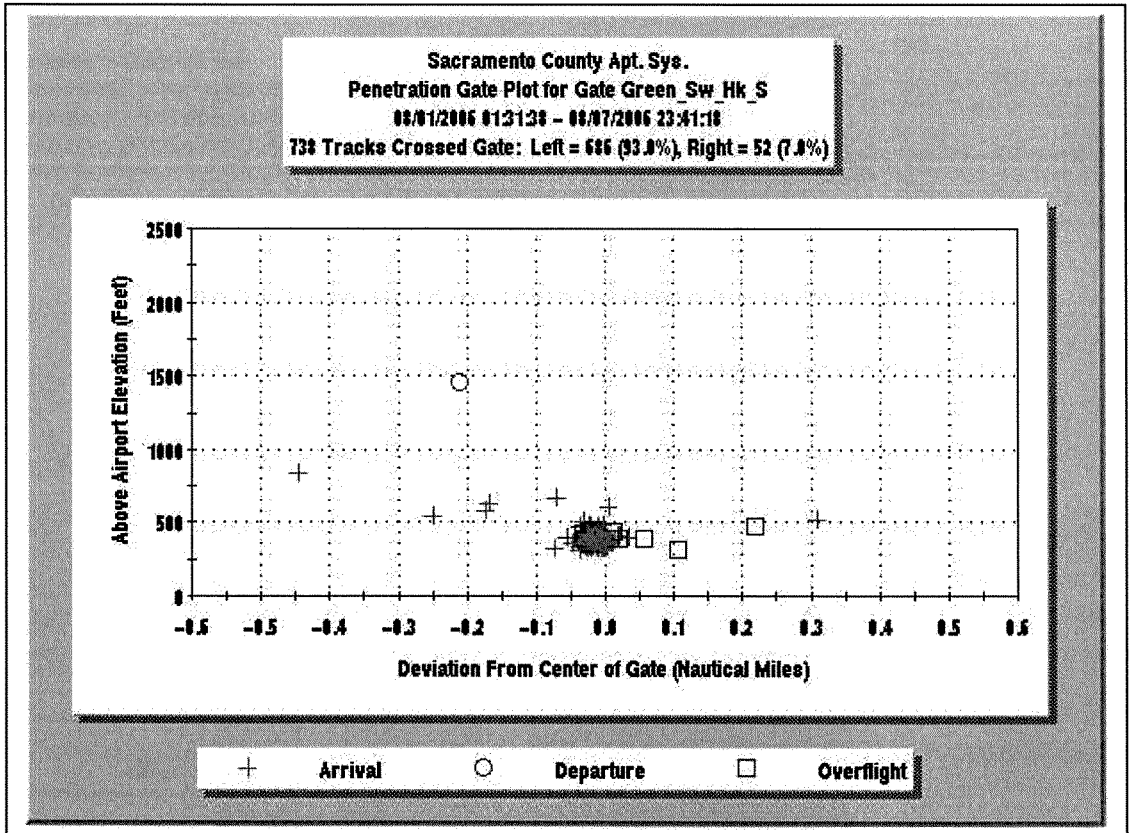
Proposed Spangler Reserve Center Swanson Hawk Mitigation Location, with one week of flight tracks for the Sacramento International East runway. The blue tracks are Touch and Go operations.



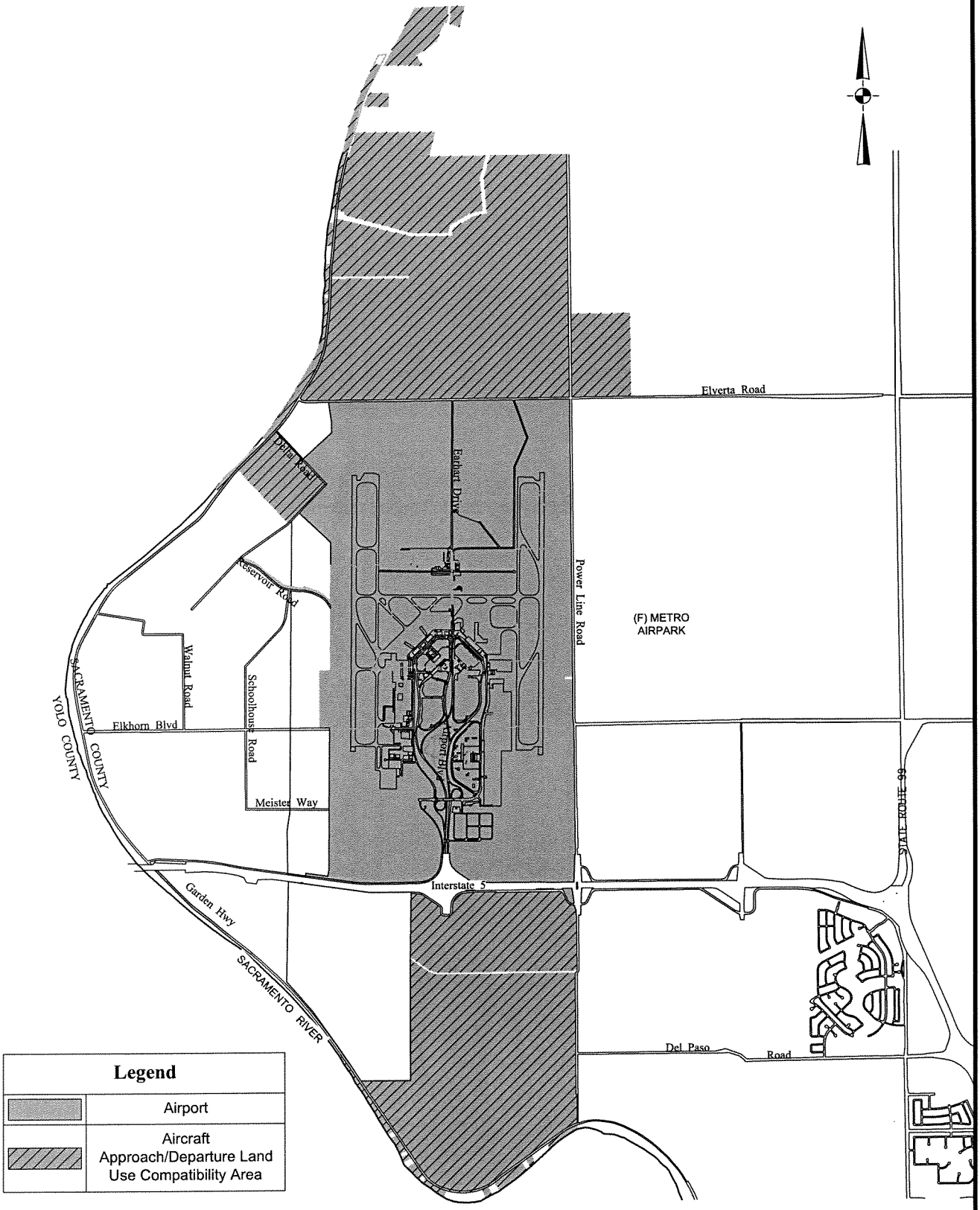
Average height of an aircraft at the Center of the Spangler Reserve is 400' to 600'. (Note: The term "Gate" refers to the intersection of the runway centerline and the Center of the Spangler Reserve.)

Sacramento County Airport System
Aircraft Noise Information Office
08/01/2006 – 08/07/2006
Aircraft Elevation Analysis

Proposed Spangler Reserve Southern Swanson Hawk Mitigation Location,
with one week of flight tracks for the Sacramento International East runway.
The blue tracks are Touch and Go operations.



Average height of an aircraft at the Southern Boundary of the Spangler Reserve is 300' to 500'. (Note: The term "Gate" refers to the intersection of the runway centerline and the Southern Boundary of the Spangler Reserve.)



DRAWING:		DRAWN BY:	SACRAMENTO INTERNATIONAL AIRPORT	SACRAMENTO COUNTY AIRPORT SYSTEM
Property Map		KLM	County Owned Airport Property	6900 AIRPORT BLVD. SACRAMENTO, CA 95837
SHEET: 1	SCALE: N.T.S.	DATE: 8/25/2006		

File: W:\AUTOCAD\master\smf\FAC\10250-SMF\ENV\Property Map (Layout1) Updated: 8/25/06 Printed: 8/25/06-1:43pm By: MoultonK

LETTER 21

Sacramento County Airport System
Greg Rowe
Senior Environmental Analyst – Planning and Development
August 29, 2006

21-1 The commenter expresses concern with the wildlife hazards posed by the management of the Spangler property for biological mitigation. Regarding the potential hazards associated with this property, please refer to response to comment 19-6.

21-2 The Sacramento County Airport Systems' (SCAS) concerns are noted. Impact and Mitigation Measure 6.8-4 address the issue of water features and bird strike hazards on the project site and include extensive features to reduce this potentially significant impact. Please see comment and response 21-3 for further discussion of this issue.

21-3 SCAS's concurrence with proposed mitigation to reduce wildlife hazards associated with the proposed lake/detention basin is noted. The comment does not raise any issues related to the environmental analysis presented in the DEIR, and no further response is necessary.

21-4 Please refer to response to comment 19-6.

21-5 The comment does not raise any issues related to the environmental analysis presented in the DEIR, and no further response is necessary.

21-6 The comment does not raise any issues related to the environmental analysis presented in the DEIR, and no further response is necessary.

21-7 The comment does not raise any issues related to the environmental analysis presented in the DEIR, and no further response is necessary.

21-8 The comment does not raise any issues related to the environmental analysis presented in the DEIR, and no further response is necessary.

21-9 The comment does not raise any issues related to the environmental analysis presented in the DEIR, and no further response is necessary. Please refer to response to comment 21-16 below.

21-10 The comment does not raise any issues related to the environmental analysis presented in the DEIR, and no further response is necessary.

21-11 Please refer to response to comment 19-6.

21-12 The location of the Spangler preserve within the critical zone is noted. Please refer to response to comment 19-6 for a discussion of how the proposed mitigation lands would be managed in comparison to existing conditions.

21-13 The comment does not raise any issues related to the environmental analysis presented in the DEIR, and no further response is necessary.

21-14 Please refer to response to comment 19-6. As described, the consultation sought by the Airport would take place as part of the Natomas Basin Conservancy's (NBC) habitat establishment process, in accordance with the requirements of the NBHCP.

21-15 Please refer to response to comment 19-6.

21-16 The Sacramento International Airport Development Plan is identified as part of the cumulative impact analysis for biological resources (see Section 7.2.12 of the DEIR). Please refer to the discussion in the referenced section of the DEIR.

21-17 Please refer to response to comment 19-6. As noted, NBC is required, as part of the NBHCP, to submit mitigation plans to the Airport, and this procedure would be followed for the Spangler site. All habitat mitigation lands are required to be designed to avoid potential safety conflicts from potential collisions between aircraft and birds.

21-18 Please refer to response to comment 19-6, as well as response to comments 21-14 and 21-17.

21-19 Although the boundaries of the Sacramento International Airport may not accurately portray all airport controlled lands in Exhibit 6.12-4 of the DEIR, the purpose of the exhibit is to depict the locations of existing biological habitat reserves that have been established by the NBHCP. Changing the exhibit to show all parcels owned by the County would not change the overall depiction of the exhibit and does not affect the analysis of biological resource impacts conducted in the DEIR. However, Exhibit 6.12-4 has been revised to incorporate the commenter's requested changes. The revised exhibit is presented in Chapter 7, "Revisions to the DEIR, RDEIR, and Second RDEIR."

21-20 Please refer to response to comment 29-44.

21-21 The description of Elverta Road in Section 6.1.2 of the DEIR is based on existing conditions. The City and LAFCo acknowledge that future roadway construction and alignment modifications may be required as a result of planned projects at the Sacramento International Airport and other cumulative developments in the area. The analysis presented in the EIR evaluates the impacts of the project on the existing roadway network and on approved future roadway alignments (see the cumulative analysis in Section 4.1, "Transportation and Circulation"). The realignment of Elverta Road is not a project under consideration at this time. Therefore, it would be speculative to evaluate the project-related impacts to this proposed alignment, should it occur sometime in the future.

21-22 Please refer to response to comment 21-16.

County of Sacramento
MUNICIPAL SERVICES AGENCY – CHERYL CRESON, ADMINISTRATOR
Department of Transportation
Including service to the Cities of Citrus Heights and Rancho Cordova
Thomas J. Zlotkowski, Director

22

July 24, 2006

Mr. Tom Buford
City of Sacramento
Development Services Department
2101 Arena Boulevard, Second Floor
Sacramento, CA 95834

SUBJECT: COMMENTS ON DEIR FOR GREENBRIAR MASTER PLANNED COMMUNITY

Dear Mr. Buford:

The Sacramento County Department of Transportation has reviewed the Draft Environmental Impact Report (DEIR) for the Greenbriar Master Planned Community. We appreciate the opportunity to review this application. Our comments are as follows: 22-1

1. The cumulative traffic volumes shown in the DEIR do not match the cumulative traffic volumes shown in the report for the Metro Air Park traffic study prepared in 2003. In some cases these volumes are significantly different. Please justify this volume difference. 22-2

2. Any transportation modeling performed in the study should include buildout of Metro Air Park as part of the cumulative base conditions. The text appears to state that this land use was included in the traffic model. The traffic model should also take into consideration the land use being considered in the Elverta Specific Plan. This project has been forwarded to the County Board of Supervisors by the Planning Commission and is therefore in process. 22-3

3. The DEIR should identify funding for any improvements that the study recommends and those improvements should be consistent with the improvements identified for the recently approved Metro Air Park development. The development of the financing plan for Greenbriar should be closely coordinated with the financing plan for Metro Air Park. 22-4

If you have any questions, please feel free to contact me at 874-7052.

Sincerely,

Matthew G. Darrow
Senior Civil Engineer
Department of Transportation

MGD:mgd

C: Steve Hong -IFS
Dan Shoeman – DOT
Dean Blank – DOT
Bob Davison – IFS
Theresa Mack – IFS

LETTER 22

Sacramento County Department of Transportation
Matthew Darrow
Senior Civil Engineer
July 24, 2006

22-1 Because the comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

22-2 While the commenter states that the traffic modeling data for the Greenbriar project does not "match" the traffic modeling data for the Metro Air Park development, the commenter does not identify any specific discrepancies. The traffic modeling analysis performed for the Metro Air Park development was completed in 1993 and was based on the existing roadway and traffic volume conditions at that time. Further, the cumulative analysis prepared for the Metro Air Park development included projects that were known to be in process at that time.

The traffic analysis for the Greenbriar project was prepared based on the most recent traffic data and list of cumulative projects available (July 2006). Traffic conditions have changed since the preparation of the Metro Air Park traffic analysis and these changes would be expected to result in differences in the modeling data for the two projects. Further, additional cumulative projects have been proposed and were included in the analysis for the Greenbriar project. One specific example is that the Greenbriar analysis included the proposed Panhandle development while the Metro Air Park analysis did not. As described on page 6.1-20 of the Second RDEIR, the traffic model used for the Greenbriar project assumed the traffic generated by the Metro Air Park development, West Lakeside development, Natomas Shopping Center development, and the Panhandle development. In addition, the SACMET model includes regional growth factors for growth and development. For this reason, the volumes shown in the Metro Air Park traffic report will not be exactly the same as those volumes used in the traffic analysis prepared for the Greenbriar project.

In response to several comments, the cumulative traffic analysis was revised to specifically address several additional projects in the region; these projects were more generally included in the traffic analysis conducted in the DEIR through use of the SACMET Regional Travel Demand Forecasting model, a traffic model that forecasts Sacramento regional traffic conditions based on projects throughout the region. The model was supplemented to add in the Metro Air Park project, as noted on page 6.1-20. To review the revised cumulative analysis, please see the Second RDEIR for the Greenbriar Development Project (April 10, 2007).

22-3 The Metro Air Park and Elverta Specific Plan projects have been incorporated into the cumulative traffic analysis for the project. The Metro Air Park development was included in the cumulative traffic analysis prepared for the DEIR and the Elverta Specific Plan was added to the cumulative analysis as part of the Second RDEIR. Please refer Master Response 2. To review the revised cumulative analysis, please see the Second RDEIR for the Greenbriar Development Project (April 10, 2007).

22-4 As identified in Mitigation Measure 6.1-1a of the DEIR, the project applicant is required to prepare a finance plan for the Greenbriar project. A copy of the Draft Finance Plan for the Greenbriar project was included as Appendix C of the DEIR and was prepared in part based upon information contained within the Metro Air Park finance plan. The Metro Air Park finance plan identifies funding for improvements to several of the facilities that the project would result in significant impacts. The Greenbriar draft finance plan incorporates Metro Air Park's financing commitments identified in its finance plan and adds the project's fair-share contribution to the funding pool for facilities that would be affected by the project. The City has reviewed the Draft Finance Plan and provided comments to the project applicant. A copy of the Revised Draft Greenbriar Finance Plan is included as Appendix E of this document.

August 31, 2006

Mr. Tom Buford
Associate Planner
Development Services Department
City of Sacramento
901 I St.
Sacramento, CA 95814

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

SUBJECT: DRAFT EIR, GREENBRIAR PROJECT
FILE # P05-069, SAC 200400304D

Dear Mr. Buford and Mr. Brundage:

Thank you for sending the DEIR for the project listed above to the Sacramento Metropolitan Air Quality Management District (District) for review and comment. District staff comments follow. 23-1

This project is located outside of the County Urban Services Boundary and the City of Sacramento city limits. The existing City General Plan (1999) with its amendments did not anticipate growth on this parcel although growth was anticipated on the adjoining parcel. That current General Plan states City policy supports "contiguous growth.[1]" The new General Plan update will evaluate this project in one of its potential development scenarios, however, it is not known whether or not the project will be part of the Preferred Alternative Scenario. That will not be decided until March, 2007. 23-2

If the project moves forward, we suggest the City account for the project's accompanying Vehicle Miles Traveled (VMT) and trip growth in the data the City provides SACOG for use in the travel model. Accurate land use and corresponding travel data are necessary to determine the emissions inventory calculated for the State Implementation Plan (SIP). 23-3

According to the DEIR, the project is projected to generate short term air quality emissions which will be significant for construction activities. Mitigation Measure 6.2-1 applies the District's on-site construction mitigation to the project. We look 23-4

forward to working with the contractors and their sub-contractors on their construction mitigation plans prior to site disturbance. 23-4 Cont'd

Mitigation measure 6.2-1 c requires the applicant to pay into SMAQMD's off-site construction mitigation fund a fee of $1,525,537 for the total project in order to further mitigate the significant air quality emissions prior to any ground disturbance of the site. The spreadsheet for the fee calculation appears in Appendix D of the document. Not only does it give the total figure (above), but it gives a cost of fee per acre ($5,959.13). We believe the cost per acre fee has been erroneously determined using only the acreage of the residential development. It would be more correct to have that cost/acre based on all developed acres in the project. That would include the residential as well as the acres for village commercial, community commercial, elementary school and any other use such as parks where site disturbance will occur. In including those uses and their corresponding acres, the cost per acre will come down. The total fee will remain the same. 23-5

According to the DEIR, the project, once built out, will generate emissions in excess of the District's operational threshold of significance. Mitigation measure 6.2-2 presents an on-site Air Quality Mitigation Plan designed to reduce NOx emissions by 15%. In a letter dated 12/21/05 to Ms Hughes of the Hoyt Company about the Air Quality Mitigation Plan, Art Smith, now retired from the District stated that this Plan "met the expectations of the District." This letter is included in the DEIR. If desired by the City, we would welcome the opportunity to work with the City and the proponent to further refine and strengthen this Plan. It currently lacks some details which would strengthen it. 23-6

Since this project is located within 500 feet of a major roadway (two major freeways, I-5 and SR 99), the California Air Resources Board's "Air Quality and Land Use Handbook: A Community Health Perspective" applies. The Handbook suggests that, at a minimum, the siting of residential uses should not occur within 500 feet of a freeway because of potential health risks related to exposure to toxic air contaminants (TACs). 23-7

The DEIR discusses the impact (Impact 6.2-4) of toxic air contaminants (TAC) emissions from mobile sources (pg 6.2-23). It makes the statement that *"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."* A quantifiable risk assessment for cancer risk is possible through performing air dispersion modeling and a health risk assessment and we recommend one be performed for this project. The District now has a *Draft Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways (Protocol)* that should be referenced. The Recommended Protocol can be found at http://www.airquality.org/bod/agenda2006Augfinal.shtml. 23-8

Although there are no verified mitigation measures for reducing the risk of TACs from mobile sources at this point in time, if the City Council approves this project, we urge it to consider locating non-residential uses in the parts of the project area closest to the freeway. As an alternative, minimize impacts on residential development by orienting buildings away from the freeway or providing appropriate setback or buffer zones. 23-9

In addition, the DEIR states that even though there is "no accepted or prescribed threshold for exposure to the impacts of TAC emissions from mobile sources," that the impact from TACs would be "less than significant." The District believes that absent a threshold of significance, one cannot make a determination of significance for mobile source TACs. 23-10

All projects are subject to SMAQMD rules and regulations in effect at the time of construction. A complete listing of current rules is available at www.airquality.org 23-11

If you have questions, please contact me at 874-4885 or at jborkenhagen@airquality.org.

Sincerely,

Jeane Borkenhagen

cc Larry Robinson SMAQMD
Scot Mende City of Sacramento

[1] City of Sacramento General Plan, 1999, pg 1-29

LETTER 23

Sacramento Metropolitan Air Quality Management District
Jeane Borkenhagen
September 5, 2006

23-1 Please refer to responses to comments 23-2 through 23-11.

23-2 The City of Sacramento's general plan update process is acknowledged. The proposed project is being evaluated at this time for inclusion in the General Plan and General Plan Land Use Map as residential development, both because it is contiguous to other areas of the City that are planned for development or already built out and is a logical extension of the City, and because the development application that is the subject of this EIR was submitted. Please refer to response to comment 23-3.

23-3 If the project moves forward, the City of Sacramento will amend its general plan to reflect the project. This will become the basis for future City planning, including planning for compliance with the SIP.

23-4 The comment concurs with the analysis in the DEIR. No further response is needed.

23-5 The mitigation fee was recalculated and the recalculation is presented in the RDEIR. See page 6.2-20 of the RDEIR, as well as responses to comment letter R7.

23-6 The comment concurs with the analysis in the DEIR; no further response is needed.

23-7 The DEIR acknowledges on page 6.2-26 that the California Air Resources Board recommends that residences should not be sited within 500 feet of a freeway. The DEIR also acknowledged that this is guidance and not regulatory, and provided a site-specific analysis of risk based on exposure to toxic air contaminants (TAC) from current and future traffic on freeways adjacent to the Greenbriar site, considering both current vehicular emissions, and reasonably expected future emissions, based on emissions controls required by CARB and federal air pollution control regulations. The RDEIR conducted additional analysis of exposure to TAC, and concluded that impacts from exposure to freeway TAC would be less than significant. Please see, also, responses to comment letter R5 and R7-13.

23-8 In response to this and other comments, the analysis in the DEIR was revised to reflect the referenced draft protocol as well as to include a more detailed, site-specific analysis. This information is presented in the RDEIR at pages 6.2-24 and 6.2-26 through 6.2-29. The analysis concluded that, due to improvements in emissions control technology, the health risks from exposure to emissions from the freeway will be substantially reduced over time, and the long-term health risks at Greenbriar will be less than current background health risks from exposure to toxic air contaminants in the Sacramento region (whether near a freeway or not). Please also refer to responses to comment letter R7.

23-9 The comment recommending that sensitive land uses be located at an appropriate setback from the freeway is acknowledged. The RDEIR analyzed risk from exposure to TAC from the freeway, and concluded that while the risk was elevated compared to exposure to TACs away from the freeway, the increased risk was less than significant. Therefore, providing additional setbacks for sensitive land uses would not be required to reduce impacts to a less-than-significant level. Please also refer to responses to comment letter R7.

23-10 It is acknowledged that, absent a threshold or other determinants of significance, the conclusion in the DEIR that exposure to freeway TAC was less than significant was not strongly supported by the analysis. A threshold of significance was developed for TAC exposure for the RDEIR (see pages 6.2-15 through 6.2-16), and this threshold was the basis for determining the significance of related impacts in the RDEIR. Please refer to response to comment R7-13.

23-11 This comment is noted. Because the comment does not raise any issues related to the environmental analysis conducted in the DEIR, no further response is necessary.

CSD-1
COUNTY SANITATION DISTRICT 1
Wastewater Collection For a Growing Sacramento

10545 Armstrong Avenue
Mather
California
95655
Tele: [916] 876-6000
Fax: [916] 876-6160
www.csd-1.com

August 18, 2006
E225.000

24

Tom Buford
City of Sacramento
Development Services Department
Environmental Planning Services
North Permit Center
2101 Arena Boulevard, Second Floor
Sacramento, CA 95834

Subject: Notice of Availability of the Draft Environmental Impact Report for the Greenbriar Project
Control No. P05-069/2005062144

Dear Mr. Buford:

County Sanitation District 1 (CSD-1) has reviewed the Draft Environmental Impact Report (DEIR) for the Greenbriar project. CSD-1 will not be providing sewer service for this project. The City of Sacramento Department of Utilities should be contacted in reference to local sewer collection for Greenbriar. Therefore, we request that any and all references to CSD-1 be removed from all documents, including the DEIR, the sewer study, and the Draft Financing Plan. 24-1

If you have any questions regarding these comments, please call me at (916) 876-6094.

Sincerely,

Wendy Haggard

Wendy Haggard, P.E.
Department of Water Quality
Development Services

WH: cc

cc: Melenie Davis
Amber Schalansky
Don Lockhart
Sacramento Local Agency Formation Commission
1112 I Street, Suite 100
Sacramento, CA 95814

LETTER 24

County Sanitation District 1
Department of Water Quality, Development Services
Wendy Haggard, P.E.
August 18, 2006

24-1 The commenter states that County Sanitation District 1 (CSD-1) will not be providing sewer service to the project and that all such references should be removed from the document. Subsequent to receipt of this letter, CSD-1 has indicated that it will now be providing sewer service for the project by letter dated July 3, 2007 and included as Appendix F of this document. As such, no changes to the text of the EIR have been made.

RD1000

RECLAMATION
DISTRICT 1000

25

September 5, 2006

Tom Buford, Senior Planner
City of Sacramento, Development Services Department
Environmental Planning Services
North Permit Center
2101 Arena Boulevard, Second Floor
Sacramento, CA 95834

Subject: Draft Environmental Impact Report—Greenbriar Project (P05-069)

Dear Mr. Buford;

Reclamation District 1000 is a local special district who is responsible for the operations and maintenance of the levee system protecting the Natomas Basin from exterior flood threats. In addition, our District also operates the main canals and pump stations associated with the interior drainage system. As such, we will be impacted by the proposed development and need to insure such impacts are appropriately mitigated to the satisfaction of the District. 25-1

We have worked closely in the past with the City of Sacramento and the development community during the planning and implementation of the North Natomas Community Plan. As these properties have developed, we have learned more about the impacts urbanization has on the District's facilities—some anticipated and others which were not anticipated. We hope to use these experiences to insure future development in the basin fully mitigates for its impacts. In general, as the Natomas Basin has evolved from a primarily rural agricultural district to an urban area, the need to provide a higher level of flood protection and a correspondingly higher standard of maintenance has and continues to evolve. This is a key consideration in the City's land use decision process and an issue which must be properly addressed in the conditions set forth. 25-2

Based on our review of the document and the issues described above, we have the following comments. 25-3

1. Recently, the Sacramento Area Flood Control Agency (SAFCA) undertook a geotechnical study of the levees protecting Natomas. Based on the data they collected and the analysis of that data, the levees surrounding Natomas do not

provide the level of protection previously credited. This is primarily due to an underseepage concern that was not as well understood when the levees were repaired in the 1990's. Based on their analysis, SAFCA has concluded the levees do not provide an urban levee of protection, and in some areas do not provide protection against the 1% flood generally referred to as the 100-year FEMA flood. As the flood control district responsible for the operation and maintenance of these levees, we are providing this information to the City for their use in making land use decisions. We understand you have already received letters from the Corps of Engineers and the State Department of Water Resources forwarding this information.

25-3 Cont'd

2. As property is developed, the runoff due to precipitation falling on the ground is increased as compared to the current agricultural rate of runoff for the property. This is the result of additional impervious material such as pavement, buildings, concrete and other improvements which do not allow water to infiltrate the ground surface. This results in more runoff at a greater rate to enter the interior drainage system. The impact of this additional runoff must be mitigated by the proposed development. This will likely include a combination of on-site detention to reduce the rate of runoff as well as improvements to the existing drainage facilities. In addition, the higher volume of runoff which must be pumped into the exterior river system results in more overall power costs. All these impacts must be addressed by the development and properly mitigated to the satisfaction of the District.

25-4

3. As urbanization of the basin encroaches on the existing drainage canals and pump stations, there are more impacts which result in higher maintenance costs. In other parts of the basin, urbanization has resulted in additional maintenance including, but not limited to, more frequent mowing, illegal dumping, additional trash removal, more vegetation management for fire suppression, higher maintenance costs due to safety concerns, higher capital improvement costs and more restrictions on District operations due to noise and dust control among other issues. All these impacts and their associated costs need to be addressed by the proposed development to the satisfaction of the District.

25-5

4. Our experience during the implementation of the North Natomas Community Plan is the desire of the City and the community to incorporate the District's drainage system, especially the canals, into its open space and recreation plans. The District and the City are currently meeting to develop a consistent policy where urbanization has and will impact the District's facilities. As describe above, this policy could have a significant impact on the District's operation and maintenance costs. In addition, the City has recently expressed its desire to undertake the maintenance along certain corridors in exchange for the District allowing certain improvements to encroach in the District's easement such as landscaping and recreation trails. All these costs must be

25-6

appropriately included in fees and future maintenance assessment districts supporting the new development.

25-6 Cont'd

It is clear, based on our experience with other recent development in Natomas that other unforeseen issues will arise. We believe the City along with the development community will work cooperatively to address these concerns along with the issues described above. Our mutual goal is to provide the community a safe place to live and work. The District desires to be a good neighbor to the community and a steward of the landscape; however our primary responsibility is the safety of the residents and property owners in Natomas. We look forward to working with the City of Sacramento throughout the planning process to insure our needs are properly addressed. If you have any questions please do not hesitate to call me at 922-1449.

25-7

Sincerely,

Paul T. Devereux
General Manager/District Engineer

cc. Board of Trustees
Stein Buer (SAFCA)

LETTER 25

Reclamation District 1000
Paul Devereux
General Manager/District Engineer
September 5, 2006

25-1 The DEIR provides a thorough evaluation of the project's hydrology and water quality impacts to on-site and downstream drainages. Please refer to Section 6.10, "Hydrology, Drainage, and Water Quality," of the DEIR.

25-2 Because the comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

25-3 Regarding the project's flooding impacts please refer to Master Response 1.

25-4 As described in Section 6.10, "Hydrology, Drainage, and Water Quality," of the DEIR and RDEIR, the project's potential impacts to on-site and downstream drainage systems were evaluated in impact 6.10-2 (page 6.10-19). As described therein, the project would result in less-than-significant drainage impacts because on-site drainage facilities would be designed to meet the capacity needs of the project, would be designed in accordance with the City and Reclamation District 1000 design standards, and mitigation has been required (see Mitigation Measure 6.4-5) that would require the project applicants to increase RD 1000's pumping plant #3 capacity to adequately serve the project in addition to existing stormwater demands. Further, prior to implementation of the project the City and RD 1000 would review final drainage system designs prior to approval of final maps to ensure that the plans meet current standards for each agency.

25-5 The applicants of the project have prepared a Draft Finance Plan that was included as Appendix C of the DEIR. The Draft Finance Plan has been reviewed by the City and a Revised Draft Greenbriar Finance Plan has been prepared and is included as Appendix E of this document. The finance plan identifies the project's fair share costs of constructing and maintaining necessary drainage infrastructure to serve the project and the applicant's have consulted with RD 1000 to determine appropriate costs.

25-6 With regard to the project's fair share costs of on-site and off-site drainage infrastructure, please refer to response to comment 25-5.

25-7 Because the comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

Regional Transit

Sacramento Regional Transit District
A Public Transit Agency
and Equal Opportunity Employer

Mailing Address:
P.O. Box 2110
Sacramento, CA 95812-2110

Administrative Office:
1400 29th Street
Sacramento, CA 95816
(916) 321-2800
(29th St. Light Rail Station)
Bus 36,38,50,67,68)

Light Rail Office:
2700 Academy Way
Sacramento, CA 95815
(916) 648-8405

26

September 5, 2006

Dana Allen
Environmental Planning Service
CITY OF SACRAMENTO
2101 Arena Boulevard, Second Floor
Sacramento, CA 95834

NAME OF DEVELOPMENT: Greenbriar Development Project

CONTROL NUMBER: State Clearinghouse No: 2005062144

TYPE OF DOCUMENT: Draft EIR

Dear Ms. Allen:

Regional Transit (RT) staff has reviewed the Draft EIR for the proposed Greenbriar Development Project and provide the following comments:

This letter is consistent with previous letters sent to the City by RT on July 21, 2005, January 27, 2005, and April 12, 2002. These letters requested land for:

- light rail track and station area along the alignment within the Greenbriar property including track area, 40 feet wide; and station area, 60 feet wide and 400 feet in length,
- a .25 acre adjacent to the track for a substation, and
- a 2-acre park and ride area. 26-1

The site is situated north of Interstate 5 and west of Highway 99 approximately two miles east of the Sacramento International Airport. RT currently does not provide any service in the subject area. The nearest transit service now available operates along North Market Boulevard, Truxel Road and the Natomas Marketplace via bus Routes 11, 13 and 14 on an hourly basis, seven days a week. 26-2

Planning for the Downtown Natomas Airport (DNA) Light Rail Extension includes light rail service along Meister Way through the project area. 26-3

RT supports the proposed Greenbriar project as being a transit-oriented development (TOD). Land uses proposed with the project must be provided at high densities to support transit and generate ridership. They must also integrate with surrounding land uses. The additional ridership 26-4

generated by the development will help justify the project for federal funding, and support the major capital investment. 26-4 Cont'd

The DEIR indicates that a shuttle service from the project to the Central Business District of Sacramento will be funded and operated by the project applicant as an interim mitigation measure (DEIR, pg. 6.1-85). RT appreciates that other provisions, including the dedication of land and construction of a light rail station by the project applicant at a cost of $2,260,130 (2006$), with no cost to RT will be included in the project. These funds will be kept current with inflation through the finance plan (Draft Greenbriar Finance Plan, page A-6). 26-5

If you have further questions regarding these comments, please contact me at 556-0507, or Don Smith at 556-0506, dsmith@sacrt.com.

Sincerely,

Taiwo Jaiyeoba
Planning Director

c: Joanne Koegel, DNA Project Manager
Myrna Valdez, PB Company
Bryan Porter, PB Company
Don Smith, RT

LETTER 26

Sacramento Regional Transit District
Taiwo Jaiyeoba
Planning Director
September 5, 2006

26-1 The City and LAFCo acknowledge receipt of letters from RT dated July 21, 2005, January 27, 2005, and April 12, 2002.

The project's land use plan includes dedication of a corridor along the proposed Meister Way that could accommodate a future transit stop and light rail line. These lands would be developed with the light rail line, transit station, and parking facilities by Sacramento Regional Transit District at the time funding is secured for the proposed Downtown-Natomas-Airport light rail line.

26-2 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

26-3 Please refer to response to comment 26-1.

26-4 RT's support for Greenbriar as a transit-oriented development project is noted. The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

26-5 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

27

From: "Amanda Olekszulin" <Amanda.Olekszulin@edaw.com>
To: "Tom Buford" <tbuford@cityofsacramento.org>, "Don Lockhart" <Donald.Lockhart@SacLAFCo.org>
Date: 08/23/2006 8:37:23 AM
Subject: Call from Wendell Kido at SRCSD

Tom/Don-

I received a call from Wendell Kido at SRCSD asking a question about some of the text in the EIR related to the SRCSD Master Plan Expansion. Wendell was concerned that the language implies the District is currently undertaking construction projects to expand plant capacity as identified in the 2020 Master Plan; however, because of the pending lawsuit against that project the District has not proceeded with any expansion projects. I told him that the EIR discusses the pending lawsuit and that within the FEIR we could clarify that no expansion projects have proceeded. 27-1

Tom/Don- Please add this e-mail to your record of comments.

Amanda Olekszulin

Please note that effective immediately, my e-mail address has changed to: amanda.olekszulin@edaw.com
Please update your address books accordingly.

Amanda Olekszulin
Senior Project Manager
EDAW, Inc.
2022 J Street
Sacramento, CA 95814
(916) 414-5800
916-414-5850 (fax)

CC: "Gary Jakobs" <Gary.Jakobs@edaw.com>, <kidow@saccounty.net>

LETTER 27

Sacramento Regional Community Services District
Wendell Kido
August 23, 2006

27-1 The commenter requested clarification regarding the status of the approved Sacramento Regional Wastewater Treatment Plant (SRWTP) 2020 Master Plan Expansion. The first paragraph of page 6.4-14 of the DEIR is hereby revised as shown below. This change does not alter the conclusions presented in the DEIR. This change is also shown in Chapter 7, "Corrections and Revisions to the DEIR, RDEIR, and Second RDEIR."

Environmental Impacts Associated with SRWTP Expansion. *The SRWTP would provide wastewater treatment services for the project. The SRCSD approved an SRWTP expansion ~~SRWTP is currently undergoing expansion~~ to accommodate wastewater treatment demands for future growth and development. . ~~As a result, t~~The project would contribute to the need to expand the SRWTP. According to the EIR prepared for the SRWTP 2020 Master Plan Expansion, construction and operation of facility improvements could contribute to significant and unavoidable impacts related to construction-related air quality. Because the project would contribute to the need for expanding the SRWTP, and would contribute to the impacts assessed in the EIR for the SRWTP 2020 Master Plan Expansion would be a* ***significant*** *impact to wastewater facilities.*

SACRAMENTO COUNTY TAXPAYERS LE

28

September 7, 2006

Mr. Stein Buer, Executive Director
Sacramento Local Agency Formation Commission
1112 I Street, Suite 100
Sacramento, CA 95814-2836

Subject: City of Sacramento Annexation of Greenbriar Area in Natomas

Dear Mr. Buer,

The 3,450 housing unit project, titled the Greenbriar Project, being urged by a developer, and supported by the City of Sacramento, is not in the City's General Plan. Oddly, the Local Area Formation Commission (LAFCo) is expediting the project before the City's General Plan has been completed. It is zoned agricultural, and is outside the City limit and the County's Urban Services Boundary (USB). As the area is outside either plan, we are advised the impact of its conversion from agricultural to urban use is not addressed in any environmental review. Expansion seems to push the urban limit line further into the Natomas Basin, a change not identified in any City or County planning document.

Greenbriar's conversion to urban use is opposed by environmentalists complaining about habitat losses, and others whom are concerned about inadequate flood protection for future residents and businesses. The Corps of Engineers in July decertified the levee system surrounding the Natomas basin as inadequate to sustain the 100-year flood level. This is a major problem, and the thrust to put 3,450 homes and commercial enterprises in harms way, in anticipation of future improved flood control improvements, seems a folly. 28-1

The League joins those in opposition from the taxpayer's standpoint, as costs to accomplish everything required to make this a safe and well serviced area is going to be astronomical. And the cost will be borne by taxpayers, whether the money is provided by the Federal Government, the State, the County, the City or by the individuals who live and work in the area. Further, if this area is annexed by the City, and removed from the control of the unincorporated County, residents and commercial enterprises will be taxed at levels many times higher than anywhere else in the County. City utility taxes on electric power, natural gas, telephone and television service at 7.5% is three times higher than anywhere else in the County. And the City alone has the audacity to tax water, garbage, sewerage, and storm water runoff rates, provided as City utilities, by 11%. The State does not tax food or medicine, considering them to be necessities of life. Yet the City of Sacramento has an 11% tax built into their water rates. This potential difference in tax rates, if City annexation takes place should be addressed in your considerations.

If the Greenbriar must be developed some time in the future, consideration should be given to keeping it in the unincorporated County. Overall it would cost taxpayers less.

Respectfully,

Joe Sullivan
Executive Director

LETTER 28

Sacramento County Taxpayers League
Joe Sullivan
Executive Director
September 11, 2006

28-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary. The comments pertaining to tax issues are not environmental issues. Please refer to Master Response 1 for a discussion of the project's flooding impacts. A copy of the Revised Draft Greenbriar Finance Plan is included in Appendix E of this document.

Regarding the comment that no environmental review has been conducted on the site, the present EIR is the environmental review needed for consideration of the project.

James P. Pachl
Attorney at Law
717 K Street, Suite 534
Sacramento, California, 95814
Tel: (916) 446-3978
Fax: (916) 447-8689 jpachl@sbcglobal.net

29

September 5, 2006

Tom Buford, Senior Planner
City of Sacramento, Development Services Dept
North Permit Center
2101 Arena Boulevard
Sacramento, CA 95834

Comments of Sierra Club - Mother Lode Chapter, Environmental Council of Sacramento, Sacramento Audubon Society, and Friends of the Swainson's Hawk, on the Draft Environmental Impact Report of the Greenbriar Development Project, City of Sacramento and LAFCo, July 2006

Dear Mr. Buford,

The following comments, which incorporate the accompanying documents submitted as Exhibits, are submitted on behalf of Mother Lode Chapter, Environmental Council of Sacramento, Sacramento Audubon Society, and Friends of the Swainson's Hawk regarding the DEIR for Greenbriar. We also incorporate into our comments all of the comments of other individuals and organizations, and will rely on these comments as well as our own. These comments highlight some of the deficiencies of the DEIR and the project. We also request information in a Recirculated DEIR. Our organizations oppose the project, including the proposed expansion of the City's Sphere of Influence, General Plan Amendment, annexation, rezone, and development of the project site. 29-1

A. HYDROLOGY: FLOOD HAZARD FROM POTENTIAL LEVEE FAILURE ON SACRAMENTO AND AMERICAN RIVERS, NATOMAS CROSS-CANAL: Recirculated DEIR Required

1. Violations of CEQA

Information on potential for deep flooding provided by the DEIR is inaccurate, unsubstantiated, incomplete, and lack the level of detail and specificity required by CEQA. The DEIR's failure to disclose to the public the well-documented proven inadequacy of the levees protecting Natomas Basin and the potential for catastrophic deep flooding is so misleading as to be fraudulent. 29-2

A Recirculated DEIR which truthfully discloses and addresses the deficiencies of the levees surrounding the Basin and the potential impacts of deep flooding is required by Public Resources Code 21092.1 and CEQA Guideline 15088.5. Such a Recirculated DEIR must also provide the sufficient level of detail and specificity required by CEQA which is sorely lacking in the present DEIR's discussion of the flooding issue 29-3

a. **There is no evidence which supports the DEIR's assertion that the project would have less than significant flooding impacts**

The DEIR, p. 6.10-20, Impact 6.10-3, states that the project is not located within a designated 100-year floodplain as delineated by FEMA, and therefore would result in less than significant flooding impacts. As shown below, the DEIR's conclusion that the project would have "less than significant flooding impacts" is contrary to all current engineering analyses and evidence.

.

The DEIR violates CEQA by failing to disclose, consider, or even identify any other information which would point to significant impacts from flooding, even though engineering studies performed for the US Army Corps of Engineers ("Corps") and Sacramento Area Flood Control Agency ("SAFCA") completed and known prior to release of the DEIR in July 2006, were readily available to the City, applicant, and authors of the DEIR In view of the severity of the consequences of deep flooding in Natomas Basin, the DEIR's failure to disclose the existence and contents of available documents, and the true risk of deep flooding, is irresponsible. We suggest that a different consultant be retained to draft a Recirculated or Supplemental DEIR which deals truthfully with the very serious issue of the flood hazard presently facing residents of Natomas Basin. 29-4

The DEIR p. 6.10-20 correctly says that "the levees protecting Natomas from the Sacramento and American Rivers were found to meet the FEMA criteria for 100-year flood protection under a levee evaluation by the U.S. Army Corps of Engineers ["Corps"] in l998." However, by letter dated July 20, 2006, the Corps formally withdrew its opinion stated in its 1998 letters (attached to the July 20, 2006 Corps letter) that the levees protecting the Basin were adequately constructed to withstand the FEMA 100-year flood. **(EXHIBIT ONE).**

The now-rescinded 1998 Corps opinion was the sole basis for FEMA's determination to show the Basin on the FEMA's Flood Insurance Rate Map ("FIRM") as being outside of the FEMA 100-year flood plain. FEMA's National Flood Insurance Program is primarily an insurance program which relies upon engineering determinations performed by, or reviewed by, the Corps, in its determination of those lands to include in its Flood Insurance Rate Map, ("FIRM"). 29-5

In a press interview responding to the Corps letter of July 20, 2006, a spokesman for the Corps stated that "We agree, the levees today do not meet current certification criteria" **(EXHIBIT TWO,** Sacramento Bee, "Faith in Levees Officially Downgraded", July 27, 2006).

By separate letters dated July 31, 2006, to SAFCA and to FEMA, Les Harder, Deputy Director of the California Department of Water Resources ("DWR") stated that DWR concurred with the Corps opinion; that "additional analyses are underway to develop a strategy for providing FEMA 100-year flood protection"; and that "even under the best scenario, it will take several years to make the necessary improvements." **(EXHIBITs THREE, FOUR)**

Mr. Harder's letter to SAFCA, p. 2, stated DWR's concurrence with the Corps letter of July 29, 2006, and expressed the urgency of timely FEMA re-mapping of the Basin "to accurately depict the level of increased flood risk" because of the extent of existing and planned development. **(EXHIBIT THREE)** In his letter to FEMA, Mr. Harder stated that "it is clear that that portions of the levees protecting the Natomas Basin do not meet the [FEMA] levee certification requirements." **(EXHIBIT FOUR.)**

The SAFCA "Executive Director's Staff Report for August 2006" to the SAFCA Board states that the Natomas levees do not meet the 100-year FEMA standards for certification, that re-mapping Natomas Basin as a flood zone is not a high priority for FEMA, and that the final FEMA flood zone maps will be completed in 2012 by which time SAFCA anticipates completing its Natomas Levee Improvement Project. (**EXHIBIT FIVE).**

The SAFCA Executive Director's report to the SAFCA Board ,dated February 16, 2006, titled "Information - Natomas Levee Evaluation Study", **(EXHIBIT SIX)** acknowledged that less than 100-year flood protection was "high risk", and that greater than 100-year but less than 200 year protection was "moderate risk." (p. 1); that a study by URS in 2002 concluded that most of the levees would need "substantial additional work . . .to reach a high level of flood protection" (p. 2), and that the 2005, URS report for the Corps determined that at some locations, there was potential for subsurface permeability "that could threaten the stability of the affected levees ..." (p. 3)

29-5 Cont'd

There is a long history of through-seepage and underseepage of the levees protecting the Basin during high water events. The failures of the levees along the Feather and Yuba Rivers in l986 and 1997 were caused by underseepage, during high water conditions which were well below the tops of the levees. There were significant weaknesses manifested at points along the Sacramento River levee during the l997 high water event. During the January 1, 2006 high water event, which was much less than the 100-year flood level, there were significant boils landward of the Sacramento River levee at the RD 1000 Prichard Lake Pump Station, which were remedied by removal of the pump station and filling 800 feet of the North Drainage Canal. Additional repairs at that site were authorized by SAFCA and are ongoing.

Well before release of the DEIR in July, 2006, geotechnical engineering studies and soil borings performed for the Corps in 2000-2001 (**see EXHIBIT SEVEN)** circular for the Corps and SAFCA distributed to public meetings, July 2002**)** and 2005 ("Final Geotechnical Report For Sacramento River East Levee and Natomas Cross Canal South Levee" November 2005, by URS Engineering for the Corps), and the Draft and Final SAFCA Levee Evaluation Report, March 2006 and July 14, 2006, **(see EXHIBITS EIGHT, NINE**) and exhaustive geotechnical engineering studies, released in March 2005, (**see EXHIBITS TEN, ELEVEN, TWELVE),** technical charts omitted but available at SAFCA office) and designated as Appendices of Draft and Final SAFCA Reports, disclosed extensive subsurface soil permeability and vulnerability to serious underseepage in numerous locations along the levees of the Sacramento and American Rivers and the Natomas Cross-Canal protecting the Basin, that failed to meet Corps standards for the 100 and 200-year water surface event and could cause levee collapse during high water events occurring more frequently that the 100-year event (i.e.: the levees did not provide 100-year flood

protection.) The DEIR spoke generally about studies and planned improvements (DEIR p. 6.10-20) but failed to disclose the identity of these documents or list them as references in the DEIR. 29-5 Cont'd

Exhaustive engineering studies designated as Appendices of SAFCA's Draft and Final Natomas Levee Evaluation Study Reports disclose numerous reaches of levee which do not meet U.S. Army Corps ("ACE") underseepage guidelines for the 100-year Water Surface Elevation (WSE.) **See** (1) "Problem Identification Report, Sacramento River East Levee Natomas Basin Evaluation," February 1, 2006, **EXHIBIT TEN,** pp. 12, 22, 30, 33, 35, 40, 46, 50, 54-55, 58, 62; "Problem Identification Report, American River North Levee Natomas Basin Evaluation," February 1, 2006, **EXHIBIT ELEVEN,** (failure to meet Corps guidelines for through seepage) pp. 16, 21, 25, 27; and (3) "Problem Identification Report, Natomas Cross Canal Levee Natomas Basin Evaluation," March 14, 2006, **EXHIBIT TWELVE,** pp. 24, 27, 29, 32, 34, 37, 39. The reports recommend construction of deep slurry walls, generally 50 - 60 feet deep, sometimes deeper) through and beneath the levees to attain compliance with Corps standards. A map showing the location of recommended slurry walls is in f SAFCA's Draft and Final Natomas Levee Evaluation Study Reports. The 29-6

Please explain why the DEIR failed to disclose, discuss, and consider those documents listed above, which were readily available and known prior to the release of the DEIR on July 18, 2006.

It is increasing apparent that the City and Applicant are fast-tracking the Greenbriar project for expedited approval, hoping for land use entitlements and start of construction before FEMA issues new a Floodplain Insurance Rate Map ("FIRM") which recognizes that the Natomas Basin, including Greenbriar, is a flood plain. Such a designation by FEMA would require City to impose very strong restrictions on new development within the Natomas flood plain, including Greenbriar, as a condition of retaining the community's eligibility for FEMA Flood Insurance. See FEMA Memo, "Status of Digital Flood Insurance Rate Map (DFIRM)," April 17, 2006, and attachments thereto. (**EXHIBIT ~~XXX~~**). 13. 29-7

The DEIR, p. 6.10-21, states that "SAFCA is proceeding with implementation of the necessary improvements to correct existing deficiencies ... which are anticipated to be constructed within the next 2 to 5 years." What information and documents supports the DEIR's statement that these improvements will be completed within 2 to 5 years? Isn't 2012 a more realistic date for expected completion? What is SAFCA's estimate of the approximate date of completion? P 29-8

Please explain in detail how the levees protecting the Basin meet current FEMA and Corps standards for certification as providing 100-year flood protection, and please disclose all documents and engineering reports supporting such a contention. Such discussion should consider all of the documents referenced above which state that portions of the levees do not meet current Corps criteria for 100-year flood protection. 29-9

What is the likelihood, expressed in percentage of occurrence of a flood event occurrence equal to, or exceeding, the FEMA 100-year flood event occurring during any one-year period? What is the mathematical likelihood of such an event during a 30-year period? Please provide documentation and calculations which support the answer. 29-10

Please explain why the DEIR concludes that the likelihood and consequences flooding during a 100-year flood event are less than significant? 29-11

Please disclose the water surface elevation and flood depths that would occur at the highest and lowest present elevations of the Greenbriar project during a 100-year flood event. 29-12

Please disclose the water surface elevation and flood depths that would occur at the highest and lowest present elevations of the Greenbriar project during a 100-year flood event 29-13

What will be the cost of upgrading all of the levees protecting Natomas Basin to the current Corps and FEMA 100-year standard? Please explain how the cost was calculated.

What will be the cost of upgrading the levees protecting Natomas Basin to the current Corps and FEMA 200-year standard of flood protection? Please explain how the cost was calculated 29-14

Please identify the amount and sources of all funding which has been approved, authorized and appropriated, or is actually available now or is committed to being available when needed, to pay for the upgrades necessary to provide FEMA 100-year and 200-year levels of protection. Please identify and provide supporting documentation. 29-15

Please disclose and identify anticipated sources of funding which have not yet been approved or committed. Please explain why it is reasonable to believe that such funding will be approved? 29-16

Please describe what the City has done to fund the future upgrading of the levees protecting the Natomas Basin. How much money has City contributed, or has committed to contribute, to efforts to upgrade the levees, since January 2005? 29-17

What actions is City undertaking to restrict or delay further residential development in Natomas Basin until the levees are upgraded and re-certified by the Corps as providing adequate protection against the FEMA 100-year flood event? 29-18

b. Mitigation Measures

Proposed Mitigation Measure 6.10-3, DEIR p. 6.10-21, states that if FEMA decertifies the levees , the applicant shall implement one of the following mitigation measures, to be terminated upon re-certification by FEMA: either MM 6.10-3 (b): raise building pads high enough to remove structures from the 100-year floodplain as identified by FEMA in its decertification, , or; MM 6.10-3 (c): developer would participate in a regional mechanism for funding the upgrade of levees to the FEMA 100-year level of protection. However, neither measure would be applicable to construction started prior to FEMA's de-certification, thereby leaving the residents of those homes vulnerable to deep flooding. Moreover, the regional mechanism to fund levee upgrades, hypothesized by MM 6.10-3 (c) does not exist. 29-19

These Mitigation Measures obviously fail to mitigate for impacts of flooding as to those structures built prior to FEMA's re-mapping of Natomas Basin as a flood plain. .Moreover, MM 6.10-3(c) even if implemented, provides no mitigation until the levees are upgraded and certified by the Corps as adequate to protect the Basin against the FEMA 100-yer flood event, or such

greater level of protection that the Corps may deem adequate to provide a safe level of flood protection for an urban area. Mere payment of money to a levee repair fund (if one then exists) as required by MM 6.10-3(c) provides no flood protection. Flood protection is only provided by upgraded levees. 29-19 Cont'd

Does the levee repair fund described in Mitigation Measure 6.10-3 (c) presently exist? If so, please describe. 29-20

Until necessary levee upgrades are completed and certified by the Corps as adequate to protect the Basin against the FEMA 100-year flood event, will the City require that Greenbriar landowners, developers and their successors-in-interest, employees, and agents, including real estate brokers, provide written disclosure to all prospective buyers, lenders, bond, and insurers of property within Greenbriar of (1) the Corps determination that levees surrounding the Basin may fail during high water events which are less than the FEMA 100-year flood; and (2) the anticipated flood depths at Greenbriar, as estimated by the Corps, in the event of levee failure during 100-year FEMA flood event, and also during a 200-year FEMA flood event? 29-21

If the City will not require such written disclosures, explain why not.

Will the City provide such written disclosures? If not, please explain why not.

If the City will not require such written disclosures, will the landowner (AKT) and applicant (River West Investments) provide such disclosures?

If the project Applicant will not require such written disclosures, explain why not.

Will City require all owners of residential and commercial property in Greenbriar to buy and maintain FEMA flood insurance, until the levees are re-certified by the Corps? If not, please explain why. 29-22

We suggest the following alternatives:

(a) Consideration of extension of the City's SOI, annexation, and development be deferred until levee upgrades are complete, and the Corps has certified that the levees meet the FEMA criteria for 200-year flood protection. If the SOI is approved by LAFCO, it should be subject to the above LAFCO conditions, which should be enforceable. 29-23

(b) If LAFCO approves the SOI and annexation without conditioning development upon completion and certification of levee upgrades as meeting the FEMA criteria for 200-year flood protection, then LAFCO should require, as conditions of approval, that all structures be built at least 3 feet above the 100-year flood elevation, as determined by the Corps, that flood insurance be required, and that the City develop an evacuation plan for Natomas Basin, to be implemented in the event of levee breach. 29-24

c. The DEIR failed to consider effect of global warming in its analysis of flood hazards threatening the Natomas Basin

The DEIR fails to disclose, analyze or consider the possible effect of global warming on the frequency and elevation of high water conditions in the Sacramento or American Rivers, and thus the potential for flooding of Natomas Basin. A Recirculated DEIR should do so. 29-25

It is now generally recognized that global warming will, among other things, lead to (1) sea level rise, and (2) generally warmer winters in California. **See,** for example, California Dept. of Water Resources, "Progress on Incorporating Climate Change Into Planning and Management of California's Water Resources: Technical Memorandum," July 2006. Sufficient modeling data now exists to permit estimates of risk in future years.

The elevation and flow of the Sacramento and American Rivers adjacent to Natomas Basin, are affected by the level of the sea and tidal action, particularly during winter and spring, when the tides are the highest and when the flows of the Sacramento and American Rivers are the greatest. The juxtaposition of high tide and high river flows led to the near-overtopping of the Sacramento River east levee, at Sacramento, in l987. It is logical to conclude that the predicted rise in sea level, accompanied by a correlating rise in the elevation of the tides, may affect the influence of high tides on the surface elevation and flow of the Sacramento River. A probable consequence would be to increase the river's surface elevation beyond what it is under today's tidal conditions.

Assuming, hypothetically, that winter and spring precipitation remains the same, and that the prediction of generally warmer winters is accurate, then a larger proportion of the winter and spring precipitation on the Sacramento and American River watersheds will be in the form of rainfall, which drains to the Sacramento and American Rivers, and a lesser proportion will be retained as snowpack, which melt more gradually in the spring. This phenomenon has already been observed occurring in recent years, as northern California's winter snowline shifts to higher elevation, and rains more frequently fall onto snowpack during winter. 29-26

The scenario of sea level rise and warmer winters during the lifetime of the Greenbriar project have potential to lead to increased volume and surface elevation of the 100-year flood event, and more frequent occurrence of what is recognized by the Corps today as the 100-year flood event under present conditions.

Thus, the Recirculated DEIR should base its analysis of flood hazard not only on the present flows of the Sacramento Rivers, but also on the projected future flows and surface elevations during the lifetime of the project which take into account climate change, including the effects of (1) rising sea level, and (2) a higher proportion of winter precipitation being in the form of rainfall, possibly leading to increased rate and volume of runoff during the winter and early spring. Recent scientific studies regarding the effect of global warming on California's future climate and water regime are readily available from the State of California global climate change website.

Climate change in the near future which will affect sea level and flows of the Central Valley rivers is now recognized as something that will happen, and cannot be dismissed as too speculative for analysis and consideration in an EIR for a project which is protected from deep flooding by levees which the Corps has determined do not meet even the FEMA standards for protection against the 100-year flood event.

d. Exposure Of City And Possibly LAFCO To Legal Liability For Consequences Of Flooding Of Project Approved With Knowledge That Project Was Exposed To Hazard Of Deep Flooding

The Paterno decision found the State of California liable for damages to persons and property arising from a 1986 levee breach because the State knew that a levee section was defective and did not make repairs. The full scope of governmental legal liability for damages due to flooding have not yet been determined. The rationale that supports the Paterno decision, that the State knew of the defect, had the responsibility to repair, and didn't repair, could also be extended to local government, such as the City of Sacramento which exercises its discretion to approve a project in a deep floodplain with full knowledge that engineers and the Corps have determined that the project site has less than 100-year flood protection. Despite SAFCA's plans for upgrading the levees, which are not yet funded and which cannot be implemented until fully funded, the project site and the entire Natomas Basin, will be remain exposed to unreasonable flood hazard until the levees are upgraded to a level sufficient to protect against flood hazard.

29-27

Be assured that if there is a levee breach, and massive damage therefrom, the City will be one of the defendants named in the resulting litigation.

The cost of defending litigation and paying awards of damages may significantly impact the environment to the extent that City's ability to perform those functions which would benefit the environment (e.g.: trash collection, parks) may be impeded by the diversion of resources to defending litigation and paying damages.

LAFCO should also consider that its approval of this annexation, with full knowledge of City's intention to permit Greenbriar development without adequate flood protection, may carry the possibility of exposing even LAFCO to potential liability in the event of levee breach and flooding.

2. Violation of City General Plan Section 8, Health and Safety, Goal A, Policy One - Flood Hazards

The Sacramento City General Plan Section 8, Goal A, Policy One, Flood Hazards, states:

"Prohibit development of areas subject to unreasonable risk of flooding unless measures can be implemented to eliminate or reduce the risk of flooding."

29-28

Why would approval of new development on the Greenbriar site by the City not be in violation of that General Plan Policy?

B. HYDROLOGY: DRAINAGE OF PROJECT SITE

The DEIR and Greenbriar Master Drainage Study (Appendix J) apparently assumes that the existing RD-1000 West Drainage Canal adequately accommodates current drainage from the Basin, including the project site. However, on January 2, 2006, immediately following a large storm event, the author of this letter observed water overflowing from the north bank of the West Drainage Canal south of I-5, between Powerline Rd and Fisherman Lake. A large area was

29-29

covered with a shallow sheet of water, indistinguishable from the surface of the West Drainage Canal. If the Drainage Plan Master Study assumes that the West Drainage canal has adequate capacity under present conditions, then it is faulty and should be re-done.

29-29 Cont'd

The future Metro Air Park project proposes various off-site improvements of drainage facilities south of I-5, which will also receive water from Greenbriar. These include widening of the extension of the Lone Tree Canal south of I-5, a new drainage canal running from the West Drainage canal to the river, and a new pump station at that site.

Do the DEIR and the calculations of the Master Drainage Plan Study assume that drainage improvements planned but not yet constructed or operational for the Metro Air Park project, which also receive water from Greenbriar, will in fact be constructed and operational? The Drainage Study, p. 5, states that "the data from the improved channel and Interstate 5 crossing was used to analyze the developed Greenbriar downstream condition," but it is not stated whether the "improvements" are in place, or are only planned. That information must be clarified and disclosed. Due to the unpredictability of the extent of industrial-commercial development which will occur at the Metro Air Park site, and thus that project's capability to construct its planned off-site drainage infrastructure, it would be unreasonably speculative to assume that off-site drainage facilities for Metro Air Park project which are planned but not constructed will actually be constructed in time to serve Greenbriar development, or ever.

29-30

Has RD 1000 agreed that the proposed drainage facilities for Greenbriar are adequate? Has RD 1000 agreed to accept the increased stormwater flows that would result from conversion of Greenbriar from agriculture to urban development?

29-31

Increased stormwater flows from Greenbriar development will pass through Fisherman's Lake, which has been incorporated as part of the West Drainage Canal, and thus will be affected by both urban stormwater surges, and the content of urban stormwater, from Greenbriar. Fisherman's Lake is a former natural slough which is recognized by the Federal and State wildlife agencies and the NBHCP as a biologically valuable area which contains open water, marshland, and riparian habitat.

The West Drainage canal, as well as Fisherman Lake, is habitat for numerous animals, including the threatened Giant Garter Snake, herons, egrets, and other wading birds, nesting waterfowl, and various fish, including bass, catfish, and carp.

29-32

What will be the effects of additional surges of stormwater drainage from Greenbriar upon Fisherman's Lake? What will be the biological effect of the content of urban stormwater from Greenbriar upon the Fisherman's Lake and the entire West Drainage Canal?

What is the risk of overflow from the West Drainage canal and Fisherman's Lake onto the Fisherman's Lake preserve of the Natomas Basin Conservancy, on the south side of the West Drainage Canal and east side of Fisherman's Lake? What would such flooding do to the managed marsh which the Conservancy has created on the east side of Fisherman's Lake to mitigate for the impacts of previous urban development.

29-33

B. CIRCULATION AND TRAFFIC: recirculated DEIR required

1. Vehicular Traffic

The Cumulative (2025) Plus Project conditions traffic analysis assumes traffic from the project, build-out of the North Natomas Community Plan, Metro Air Park, Panhandle, West Lakeside, and North Natomas Shopping Center. (DEIR pp. 6.1-10, 6.1-40). 29-34

The Cumulative (2025) Plus Project conditions traffic analysis also assume light rail transit (LRT) from downtown to the Airport which would serve Greenbriar, and therefore applies "a trip reduction of 11% " for the trips generated by the residential portion of Greenbriar. (DEIR p. 6.1-40). However, there is no evidence in the DEIR, or elsewhere, that there is, or will be, funding to construct LRT from downtown to Airport. To assume LRT serving Greenbriar by 2025, or at all, is total speculation. A DEIR cannot rely upon speculation. 29-35

To comply with CEQA, a Recirculated DEIR must include a traffic analysis based on Cumulative (2025) Plus Project conditions which does not assume that Greenbriar, or any other part of Natomas Basin, is served by light rail.

If a traffic analysis in a Recirculated DEIR still assumes light rail, then there must be evidence that sufficient funding for construction of LRT has been committed or that is otherwise reasonably probable that LRT will be funded and completed. Please see discussion of light rail issues, below. 29-36

The DEIR and its traffic analysis fails to consider the cumulative impacts of projected Greenbriar traffic considered in combination with additional new traffic that would be generated onto Highway 99 southbound onto I-5 southbound by the build-out of these approved developments:

(1) Plumas Lakes, which is underway alongside Hwy 70 between Marysville and the Bear River, and other approved or foreseeable probable new development in Sutter and Yuba Counties which is likely to generate commute traffic to Sacramento. Yuba-Sutter commuters use Hwy 99 through Natomas Basin, connecting with I-5 next the Greenbriar project. 29-37

(2) Placer Vineyard, which is designated for development in the Placer County General Plan, and is awaiting Specific Plan approval; West Roseville Specific Plan, approved for new development; and other approved or foreseeable new development projects in West Placer. Future residents of these projects commuting to Sacramento would generally use Baseline-Riego Road, or other routes further northward, intersecting Hwy 99 north of Greenbriar, and then continuing southward on Hwy 99, connecting with I-5 next to Greenbriar.

The DEIR and its traffic analysis do not consider traffic from build-out of Sutter County's 7000-acre "Measure M" area, nor from the "Joint Vision" area. While there are not yet approved development projects in these areas, such new development is reasonably foreseeable. Therefore, CEQA requires that the DEIR traffic cumulative impact analysis account for these projects. 29-38

The DEIR and traffic analysis fail to consider the dramatic increase in long-distance highway truck trips ("goods movement") from ports in the Bay Area and southern California, due to 29-39

The DEIR and traffic analysis fail to consider the dramatic increase in long-distance highway truck trips ("goods movement") from ports in the Bay Area and southern California, due to increase of imports from China and East Asia. Much of this passes through Sacramento using I-5 and I-80, which intersect in Natomas Basin. This must be accounted for in the DEIR's assessment of cumulative traffic impacts. The State and SACOG have updated goods movements projections by modem which are readily available to the authors of the DEIR. Truck traffic estimates have recently been increased for both base case and future years. How does the DEIR incorporate these changes.

29-39 Cont'd

Even without considering foreseeable vehicle trips likely to be generated by foreseeable new development in Placer , Yuba or Sutter Counties or Joint Vision, and increases in truck traffic, the DEIR finds significant unmitigated traffic impacts after mitigation, or no mitigation feasible, on regional highway infrastructure, with F level of service during peak hours, which raises major policy issues for LAFCO in its consideration of whether to approve the Greenbriar project at this time. (See DEIR pp. 2-21 - 2,-25, 2-30 - 2.37, Impacts 6.1-3 -6.1-5, 6.1-7 through 6.8-8.)

29-40

The DEIR analyzes traffic impacts on Hwy 99 from Elverta Road to the I-5/Hwy 99 interchange, and on I-5 between the I-5/Hwy 99 interchange and I-5/I-80 interchange. However the DEIR incorrectly fails to analyze the impacts traffic impacts of the project on I-5 between the I-5/I-80 interchange and downtown Sacramento. The destination of much of the commuter traffic generated by Greenbriar will be downtown Sacramento or points further south or west. At minimum, an assessment of traffic impacts generated by Greenbriar should include I-5 southward to include effects on the I-5/Hwy 50 interchange, and effects on Pioneer Bridge. Traffic congestion in that stretch of I-5 has major impacts which must be considered in CEQA traffic analysis of any project in North Natomas. A Recirculated DEIR should include traffic analysis for that segment of I-5.

29-41

The DEIR states that impacts of traffic can be relieved by adding lanes to I-5 north of the I-5/I-80 interchange to the I-5/Hwy 99 interchange, but that additional right of way is not available for such expansion "due to the developing nature of the properties on both sides." (MM 6.4-4b, -4c. In fact, land of sufficient width is vacant along much of both sides, and is within the land use jurisdiction of the City of Sacramento. The DEIR should describe what lands are vacant, explain why this land is not available to reserve for widening, and why the City will not exercise its land use authority to reserve it for needed future lanes. Mitigation that simply moves bottlenecks is not adequate mitigation.

29-42

Effects of increased congestion on Sacramento Airport. Most vehicle access to the Airport for most passengers I-5 between downtown or I-80, and the Airport. The DEIR projects unacceptable peak hours level of service for I-80 in that area, and does not consider the added traffic likely to generated by developments at Plumas Lakes, Placer Vineyard, West Roseville, other development in Yuba, Sutter, and Placer Counties, or Joint Vision.

29-43

The DEIR fails to disclose, but certainly should consider, how traffic generated on I-5 and Hwy 99 by Greenbriar and these other new development projects, in addition to existing projects, will affect vehicle access to the Sacramento Airport? What will be the effect of additional congestion of Greenbriar and other approved or foreseeable new development on the Airport operations, passengers missing flights due to traffic congestion, and consumer perceptions about the

29-44

desirability of using Sacramento Airport, if access is frequently impeded by traffic congestion? What will be the effect on freight operations at International Airport, and transport of air freight (including Federal Express) from the Airport to Sacramento businesses. 29-44 Cont'd

The DEIR fails to consider the impacts of the project on nearby rural roads. Greenbriar residents wishing to avoid southbound freeway traffic, particularly during commute, would be tempted to travel southbound on Powerline Road to Garden Highway or to Del Paso Road, and the reverse to return. Neither road is suitable for commute traffic. Garden Highway is a narrow winding levee road suitable only for local traffic. Del Paso Road is unsuitable because it passes through the Natomas Basin Conservancy's Fisherman Lake Preserve, and in front of Natomas Middle School. Powerline Rd also connects with the South Bayou Road, a frontage road which parallels the south side of I-5, passes around the Westlake subdivision, and then becomes El Centro Road, which connects to Del Paso Rd and I-5 and continues southward. 29-45

The DEIR must analyze the impacts of commute traffic on Garden Highway, and the effect upon the Fisherman Lake preserve of commuter traffic on Del Paso, and potential hazards of commuter traffic on Del Paso Road passing by Natomas Middle School. We urge that Bayou Road be widened to four lanes (it is already 4-lane to the City limit at Westlake), which will bypass both the environmentally-sensitive area of Fisherman Lake Preserve and the Natomas Middle School on Del Paso, that through traffic between I-5 and Garden Highway via Powerline Road be discouraged, and that Del Paso Rd be closed at Fisherman's Lake, by a barrier, which would protect both the Natomas Basin Fisherman Lake preserve and the Natomas Middle School from the effect of passing commuter traffic generated by Greenbriar. 29-46

2. Transit Service

The DEIR and project description assume light rail to the Airport by 2025. At the December 2005 meeting of the Regional Transit Board, it was disclosed that the DNA line would cost $650,000,000, not including inflation, from downtown to the Airport. Moreover, Regional Transit at present and for the foreseeable future does not have a source of operating funds to operate transit to the Greenbriar community. Without operating funds, funding for construction of LRT to the Airport cannot be approved by the Federal government. there is no evidence in the DEIR, or elsewhere, that there is, or will be at any time in the future, funding to construct LRT from downtown to Airport. To assume LRT serving Greenbriar by 2025, or at all, is total speculation. A DEIR cannot rely upon speculation 29-47

Why does City believe that LRT to the Airport is financially feasible? Please disclose all documents which support the answer. It should be noted that in 2003, BART opened a very expensive extension of its rail line to San Francisco Airport, with 3 new stations en route. However, ridership proved to be 1/3 of what was projected. 29-48

The DEIR states that the project applicant will dedicate land the needed for the light rail right of way through Greenbriar, and the Greenbriar light rail station. What entity will be the recipient of the dedication, the City or Regional Transit? Will the dedication be at no cost to the City and Regional Transit? Would the dedication be in unrestricted fee title to City or Regional Transit, or would it be conditioned for exclusive use by light rail? Will the term of the dedication be indefinite, until unless and until terminated by Regional Transit if Regional Transit determines 29-49

that it does not need the dedicated property for light rail? Or would the dedication terminate, and the dedicated land revert to the Greenbriar developer, if light rail facilities are not constructed on the dedicated land by a certain date? 29-49 Cont'd

Light rail transit has been the reason stated for accelerating the processing of Greenbriar's annexation to the City of Sacramento and processing the project independently of the City's General Plan update. Both of these actions are at odds with the intent of LAFCO policy and General Plan law. 29-50

Project proponents, including LAFCO Board members and members of the City Council, have stated that Greenbriar land use approval will improve the likelihood of Federal approval of Federal funds to construct the DNA light rail line. At the August, 2005 LAFCO hearing regarding approval of the application process, the General Manager of the Regional Transit District supported the Greenbriar project as helpful in establishing the population needed to generate transit ridership high enough to justify the Federal funding for the line. 29-51

What specifically does Greenbriar contribute to the viability of transit development in the Sacramento region? What specifically does the Greenbriar project contribute to the DNA light rail line project? What specifically does the DNA LRT line contribute to the viability of, or environmental mitigation for the project? What documents support the answers to these questions?

Won't it be necessary for the voters to approve a special tax to pay for the local funding share of the DNA line? Won't the cost of processing, designing, and building the DNA line divert resources that could otherwise be available for other transit purposes in the community? 29-52

The DEIR for the DNA line is underway with a public draft due in Spring 2006 (now overdue). It would seem to make more sense to either process the two project EIRs together if the projects are interdependent, or to include the Greenbriar project in the City's General Plan update after the LRT DEIR is available. Processing the land use application prior to the public availability of the DEIR for light rail, denies the public and decisionmakers the opportunity to align the information in both documents and assure that the environmental impacts and benefits are accurately portrayed. This segmentation of environmental review is not consistent with the purpose of CEQA. 29-53

Absent the availability of the DNA LRT DEIR, how can policymakers judge the risk and consequences of allowing Greenbriar to proceed with construction without firm assurances of light rail service? How can they judge the risk of allowing a transit oriented development obligating them to provide transit service for which no funding source currently exists? 29-54

A Recirculated DEIR should address the issue of what evidence exists to assess the impact (if any) the project approval will have on the likelihood of approval of federal transit funding for light rail service to the project area. What communications have taken place between Regional Transit, the City, applicant and federal agencies regarding the feasibility of federal support and timing of such support? Please identify and provide the written records of such communications. We understand from the staff report presented to the Regional Transit District Board meeting of December, 2005, that the cost of the alignment serving the project area could well preclude 29-55

federal funding for the project, and instead that bus or rail transit service to the airport could well be provided via I-5 at much less cost. Given the detrimental impacts of light rail upon the community in the Truxel Avenue area, testified to in numerous public hearings by homeowners and residents in that corridor, and the other factors noted here, what is the likelihood of LRT service to Greenbriar and what is the likely time frame for providing that service? Please disclose all documents which support your answer. 29-55 Cont'd

We understand that the DNA project application will be segmented (downtown to Richard Blvd, Richards Blvd to Natomas Marketplace, Natomas Marketplace to Airport) so that Regional Transit can apply for Federal funds in segments, rather than seek funding for entire project. The segmentation may not result in a viable minimum segment for which funding can be found. What evidence is there that the segmentation strategy proposed by Regional Transit will be acceptable to the Federal Transportation Agency? When is the DEIR on DNA light rail line expected to be released to the public? Is it not appropriate for LAFCO to address the cumulative impacts of the light rail to Airport and Greenbriar projects prior to action by LAFCO? 29-56

If Greenbriar is essential to the DNA light rail line, why is the federal and state capital funding approval and approval of a source of operating funds not included as a required mitigation measure for the project. If the land use project were conditioned on a corresponding approval of the transit service needed to serve it, and which it contributes to, the linkage relied upon by policymakers to approve the project could be guaranteed. 29-57

Page 5-11 says that the project will begin in 2007 and be fully built and occupied in 2012. The City of Sacramento General Plan requires transit service to newly developing areas. Page 6.1-40 of Volume 1, EDAW Transportation and Circulation says that a trip reduction of 11 percent of all residential project trip generation for 2025 for LRT mode split. [See also Appendix B] Eleven percent of all residential project trip generation is a very high-end estimate as noted in the text. What will be the traffic and air quality consequences if the actual use is lower? What if light rail service is not provided at all? What are the traffic impacts between 2012 and the 2025 traffic analysis if no light rail service is assumed? 29-58

Page 35 Volume II Appendix C, Draft Greenbriar Financing Plan and Mitigation Measure 6.1-10 very vaguely describes how "interim" transit service will be provided. How will the interim facilities for transit be funded? What is the source and amount of funding to be used to provide interim facilities for transit service? Since interim services serves only trips to downtown, when and how will transit service be provided to connect Greenbriar with other parts of the Natomas Community? How will transit facilities be provided in the long term should the federal government elect not to fund the extension of light rail to the Greenbriar project. 29-59

The DEIR states at p. 7-6 that the LRT project is not designed nor has environmental review been performed. In fact, environmental review is reportedly underway. Isn't it more consistent with the requirements of CEQA to consider the cumulative impacts of the project and the light rail line on habitat and species, together in one document than to segment these projects and ignore their interactive effects on the habitat and preserves needed to sustain threatened species. For example, if the project and the LRT are mutually interdependent, does it would provide more protection for habitat to implement them in tandem, and to accelerate construction of the transit oriented part of the project while delaying implementation of the more auto dependent portions 29-60

of the project to ensure species impacts are minimized. Instead, the project phasing emphasizes building the auto dependent portion of the project first.

29-60 Cont'd

Finally, regarding Alternatives analysis, why was not an LRT oriented alternative identified? Specifically, we think a project that is limited to a transit oriented village around a proposed LRT station would be much more consistent with what the policy makers have said is the overriding reason for moving forward with Greenbriar at this time. The rest of the project area could be designated urban reserve. Would not a project alternative of limited scope, and timed to the availability of light rail transit service, address many of the environmental issues and unavoidable, significant impacts identified in the DEIR and public comment? Why was such an alternative not studied in the DEIR?

29-61

C BIOLGICAL IMPACTS AND ENDANGERED SPECIES

The NBHCP requires that Incidental Take Permits be approved and issued by USFWS and DFG before City approves prezoning. The DEIR fails to acknowledge this requirement in finding consistency with existing plans nor as a mitigation measure. The purpose of this requirement is to ensure that land is not zoned or entitled prior to establishment of the required mitigation program under CESA and ESA. **See** enclosed letter of James Pachl, Attorney, to LAFCO, dated August 23, 2006, refuting City's contention to LAFCO that it not obtain an Incidental Take Permit until prior to City approval of the Final Map for development.

29-62

The Effects Analysis included in the DEIR should be approved by the wildlife agencies before it is included in the project EIR. As an applicant produced document, the effects analysis lacks necessary regulatory agency review to be used as justification for the mitigation program proposed for this project. What have been the responses of USFWS and DFG to this document?

29-63

Inconsistent with the Natomas HCP:

There seems to be no recognition that the Natomas HCP requires that the City obtain new or amended Federal and State Incidental Take Permits prior to prezoning. Failure to do so would expose City to revocation of the City's ITP's under the 2003 NBHCP and potential civil and criminal sanctions for violation of the Federal and California Endangered Species Acts

29-64

The effectiveness of the NBHCP's Operating Conservation program is explicitly premised on City's commitment to limit development to 8,050 acres within the City's Permit Area, Sutter to 7,464 acres, and Metro Air Park's to 1,986 acres, for a total of 17,500 acres. The NBHCP, EIR/EIS, and other decision documents rely upon the assumption that the rest of the Basin will remain in agriculture and continue to provide habitat values for threatened Giant Garter Snake (GGS) and Swainson's Hawk (SWH).

29-65

The Federal District Court, Judge David Levi, construed the effect of these provisions in its decision upholding the 2003 NBHCP, September 8, 2005, as follows:

At pg. 30, ftnt 13, of the Opinion, the Court states that:

> "...the Service and ***those seeking an ITP (Incidental Take Permit) in the future will face an uphill battle if they attempt to argue that additional development in the Basin beyond 17,500 acres will not result in*** *jeopardy*," pointing out that the

HCP, Biological Opinion, Findings, and EIR/EIS are predicated on the assumption that development will be limited to 17,500 acres and the most of the remaining lands will remain in agriculture during the 50-year Permit Term.

At pg. 22 ftnt 10, of the Opinion, the Court states that:

"...while plaintiffs contend that future development will vitiate the NBHCP, it is more likely that, if future development in the [Sacramento] County will have this effect, *the Secretary will decline to issue ITP's for development* in [Sacramento] County or *will insist on mitigation that may be considerably greater than required by the NBHCP."*

29-65 Cont'd

The wildlife agencies have not agreed to issue Incidental Take Permits for Greenbriar. The required habitat mitigation ratio may substantially exceed 1 to 1 if these agencies were to issue such a Permit.

City's FEIR/EIS for the Natomas Basin Habitat Conservation Plan, pp. 3-30 - 3-31, certified by Sacramento City Council on May 13, 2003, represented to the wildlife agencies that:

"Development of West Lakeside and Greenbriar Farms is not considered reasonably certain to occur ***because extensive studies, planning and further analyses are required as part of the Joint Vision process before any development approvals may be considered*** for any of these areas, and because the outcome of these efforts is unknown." (FEIR/EIS p. 3-31, attached.)

Deferred Mitigation:

The mitigation measures call for certain specific mitigation measures, plus creation of an HCP, approved by USFWS and DFG, which will contain more mitigation measures. The latter is deferred mitigation measure, because it is not known what these measures will be, which is impermissible under CEQA, because the public and decision-makers do not know what the content of the deferred HCP will be.

29-66

On-Site Mitigation:

A 200 foot buffer on the north side of the project is necessary to buffer urban impacts on agricultural land to the north. A linear forested area, of appropriate native trees within the buffer could provide an additional amenity to the Greenbriar community while protecting the habitat and agricultural uses to the north. On the east side of the project area, proponents envision a habitat corridor along the Lone Tree Canal. Again, an area 800 feet east of the canal would protect the habitat area which is a minimum of 200 feet east of the water line of the canal with a buffer area that could also be an amenity for the residents of the community. It is inconsistent with the Natomas Basin HCP to locate urban uses without a sizeable buffer between the onsite habitat corridor and the urban uses.

29-67

MM 6.12-1 provides for a 250 foot upland buffer alongside the Lone Tree Canal. However, that buffer includes construction of a "tule bench" with an elevation below the grade of the neighboring upland. That "tule bench" could be flooded during a high stormwater event, even though the higher upland remains dry. However, one of the uses of the 200-foot upland habitat buffer, which is required by standard FWS and DFG rules for Giant Garter Snake mitigation and take avoidance, is to provide dry upland for the GGS to find burrows and cracks in the ground

29-68

for its winter hibernation. The "tule bench" should not be counted as part of the 200-foot upland buffer, because it is below grade and may be flooded i high stormwater events. Thus, the 200-foot upland buffer should be measured from the beginning of upland grade, not the transition between the Lone Tree canal and the tule bench. 29-68 Cont'd

Cumulative effects

What is the justification for processing this project independently of the Joint Vision HCP and in the context of an updated City's General Plan? In the absence of a thorough cumulative analysis of the City's proposed build out of North Natomas, it is not possible to assess the correct mitigation ratio for Greenbriar. How can the City determine how to protect all the remaining habitat areas permanently if it does not know the location of all expected urban development and the areas to be preserved and spreads the cost of protection and enhancement across all the permitted development? To do otherwise is to leave some landowners without compensation for the habitat values that they are providing to the City's mitigation program. 29-69 29-70

The City's current NBHCP relies on continued agriculture in the basin and in basin mitigation to protect the species. However, Greenbriar is the first of a number of anticipated projects that would substantially reduce the amount of land available for agriculture and create more urban/agricultural conflicts. Therefore the strategy of relying on private agricultural lands remaining undeveloped is not sustainable. Conservation easements and land acquisition for all lands on which species depend must be an integral part of mitigating for further development in the Basin. Landowners not in the developing area who are expected to provide support for species by remaining in agriculture must be compensated to guarantee that these actions occur. Therefore the minimal o.5 to 1 mitigation ratio assumed for Greenbriar in the DEIR is seriously deficient. Only through a comprehensive basinwide assessment of the cumulative impacts of development in the basin, can a suitable mitigation ratio be calculated. How does applicant justify piecemeal changes to the NBHCP? 29-71

Off-Site Mitigation:

The applicant has compared its proposed Greenbriar mitigation program to the Metro Air Park HCP, adopted in 2001. In fact, there is a very major difference: the Metro Air Park HCP and its environmental analysis and conclusions assumed, like the Natomas HCP, that new development in the Basin would not exceed 17,500 acres, and that much of the Basin outside the Metro Air Park HCP NBHCP Permit Areas would remain undeveloped and in agriculture during the 50-year Permit term. The MAP HCP also automatically adopted the provisions of the 2003 NBHCP. By contrast, Greenbriar is above and beyond the 17,500 acres of new development assumed and relied upon by the MAP HCP, NBHCP, and the environmental analyses that justified approval of those documents by USFWS and CDFG. 29-72

The mitigation ratio must take into account the total habitat needs of the species in the basin and the need to acquire all lands to be preserved for species from mitigation fees on all remaining urbanization. It is unrealistic to assume that the species can be protected through piecemeal mitigation. 29-73

There is no showing that the mitigation program proposed by the DEIR mitigates impacts to GGS or SWH to less than significant (CEQA requirement), and no showing that these measures 29-74

fully mitigate or mitigate to the extent feasible, or avoid jeopardy, as defined by the Federal and California Endangered Species Acts. 29-74 Cont'd

Given the land remaining and the habitat which must be maintained to assure the survival and recovery of viable populations of Giant Garter Snake and Swainson's Hawk in the Natomas Basin, including lands within the Swainson's Hawk zone and competing land use needs (airport, flood control, road widenings, infrastructure, etc.), a mitigation ratio of 3 to 5 times the land developed at Greenbriar could be justified as a mitigation ratio? 29-75

Project proponent owns several parcels of land in the vicinity of the project that are suitable for habitat mitigation. The Spangler reserve has some merit as preserve land, but there are lands south of the project area that would make a more substantial contribution to the success and protection of the Fisherman's Lake preserve that would be preferable. These lands are more directly related to the mitigation of the specific cumulative impacts of the project described in these comments. The Spangler property doesn't actually connect with existing preserve lands, while other properties owned by the applicant are contiguous with a preserve area that is currently not meeting the important 400 acre minimum requirement in the NBHCP. 29-76

The DEIR provides no evidence as to whether the parcels proposed as habitat mitigation are in fact suitable as either upland habitat benefiting the Swainson's Hawk, or suitable for rice fields or conversion to managed marsh to benefit the Giant Garter Snake. It is significant that the Natomas Basin Conservancy was not consulted on these questions. 29-77

The project will significantly increase traffic on rural roads and roads adjacent to current NBC preserves. It will also be growth inducing for properties between the project area and preserve lands, putting more pressure on prices for preserve lands and expectations of landowners to develop. To mitigate these impacts, the project mitigation lands should be located to offset these pressures, and barriers to traffic from the project area to rural roads should be created. Specifically, the City and county should control and limit access to Del Paso Road between the City limit and Power Line Road and between Power Line Road and Garden Highway. 29-78

D. AIR QUALITY

The DEIR does not assess the consistency between the project and the current adopted air quality plans in Chapter 5 ("project consistency"). How is the project consistent or inconsistent with the current air quality plans adopted by the Sacramento Metropolitan Air Quality Management District, and specifically its ozone attainment plan? 29-79

The DEIR says that City does not have an air quality element in its general plan. However, the North Natomas Community Plan does have air quality policies. How is the project consistent or inconsistent with the air quality policies of the North Natomas Community Plan? 29-80

The North Natomas Community Plan requires projects to reduce emissions by 35 percent, so why does the Greenbriar air quality plan requires only 15 percent emission reductions for residential uses and 35 percent for commercial uses? 29-81

Neither construction emissions impacts, toxic contaminant emission impacts, nor on going NOx, ROG and PM emission impacts of the project on air quality are reduced to 29-82

less than significant. While the DEIR states that these impacts are unavoidable, and no feasible mitigation exists, further analysis is warranted. SMAQMD requires that all SIP measures be implemented. The DEIR seems to lack explicit comparison with required SIP measures.

29-82 Cont'd

Moreover, other air districts have adopted feasible indirect source control measures not yet adopted as rules in the SMAQMD jurisdiction that could be used as mitigation for this project. What would the San Joaquin Valley Unified Air Pollution Control District require from this project in addition to what is included in this EIR as mitigation?

29-83

Other options exist that were not considered, including phasing the project, and/or delaying project approval until the 2007 ozone and pm (particulate matter) plans are completed that could describe new feasible mitigation measures. If the project EIR were delayed until after the adoption of pending air quality plans (required by law to be adopted in 2007), would additional mitigation measures likely be available to reduce project impacts? Can LAFCO condition project approval on meeting all feasible measures identified in the 2007 Ozone and PM 2.5 State Implementation Plans?

29-84

SMAQMD asks that the EIR provide for the following:

- **copy mitigation fee table into environmental document;**
- **require SMAQMD endorsement of contractor list prior to issuing grading permit**
- **require proof of fee payment from SMAQMD before issuing grading permit.**

Please explain how these requests are being met in the EIR documents.

29-85

SMAQMD allows project applicants to estimate emissions using URBEMIS, a model that estimates both vehicle emissions generated from the project and energy use by the project land uses. It apparently allows project applicants to set the temperature for the winter and summer days used for modeling. In this DEIR, the temperature used for modeling emissions for summer was a mild 85 degrees. Both peak ozone production and peak energy use are found on much hotter days; emissions are underestimated for these days because evaporative hydrocarbon emissions which are a key component of valley smog production and air conditioning use, a prime producer of NOx and greenhouse gas, are highest on days of 95 degrees and higher. What would be the difference in emission estimates if the summer day temperature setting for Urbemiss were 95 degrees and 100 degrees, instead of 85 degrees?

29-86

Aren't emission factors for NOx Heavy Duty Diesel Vehicles being changed to increase the factor about 23 percent right now by the California Air Resources Board in an EMFAC update? What impact would the changes in EMFAC taking place now have on the mitigation fees defined by this EIR? Also the state's effort to model and assess mitigation for goods movement in the state has resulted in new analysis about statewide goods movement impacts in our region. How consistent are the traffic, air quality and toxic air contaminant analyses performed for this DEIR with the updated state of knowledge of goods movement on I-5 and 99 and related emissions, and project growth rates in goods movement travel on I-5, and related toxic emissions and exposures along I-5 and 99/70 at the project site?

29-87

Because the goods movement study by state government was recently completed, how different would the toxic air contaminant analysis be using those updated truck traffic numbers for I-5 and 99/70 for 2012 and 2025?

29-88

An air quality plan to meet the federal eight-hour ozone standard will be complete within a year. Simply delaying project processing would enable the project impacts on air quality to be better assessed and mitigated, and would potentially provide much more reliable estimates about toxic air contaminant exposures from goods movement in the project area on state and federal highways. 29-89

The TSM/AQ Plan is the basis for AQMD findings on the project but it contains assumptions and measures that are not adopted and funded as explicit mitigation measures for the project. The DEIR does not require that the TSM/AQ Plan be adopted and funded prior to the first grading permit. Instead, it allows development to proceed until a threshold level has been reached. However, some of the measures in the plan are about land use design. How will the mitigation monitoring program ensure that the TSM/AQ Plan mitigation measures are implemented and transit service is funded and delivered to residents? 29-90

The TSM/AQ Plan has little mitigation for household heating and cooling. Can mitigation be obtained through requiring solar photovoltaic installations on homes, community and commercial facilities? Why wasn't solar photovoltaic considered as a mitigation measure? 29-91

How did the Toxic Air Contaminant analysis estimate diesel pm (particulate matter) emissions? Diesel pm is overwhelmingly the most important toxic air contaminant to assess, yet is not directly measured by the California Air Resources Board. How did the toxic air contaminant consultant conclude that diesel particulate matter would not pose a health threat to Greenbriar residents? 29-92

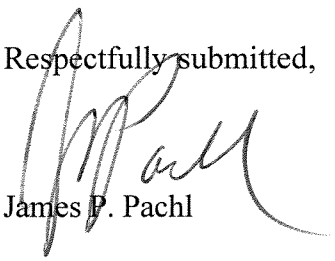
The DEIR should address project impacts on climate change and greenhouse gas emissions and include the impact of converting irrigated agriculture to urban land use on the urban heat island effect in Sacramento. Again, solar roof requirements are a feasible mitigation measure. Other useful and feasible mitigation measures are described in the Sacramento Tree Foundations Cool Communities Program. They include cool street surfaces, parking lots with permeable surfaces, and tree shading requirements beyond the City's current shade ordinance. 29-93

E. INCOMPATIBILITY WITH OPERATION OF INTERNATIONAL AIRPORT

The DEIR fails to address incompatibility with the operation of Sacramento International Airport. Noise impacts, including issues involving training flights of military aircraft passing at low altitude over the Greenbriar site, will be addressed in a separate letter by the Airport. 29-94

Dated: September 5, 2006

Respectfully submitted,



James P. Pachl

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO
ATTENTION OF

July 20, 2006

Hydraulic Design Section

Mr. Stein Buer
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814-3407

Dear Mr. Buer:

In letters to SAFCA dated February 11, 1998 and February 26, 1998, the Corps of Engineers Sacramento District (Corps), based on technical information available at the time, provided its position that the levee system surrounding the Natomas area and levees protecting portions of North Sacramento were designed and constructed to withstand the FEMA base flood event.

Subsequent to the 1997-1998 flood event, the Corps completed additional analysis that has led to a broader understanding of levee failure attributable to deep under seepage. The Corps convened a Levee Seepage Task Force (LSTF) in February 2003 to better understand levee seepage and developed standards to apply to levees to determine their integrity. The LSTF completed its report in June 2003. The Corps then adopted standard operating procedures (SOP) for levee seepage analysis in August of 2004. The guidance in these reports formed the basis for the findings included in the Corps' "Final Geotechnical Report For Sacramento River East Levee and Natomas Cross Canal South Levee" dated November 29, 2005. Information developed in SAFCA's report titled "Natomas Levee Evaluation Report," dated March 13, 2006, and its associated appendices also confirms the presence of physical conditions that are conducive to deep levee under seepage in the Natomas area.

Based on this information we can no longer support our original position regarding certification of the levee system surrounding the Natomas area. This determination does not apply to those levees previously certified that provide protection for portions of the North Sacramento area.

It is important to note that the Corps was authorized to modify a portion of the Natomas Basin Levees in both WRDA 1996 and WRDA 1999 as part of the American River Watershed, California (Common Features) project. The Corps is currently working with you to design and construct the appropriate levee modifications necessary to meet the requirements of the authorizations. Based on the findings of the reports described above, a Post Authorization Change Report is in progress to include measures to deal with the deep under seepage issues.

Greenbriar Draft EIR Comments
James P. Pachl, 9/5/06
Exhibit One

EXHIBIT ONE

In addition to the Corps' authorized projects and SAFCA's existing levee improvements, the Corps recognizes and fully supports SAFCA's proposed additional efforts to construct remedial actions in the Natomas area which are aimed at achieving 200-year level of protection. We understand that these actions will take approximately five years to complete. We will do everything we can to facilitate expedited decision-making and approvals of Federally authorized work and SAFCA's proposed efforts for this work.

In view of our findings described above, the information contained in your report regarding 100-year level of protection issues in the Natomas area, and the length of time required for the Corps and SAFCA to complete the recommended actions, we, by copy of this letter, are informing FEMA of the current risk in the Natomas area.

We are anxious to work with you to prioritize, for design and construction, those areas identified in your report that will remediate where the greatest risk exists in the Natomas area for the FEMA base flood event. Once these areas are remediated and analysis shows the levee system can safely convey the FEMA base flood event, we will recommend to FEMA that the area be certified to that level.

We look forward to continued cooperation between our agencies in improving flood protection for the greater Sacramento area.

Sincerely,

Thomas E. Trainer

Thomas E. Trainer, P.E.
Chief, Engineering Division

Copies Furnished:

Mr. Les Sakumoto
Federal Emergency Management Agency, Region IX
1111 Broadway, Suite 12
Oakland, CA 94607-4052

Mr. Les Harder
Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO
ATTENTION OF

February 11, 1998

Central Valley Section

Mr. F.I. Hodgkins
Executive Director
Sacramento Area Flood Control Agency (SAFCA)
1007 7th Street, 5th Floor
Sacramento, California 95814

Dear Mr. Hodgkins:

This is in response to your January 28, 1998 letter requesting the Corps to provide FEMA certification of the levee system and appurtenances around Natomas and portions of North Sacramento. Based on our technical review of as-constructed drawings and associated information, we have determined that the levee system and appurtenances around Natomas and portions of North Sacramento constructed by SAFCA were adequately designed and constructed to withstand the FEMA 100-year base flood. By this letter, the Corps of Engineers is providing our certification for the following features:

a. East Levee of Sacramento River from approximately River Miles (R.M.) 60.0 to R.M. 79.0
b. North Levee of American River from approximately R.M. 0.0 to R.M. 1.7
c. East and West levees of Natomas East Main Drainage Canal (NEMDC) from American River upstream to the SAFCA constructed pump station north of Dry Creek
d. NEMDC Pump Station
e. South Levee of Natomas Cross Canal from R.M. 0.0 to R.M. 5.5
f. Pleasant Grove Canal levee upstream of pump station to Sankey Road
g. North and South levees along the Arcade Creek from R.M. 0.0 to R.M. 2.15
h. North and Phase I of South levees along the Dry/Robla Creek from R.M. 0.0 to R.M. 2.25
i. Main Avenue Bridge
j. Structural stability and acceptability of closure structures at locations where road or railroad cross at an elevation below the constructed top of levee. Closure structures were constructed at the following locations:

(1) NEMDC east levee near Del Paso Boulevard at UPRR/SPRR
(2) NEMDC east and west levees at West El Camino Avenue
(3) NEMDC east and west levees at Main Avenue
(4) Dry Creek north levee at UPRR/SPRR and south levee at UPRR/SPRR and at Rio Linda Boulevard
(5) Arcade Creek north and south levees at UPRR/SPRR
(6) Arcade Creek north and south levees at Norwood Avenue

Our technical review has confirmed that closure structures originally proposed along Arcade Creek, north and south levees at Rio Linda Boulevard and along Arcade Creek, north and south levees at Marysville Boulevard were replaced with floodwalls. We have determined that the floodwalls at these locations are adequately constructed to withstand the FEMA 100-year flood.

As stated in our April 17, 1997 letter to you, it is our understanding that SAFCA shall independently coordinate with FEMA in preparing an acceptable operation plan to ensure closure structures are properly installed in a timely manner during flood events. SAFCA shall also independently reach agreement with FEMA regarding the complete certification package, with specific responsibility for designation of the residual floodplains that will remain upon completion of the Natomas Local Area Project. The residual floodplains include:

a. Interior floodplain within Natomas basin
b. Magpie Creek floodplain along I-80 east of the NEMDC
c. Floodplain north of the NEMDC pump station
d. American River floodplain south of Arcade Creek
e. Floodplain at the east end of the existing Robla Creek levee (Phase I) south of Claire Avenue

If you have any questions regarding the FEMA certification of this levee system, please contact our Project Manager, Mr. Bob Childs, at (916) 557-7831 or our Chief, Civil Design Branch, Mr. John Mack at (916) 557-7201.

Sincerely,

Dorothy F. Klasse
Colonel, Corps of Engineers
District Engineer

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

RECEIVED
SAFCA

REPLY TO ATTENTION OF

February 26, 1998

Central Valley Section

Mr. F.I. Hodgkins
Executive Director
Sacramento Area Flood Control Agency (SAFCA)
1007 7th Street, 5th Floor,
Sacramento, California 95814

Dear Mr. Hodgkins:

As telephonically requested by Mr. Paul Devereux of your staff, this letter serves to clarify our prior letter to you dated February 11, 1998 which provided FEMA certification of the levee system and appurtenances around Natomas and portions of North Sacramento. The flood control features requiring clarification are those addressed in items c and f of our February 11, 1998 letter. The revised descriptions for these items are as follows:

c. East and West levees of Natomas East Main Drainage Canal (NEMDC) from the American River upstream to the SAFCA constructed NEMDC pump station north of Dry Creek, and the existing West levee from the NEMDC pump station to Sankey Road.

f. Pleasant Grove Creek Canal levee from Sankey Road upstream to the south levee of the Natomas Cross Canal, and the reinforced levee openings at Howsely Road, Fifield Road, and Sankey Road.

If you have any questions, please contact our Project Manager, Mr. Bob Childs, at (916) 557-7831 or our Chief, Civil Design Branch, Mr. John Mack at (916) 557-7201.

Sincerely,

for Brian W. Doyle
Chief, Engineering Division

sacbee.com
The Web Site of The Sacramento Bee

This story is taken from Metro/Regional News at sacbee.com.

Faith in levees officially downgraded

By Deb Kollars -- Bee Staff Writer
Published 12:01 am PDT Thursday, July 27, 2006

SACRAMENTO -- In a move expected since March, the U.S. Army Corps of Engineers has formally withdrawn a determination that many of the levees protecting the Natomas area meet minimal 100-year flood standards.

Thomas E. Trainer, chief of the engineering division of the Sacramento corps office, sent a July 20 letter to the Sacramento Area Flood Control Agency, notifying the agency of its reduced faith in the levees.

The letter came in response to the flood control agency's own findings, released last spring, that deep seepage problems were undermining reliability of the levees.

"This letter is what we said we were going to do," said Jason Fanselau, chief of public affairs for the corps. "We agree, the levees today do not meet current certification criteria."

The flood control agency, which had expected the notification, is planning to upgrade Natomas levees to a 200-year protection level -- meaning the levees could be expected to withstand a rare and large flood with a 1-in-200 chance of occurring in any given year.

Go to: Sacbee / Back to story

Greenbriar Draft EIR Comments
James P. Pachl, 9/5/06
Exhibit Two

EXHIBIT TWO

STATE OF CALIFORNIA -- THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, Gov

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

JUL 31 2006

Mr. Stein Buer, Executive Director
Sacramento Area Flood Control Agency
1007 Seventh Street, 7th Floor
Sacramento, California 95814

Dear Mr. Stein Buer:

Thank you for the opportunity to review the Natomas Levee Evaluation Report, Public Review Draft, dated March 13, 2006, that was prepared for the Sacramento Area Flood Control Agency (SAFCA). Our technical comments on the Public Review Draft were previously forwarded under separate cover.

SAFCA is to be commended for taking the initiative to evaluate the levees of the Natomas Basin in advance of the planned efforts of the U.S. Army Corps of Engineers (Corps) under the American River Common Features Project. The Department of Water Resources (DWR) strongly supports expedited levee improvements for the Natomas Basin and will continue to support The Reclamation Board in constructing the American River Common Features Project in partnership with the Corps and SAFCA.

The Natomas Levee Evaluation Report provides a comprehensive summary of the region's construction improvement projects that have been completed to date, and clearly defines the need to provide continued improvement of the levees protecting the Natomas Basin. It is consistent with the previous efforts by the Corps, which include the report of the Levee Seepage Task Force (June 2003), the "Standard Operating Procedure for Geotechnical Levee Practice" (August 2004), the Natomas General Reevaluation Report, and the Final Geotechnical Report for Sacramento River East Levee and Natomas Cross Canal South Levee (November 29, 2005).

While the report focuses primarily on the steps required to achieve a 200-year level of flood protection, the report also includes strong geotechnical and hydraulic evidence that the Natomas levees do not meet current Corps criteria for providing 100-year flood protection as mandated by the Federal Emergency Management Agency (FEMA). As a result of this new information, the Corps issued a letter to SAFCA on July 20, 2006 stating that it no longer can support its 1998 certification of the Natomas levee system for the FEMA-Base Flood Event (see attached letter). Prior to this 1998 certification by the Corps, the Natomas Basin had been mapped into the FEMA 100-year floodplain, and mandatory flood insurance was required by FEMA for homes with federally-backed mortgages.

Greenbriar Draft EIR Comments
James P. Pachl, 9/5/06
Exhibit Three

EXHIBIT THREE

We understand that additional analyses are underway to develop a strategy for providing FEMA 100-year flood protection. However, even under the best scenario it will take several years to make the necessary improvements. Since over 12,000 homes have been constructed in this deep flood basin, and more development is planned, we believe that it is necessary for DWR to initiate immediate consultation with FEMA. DWR plans to officially notify FEMA of this information right away. DWR also intends to work with FEMA to have the Natomas Basin remapped to accurately depict the level of increased flood risk.

In addition, we plan to work closely with SAFCA, the Corps, and FEMA to complete the floodplain mapping efforts, and to determine the most appropriate Special Flood Hazard Area zoning for the basin. Over the next few years, we will also make it a very high priority to work with these same agencies to remediate the Natomas levees and have them upgraded to the 200-year level of protection that has been previously targeted.

We hope to continue to work closely with you and your staff to overcome these challenges and to improve the flood management system of the Sacramento area. If you have any immediate questions regarding this, please call me at (916) 653-9502. We look forward to a continued partnership on these critical issues.

Sincerely,

Leslie F. Harder, Jr.
Deputy Director

Attachment

cc: Honorable Doris Matsui
Representative, U.S. Congress
2310 Rayburn House Office Building
Washington, DC 20515

Colonel Ronald N. Light
District Commander
Sacramento District
U.S. Army Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

1

STATE OF CALIFORNIA – THE RESOURCES AGENCY
ARNOLD SCHWARZENEGGER, Gove
DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

JUL 31 2006

Ms. Sally M. Ziolkowski
Mitigation Division Director
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, California 94607-4052

Dear Ms. Ziolkowski:

The Department of Water Resources (DWR) has just recently reviewed the Natomas Levee Evaluation Report, Public Review Draft, dated March 13, 2006, that was prepared for the Sacramento Area Flood Control Agency (SAFCA). Based on the information presented in the SAFCA report, it is clear that portions of the levees protecting the Natomas Basin do not meet the Federal Emergency Management Agency's (FEMA) levee certification requirements. As a result of this new information, the U.S. Army Corps of Engineers (Corps) issued a letter to SAFCA on July 20, 2006, stating that it no longer can support its 1998 certification of the Natomas levee system for the FEMA-Base Flood Event (see attached letter). Since over 12,000 homes have been constructed in this deep flood basin, and more development is planned, we believe that it is necessary that FEMA revise the Flood Insurance Rate Maps for the Natomas Basin to accurately reflect the level of flood risk. Accurate maps are a primary mechanism for disclosing flood risks to local government, home owners and potential home buyers.

The Natomas Levee Evaluation Report provides a comprehensive summary of the region's construction improvement projects that have been completed to date, and clearly defines the need to improve the levees protecting the Natomas Basin. While the report focuses primarily on the steps required to achieve a 200-year level of flood protection, the report also includes strong geotechnical and hydraulic evidence that the Natomas levees do not meet current Corps criteria for providing 100-year flood protection as mandated by FEMA. Prior to this 1998 certification by the Corps, the Natomas Basin had been mapped into the FEMA 100-year floodplain, and mandatory flood insurance was required by FEMA for homes with federally-backed mortgages.

The Reclamation Board of the State of California has been partnering with SAFCA and the Corps since 1996 to improve the levees protecting the Natomas Basin under the American River Common Features Project. DWR strongly supports expedited levee improvements for the Natomas Basin and will continue to support The Reclamation Board in constructing the American River Common Features Project in partnership with the Corps and SAFCA. We understand that additional analyses are underway to develop a strategy for providing FEMA 100-year flood protection. However, even under the best scenario, it will take several years to make the necessary improvements.

Greenbriar Draft EIR Comments
James P. Pachl, 9/5/06
Exhibit Four

EXHIBIT FOUR

Over the next few years, we will make it a very high priority to work closely with SAFCA and the Corps to remediate the Natomas levees and upgrade them to the 200-year level of protection. Meanwhile, we will work closely with your staff to incorporate this new information into your floodplain mapping efforts and to determine the appropriate Special Flood Hazard Area zoning for the basin.

If you have any immediate questions regarding this letter, please call me at (916) 653-9502. We look forward to your reply regarding your intentions for incorporating this new information into your floodplain mapping efforts.

Sincerely,

LES HARDER

Leslie F. Harder, Jr.
Deputy Director

Attachment

cc: Honorable Doris Matsui
Representative, U.S. Congress
2310 Rayburn House Office Building
Washington, DC 20515

Colonel Ronald N. Light
District Commander
Sacramento District
U.S. Army Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

Mr. Stein Buer
Sacramento Area Flood Control Agency
1007 Seventh Street, 7th Floor
Sacramento, California 95814

ITEM 8

Agenda of August 17, 2006

TO: **Board of Directors**
Sacramento Area Flood Control Agency

FROM: **Stein M. Buer, Executive Director**
(916) 874-7606

SUBJECT: **EXECUTIVE DIRECTOR'S REPORT FOR AUGUST 2006**

1. Natomas Levee Evaluation Report: Next Steps

As noted in the July 2006 report, concurrent with the technical review of SAFCA's Natomas Levee Evaluation Study Report, the U.S. Army Corps of Engineers (Corps), the Department of Water Resources (DWR), and the Federal Emergency Management Agency (FEMA) have been evaluating how they should respond to the conclusions set forth, particularly with respect to potential actions which might lead to FEMA remapping the Natomas Basin (Basin) to reflect the new information about its levees. SAFCA and its member agencies have been in discussions with these key agencies to discuss the short- and long-term implications with respect to public safety and the regional economy in an effort to develop and agree upon such potential actions. Recently, SAFCA received formal letters from the Corps and DWR (Attachment 1 and 2, respectively), as well as informal guidance from FEMA. The agency responses are summarized as follows:

The Corps has indicated that it can no longer stand behind the 1998 certification of the Natomas levee system, and will work closely with DWR and SAFCA to expedite the levee improvements needed to allow the Corps to again certify the levees and move towards a higher level of protection.

DWR recognizes that SAFCA is implementing a strategy for providing FEMA 100-year flood protection for the Basin. However, given that under the most optimistic scenarios, it will take several years to make the necessary levee improvements, during which development in the Basin will continue, DWR feels it is necessary to immediately initiate consultation with FEMA (Attachment 3). DWR intends to work with FEMA to have the Basin remapped to accurately depict the level of increased flood risk.

FEMA plans to work cooperatively with communities to facilitate good floodplain management in an orderly fashion. It plans to expedite the issuance of preliminary updated floodplain maps in accordance with David Maurstad's August 5, 2005 Memo 34 and Les Sakumoto's April 17, 2006 memo (presented and discussed at your March 2006 Board Meeting, Item 9), then allow local communities a

Greenbriar Draft EIR Comments
James P. Pachl, 9/5/06
Exhibit Five

EXHIBIT 5

reasonable opportunity to respond before finalizing those maps.

FEMA indicates that the preliminary maps are intended to serve as an incentive for communities to take the actions necessary to achieve recertification of the levees which protect them against flood hazards, including remediating any identified structural deficiencies.

FEMA will work cooperatively with those communities which are expediting levee evaluations and improvements; notifying the affected communities of current flood risks; promoting flood insurance; and otherwise demonstrating adherence to good floodplain management practices to achieve the long-term goals of greater flood safety and wise floodplain management. FEMA will place a lower priority on finalizing the floodplain maps of communities which react in a proactive and effective manner to the levee recertification challenge.

FEMA acknowledges that there exists a tradeoff between the benefits of expedited floodplain mapping, which will force most levee protected property owners in the Central Valley to begin paying flood insurance premiums, and the need to assess those same property owners for the local share of funds required to fix the levees and reduce the threat of flooding.

FEMA views SAFCA as among the most proactive in the State in this regard, and therefore does not see a compelling case for giving top priority to finalizing flood maps for Natomas to reflect the current flood risk. It anticipates issuing preliminary flood maps for Sacramento County by July of 2007, then finalizing them about 2012; by which time we expect to have completed our Natomas Levee Improvement Program, including both 100-year remedial work and 200-year improvements.

Thus, if FEMA's map update program and our levee improvement program moves forward substantially in accordance with current projections, we anticipate that the updated flood maps will reflect the achievement of SAFCA's goal of 200-year flood protection for the Natomas Basin. In short, from FEMA's perspective, the sky is not falling and SAFCA will have sufficient time to complete our levee improvements before the effective maps are published.

While SAFCA has sought to facilitate discussions prompted by the release of the draft Natomas Levee Evaluation Draft Study Report; land use decisions within the Natomas Basin; flood hazard mapping; and flood insurance issues remain the responsibilities of the City of Sacramento, Sacramento County, and Sutter County. SAFCA will continue to provide technical assistance and resources as appropriate as these issues are addressed.

2. South Sacramento Streams Group Project Levee Certification Letters

It is the goal of the Corps, DWR, and SAFCA that the 2006 levee improvements for

the Pocket-Meadowview area will lead to certification of the levees by the Corps at the end of calendar year 2006. This would set the stage for updating flood insurance rate maps in early 2007, thus making Preferred Risk flood insurance policies available for property owners in the region.

As part of this process, the Corps has produced two letters. First, the Corps has documented its intent to certify the Sacramento River east levee as far south as Freeport in a recent letter to SAFCA, which was attached for reference as Attachment 2 of my July 2006 report to your Board. Second, the Corps has recently certified the levee work that was completed last year on the Beach Lake Levee system (Attachment 4).

Work along Morrison Creek will need to extend upstream to at least Brookfield Drive this year in order to allow the Pocket/Meadowview area to be remapped and eligible for low-cost flood insurance.

Certification is dependent upon the successful execution of all construction planned for this season; an ambitious and difficult undertaking.

3. Sacramento Riverfront Riparian Project

In June, your Board agreed to accept mitigation funds from Woodside Homes of California (Woodside) for the implementation of a part of the Sacramento Riverfront Riparian Enhancement Project immediately downstream of the mouth of the American River. The (Corps) has since determined that mitigation at this site would not be "in kind" or equal in quantity to the wetlands Woodside had proposed to fill, and declined to accept the mitigation. Woodside subsequently bought credits at a mitigation bank. SAFCA staff will not advance the enhancement project until another source of funds can be found.

4. American River Parkway Plan Update

The initial phase of the American River Parkway Plan Update process has concluded with the adoption of recommendations by the advisory committee appointed by the Sacramento County Board of Supervisors, the Sacramento City Council and the Rancho Cordova City Council. These recommendations are being reviewed by the Project Management Team so that a draft of the updated plan can be prepared and presented to the public at a series of meetings being scheduled for the months of September, October and November before the draft is presented to the two City Councils and the Board of Supervisors at the end of the year. This schedule anticipates that the draft update will be presented to the SAFCA Board on November 16, 2006.

SMBsc\ExecDirRpt-Aug06.bd.doc
Attachments

ITEM 8

Agenda of February 16, 2006

TO: **Sacramento Area Flood Control Agency Board of Directors**

FROM: **Stein Buer, Executive Director (916) 874-7606**

SUBJECT: **INFORMATION – NATOMAS LEVEE EVALUATION STUDY**

SUMMARY

This is an information item to provide your Board with a summary of the preliminary findings and conclusions of the Natomas Levee Evaluation Study (Study), which SAFCA initiated in 2005 to identify the improvements needed to provide the Natomas area with at least a 200-year level of flood protection. No action is requested at this time. Staff intends to return to your Board in March with recommendations as to the next steps which should be taken in responding to the conclusions of the Study.

BACKGROUND

After the record storm of 1986, SAFCA was formed to work with the responsible Federal and State agencies to plan and implement the system-wide improvements needed to provide the Sacramento area with at least a 100-year level of flood protection as quickly as possible while working to provide the area with at least a 200-year level of protection over time. SAFCA has characterized this improvement program as progressing from high risk (less than 100-year) through moderate risk (greater than 100-year but less than 200-year) to low risk (greater than 200-year). The Natomas Basin has been a major focus of this effort. Between 1990 and 1993, about $20.0 million was spent as part of the Sacramento Urban Levee Reconstruction Project to strengthen the east levee of the Sacramento River so as to address through-levee seepage problems experienced during the 1986 flood. Thereafter, another $80.0 million was spent as part of the North Area Local Project (NALP) to raise and strengthen the levees along the eastern and northern flanks of the basin.

As a result of these efforts, the U.S. Army Corps of Engineers (Corps) concluded in 1998 that the Natomas area had adequate protection to safely contain a 100-year flood. In rendering this conclusion, the Corps acknowledged that portions of the east levee of the Sacramento River had less than the normally required three feet of freeboard on the 100-year water surface profile. This was considered acceptable because this levee performed well during the 1997 flood and because the Corps

Greenbriar Draft EIR Comments
James P. Pachl, 9/5/06
Exhibit Six

EXHIBIT SIX

anticipated that the levee would be raised in the near future as part of the Federally authorized American River Common Features Project (Common Features). In addition, the Corps assumed that ongoing erosion in the Sacramento River channel would be addressed, either as part of routine local levee maintenance efforts or as part of the Sacramento River Bank Protection Project.

For the 1998 certification process the Corps did not evaluate the risk of underseepage. Although such an evaluation was technically part of their standard operating procedure for evaluating levee performance, underseepage was not considered a significant failure mechanism for levees in the Sacramento Valley, and the effort necessary to accumulate and analyze boring data was not thought to be cost-effective.

However, over time, the Corps' assessment of levee failures during the 1997 flood indicated that underseepage was a potentially significant contributor to levee instability and some of the levee failures during the flood. As a result, in 2000 the Corps retained the engineering firm URS to help evaluate the underseepage risk in Natomas, as well as other levee performance parameters which would need to be addressed to achieve the 200-year flood performance threshold. Boring data was collected along the south levee of the Natomas Cross Canal and the east levee of the Sacramento River, and an initial assessment of the potential for underseepage was completed.

Based on the analysis of the available data, including extensive additional borings, URS, in 2002, concluded that most of the studied levee reaches would need substantial additional work to address underseepage, erosion protection, and freeboard requirements in order to reach a high level of flood protection. Because of the magnitude and anticipated cost of the recommended work, and because underseepage was a newly identified concern in the Sacramento Valley, the Corps and its non-Federal partners determined a panel of experts should be convened to review and refine the Corps' guidelines for evaluating the risk of underseepage and designing remedial measures before proceeding further.

The Corps' Levee Seepage Task Force was convened in early 2003 and completed its work in July 2003. Based on its findings, the Corps developed a new Standard Operating Procedure (SOP) for Geotechnical Levee Practice, recommending guidelines for evaluation, design, and maintenance, which were adopted by the Corps' Sacramento District in August 2004. The most important recommendation embodied in the new SOP was that additional resources should be used in the evaluation, design, and maintenance phases so that less conservative and costly remedial measures could be recommended for construction.

With the new SOP as a guide, the Corps, the State Reclamation Board, and SAFCA staffs collaborated to develop a plan for moving forward with the Natomas levee improvements needed to achieve 200-year flood protection, while at the same time addressing any priority levee deficiencies which might be identified. Given the limited funding available to the Corps through Common Features, it was agreed

that SAFCA would take the lead in conducting a Natomas levee evaluation which would be the basis for planning additional levee improvements. In addition, it was agreed that the Corps would conduct a re-evaluation of data collected from earlier studies in light of the new SOP, using the 100-year flood profile as a basis for evaluation.

At the Corps' direction, URS re-analyzed the boring data that it had earlier collected using the new guidelines, summarizing its findings in a report dated November 2005. For water surface elevations produced by a 100-year flood, URS determined that, at some locations, calculated exit gradients exceeded the adopted guideline for levee stability and the borings indicated a potential for subsurface permeability that could threaten the stability of the affected levees if not addressed.

In accordance with SAFCA Board Resolution Nos. 05-018, 05-033, and 05-054, SAFCA's Natomas Levee Evaluation Study was initiated in June 2005, including extensive additional geotechnical exploration along the existing levee and the proposed levee setback alignment in North Natomas. SAFCA's study has focused on the potential for underseepage failure in a 200-year flood event along the south levee of the Natomas Cross Canal, the east levee of the Sacramento River and the north levee of the American River. Unresolved levee freeboard and streambank erosion issues affecting these levees were also evaluated in order to identify the scope of the improvements needed to reduce the annual risk of flooding to less than 1/200. Lastly, in order to identify the magnitude of the problems and prioritize remedial activities, the potential for underseepage failure was also assessed for a 100-year flood event.

SAFCA's administrative draft Natomas Levee Evaluation Study is currently undergoing review by the Corps and The Reclamation Board staffs.

The URS November 2005 report to the Corps and the draft findings of SAFCA's study reconfirm the Corps' post-1997 flood concerns regarding underseepage and underscore the need for a substantial expansion of the scope of the Common Features Project in Natomas. The current Corps and SAFCA studies will contribute to the ongoing Corps General Re-evaluation Report (GRR) process, which is documenting the extent of the underseepage problem and identifying a range of solutions to this problem, as well as other levee concerns. However, because of anticipated continued Corps funding limitations and the priority of eliminating high risk levee deficiencies in other areas along the Lower Sacramento and American River levees, this GRR will not likely be completed until 2009.

DISCUSSION

Deficiencies in the Natomas levees were identified based on the following engineering criteria. For levee freeboard, the criterion was to provide at least two feet above the 200-year design water surface elevation. Levee foundations were deemed deficient if soil boring data gathered at multiple locations along the landside of the affected levee reaches indicated exit gradients at or above the

Corps' adopted guideline for underseepage. The risk of bank erosion was assessed based on the width of the bank (berm) between the levee and the active river channel, the steepness of the bank, the potential for scour along the waterside toe of the bank, and the cohesiveness of the soils comprising the bank.

The preliminary findings and conclusions of the draft study report indicate that:

(1) Much of the upper 11 miles of the east levee of the Sacramento River downstream of the mouth of the Natomas Cross Canal does not provide at least two feet of freeboard and needs to be raised one to two feet;

(2) The east levee of the Sacramento River between the Natomas Cross Canal and the American River also contains several at-risk erosion sites totaling over two miles in length; and

(3) Almost 20 of the 26 miles of levee extending along the northern, western and southern flanks of Natomas are susceptible to seepage at the 200-year water surface elevation, and, at several locations, this susceptibility also occurs at the 100-year water surface elevation. This suggests that the risk of levee failure is greater than was previously thought.

Proposed remedies for identified deficiencies were developed based on established levee improvement and bank protection techniques. The draft report proposes to address levee freeboard deficiencies through levee raising; address foundation stability issues primarily through construction of slurry walls; and address erosion risks through minimum impact toe rock and bank re-vegetation techniques in use along the Lower American and Sacramento rivers.

The draft report also considers the possibility of addressing identified deficiencies in the upper five miles of the east levee of the Sacramento River through construction of a new secondary levee set back about 1,000 feet from the existing levee. Under this alternative, the existing levee would continue to confine the river channel and serve as a local roadway for residents along the Garden Highway. The new levee would eliminate the uncertainties associated with refurbishing the existing levee, avoid ongoing erosion problems, and ensure safe containment of the 200-year flood if the existing levee fails.

POLICY CONSIDERATIONS

The preparation of the Corp's November 2005 report and SAFCA's draft report are the latest in a series of steps taken by SAFCA, the Corps, and the State Reclamation Board (State) to identify and implement the improvements needed to provide the Sacramento urban area with a 200-year level of flood protection, while addressing any deficiencies which might require higher priority action. This effort is

continuing to unfold within the framework of the Federally authorized American River Watershed Investigation (ARWI).

While the Corps has been the lead agency for the ARWI, SAFCA and the State have played important complementary roles. At several critical junctures, the partners have altered their traditional relationship to address urgent needs, with SAFCA and/or the State assuming greater-than-normal financial burdens in order to facilitate needed work that would otherwise have been delayed substantially. This occurred in connection with the NALP, where SAFCA took the lead in designing and constructing the project, and with bank protection along the Lower American River, where SAFCA helped to broker an agreement on the design of the improvements and took responsibility for the performance of this design. The identified issues with the levees protecting Natomas may present another opportunity for such adaptation given the urgency of correcting the deficiencies and the pace at which it is likely to be addressed without local intervention.

FINANCIAL IMPLICATIONS

Based on preliminary cost estimates, the Study indicates that the cost of the improvements needed to address all of the identified deficiencies in the Study area is approximately $270.0 million. The majority of this cost is attributable to addressing underseepage problems. In devising a strategy for funding the needed improvements, staff will consider various combinations of options, including the following, with the aim of initiating the response process as quickly as possible:

- State Infrastructure Bond and Assessment District. The Legislature is currently considering whether or not to ask California voters to approve up to $6.0 billion in bond funding in 2006 and 2010 for water resource related projects including flood control. If these bonds are approved, substantial funding would be available for Sacramento flood control. The Legislature is also likely to consider companion legislation that could include creation of a Sacramento Valley-wide assessment district to raise the local share of the cost of the improvements funded through the bonds and to provide sustainable long-term funding for operation and maintenance of the Sacramento River Flood Control Project. If such a district is formed, Sacramento property owners would be major contributors, and district revenues could be used to address Sacramento's flood control problems.

- Federal Funding. With additional congressional authorization, the needed improvements would likely qualify for Federal funding as part of the authorized American River Common Features Project. The Corps is in the initial phase of preparing a GRR that will document the conditions outlined in SAFCA's Study and serve as a vehicle for Congress to expand the scope of the Common Features Project and authorize additional Federal funding for the Natomas area. The GRR is expected to be completed in 2009 and presented to Congress in 2010.

- Local Assessments. There is approximately $37.0 million in bonding capacity remaining in SAFCA's NALP Capital Assessment District. Depending on the financing needs of the area covered by SAFCA's American River/South Sacramento Streams Capital Assessment District, which will also need to fund additional levee improvements to meet a 200-year level of protection. An extension of the payment period and an adjustment in the amount of the assessments in both districts could be pursued either by maintaining the current separation of these districts, or by combining them into a single district with appropriate benefit zones to ensure the legally required proportionality of the assessment burden.

Regardless of which options are developed and pursued singly or in combination, it would make sense for your Board to consider phasing strategies that would prioritize the remedial work and help to manage local, State and Federal cash flows.

RECOMMENDATION

This is an information item to present the preliminary findings and conclusions of the Natomas Levee Evaluation Study to your Board for consideration while the draft report and its extensive technical appendixes are undergoing review by the Corps and The Reclamation Board staffs. Staff intends to return to your Board in March with recommendations as to the next steps which should be taken in responding to these findings and conclusions.

(16)

SAFCA

Meeting July 25, 200;

Commonly Asked Questions About the Proposed Modifications
To
The Sacramento River East Levee and Natomas Cross Canal Levees

1. What is the purpose of the proposed project?

In 1996, Congress authorized a project to raise the east levee of the Sacramento River in Natomas between Powerline Road and Verona so that it could safely withstand higher water levels that are expected during very large storms. In 1999, Congress approved raising the north and south levees along the Natomas Cross canal so that they could contain the same higher water levels. Engineering studies for designing the projects have revealed that the foundation soils under the levee do not meet engineering criteria for under-seepage. Therefore, without corrective action, the levees could be unsafe when higher water occurs. Consequently, the Corps, the State Reclamation Board and the Sacramento Area Flood Control Agency are evaluating options to address this under-seepage issue. One or more of these options would be implemented as part of the levee raise project.

2. What is "under-seepage"?

Under-seepage is water seeping through permeable levee foundation soil strata such as sand and gravel. During a flood, high river stage creates pressure that forces water into the strata on the river side of the levee. The water flows away from the river under the levee and either seeps out of the ground on the dry side of the levee or becomes groundwater. If the surface soils on the dry side of the levee have low permeability, such as silt and clay, they restrict seepage to the surface. The restriction causes the water to exert upward pressure on the surface soils and can "lift" them, causing boils. The boil provides a passage for increased flow of water and the increased flow can wash away the sand below the levee. If not reinforced, the levee could breach and cause major flooding within the Natomas Basin.

3. How could the risk of under-seepage be addressed?

The project sponsors are evaluating three different options to reduce the risk of levee failure due to under-seepage. The first option is to reinforce the affected levees with a berm extending outward 100 to 200 feet from the landside of the levee. At the levee, the berm has a thickness of about eight feet tapering to about three feet at the edge. The second option is to install a seepage cut-off wall through the levee. To be effective, the bottom of the cut-off wall must extend into a low permeability soil strata such as clay. Construction equipment limits the depth of cut-off wall construction to about 80 feet below the top of levee. In locations where the depth to clay strata exceeds 80 feet, the cutoff wall is not feasible. The third option is to install wells, ditches and pumps along the land-side of the levee that are designed to relieve the pressure by releasing the confined water to the surface and then moving it back to the river.

4. What is the purpose of this meeting?

In order to facilitate public input into the project planning process and to comply with State and Federal environmental laws, the Corps will produce an environmental document disclosing the environmental impacts of raising the levees and implementing the various under-seepage containment options. The purpose of today's scoping meeting is to provide interested members of the public with information about these measures so they in turn can identify environmental and other concerns that need to be considered in the project planning process and the environmental document. Public input will again be sought when the environmental document is complete in draft form, later this year.

Greenbriar Draft EIR Comments
James P. Pachl, 9/5/06
Exhibit Seven

1 EXHIBIT SEVEN

5. **Who will pay the cost associated with this project?**

If the State legislature and Congress approve the project, costs will be shared as follows:

Federal Share:	75 percent
State Share:	17.5 percent
SAFCA Share:	7.5 percent

6. **Who will be affected by construction of the proposed project?**

During construction, this project will affect residents and businesses in the approximate geographical area of the Garden Highway levee between Orchard Lane and Verona and the Natomas Cross Canal north and south levees. Lands and easements will be acquired from property owners along both sides of these levees.

Work along the Garden Highway levee will require that local and through traffic be detoured around the construction area. Provisions for emergency access by police, fire, and ambulance will be maintained at all time. Controlled provisions for access and egress from homes and business will be maintained at all times. The exact nature of the traffic control plan cannot be determined until all information on project impacts is available.

Property owners and residents within the affected construction "zone" will be kept informed and are needed to participate in the planning process for this project.

7. **When will the construction start?**

Projected construction is expected to begin in 2005

8. **How long will it take to construct the project?**

The construction schedule will be dependent on the alternative selected, requirements to avoid environmental impacts on threatened and endangered species, and the need to insure public access around and through the construction area.

9. **Who will benefit from construction of this proposed project?**

The project levees protect all 55,000 acres of the Natomas basin, so all properties in the basin will benefit from the project. Properties on the waterside of the levee will also benefit by decreasing the risk that the levee will fail.

Scoping Meetings

(Community Meetings)

Sacramento River East Bank Levee
And
Natomas Cross Canal

The U.S. Army Corps of Engineers (Corps), the State Reclamation Board (State) and the Sacramento Area Flood Control Agency (SAFCA) invite you to attend any or all of the Scoping Meetings listed below. We will discuss remedies for (1) seepage problems along the East Levee of the Sacramento River and the North and South Levees of the Natomas Cross Canal, (2) erosion protection along the east bank of the Sacramento River at several sites and (3) raising of the Sacramento River East Bank Levee and Natomas Cross Canal Levees.

Thursday, July 25	**Tuesday, July 30**	**Wednesday, July 31**
6:00 – 8:00 P.M.	6:00 – 8:00 P.M.	6:00 – 8:00 P.M.
South Natomas	Teal Bend Golf Course	Holt of California
Community Center	Meeting Room	Conference Room
2921 Truxel Road	7200 Garden Hwy.	7310 Pacific Avenue
Sacramento, CA 95833	Sacramento, CA 95837	Pleasant Grove, CA 95668

High flows in the Sacramento River during the Flood of 1986 triggered seepage through the Sacramento River East Levee in Natomas nearly failing the levee in several locations. The problem was remedied through insertion of a slurry wall along a reach of the levee and construction of a stability berm along another reach of the levee between 1990 and 1993.

After the Flood of 1997, engineers determined that flows higher than those experienced in 1986 could create high pressure in porous materials under the levee. This higher pressure may penetrate the surface soils on the landside of the levee resulting in serious boils that destabilize the levee foundation soils. At the above Scoping Meetings, representatives from the Corps, the State and SAFCA will present information on alternative remedies to address this underseepage problem and plans to raise the levees. The public will have an opportunity to identify concerns that need to be addressed as the project planning process continues.

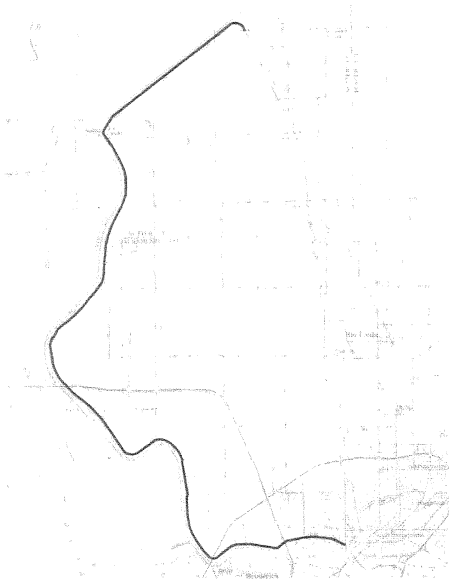
PLEASE PLAN TO ATTEND.

For further information, contact Maggie Franklin, Public Information Officer at the Sacramento Area Flood Control Agency, (916) 874-4582.

NATOMAS LEVEE EVALUATION STUDY

Prepared for SAFCA in Support of the Natomas Basin Components of the American River Common Features Project

Final Report



Prepared for:
SAFCA

Prepared by:
MBK Engineers
Kleinfelder
Northwest Hydraulics Consultants
Parsons Brinckerhoff
EDAW
Jones & Stokes Associates

July 14, 2006

Greenbriar Draft EIR Comments
James P. Pachl, 9/5/06
Exhibit Eight

EXHIBIT Eight

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EXECUTIVE SUMMARY

This report summarizes the preliminary conclusions and recommendations of the Natomas Levee Evaluation Study (Levee Evaluation Study or Study) that is contained in a series of technical reports commissioned by SAFCA. This Study, which was initiated in 2005, follows more than a decade of levee improvement activity aimed at safely containing a 200-year flood in the Lower Sacramento and American Rivers and the diversion channels around the perimeter of the Natomas Basin. The improvements have significantly reduced the risk of flooding in Natomas, particularly along the eastern flank of the basin. However, recent experience has persuaded flood managers that levees throughout the Lower Sacramento Valley may be subject to an unacceptable risk of failure due to deep underseepage and continuing erosion. One of the principal aims of the Levee Evaluation Study was to assess this risk in the Natomas area using new guidelines adopted by the Sacramento District of the U.S. Army Corps of Engineers (Corps). The Study also addressed levee freeboard and streambank erosion issues in order to identify the scope of the improvements needed to reduce the annual risk of flooding to less than 1/200 in any given year.

Conditions along the south levee of the Natomas Cross Canal, the east levee of the Sacramento River, and the north levee of the American River were assessed in relation to water surface elevations produced by a hypothetical flood with a 1/200 Annual Exceedence Probability (AEP). The size of this flood was determined based on hydrology developed by the Corps as part of the Sacramento and San Joaquin River Basins Comprehensive Study. This flood was routed through the flood control system using a hydraulic model developed by MBK Engineers (MBK). The resulting water surface elevations reflected two key modeling assumptions. First, it was assumed that levees upstream of Natomas would not fail when overtopped, but would act as weirs, thus only slightly diminishing peak flows in the channels around Natomas. Second, it was assumed that flows in the Lower American River would be controlled to 160,000 cfs during the modeled event.

The Natomas levees were evaluated based on the following engineering criteria. For freeboard, levees were deemed deficient if they did not have at least three feet above the 1/200 AEP water surface elevations. Levee foundations were deemed problematic if seepage analyses indicated exit gradients at or above the Corps adopted guideline for underseepage and other indicia of subsurface permeability (such as the presence of standing water at the landside toe of levee) were present in the affected levee reach. The risk of bank erosion was classified as 'high', 'moderate', or 'low' based on evidence of recent erosion and slope failure, the width of the bank (or "berm") between the levee and the active river channel, encroachment into the projected waterside levee slope, the steepness of the bank, the potential for scour along the waterside toe of the bank, and the cohesiveness of the soils comprising the bank.

Remedies for identified problems were developed based on established levee improvement and bank protection techniques. It was assumed that levee freeboard deficiencies would be addressed through levee raising; foundation seepage issues would be addressed through construction of cutoff walls; and erosion risks would be addressed through minimum impact toe rock and bank re-vegetation techniques commonly in use along the Lower American and Sacramento Rivers. The Study also raised the possibility of addressing identified deficiencies in the upper 5 miles of the east levee of the Sacramento River through construction of a new secondary levee set back about 1,000 feet from the existing levee. Under this alternative, the existing levee would continue to confine the river channel and serve as the Garden Highway. The new levee would eliminate the uncertainties

associated with refurbishing the existing levee, reduce erosion concerns, and ensure safe containment of the 1/200 AEP flood if the existing levee were to fail.

Based on the preliminary conclusions and recommendations of the Levee Evaluation Study, the cost of the improvements needed to address the problems identified in the Study would be approximately $300 million. The cost of the secondary levee alternative would range from approximately $354 million to $432 million depending on the source of material used to construct the new levee.

The Study notes that environmental considerations will affect the timing and cost of constructing the needed levee and streambank protection improvements. In order to minimize construction delays and avoid unnecessary project cost increases, the improvement program should include a comprehensive approach to mitigating unavoidable environmental impacts that complements ongoing habitat conservation efforts in the Natomas Basin and the Sacramento River channel.

The Study also indicates that the risk of flooding at the 100-year level is greater than previously assumed, underscoring the urgency of expediting the needed improvements.

SAFCA will utilize the results of the Study to support the Corps' continued work on the Natomas Basin Components of the American River Common Features Project and to evaluate the potential to move forward with the identified flood control improvements using local and state funds.

1.0 BACKGROUND

1.1 STORMS OF 1986

The Sacramento River Flood Control Project (SRFCP) is an integrated system of levees, overflow bypass channels, and dams that was designed and constructed by federal, state and local interests over several decades of the 20th Century to protect farmlands, towns and cities in the Sacramento Valley from large floods. The record storms of 1986 tested the limits of the SRFCP's storage and conveyance capacity, causing levee failures in many areas of the Valley that resulted in millions of dollars of property damage. The flood exposed numerous deficiencies in the SRFCP. In the Sacramento area, these deficiencies included: (1) unstable levees along the east bank of the Sacramento River that were susceptible to failure due to the porous nature of the material used in their construction; (2) inadequate conveyance capacity in the drainage channels around the Natomas Basin that serve to divert runoff from the foothills into the Sacramento and American Rivers; and (3) inadequate reservoir storage capacity for controlling large floods in the American River watershed. The Natomas Basin levees that are part of the SRFCP are shown in Figure 1-1

Prior to 1986, the Federal Emergency Management Agency (FEMA) judged that the SRFCP could safely contain a 100-year flood event along the Sacramento and American Rivers. This judgment informed Sacramento's entry into the National Flood Insurance Program (NFIP) in the late 1970's and allowed property owners in the protected Sacramento and American River floodplains to obtain flood insurance on a voluntary basis at favorable rates. After 1986, the U.S. Army Corps of Engineers (Corps) concluded that the SRFCP's deficiencies rendered Sacramento vulnerable to about a 70-year flood. This conclusion caused the FEMA, administrator of the NFIP, to issue new floodplain maps indicating that most of the City of Sacramento and portions of Sacramento and Sutter Counties were in the 100-year floodplain. These new maps were issued in November 1989 and had the effect of raising the cost of flood insurance and making property owner participation in the insurance program mandatory.

1.2 LOCAL-STATE-FEDERAL RESPONSE

SAFCA was formed in September 1989 to work with the Corps and the State of California (State) through the California Reclamation Board (Reclamation Board) to provide all of Sacramento's SRFCP protected floodplains with at least a 100-year level of flood protection as quickly as possible while working to achieve a 200-year level of flood protection over time. The rationale for this flood risk reduction program was that an uncontrolled flood would expose Sacramento's low-lying, heavily urbanized floodplains to a potentially catastrophic loss of life and property. A 100-year level of flood protection is the minimum national standard for protecting urban areas and it was essential to meet this standard as quickly as possible. However, given the likely consequences of an uncontrolled flood, it was also necessary to work toward the higher standard of protecting Sacramento from at least a 200-year flood, since this was considered to be representative of the most severe flood that could be reasonably expected to occur along the Sacramento and American Rivers. A 200-year level of flood protection was also consistent with the minimum level of protection enjoyed by other urban areas in the United States with substantial development in protected floodplains. This flood risk reduction program was subsequently characterized as progressing from

high risk (less than 100-year protection) through moderate risk (greater than 100-year but less than 200-year protection) to low risk (greater than 200-year protection).

1.3 SACRAMENTO URBAN LEVEE RECONSTRUCTION PROJECT

In order to achieve the goals of the flood risk reduction program, the Corps proposed to quickly implement a levee stabilization project along the 33-mile reach of the Sacramento River east levee that protects Natomas, downtown Sacramento, and the Pocket area, and to pursue a comprehensive program of levee improvements along the diversion channels around Natomas combined with construction of a flood control dam near Auburn to control flows in the Lower American River. The levee stabilization effort focused on the two segments of the east levee of the Sacramento River upstream and downstream of the American River: the downstream segment connecting the American River south levee to the North Beach Lake levee near the town of Freeport and the upstream segment connecting the American River north levee to the south levee of the Natomas Cross Canal near Verona. These levees were constructed in the early part of the 20th Century using materials dredged from the river channel that contained significant amounts of sand and silt dislodged from the foothills and mountains along the east side of the Sacramento Valley during the hydraulic mining era. These materials proved to be extremely porous when subjected to the prolonged high flows produced by the storms of 1986, particularly in the Natomas area where levee failure due to seepage through the levee was avoided only through a massive effort to shore up the levee during the height of the flood.

The stabilization effort, which was referred to as the Sacramento Urban Levee Reconstruction Project, employed two measures to address this seepage problem. Where space permitted, as in much of the upper Natomas Basin, the plan called for construction of a seepage stability berm along the landside of the levee to intercept any water seeping through the levee and discharge it into a drainage ditch to be pumped back into the river. Where space was limited, as in the Pocket area and the lower Natomas Basin, the plan called for construction of a slurry cutoff wall excavated through the levee and into less permeable ground below. This cutoff wall serves as a barrier to seepage through the permeable levee embankment soils. Construction of these improvements, covering approximately 33 miles of the Sacramento River east levee, was initiated in 1990 and completed in 1993.

1.4 NORTH AREA LOCAL PROJECT

With the completion of the Sacramento Urban Levee Reconstruction Project, attention shifted to the American River and the diversion channels around the Natomas Basin. Here the plan was to raise the diversion channel levees and control water surface elevations in the channels and the Lower American River by constructing a flood detention dam at Auburn. This plan was presented to Congress in 1992. However, in the face of opposition to the detention dam, Congress authorized only the levee improvements around Natomas and directed that these improvements should proceed while the Corps re-evaluated the options for controlling high flow along the remainder of the Lower American River. The legislation left open the possibility that the authorized improvements could be constructed by non-federal interests in exchange for future credits or reimbursements.

Taking advantage of this provision, SAFCA opted to move forward with a slightly redesigned plan that would protect the Natomas Basin from a 200-year flood along the American River without the benefit of the Auburn flood detention dam. This plan was feasible because of the design of the

American River levee system upstream of Natomas. The last segment of this system was constructed in 1958, after the completion of Folsom Dam. Believing that the dam afforded protection against extremely large floods, the Corps permitted the American River north levee to be extended upstream from Cal Expo to the Carmichael Bluffs along an alignment very near to the north bank of the river channel, thus cutting off a historic overflow area and creating a relatively narrow river channel. This channel cannot contain very high flows discharged from Folsom Dam. Instead, such flows are likely to trigger a levee failure upstream of Natomas, thus causing large volumes of flood water to flow into the surrounding floodplains of the American River outside of Natomas. Levee failures such as this would actually result in a reduction of water surface elevations in the vicinity of Natomas.

With this knowledge, SAFCA revised the design of the diversion channel levee improvements to contain the maximum water surface elevation likely to be produced by a 200-year flood along the southeastern flank of the Natomas Basin, combining foothill runoff with American River flows, reflecting the effects of upstream levee failures. Based on this design, SAFCA raised the east and west levees of the Natomas East Main Drainage Canal (NEMDC), the north and south levees of Arcade Creek, and the south levee of Dry/Robla Creek. In addition, SAFCA constructed a new levee along the north side of Dry Creek, extended the south Robla Creek levee, and installed a new pumping plant in the NEMDC channel connecting the new Dry Creek north levee to the raised NEMDC west levee. Finally, SAFCA strengthened the south levee of the Natomas Cross Canal (Cross Canal) and portions of the Pleasant Grove Creek Canal levee in Sutter County to control flooding along the northern perimeter of the Natomas Basin.

This North Area Local Project (NALP) was substantially completed in 1996. That same year, the Corps issued a Supplemental Information Report (SIR) to Congress that concluded the project provided Natomas with enough protection to control at least a 200-year flood along the American River and about a 140-year flood along the Sacramento River. Judged by the standards of the adopted flood risk reduction program, Natomas had progressed from a high-risk to a moderate-risk status. The SIR indicated that with a slight increase in the height of the Sacramento River east levee just downstream from its junction with the south levee of the Cross Canal, the area could be secured from a 200-year flood along the Sacramento River, thus attaining the low-risk goal of the program. In response to the SIR, which also addressed the ongoing risk of flooding in the Sacramento area outside Natomas, Congress directed the Corps to initiate extensive improvements to the levees along the American River upstream of the Natomas Basin and to address the residual risk of flooding along the east levee of the Sacramento River downstream of the Cross Canal. These improvements were considered a common element of any long-term effort to provide Sacramento with at least a 200-year level of flood protection, and the project was referred to as the American River Common Features Project (Common Features Project). Figure 1-2 illustrates the Natomas improvements constructed as part of the Sacramento Urban Levee Reconstruction Project, North Area Local Project, and Common Features Project.

1.5 NATOMAS BASIN COMPONENTS OF THE AMERICAN RIVER COMMON FEATURES PROJECT

Shortly after the conclusion of the 1996 federal legislative session, the Sacramento Valley was again visited by a flood of record magnitude. The storms of 1997 produced flows in the Lower Sacramento and American Rivers comparable to those of the storms of 1986. Nevertheless, the

levees around the Natomas Basin, improved by the NALP and the levee stabilization work that preceded it, passed these flows without the significant signs of stress that occurred in 1986. On the other hand, the flood did cause failures of some SRFCP levees along the Feather River and Sutter Bypass upstream of Natomas. The Corps' post-flood assessment concluded that underseepage may have contributed to these levee failures. As shown in Figure 1-3, underseepage can act as a levee failure mechanism where the soils in the ground beneath a levee contain materials that are sufficiently permeable to transmit water under high pressure from the riverside to the landside of the levee. During a flood event, these high-pressure flows can create a strong upward force. If the soil mantle on the landside of the levee is not able to withstand or safely release this uplift force, the result can be a rupture of the soil mantle allowing seepage to erode and remove the soils below the levee. In severe cases the levee can collapse into the void that is created and be overtopped by flood water.

In order to address the risk of underseepage, the Corps recommended a broader scope for the Common Features Project, advocating that deep seepage cutoff walls be inserted through the levees along the Lower American River and calling for an assessment of the need for similar measures along the east levee of the Sacramento River in the Natomas area. These recommendations were adopted by Congress in 1999.

After initiating the design of the project to raise the east levee of the Sacramento River, engineers reviewed the conditions observed at the Pritchard Lake canals during the Storm of 1997. Based on this review, deep underseepage was identified as a possible concern. The Corps formed a levee review panel composed of experts in soil mechanics and geotechnical exploration and evaluation. The panel met periodically to review the investigation plan, conclusions and to provide guidance on alternative remediation measures. As the investigation proceeded, it became apparent that more information on subsurface conditions was needed. A program of soil borings and samplings began in 2000 and was completed in late 2001. Analysis of the accumulated data indicated that there is a threat of underseepage-induced failures along the Sacramento River east bank levee and the Natomas Cross Canal south bank levee during high water conditions. Preliminary identification of alternatives was completed and the Corps and its partners began a public involvement program to identify issues of concern of the local community before developing a final design for congressional approval.

Public Scoping meetings were held in July 2002 to present information on the preliminary levee modifications and receive comments from the public. It was anticipated that information obtained in these scoping meetings would be used to assist in plan selection and to complete the draft environmental documents necessary to meet both Federal and State requirements.

Because of the magnitude and anticipated cost of the recommended work, and because deep underseepage was a newly recognized concern in the Sacramento Valley, the Corps and its non-Federal partners, the State and SAFCA, determined that a panel of experts should be convened to review and refine the Corps' guidelines for evaluating the risk of underseepage and for designing remedial measures.

The Corps' Levee Seepage Task Force was convened in early 2003 and completed its work in July 2003. Based on its findings, the Corps developed a new Standard Operating Procedure Engineering Design Guidance 2003 (SOP EDG-03) for Geotechnical Levee Practice, recommending guidelines for evaluation, design, and maintenance, which were adopted by the Corps' Sacramento District in August 2004. The most important recommendation embodied in the new SOP EDG-03 was that

additional resources should be used in the evaluation, feasibility and design phases of a project so that less conservative and more cost effective remedial measures could be recommended for construction.

With the new SOP EDG-03 as a guide, the Corps, the State, and SAFCA staffs collaborated to develop a plan for moving forward with the Natomas levee improvements needed to achieve 200-year flood protection, while at the same time addressing priority levee deficiencies which might be identified. Given the limited funding available to the Corps through the Common Features Project, it was agreed that SAFCA would take the lead in conducting a Natomas levee evaluation study which would be the basis for planning additional levee improvements. In addition, it was agreed that the Corps would conduct a re-evaluation of data collected from earlier studies in light of the new SOP, using the 100-year flood profile as a basis for evaluation.

The Corps re-analyzed the boring data that it had earlier collected using the new guidelines, summarizing its findings in a report dated November 2005. For water surface elevations produced by a 100-year flood, the Corps determined that, at some locations, calculated exit gradients exceeded the adopted guideline for levee stability and the borings indicated a potential for subsurface permeability that could threaten the stability of the affected levees if not addressed.

SAFCA initiated the Natomas Levee Evaluation Study (Levee Evaluation Study) in June 2005, including extensive additional geotechnical explorations along the existing Natomas levees and along a proposed setback levee alignment for the northern 5.5 miles of the Sacramento River east levee. SAFCA's study focused on the potential for seepage failure in a 200-year flood event along the south levee of the Natomas Cross Canal, the east levee of the Sacramento River and the north levee of the American River. Unresolved levee freeboard and streambank erosion issues affecting these levees were also evaluated in order to identify the scope of the improvements needed to reduce the annual risk of flooding to less than 1/200. Lastly, in order to identify the magnitude of the problems and prioritize remedial activities, the potential for seepage failure was also assessed for a 100-year flood event.

The results of the Corps' November 2005 report and SAFCA's Levee Evaluation Study reconfirmed the Corps' post-1997 flood concerns regarding underseepage and underscore the need for a substantial expansion of the scope of the Common Features Project in Natomas. The current Corps and SAFCA studies will contribute to the ongoing Corps General Re-evaluation Report (GRR) process, which is documenting the extent of the underseepage problem and identifying a range of solutions to this problem, as well as other levee concerns. However, this GRR will not likely be completed until 2009.

Natomas Levee Evaluation Study
FINAL REPORT SUMMARY

SAFCA issued the Public Review Draft Natomas Levee Evaluation Study report on March 13, 2006 (Draft Report). The report was available to the public on-line at SAFCA's website and copies were also available at the SAFCA office. The report was provided to the U.S. Army Corps of Engineers (Corps) and the State Reclamation Board.

The Corps provided written comments in a letter dated May 26, 2006. The Reclamation Board, through the State Department of Water Resources (DWR), provided written comments in a letter dated June 14, 2006. No written comments were received from the public.

This Final Report presents the comments by the Corps and DWR and provides responses to the comments. None of the comments required revision to the text of the Draft report. Figure 7-2 - Location of Improvements has, however, been revised so that the stationing along the levees is more readable.

Most of the comments received on the Report concern the need for additional investigations or analyses during design of the improvements. SAFCA has responded that it will include these activities during the design process and provide the data to the Corps and DWR for review and approval.

One of the comments indicated that the report should focus more heavily on improvement required to assure that 100-year protection is maintained for the Natomas Basin. The main purpose of the Natomas Levee Evaluation Study is to determine the improvements needed to provide a 200-year level of flood protection to the Natomas basin and to determine the magnitude of the cost of such a program so that a funding mechanism can be developed. In response to the comment, and in light of the letters that are anticipated from the Corps and DWR concerning the ability of the Natomas flood control improvements to currently provide 100-year FEMA flood protection, SAFCA has indicated that it will prepare a supplemental report that will address the issues associated with assuring FEMA 100-year flood protection and develop a prioritization of the improvements so that the most at risk areas are improved early in the program.

Another comment concerned the schedule under which the improvement program would be implemented. SAFCA has indicated that it has targeted 2007 for the first construction contract with completion of the improvements in 2012. The $302 million cost presented in the Draft Report is a first cost or "present day" value. If the program is completed over the timeframe anticipated, with annual escalation of costs (see attached Table FR-1), the "fully funded" cost of the program, assuming an annual 10% escalation rate, could rise to $414 million.

TABLE FR-1: NATOMAS LEVEE EVALUATION STUDY - SUMMARY TABLE SHOWING ESCALATED COSTS

		2006	2007	2008	2009	2010	2011	2012
1	Cross Canal - Seepage - Freeboard		$35.4 $3.0		$21.3 $ 6.4			
2	Sac River - Seepage - Freeboard			$30.6 $ 9.6	$11.5 $ 1.0	$27.2 $9.8	$41.5 $5.0	$28.4 $0.6
3	American River - Seepage - Freeboard							$13.0
4	East Side Levees							$25.0
5	Bank Protection			$13.0	$9.0	$10.8		
6	Total for Year {1+2+3+4+5}		$38.4	$53.2	$49.2	$47.8	$46.5	$67.0
7	Cumulative Yearly Total (2006 $$)		$38.4	$91.6	$140.8	$188.6	$235.1	$302.1
8	Remaining Project Cost {8-6}	$302.1	$263.7	$210.5	$161.3	$113.5	$67.0	0.0
9	Remaining Project Escalation (10%)		$30.2	$26.4	$21.1	$16.1	$11.4	$6.7
10	Yearly Escalated Total {6+9}		$68.6	$79.6	$70.4	$63.9	$57.9	$73.7
11	Cumulative Escalated Total		$68.6	$148.2	$218.6	$282.5	$340.4	$414.1

Note: Dollars are in millions

Natomas SRFCP Project Levees
MBK ENGINEERS
Legend
Natomas Levees
Scale in Miles
Sankey Rd
Pleasant Grove Creek
PLACER
SUTTER
SACRAMENTO
YOLO
Elverta Rd
Dry Creek
Elkhorn Blvd
Rio Linda Blvd
Powerline Rd
Del Paso Rd
Market Blvd
Truxel Rd
Norman Blvd
Fremont Weir
Yolo Bypass
Gordon Hwy
Main Ave
Bell Ave
Norwood Ave
Eleanor Ave
Dry Creek Rd
Rio Linda Blvd
Elkhorn Blvd
San Juan Rd
Natomas Blvd
Gordon Hwy
Main Drainage Canal
American River
Figure 1-1

Previously Constructed Improvements
MBK ENGINEERS
Legend
Project
North Area Local Project - NALP
Sacramento Urban Levee
Scale in Miles
Retained and Reinforced Howsley Road Crossing @ Grade
Retained and Reinforced Fifield Road Crossing @ Grade
Retained and Reinforced Sankey Road Crossing @ Grade
Raised and Strengthened Natomas Cross Canal Levee
Constructed New Dry Creek North Levee
2L Borrow/Mitigation Site
Constructed New Robla Creek North Levee
Raised Dry/Robla Creek South Levee
NEMDC Stormwater Pumping Station
Raised East & West NEMDC Levees
Raised & Extended Arcade Creek Levees
Discovery Park East Borrow/Restoration Site
Sankey Rd
Pleasant Grove Creek
PLACER
SUTTER
SACRAMENTO
YOLO
Elverta Rd
Dry Creek
Elkhorn Blvd
Powerline Rd
Del Paso Rd
Market Blvd
Truxel Rd
Norman Blvd
Fremont Weir
Yolo Bypass
Gordon Hwy
Main Drainage Canal
American River
Figure 1-2

2.0 PURPOSE, SCOPE, AND METHODS AND CRITERIA

2.1 PURPOSE

SAFCA initiated the Levee Evaluation Study in order to (1) expedite application of the new underseepage guidelines to the Natomas area, (2) address residual streambank erosion and levee freeboard issues, and (3) consistent with the goal of moving Natomas to a low-risk status, identify the improvements needed to protect the Natomas area from a flood event that has a 1/200 chance of occurring in any given year (1/200 Annual Exceedence Probability or AEP). The Study will serve as a complement to the Natomas General Re-evaluation Report (GRR) that has been initiated by the Corps as part of the ongoing Common Features Project and will allow the SAFCA Board to determine whether or not to initiate work in the Natomas area in advance of congressional action on the GRR, which is expected to occur in 2009.

2.2 SCOPE

As discussed above, the Levee Evaluation Study is part of an ongoing effort to reduce the risk of flooding in the Sacramento area that commenced following the storms of 1986. The improvements completed in the decade after this event, including levee raising and strengthening around Natomas, improved operation of Folsom Dam, and erosion protection along the Lower American River, significantly contributed to the levee system's capacity to safely contain the high water stages and flows experienced in 1997. Since 1997, additional improvements have been authorized and substantial upgrades to the levees along the Lower American and Sacramento Rivers have been completed.

Reflecting these accomplishments, the initial phase of the Levee Evaluation Study does not include an evaluation of the levee along the east side of the Natomas basin south of the NEMDC Stormwater Pumping Station. This levee was improved as part of the NALP. Subsequent phases of the Levee Evaluation Study will evaluate whether the NALP improvements are sufficient to protect urban development in Natomas from a 1/200 AEP flood event. Accordingly, the initial phase of the Study focuses on the Natomas Cross Canal south levee from Howsley Road to the Sacramento River, the Sacramento River east levee from the Natomas Cross Canal to the American River and the American River north levee from the Arden Garden Connector to the Sacramento River.

The Pleasant Grove Creek Canal levee and NEMDC levee north of the NEMDC Stormwater Pumping Station were also not evaluated in the initial phase of the Study because the volume of water that can enter the Natomas Basin due to a failure of these levees will not result in deep flooding. These levee reaches will be evaluated once work for the other levee reaches is underway. A conceptual level cost estimate has been included in the Study cost estimate based on knowledge that there are as many as 30 historic stream channels that cross under the Pleasant Grove Creek Canal and NEMDC levees. The purpose of this estimate is to serve as a place holder until more detailed study can be performed.

In addition, the Study assumes that congressionally authorized operational and structural modifications to Folsom Dam will be implemented and will control the 1/200 AEP flood event to 160,000 cfs. As discussed below, this flow was assumed in the modeling of water surface elevations that guided the problem identification process.

Jones & Stokes nhc northwest hydraulic consultants MIG

Sacramento River Corridor Planning Forum
Final Floodway Management Plan
November 2005

Sacramento River Under-Seepage and Through-Seepage Levee Risks

Figure 1-3

2.3 METHODS AND CRITERIA

Each of the Study levees was evaluated for performance in a hypothetical 1/200 AEP flood based on established criteria for levee freeboard, levee foundation stability, and streambank erosion. The methods used to establish 1/200 AEP water surface elevations in the Study area, the engineering criteria used to identify acceptable performance, and the improvements needed to address identified problems are briefly described below and discussed more fully in the sections that follow.

2.3.1 Hydrology and Hydraulics

The profile for the 1/200 AEP flood used to derive water surface elevations in the river channels around Natomas was developed by MBK Engineers (MBK) using a modified version of the Corps' Sacramento and San Joaquin River Basins Comprehensive Study UNET model. This flood profile was routed through the SRFCP levee system upstream of Natomas and combined with flows in the Lower American River. In creating these routings, MBK made two key assumptions. First, it was assumed that the SRFCP levees upstream of Natomas would not fail when overtopped by flows in their respective channels, but would function as weirs, diverting much less water from the channel than would be the case if overtopping triggered a breach of the levee and induced a much larger discharge of flood water into the adjacent flood basin. This assumption had the effect of keeping more water in the system and moving downstream and produced higher modeled water surface elevations in the channels around Natomas than if the levees had been assumed to fail when overtopped. Second, MBK assumed that major improvements to Folsom Dam and the American River levee system would be completed, allowing dam operators to control the maximum safe release from the dam to 160,000 cfs for the 1/200 AEP event.

Levee performance was measured against the resulting water surface elevations around Natomas so as to assess the relative magnitude of the identified levee freeboard, foundation stability and streambank erosion problems, and to develop appropriate design improvements.

2.3.2 Levee Freeboard

Levee freeboard is a measure of the distance between the top of a levee and the water surface elevation produced by a given flow in the river channel confined by the levee. Raising portions of the Sacramento River east levee to increase levee freeboard was authorized by Congress as part of the Common Features Project in 1996. This authority was broadened in 1999 to include raising portions of the Natomas Cross Canal levees. The Levee Evaluation Study assumed that the top of the levees around Natomas should be at least three feet above the 1/200 AEP water surface elevation in order to provide adequate protection against such a flood. It is recognized that additional levee height may be needed to address wind and wave run-up. This analysis will be included as part of the design process.

2.3.3 Levee Foundation Stability

As discussed in the previous sections, the potential for levee failures due to foundation problems has received increased attention in the California Central Valley after an investigation of levees that failed during the 1997 storms. The task force assembled to review levee design practices produced guidelines that were adopted by the Corps' Sacramento District in "CESPK Geotechnical Levee Practice SOP-03" in late 2004. The Levee Evaluation Study generally followed these guidelines with the primary exception that the number of soil borings called for at each levee cross section location was minimized to reduce Study costs. Additional borings will be conducted during the design phase of the project.

A key criterion used in the Study to evaluate seepage was the exit gradient produced by the modeled water surface elevation interacting with the soil types identified through borings beneath and adjacent to the landside toe of the levee. SAFCA's geotechnical engineering consultant, Kleinfelder, used these data along with other indicia of subsurface permeability to identify Study area levees requiring improvements to protect against potential underseepage.

2.3.4 Bank Erosion

The Study addressed the potential for streambank erosion in the Study area by identifying the sites where erosion is most likely to occur based on a review of historical data, the findings of recently published reports, and field investigations. Bank failure mechanisms considered both longitudinal erosion during high and moderate flow events and wind and boat generated waves during lower stage periods. The risk of levee-threatening erosion at each of the identified sites was assessed based on bank geometry, berm width, bank slope stability, bed scour, and the composition of the soil material comprising the streambank. Using these criteria, SAFCA's geomorphology consultant, Northwest Hydraulic Consultants, determined the likelihood that erosion could threaten the levee in the next ten years and classified the risk as 'high', 'moderate', or 'low'. Sites classified as high risk also indicate current conditions that could threaten the levee in a single severe flood season or erosion episode. These designations were used to prioritize improvement efforts.

2.3.5 Needed Improvements

The Study assumed that the principal method of addressing identified problems in Study 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. One of the purposes of the Study was to characterize the likely magnitude, cost and prioritization of the needed improvements. While there is room for consideration of alternative techniques, particularly for treating underseepage deficiencies, assuming that established techniques would be used has expedited this effort. At the same time, the Study has pointedly included a conceptual assessment of the option of constructing a new secondary levee in the upper reach of the Natomas area set back about 1,000 feet from the existing Sacramento River east levee. This option would address identified problems in a limited portion of the Study area and could be combined with the established techniques in the remainder of the area depending on environmental, permitting, and cost considerations.

3.0 HYDROLOGY AND HYDRAULICS

3.1 BACKGROUND AND PURPOSE

An essential element of the Levee Evaluation Study was the development of an appropriate 1/200 AEP water surface elevation for purposes of assessing the performance of the levees in the Study area and developing a program of improvements to address identified deficiencies. Toward this end, MBK developed flood profiles using a modified version of the Corps' Comprehensive Study UNET model. A summary of the approach taken to accomplish this work is described below. Detailed supporting information is contained in the "Design Water Surface Profile for the Sacramento River East Levee and Natomas Cross Canal Levees in Natomas" dated August 9, 2005 prepared by MBK Engineers.

3.2 HYDROLOGY

The profile for the 1/200 AEP flood was developed based on the Comprehensive Study Sacramento River Basin UNET hydraulic simulation model for twelve hypothetical storm centerings in the Sacramento Valley. These centerings relied on historical flood patterns to define the shape and magnitude of the flow contributions from each of the major basins in the Valley, and were designed to stress specific locations in the SRFCP system. For example, the Sacramento River at Latitude of Sacramento centering was designed to place the most stress on the system at the latitude of Sacramento. A review of preliminary simulations made with the various centerings indicated that the Sacramento River at Latitude of Sacramento centering (Sac Centering) and the Feather River at Shanghai Bend centering (Shanghai Centering) produced the most flow and the highest water surface elevations in the Study area.

3.3 HYDRAULIC MODEL

The MBK version of the Comprehensive Study UNET model adopted for SAFCA's Lower Sacramento River Regional Plan study effort (MBK model) was used to route the selected flood profile through the flood control system so as to establish appropriate water surface elevations in the channels around the Natomas area. UNET is a one-dimensional unsteady open-channel flow model that was developed by, and is supported by, the Corps' Hydrologic Engineering Center. The downstream boundary of the Comprehensive Study UNET model is the Sacramento River at Collinsville, and the upstream boundaries on the major rivers are:

Sacramento River	Woodson Bridge (River Mile 215.5)
Feather River	Thermalito Afterbay Outlet (River Mile 58.6)
Yuba River	Engelbright Reservoir (River Mile 22.0)
Bear River	Wheatland Gage (River Mile 12.5)
American River	Fair Oaks Gage (River Mile 22.0)

The topographic information in the model was surveyed by the Corps in 1998.

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3.4 WATER SURFACE ELEVATION VARIABLES

In order to develop appropriate 1/200 AEP water surface elevations for the channels around the Natomas area, the MBK model had to account for the following variables:

- The effect of authorized American River projects on outflows from Folsom Dam;
- Potential levee failures along the Sacramento and Feather River systems upstream of Natomas;
- Potential failure of the Sacramento River west levee into Upper Elkhorn (RD 1600); and
- Future modifications to the SRFCP.

3.4.1 American River

Peak flows in the Lower American River affect the 1/200 AEP water surface elevations in the Study area along the north levee of the American River and the lower reach of the east levee of the Sacramento River. These flows are controlled by the operation of Folsom Dam and the condition of the levees along the American River upstream of Natomas. Several projects have been completed or are underway to improve these facilities. These projects include:

- Lower American River Common Features FEMA Certification – Completed in 2004.
- Lower American River Common Features – Anticipated completion in 2008.
- Folsom Dam Variable Space Storage Operation (400-670) – Implemented in 1994.
- Folsom Dam Outlet Modifications Project – Anticipated completion in 2013.
- Folsom Dam Revised Variable Space Storage Operation (400-600) – Anticipated implementation in 2013.
- Folsom Dam Forecast Based Operation – Anticipated implementation in 2013.
- Folsom Dam Raise Project – Anticipated completion in 2021.

Collectively, these projects will significantly reduce peak flood flows on the Lower American River. The MBK model assumed that all of these projects were in place, with the exception of the Folsom Dam Raise Project.

3.4.2 Upstream Levee Overtopping

Table 3-1 shows the locations of upstream levees where the water surface elevation of the selected 1/200 AEP flood profile exceeds the top of levee elevation. The MBK model has been calibrated to treat the effect of overtopping as creating a weir that allows a limited volume of flood water to flow over the levee and into the adjacent flood basin but without creating a breach.

TABLE 3-1: UPSTREAM LEVEE OVERTOPPING LOCATIONS FOR THE 1/200 AEP EVENT

Location	Bank	Mile	Design Deficient? (Yes/No)[1]
Sutter Bypass	Left	85.1-89.0	Yes
Wadsworth Canal	Right	3.0	Yes
Sutter Bypass	Right	78.7-84.1	Yes
Sacramento River	Left	92.3; 174.3-184.0	Yes (92.3)
Sacramento River	Right	74.5-77.0	Yes
Jack Slough	Right	5.5	NA
Yuba River	Left	6.5-6.8	Yes
Bear River	Right	1.8	Yes
Angel Slough	Right	16.0-23.0	NA
Best Slough	Right	0.5-4.5	NA
Yankee Slough	Left	7.3	NA
Yankee Slough	Right	7.3	NA
Auburn Ravine	Left	1.7	NA
Auburn Ravine	Right	1.7	NA
King Slough	Left	0.80	NA
King Slough	Right	0.99	NA
Curry Creek - Pleasant Grove Canal	Left	0.5-0.9	NA
Curry Creek - Pleasant Grove Canal	Right	0.5-0.9	NA
Pleasant Grove Creek	Left	0.8	NA
Pleasant Grove Creek	Right	0.8	NA
Pleasant Grove Canal	Right	0.5-1.5	NA
Pierce Roberts Drain	Right	0.6-0.8	NA

[1] *This is intended to show if existing top of levee elevation is deficient of the freeboard specified for the 1957 design profile.*
NA denotes 1957 design profile information not available.

3.4.3 Sacramento River West Levee Overtopping

All SRFCP levees were constructed and are maintained to provide a minimum freeboard between the levee crown and the water surface elevation corresponding to the "Federal Flood Control Project Design", which is commonly referred to as the "1957 Profile". The SRFCP design freeboard varies from reach to reach, but in general is 3 feet on the rivers and 6 feet on the bypasses. The Sacramento River west levee in Upper Elkhorn across the river from Natomas does not currently meet this standard because it has a low spot at River Mile (RM) 76.5 (roughly across the river from the westerly end of Riego Road in Natomas). Under existing conditions, this low spot is likely to be overtopped in flood events greater than the 1/100 AEP event, depending on the performance of upstream levees. Consistent with the approach taken to the overtopping of other SRFCP levees upstream of Natomas, the MBK model was calibrated to treat the overtopping of the RD 1600 Sacramento River west levee as a weir.

3.4.4 Future Modifications to the Sacramento River Flood Control Project

Several projects are currently being considered that will affect flows in the Feather River and the performance of the SRFCP levees upstream of Natomas. However, the likelihood of these projects being constructed and the timing of construction are uncertain. Accordingly, the only improvements incorporated in the MBK model are those necessary to correct the "design deficiencies" noted in Table 3-1. The model thus reflects the top-of-levee elevations from the Corps' Comprehensive Study UNET model.

3.5 1/200 AEP WATER SURFACE PROFILES

In the MBK model, the selected 1/200 AEP flood event is derived from a common profile representing a Shanghai Centering and Sac Centering storm. This profile produces the highest flows in the Study area compared to the other centerings. In order to establish these flows, the MBK model assumes that outflows from Folsom Dam will be 160,000 cfs and that neither the Sacramento River west levee in Upper Elkhorn nor the SRFCP levees upstream of Natomas will fail when overtopped. These assumptions produce water surface profiles that are conservative and exceed water surface elevations that are likely to ever reach the Study area. However, this scenario serves as an appropriate standard for identifying the long-term design requirements for the levees in the Study area given the health and safety consequences of an uncontrolled flood in Natomas.

3.5.1 Comparison of 1/200 AEP Profile to Gage Data

There are three gages in the vicinity of the Study area that can be used to compare the 1/200 AEP water surface profiles to other important flood profiles. Tables 3-2, 3-3 and 3-4 compare data at these gages.

Sacramento River at Verona (USGS 11425500) – This gage is located at Sacramento River UNET RM 78.75 (USGS RM 78.35) and is within the Study area.

TABLE 3-2: PEAK STAGES AND FLOWS AT THE VERONA GAGE

	Stage (ft, NGVD)	Flow (cfs)
1986 Flood	39.11	N/A
1997 Flood	39.09	N/A
1957 Profile	37.95	107,000
1/200 AEP profile	42.05	127,700

Sacramento River at I Street (DWR) – This gage is located at Sacramento River UNET RM 59.75 (USGS RM 59.4) and is just downstream of the Study area.

TABLE 3-3: PEAK STAGES AND FLOWS AT THE I STREET GAGE

	Stage (ft, NGVD)	Flow (cfs)
1986 Flood	30.68	115,000[1]
1997 Flood	30.38	107,520[2]
1957 Profile	31.15	110,000
1/200 AEP profile	33.46	141,600

[1]The 1986 flow was taken from the Sac Metro EIS.
[2]The 1997 flow is from a CDEC rating table and probably underestimates the discharge.

Yolo Bypass near Woodland (USGS 11453000) – This gage is located at Yolo Bypass UNET RM 51.1 and is adjacent to the Study area in the Yolo Bypass.

TABLE 3-4: PEAK STAGES AND FLOWS AT THE WOODLAND GAGE

	Stage (ft, NGVD)	Flow (cfs)
1986 Flood	31.46	374,000
1997 Flood	31.43	357,000
1957 Profile	31.00	377,000
1/200 AEP profile	34.10	469,800

4.0 LEVEE FREEBOARD

Levee freeboard is an essential design consideration that addresses the potential uncertainties associated with modeled water surface elevations and levee performance for targeted flood events. These uncertainties include variance in hydrologic estimates, unanticipated channel roughness, and unknown soil conditions in the levee foundation and cross section. In order to account for these uncertainties, the design criteria for flood control levees include varying provisions for levee freeboard depending on the design objective and the uncertainties affecting the performance of the levee.

The freeboard criterion used for this study is to obtain a minimum top-of-levee elevation three feet above the 1/200 AEP water surface profile. This criterion is similar to the standard used to evaluate freeboard for FEMA certification. It is recognized that additional levee height may be needed to address wind and wave run-up. This analysis will be included as part of the design process.

A comparison of the top-of-levee profiles in the Study area to the 1/200 AEP water surface elevations indicated there are no levee freeboard problems along the north levee of the American River as shown in Figure 4-1. Figure 4-2 compare the 1/200 AEP water surface profile to the top-of-levee profile for the east levee of the Sacramento River between the Natomas Cross Canal and the American River and Figure 4-3 provides a similar comparison for the south levee of the Natomas Cross Canal. These comparisons indicate freeboard problems in the upper 12 miles of the Sacramento River east levee and at nearly all locations along the Natomas Cross Canal south levee.

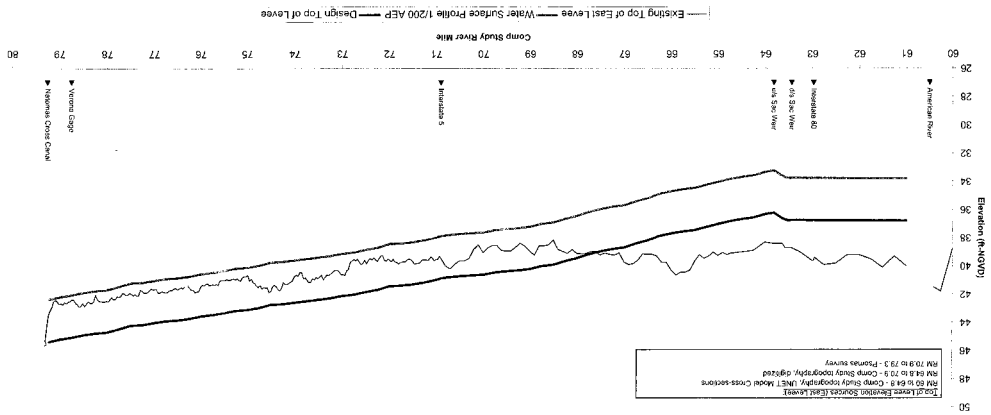


Figure 4-2: Comparison of Top of Levee and 1 / 200 AEP Water Surface Profile (with Levee Freeboard)
Sacramento River East Levee

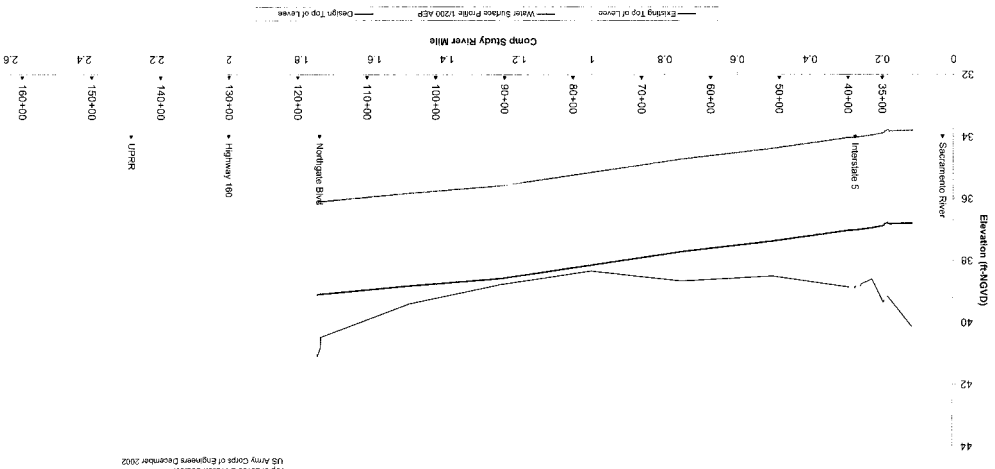


Figure 4-1: Comparison of Top of Levee and 1 / 200 AEP Water Surface Profile (with Levee Freeboard)
American River North Levee

5.0 LEVEE FOUNDATION AND SLOPE STABILITY

One of the main purposes of the Levee Evaluation Study was to evaluate how application of the new underseepage guidelines adopted by the Sacramento District of the Corps would impact the improvement of flood protection for the Natomas basin. Toward this end, a total of 86 borings were drilled to a maximum depth of about 170 feet along the Sacramento River east levee, Natomas Cross Canal south levee, and American River north levee. These additional borings supplemented the 286 explorations completed by others along these same levees. In addition to the borings drilled along the existing levees, 23 borings were drilled along the proposed alignment of the secondary levee option in the northern reach of the Natomas area. This supplemental drilling program resulted in at least one point of deep exploration completed for about every 1,000 linear feet of existing levee and 2,000 feet of the secondary levee alignment.

Laboratory testing on the boring samples was performed by Kleinfelder to further characterize the strength and permeability properties of both levee embankment and foundation soils. This information was used to create representative cross sections of levee embankments/foundations at multiple locations. Based on groupings of similar soil properties and levee configurations, each levee alignment was divided into discrete reaches. Analytical models were used to analyze seepage and stability conditions for various water surface conditions within each reach. The 1/200 AEP water surface elevations were used in combination with the new underseepage guidelines, including computed exit gradients, to identify levee foundation/stability deficiencies.

Historical levee performance documentation was also accumulated and reviewed to compare calculated seepage conditions to recorded observations. River geomorphology was used to identify reaches most likely to have permeable levee foundation deposits. Where computed exit gradients equaled or exceeded 0.50, or where exit gradients were slightly less than 0.50 but past observations indicated adverse conditions have in fact been present, the reach was rated as needing improvement. In those instances, the approximate depth of the cutoff wall needed to reduce exit gradients was identified. Other stabilization techniques such as seepage berms and/or relief wells could potentially be used. However, the cutoff wall option is considered appropriate for developing preliminary cost estimates and prioritizing the needed improvements.

The Tables 5-1 through 5-4 summarize the recommended remediation for identified seepage or stability problems for each of the levee reaches in the Study area.

Figure 4-3: Comparison of Top of Levee and 1 / 200 AEP Water Surface Profile (with Levee Freeboard)
Natomas Cross Canal

TABLE 5-1: SACRAMENTO RIVER CUTOFF WALL SUMMARY BY REACH

Levee Reach	Station	Length of Reach (feet)	Cutoff Wall Depth (feet)
1	0+00 to 48+00	4,800	
2	48+00 to 100+00	5,200	65
3	100+00 to 110+00	1,000	
4A	110+00 to 190+00	8,000	110
4B	190+00 to 228+00	3,800	110
5A	228+00 to 263+00	3,500	70
5B	263+00 to 280+00	1,700	70
6	280+00 to 330+00	5,000	110
7	330+00 to 362+00	3,200	
8	362+00 to 402+00	4,000	100
9	402+00 to 468+00	6,600	
10	468+00 to 495+00	2,700	50
11	495+00 to 635+00	14,000	30
12	635+00 to 667+00	3,200	
13	667+00 to 700+00	3,300	60
14	700+00 to 732+00	3,200	
15	732+00 to 780+00	4,800	50
16	780+00 to 832+00	5,200	
17	832+00 to 842+00	1,000	55
18	842+00 to 857+00	1,500	
19A	857+00 to 875+00	1,800	65
19B	875+00 to 925+00	5,000	65
20	925+00 to 960+00	3,500	

TABLE 5-2: NATOMAS CROSS CANAL CUTOFF WALL SUMMARY BY REACH

Levee Reach	Station	Length of Reach (feet)	Cutoff Wall Depth (feet)
1	0+00 to 5+70	570	75
2	5+70 to 105+00	9,930	70
3	105+00 to 123+00	1,800	70
4	123+00 to 173+00	5,000	80
5	173+00 to 195+00	2,200	80
6	195+00 to 280+00	8,500	80
7	280+00 to 287+00	700	

TABLE 5-3: AMERICAN RIVER CUTOFF WALL SUMMARY BY REACH

Levee Reach	Station	Length of Reach (feet)	Cutoff Wall Depth (feet)
1	34+42 to 48+00	1,358	25
2	48+00 to 95+00	4,700	30
3	95+00 to 105+00	1,000	35
4	105+00 to 153+00	4,800	30

TABLE 5-4: PROPOSED SECONDARY LEVEE CUTOFF WALL SUMMARY BY REACH

Levee Reach	Station	Length of Reach (feet)	Cutoff Wall Depth (feet)
1S	12+00 to 42+00	3,000	27
2S	42+00 to 85+00	4,300	42
3S	85+00 to 137+00	5,200	45
4S	137+00 to 215+00	7,800	87
5S	215+00 to 280+00	6,500	57
6S	280+00 to 297+00	1,700	105

6.0 STREAMBANK EROSION

6.1 PURPOSE AND SCOPE

The Levee Evaluation Study included an assessment of the potential for levee-threatening erosion along the east bank of the Sacramento River and the south bank of the Natomas Cross Canal. The north bank of the American River was not included in this assessment because of the extensive width of the berm between the levee and the low-flow river channel in this reach. The objectives of the assessment were to identify locations where high flows in the affected channels up to and including the flows generated by the 1/200 AEP event could trigger a level of erosion sufficient to compromise the flood protection performance and integrity of the levee system. Potential erosion sites were identified based on historical data, the results of recently completed reports, and field inspections. The risk of erosion at each of the identified sites was evaluated based on the width of the berm between the levee and the low-flow river channel, the stability of the berm slope, the potential for scour along the toe of the berm, and the general character of the soil material comprising the berm. The risk of erosion was classified as 'high' where erosion was considered likely to compromise the levee system within a 10 year period, with emphasis on sites where a single severe flood season or erosion episode could threaten the levee; 'moderate' where erosion was considered likely to threaten the levee system within a 10 to 50 year period; and 'low' where the risk of erosion was considered a long-term concern.

6.2 EROSION SITE IDENTIFICATION

Erosion sites of concern were identified primarily by field assessment supplemented by a review of relevant historical data and the results of recent reports prepared by the Corps, MBK and others. Early on it was determined that the risk of erosion was greatest along the east bank of the Sacramento River and the effort focused primarily on this reach.

6.2.1 Historical Review

The site identification process included a brief review of historical information on land use, flood control system construction, and channel maintenance. This review focused on changes in hydrologic and sediment supply conditions that could affect bank stability. Historical aerial photographs and maps were examined to estimate changes in river planform and profile at erosion sites. Historical bathymetric and topographic maps from 1908, 1933, and 1997 (USACE) were used to estimate changes in channel depth. Historical aerial photographs from 1938, 1965, 1972, 1982, and 1986 were compared to current aerial photographs. The profile comparisons indicate that the channel bottom (or thalweg) in the project reach lowered (degraded) 0 to 10 feet in the period between 1908 and 1933, but significant general degradation between 1933 and 1997 is not evident. The degradation between 1908 and 1933 may be associated with transport of accumulated sediments from hydraulic mining downstream into San Francisco Bay. The aerial photograph comparison showed generally minor changes in planform and berm width over time in the Study area. Although specific changes were noted, general rates of bank migration appeared to be low.

6.2.2 Previous Reports

Bank erosion in the Study area has been monitored and assessed by a number of agencies and organizations, including the Corps through its "Sacramento River Bank Protection Project", the Department of Water Resources (DWR), and Reclamation District 1000 (RD 1000). Recent reports prepared by these agencies were reviewed to identify significant erosion sites along the east bank of the Sacramento River and also to provide some history of conditions at these sites. These reports identify high-priority sites where an actively eroding bank could reach a 30-foot buffer strip on the riverside levee toe within a 50-year period, based on projecting historical bank erosion or migration rates.

6.2.3 Field Inspections

Northwest Hydraulic Consultants (NHC) reviewed these previous erosion assessments and conducted a field inspection of the area on March 17, 2005. Only sites with a berm width between the top of bank and outboard toe of levee of less than 150 feet were inspected. As indicated in Table 6-1, fifteen sites were identified for further evaluation. These sites, which are shown in Figure 6-1, largely corresponded to sites previously identified by the Corps, MBK and others. In August and September of 2005, NHC conducted additional field inspections by boat and by vehicle in order to compile more detailed information at the identified sites.

TABLE 6-1: LIST OF IDENTIFIED EROSION SITES

Site	Station	Site Length, feet	Berm Width, feet
A	7+00 to 13+00	410	40 – 45
B	25+00 to 32+00	640	25 – 45
C	40+00 to 51+00	980	17 – 50
D	79+50 to 85+50	520	50 – 100
E	152+00 to 164+50	560	50
F	225+00 to 239+00	1360	85 – 90
G	278+00 to 294+00	1430	30 – 70
H	451+00 to 456+50	480	70 – 100
I	458+00 to 463+00	400	90 – 100
J	477+50 to 486+50	690	30 – 70
K	486+50 to 498+50	1170	0 – 50*
L	498+50 to 512+50	660	30 – 70
M	512+50 to 537+50	2490	35 – 70
N	545+00 to 556+00	1390	70 – 75
O	577+00 to 581+00	370	70 – 75

**Site K has a wide levee top; centerline of levee to top of bank is never less than 70 feet. Sacramento River Erosion Risk Assessment*

TABLE 6-2: EROSION RISK FACTORS AT THE ASSESSMENT SITES

Site	Slope Stability Factors			Scour		Bank Erosion		Other Factors [6]	Cumulative Erosion Risk [7]
	Encroachment on Levee Template [1]	Stratigraphy [2]	Slope below low water [3]	Bed Elevation near Toe (ft)[4]	Predicted Scour Elevation (ft) [4]	Previous Observations [5]	2005 Field Visits		
A	Toe of bank encroaches on levee template	Silty clay extends to below toe	2H:1V	Moderately steep; low water shelf on part of site	-8 (5 feet lower than mid channel)	-15	MBK noted no change since 1999; Ayres slow retreat; WET low historic rates	Very steep at w/l; roots of shrubs exposed	Riprap u/s and d/s; loss of rock at this site	High
B	Toe of bank 30 ft outside levee template; low water shelf close	Silty clay extends to below toe	4H:1V	Moderately steep; low water shelf about 5-15 feet wide	-13	-15	MBK noted erosion extending d/s; WET low historic retreat rates	Sparse vegetation than at Sites A or C	Riprap u/s and d/s	Moderate
C	Toe of bank and low water shelf within levee template	Silty clay extends to below toe	4H:1V	Steep above low water; shelf extends to 10 ft on part of site	-2 or -3 (bed roughly flat)	-15	MBK noted erosion is extending u/s, Ayres critical due to dowtnd trees; reported 7 feet of scour at toe since 1997, WET low historic retreat rates	Fallen trees at u/s end; vegetation characteristic of moisture	Riprap u/s and d/s; wing walls opposite; tree collapse from bank retreat at lower end of site	High
D	Toe of bank 10 ft outside template	Silty clay extends to below toe	2H:1V	Shelf; steep above, flatter may encroach on levee	-8 (8 feet lower than mid channel)	-15	MBK and Ayres noted no change since 1999	Erosion above vertical silty clay layer exposing roots of shrubs	Riprap u/s and d/s; intake results in eddies and bank erosion at u/s end; loss of rock	High
E	Toe of bank 40 ft outside template	Silty clay extend to below toe	Shallow	Steep slopes above low water	+2 (deeper on opposite bank)	-12	MBK noted erosion began after 1999	Bank well-vegetated; trees fallen; slump scars above low water	Small bank failures	Low
F	Toe of bank 75 ft outside template	Silty clay extends to below toe	Shallow	Moderately steep; near-vertical at d/s end; narrow beach	-5 (shallow slope near toe)	-12	MBK noted no change since 1999	Bank heavily vegetated; fallen trees at d/s end	Fallen trees	Low
G	Toe of bank near template	Sand and silty sand to depth	3H:1V	Very steep behind beach; future may encroach on levee	-8	-12	MBK noted site is longer than in 1999 to upstream	Bank near vertical; mostly unvegetated; shelf extends out 15 feet	Bank vegetation on d/s half of site	High
H	Toe of bank 90 to 100 feet outside template	Silty clay to below toe	4H:1V	Steep	-5	-10	N/A	Bank mostly unvegetated; a few cottonwoods	Rock on levee slope	Low
I	Toe of bank 60 foot outside template	Silty clay to below toe	2-3H:1V	Moderate at u/s end; steep d/s	-5	-10	MBK noted no change since 1999	Sloughing on steep slopes in d/s half; small terraces	Active slumping of bank	Moderate
J	Toe of bank and low water line just outside template	Silty clay over silty sand	3H:1V	Moderately steep; failure may encroach on levee	-5 (section flat near left bank)	-10	WET notes moderate retreat rate	Slumps on bank; steep narrow beach	Bedcharge point and bank protection at d/s end. No shelf or bench observed off shore	High

Figure 6 - 1 Erosion Site Locations

6.3 EROSION RISK ASSESSMENT

6.3.1 Risk Factors

A critical factor for evaluating the risk of levee failure at each erosion site was encroachment of the most critical cross section at the site on the levee template, defined as a projection of a 3 horizontal to 1 vertical slope from the waterside hinge point of the levee crown. Encroachment was typically observed either at the toe of the bank or near the low water elevation where bank retreat from wave and river erosion had resulted in steepening that part of the profile. Levee stability was considered most likely to be threatened at locations with potential for slope failure and erosion with encroachment at the toe of the bank. Slope failure associated with encroachment on the levee template at the low water elevation may or may not result in levee failure. At some sites, a failure of the toe at the low water elevation might erode only part of the berm; at other sites, with different geometries, the slope failure might erode the levee prism.

Other significant risk factors were the steepness of the bank slope above and below the low-flow waterline (steeper slopes are more likely to result in a failure of the entire embankment and may indicate bed scour), the composition of the soils comprising the bank and scour as evidenced by the deepening of the bed so that slopes encroach on the levee template, the steepening of already steep slopes, or signs of recent bed adjustments. Finally, active bank erosion, particularly wave erosion generated by wind and boat wakes during low flow periods, sparse vegetation, and trees that have fallen into the river or unstable trees that are likely to fall, were considered risk factors for erosion. Well-vegetated banks reduce the risk of fluvial erosion on the upper bank, but do not affect potential erosion and failure at the toe of the bank.

6.3.2 Site Priorities

The basic approach to assigning risk priorities was to assign an initial priority based on the apparent risk of slope failure and then adjust it by considering other factors. Consequently, high priorities were assigned to those sites where:

- the toe of the bank lay inside or very near to the levee template and the slope below the waterline was reasonably steep, scour depths were below bed elevations at the toe, or the local bed had been observed to be lowering; or
- the toe of the bank lay outside the levee template but there was a risk of cantilever failure based on the estimated stratigraphy; or
- the bank at the low water elevation (the contact between the floodbasin deposits and the alluvial deposits) lay inside the levee template and there was a potential for a failure originating at the contact to intersect the levee prism. If the failure seemed unlikely to intersect the levee prism, the site was ranked as moderate.

Moderate priorities were assigned to sites where:

- the toe of the bank lay reasonably close to the levee template but the slope below the waterline was moderate and general scour elevations were not very far beneath the local bed level; or
- the bank at the low water elevation (the contact between the floodbasin deposits and the alluvial deposits) lay inside the levee template but a individual failure is unlikely to intersect the levee prism; or

Site	Encroachment on Levee Template [1]	Slope Stability Factors: Stratigraphy [2]	Slope below low water [3]	Slope above low water [3]	Bed Elevation near Toe (ft) [4]	Scour: Predicted Scour Elevation (ft) [5]	Bank Erosion: Previous Observations [6]	Bank Erosion: 2005 Field Visits	Other Factors [5]	Cumulative Erosion Risk [7]
K	Toe of bank 20 feet outside template	Silty clay over silty sand	4H:1V	Moderate to steep	-8 (deepest on left bank)	-10	WET notes moderate retreat rate	Abundant bank vegetation; 10-15 trees fallen; causing scour	Tree fall is a local erosion issue	Moderate
L	Toe of bank 30 feet outside template	Silty clay over silty sand	3H:1V	Steep	-8 (deepest on left bank)	-10	MBK noted active erosion; WET moderate retreat rate	A few large trees undercut, steep in clay; wave cut	Tree fall is a local erosion issue	Moderate
M	Toe of bank and low water line near levee template	Silty clay over silty sand	3H:1V	Moderate to steep	-5	-10	MBK noted active erosion; WET moderate retreat rate	Sparse vegetation extends to w/h; active erosion along part of bank	Active erosion at water line; now repaired	High
N	Toe of bank 75 feet outside template	Silty clay over silty sand	Shallow	Moderate	0	-10	MBK noted no change since 1999 d/s of site	Bank heavily vegetated; local erosion at wing dams	Wing dams at ends and middle of site	Low
O	Toe of bank 100 feet outside template	Silty clay over silty sand	Shallow	Moderate	0 (deepest on right bank)	-10	N/A	Sparse vegetation; shelf near water line	Inside of bend	Low

[1] Encroachment estimated from typical section for each site extracted from MBK topography and bathymetry and 3H:1V levee template extending from high point on levee crest. Bank slopes were interpreted from these sections.
[2] Stratigraphy roughly interpreted from boring results along levee crest and toe. Levee materials and a silty sand overlie the materials described.
[3] Predicted scour elevations are for general zone.
[4] Elevation of bed and general bed conditions interpreted from cross sections.
[5] Extracted from field notes and site observations. Refer to factors that might affect erosion, other than those included in the table.
[6] Ayres refers to Ayres Associates (2002); MBK to MBK Engineers (2004); WET to Water Engineering & Technology (1991).
[7] "High" refers to sites where erosion was considered likely to compromise the levee system within a 15-year period, with repairs on site where a single severe flood season or erosion episode could threaten the levee. "Moderate" refers to those sites where erosion may threaten the levee over the next 10-50 years. These sites are ones that have a higher priority of requiring repairs or remediation in the near term. "Low" refers to those sites that might threaten the levee over the next 50 years but have little potential to require improvements in the near term.

- the toe of the bank lay from 20 to 50 feet from the levee template and the risk of slope failure was low to moderate but erosion appeared to be very active or specific site factors, such as lack of vegetation, structures, or fallen trees suggested that erosion might proceed very quickly during a large flood.

The remaining sites were assigned a low priority. Their typical characteristics were:

- the toe of the bank lay more than 40 feet from the levee template, slopes below the low water elevation were shallow, banks were vegetated and erosion was not very active and did not appear to have been active historically.

One of the consequences of bank erosion is the shortening of seepage paths and the resulting impacts on levee stability due to underseepage. This was not considered directly in the priority scheme described above. However, at sites where seepage was identified as a concern, the erosion risk priority was altered if it appeared that erosion was active and might affect the potential for underseepage over a typical time frame of 10 years. Sites were reviewed with Kleinfelder to determine sensitivity of underseepage potential to erosion. Only one site was adjusted: Site G was raised from a "moderate" to "high" priority. Table 6-2 summarizes the risk factors and risk priorities assigned to each of the fifteen identified erosion sites. This summary indicates that ten of the fifteen sites qualify as either 'high' or 'moderate' priority sites.

7.0 NEEDED IMPROVEMENTS

7.1 BACKGROUND AND PURPOSE

One of the principal purposes of the Levee Evaluation Study was to characterize the likely scope and cost of the improvements needed to address identified problems in Study area levees. Toward this end, the Study assumed that identified levee freeboard, levee foundation stability, and streambank erosion problems would be addressed using established techniques previously employed under similar circumstances along the Lower American River and Sacramento River. These techniques include levee raising to address freeboard problems, levee strengthening through the construction of cutoff walls to address underseepage problems, and streambank stabilization through a combination of rock armoring and bank re-vegetation to address erosion problems. Other techniques could be employed, particularly to address underseepage problems. However, because the established techniques are well known and reliable, they were used in this instance to facilitate the scoping and cost estimating tasks.

At the same time, the Study identified construction of a secondary levee as an option to raising and strengthening the existing levee in place along a 5-mile stretch of the east levee of the Sacramento River in the northern portion of the Natomas Basin. This option was included because of the advantages associated with new levee construction along an alignment removed about 1,000 feet from the active river channel versus refurbishment of the existing levee in its current location adjacent to the active river channel. Accordingly, the Study included an initial cost estimate for a secondary levee, while recognizing that this option would be subject to a much wider range of uncertainty regarding environmental constraints, permitting obstacles, and construction timing than the established levee raising and strengthening techniques.

7.2 ESTABLISHED TREATMENTS

7.2.1 Levee Raising and Strengthening in Place

The established treatments for inadequate levee freeboard and unstable levee cross sections and/or foundations are levee raising and levee strengthening through construction of cutoff walls. These treatments have been extensively employed throughout the Lower Sacramento Valley, including along the diversion channels east of Natomas and portions of the Lower American River. In the Study area, the evaluation of levee freeboard problems indicated a need for a relatively minor amount of levee raising along an 12-mile portion of the east levee of the Sacramento River in the upper reach of the Natomas Basin and along most of the length of the Natomas Cross Canal south levee. As shown in Figures 4-2 and 4-3 above, the levee in these reaches would need to be raised to provide at least three feet of freeboard on the 1/200 AEP water surface profile. In order to address identified seepage and stability problems, cutoff walls of varying depths would be needed along several reaches of each of the three Study area levees. These reaches and the relative slurry wall depths needed to maintain levee stability are shown in Tables 5-1, 5-2 and 5-3 above. A conceptual diagram of the levee raise and slurry wall treatment is shown in Figure 7-1. The locations of required levee freeboard raises and seepage cutoff walls are illustrated in Figure 7-2.

The estimated cost of levee raising for freeboard and cutoff walls for seepage, as well as the total cost of all required treatments, is shown by levee reach in Table 7-1. The estimated total cost for all

improvements is approximately $300 million, which includes a contingency, escalation to assumed year of construction (2007), allowance for change orders during construction, and an estimate of non-construction costs (environmental mitigation, planning and engineering, construction management and regulatory permitting).

7.2.2 Erosion Control

The treatments needed to address 'high' and 'moderate' priority erosion sites were designed to stabilize the affected sites and minimize environmental impacts to riparian and fish and aquatic habitats. These treatments reflect the knowledge gained through more than a decade of experience with bank protection projects along the Lower American and Sacramento Rivers. Typically rock riprap was included in the bank protection design for each site to account for scour and to protect the areas that experience the greatest erosive forces, especially at elevations where vegetation is not expected to grow. Cobble or cobble/soil mixtures were used to provide slope protection above the rock riprap. Vegetative features were used where possible to stabilize the bank or proposed fill along the bank, and to enhance the riparian habitat of the site.

Based on the erosion risk assessment discussed above, ten high and moderate-priority sites along the east levee of the Sacramento River were identified for treatment. The locations of these sites are shown in Figure 7-2. The treatment length for each site was adjusted slightly from the lengths identified in the assessment, primarily to account for transitions and extensions in areas adjacent to the sites where bank erosion might be sensitive to construction of the proposed improvements. The ten sites represent a total length of treatment of approximately 11,100 feet. Figure 7-3 illustrates the typical cross section for one of the four erosion treatments that would be used at these sites and Table 7-2 indicates the selected treatment for each of the sites.

Table 7-1 includes the estimated construction cost for erosion treatments by levee reach. These costs were estimated using quantities developed by applying the typical treatments to topographic and bathymetric cross section data at each site. The site designs are intended to be constructed at least partially by barge. This assumption applies especially to the placement of rock and soil material. Barge placement might be supplemented by land-based equipment at some or all sites, and some landside access is assumed.

Unit costs were based on current pricing levels developed from unit costs on previous Sacramento and American River bank protection projects. Reasonably current pricing data is available for several projects that include the items included in the typical treatments. As discussed in Section 8.0, the cost of off-site mitigation was estimated based on past experience and professional judgment informed by the standard assessment methodology that has recently been developed to assess the environmental impacts and required mitigation for Sacramento River bank protection projects.

Table 7-1
COST SUMMARY

		Total	Erosion Protection	Freeboard	Under-seepage
Sacramento East Levee					
	Reach 1- Sta 00+00 to Sta 48+00	$6,576,000	$3,305,000	$3,270,000	$0
	Reach 2- Sta 48+00 to Sta 100+00	$8,083,000	$1,534,000	$956,000	$5,593,000
	Reach 3- Sta 100+00 to Sta 110+00	$571,000	$0	$571,000	$0
	Reach 4- Sta 110+00 to Sta 228+00	$24,120,000	$0	$2,131,000	$21,989,000
	Reach 5- Sta 228+00 to Sta 280+00	$6,160,000	$293,000	$885,000	$4,982,000
	Reach 6- Sta 280+00 to Sta 330+00	$10,860,000	$2,054,000	$817,000	$7,989,000
	Reach 7- Sta 330+00 to Sta 362+00	$1,479,000	$0	$1,479,000	$0
	Reach 8- Sta 362+00 to Sta 402+00	$6,805,000	$0	$739,000	$6,067,000
	Reach 9- Sta 402+00 to Sta 468+00	$2,809,000	$465,000	$2,344,000	$0
	Reach 10- Sta 468+00 to Sta 495+00	$5,337,000	$2,875,000	$456,000	$2,006,000
	Reach 11- Sta 495+00 to Sta 635+00	$14,058,000	$5,563,000	$0	$8,495,000
	Reach 12- Sta 635+00 to Sta 667+00	$5,000	$0	$5,000	$0
	Reach 13- Sta 667+00 to Sta 700+00	$2,906,000	$0	$0	$2,906,000
	Reach 14- Sta 700+00 to Sta 732+00	$5,000	$0	$5,000	$0
	Reach 15- Sta 732+00 to Sta 780+00	$3,687,000	$0	$0	$3,687,000
	Reach 16- Sta 780+00 to Sta 832+00	$5,000	$0	$5,000	$0
	Reach 17- Sta 832+00 to Sta 842+00	$858,000	$0	$0	$858,000
	Reach 18- Sta 842+00 to Sta 857+00	$5,000	$0	$5,000	$0
	Reach 19- Sta 857+00 to Sta 925+00	$6,288,000	$0	$0	$6,288,000
	Reach 20- Sta 925+00 to Sta 960+00	$5,000	$0	$5,000	$0
	Subtotal	$100,622,000	$16,089,000	$13,673,000	$70,860,000
American River Sta 34+42 to 153+00		$6,487,000	$0	$0	$6,487,000
Natomas Cross Canal Sta 0+00 to 280+00		$32,368,000	$0	$4,327,000	$28,041,000
PGCC and NEMDC Levee		$10,610,000	$0	$0	$10,610,000
	Subtotal	**$150,087,000**	**$16,089,000**	**$18,000,000**	**$115,998,000**
25%	Contingency	$37,522,000	$4,022,000	$4,500,000	$29,000,000
6%	Escalation	$9,005,000	$965,000	$1,080,000	$6,960,000
10%	Allowance for Change Orders	$15,009,000	$1,609,000	$1,800,000	$11,600,000
	Construction Subtotal	**$211,623,000**	**$22,685,000**	**$25,380,000**	**$163,558,000**
	Enviromental Mitigation	$3,850,000	$1,000,000	$1,425,000	$1,425,000
25%	Planning and Engineering	$52,906,000	$5,671,000	$6,345,000	$40,890,000
10%	Construction Management	$21,162,000	$2,269,000	$2,538,000	$16,356,000
5%	Regulatory Permitting	$10,581,000	$1,134,000	$1,269,000	$8,178,000
	Total	**$300,122,000**	**$32,759,000**	**$36,957,000**	**$230,407,000**

TABLE 7-2: EROSION SITE TREATMENTS

Site Designation	Risk Category	Approximate Location Levee Stations	Site Construction Length, feet	Typical Treatment Type 1
A	High	07+00 to 13+00	600	1
B	Moderate	25+00 to 32+00	700	2
C	High	40+00 to 51+00	1100	1
D	High	79+50 to 85+50	600	3
G	High	278+00 to 294+00	1600	4
I	Moderate	458+00 to 463+00	500	2
J	High	477+50 to 486+50	900	1
K	Moderate	486+50 to 498+50	1200	1
L	Moderate	498+50 to 512+50	1400	1
M	High	512+50 to 537+50	2500	4 and 1

7.3 SECONDARY LEVEE

As an alternative to levee raising and strengthening and erosion control treatments along the upper 5 miles of the east levee of the Sacramento River, consideration should be given to construction of a new levee set back approximately 1,000 feet to the east of the existing levee. This new levee would be designed to meet the same levee freeboard and underseepage design criteria and would therefore require a cutoff wall at depths specified in Table 5-4. However, through its location away from the active river channel, this alternative would largely avoid any need to address the ongoing erosion problems identified at Sites A through D in this reach of the Study area.

The possible alignment of the new levee is shown in Figures 7-4 and 7-5. This alignment largely occupies land owned by Sacramento International Airport (Airport), but also crosses land owned by The Natomas Basin Conservancy (TNBC) and a few smaller parcels of land currently in private ownership. The affected Airport land was acquired with Federal Aviation Administration (FAA) funds and is held subject to various restrictions on the use of the land, including restrictions on fish and wildlife enhancements that might conflict with Airport operations. Accordingly, the secondary levee alternative anticipates minimal changes to the current land use regime in the area between the new and existing levee alignments. The existing levee would continue to function as a local levee confining flows in the Sacramento River and as the Garden Highway. The new levee would ensure safe containment of the design flood in the event of a failure of the existing levee. A typical cross section showing the secondary (setback) levee and existing levee is provided in Figure 7-6.

The estimated cost of the secondary levee alternative ranges from approximately $354 million to $432 million depending on the source of material used to construct the new levee. This estimate includes a substantial cost for environmental mitigation based on environmental considerations and cost estimates for habitat replacement discussed in Section 8.0.

FIGURE 7-1: Levee Raise and Slurry Wall Treatment

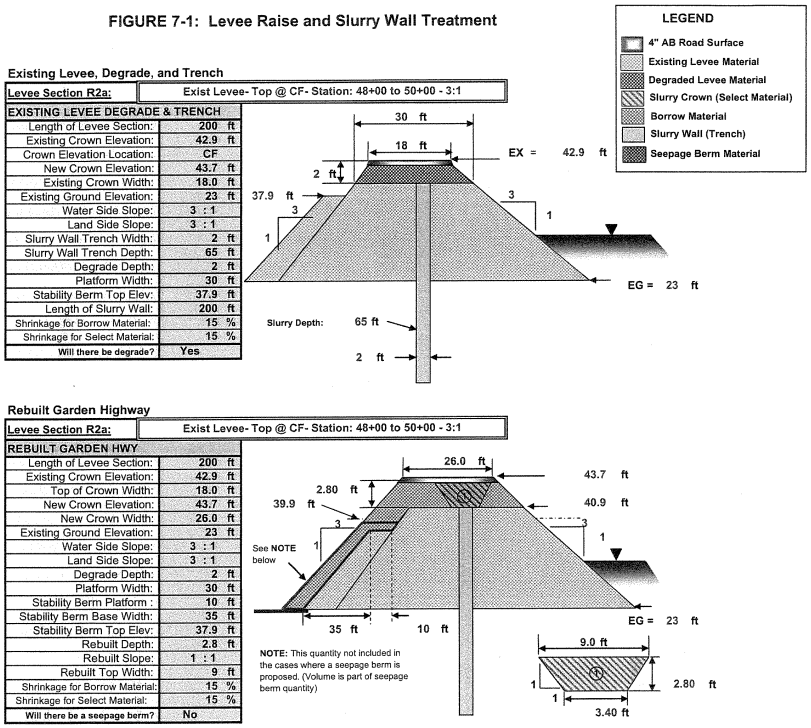


Figure 7-2
Location of Improvements

FIGURE 7-5

FIGURE 7-4

8.0 ENVIRONMENTAL CONSTRAINTS

8.1 BACKGROUND AND PURPOSE

The potential of the needed levee and streambank erosion improvements to cause significant impacts on biological and cultural resources in the Study area was a major consideration in evaluating the likely cost and permitting issues that might be encountered in proceeding with these improvements. Accordingly, as part of the Levee Evaluation Study, EDAW evaluated the potential effects of the identified levee treatments by comparing the footprint of these treatments with the locations of known sensitive resources and made a rough estimate of the scope and cost of the mitigation that might be required. NHC and Jones & Stokes Associates evaluated the potential effects of identified bank treatments using a recently developed Standard Assessment Methodology for bank protection projects along the Sacramento River and estimated the scope and cost of the mitigation that might be required for these treatments. These estimates are reflected in the cost tables provided in Section 7.0. The supporting evaluations are briefly discussed below.

8.2 IMPACTS AND MITIGATION FOR LEVEE TREATMENTS

8.2.1 Giant Garter Snake Habitat

The major biological resource concern raised by the identified levee treatments is the potential for loss of giant garter snake (GGS) habitat. This potential effect was evaluated based on GGS habitat maps prepared by Eric Hansen for TNBC and SAFCA. The most substantial loss of GGS habitat would result from construction of the secondary levee, although similar impacts would result from the need to relocate the ditches and canals near the landside toe of the levees to accommodate raising. The ditches providing habitat along the existing levee toe would need to be relocated, and aquatic habitat within existing rice acreage and along portions of the ditches that run perpendicular to the levee would be cut off inside the levee setback area and would need to be replaced. Ditch relocation would partially mitigate these losses, but it is anticipated that additional compensation would be required. The Natomas Basin Habitat Conservation Plan requires a replacement ratio of 0.5 acre of protected habitat for every 1 acre of GGS habitat affected. However, higher ratios have been required in the past for the loss of ditch habitat in the Natomas area. Accordingly, this evaluation assumed that the required mitigation ratio would be at least 1:1 and could be as high as 3:1. For comparative purposes, GGS mitigation costs were calculated based on a midpoint 2:1 ratio.

This cost estimate is based on the assumption that a traditional mitigation approach to the loss of GGS habitat would be pursued. However, such an approach may be infeasible because (1) it is unlikely that an adequate amount of land suitable for development as GGS habitat can be obtained within the Natomas basin, and (2) continuing to address GGS impacts in the basin on a ditch-by-ditch and reach-by-reach basis may be of limited ecological value and, therefore, not supported by the U.S. Fish and Wildlife Service (USFWS). Therefore, it may be preferable to coordinate with other stakeholders, including TNBC, DFG and USFWS, to develop a basin-wide strategy that compensates for the GGS impacts of the needed levee improvements and other ongoing and planned projects, helps address Airport safety issues (the need to move ditches providing GGS habitat farther from runways), and enhances the connectivity of GGS preserves in the basin. Such an approach

Figure 7-6 : Secondary Levee - Typical Section

would likely be embraced by USFWS and could provide cost-sharing opportunities that could substantially reduce the cost of mitigation for the needed levee improvements.

In addition to the issues discussed above, potential timing constraints exist in relation to any construction that would occur within 200 feet of GGS aquatic habitat. In general, construction is restricted in these areas to the period of May 1 to October 1, and careful monitoring of construction activities is required during this period.

8.2.2 Swainson's Hawk Habitat

Primary impacts on Swainson's hawk are related to loss of foraging habitat and to nest disturbance during construction. The evaluation of these potential impacts was based on data compiled by Jim Estep during annual surveys for TNBC. Active Swainson's hawk nests have been documented throughout the Natomas Basin in the last 5 years. These data indicate that there is a high potential for active nests to be present within one-quarter mile of the levees in any part of the Natomas Basin, resulting in a need for consultation and coordination with the California Department of Fish and Game (CDFG) regarding any construction timing during the nesting season. Constraints on the timing of work in areas closest to nests are most likely during April through June, when the most nests are active. Some potential exists for the removal of nest trees where the north end of the setback levee alignment crosses a riparian area and at waterside erosion sites. However, it is assumed that such losses will be avoided, and mitigation for loss of nest trees was not factored into the preliminary mitigation cost estimate. There would be a loss of foraging habitat for Swainson's hawk along the secondary levee footprint that could be mitigated through promotion of cropping patterns that enhance foraging opportunities in the area between the levees.

8.2.3 Cultural Resources

There is a high potential for the presence of previously unknown buried prehistoric resources in floodplain areas. Several historic and prehistoric resources have been documented in the project vicinity, and the site documentation indicates that two prehistoric sites may be directly affected by construction activity. In addition, based on EDAW's experience in other riverside areas, it is assumed that 10 archaeological deposits may be discovered during ground-disturbing activities and that half of these may require formal site testing, while half may be addressed with less intensive investigation efforts. Because of the sensitivity of the area for significant cultural resources, much of the levee improvement work will need to be monitored by an archaeological monitor and a Native American monitor.

8.2.4 Cost Estimate

The potential costs associated with mitigation for terrestrial resource impacts of the identified levee improvements are difficult to assess in the absence of information on site-specific footprints, likely construction practices, and coordination with resource agency personnel. Nevertheless, Table 7-1 includes the estimated environmental mitigation costs associated with the identified levee improvements. Similarly, an estimate of the corresponding environmental mitigation costs was included in the estimated costs for the secondary levee alternative. For cost-estimating purposes, it was assumed that no substantial biological resource benefits would be provided by the project. Acreage calculations were based on the footprint of project features only and did not factor in any land use changes, and resulting biological resource effects, that may result from severing existing parcels.

8.3 IMPACTS AND MITIGATION FOR EROSION TREATMENTS

Bank protection projects commonly result in a suite of environmental impacts. However, experience has shown that impacts to habitat used by threatened or endangered fish species generate the most significant mitigation costs and the evaluation of erosion treatments focuses on these impacts.

8.3.1 Impact Assessment Method

The effects of the proposed treatments on fish and aquatic habitat in the Sacramento River were assessed using a simplified version of the Corps' final review draft of the Standard Assessment Methodology (SAM) for the Sacramento River Bank Protection Project (Stillwater Sciences 2004). The methodology permits the comparison of a species response index and total habitat value for both existing and with-project conditions. The methodology also permits the estimation of the amount of instream woody material (IWM) needed to minimize or prevent net impacts on fish habitat at a site.

Given the goals and purposes of the Levee Evaluation Study, the SAM evaluation involved a series of simplifying assumptions. One typical cross section showing the existing bank and the proposed bank protection was assumed to represent each entire bank protection site. The values developed for habitat variables focused only on habitat requirements of juvenile rearing life stages of Chinook salmon, whereas a full assessment would explore requirements of steelhead, as well as salmon adults and smolts. Existing conditions were assessed based on reconnaissance visits via boat and landside access, including extensive site photography, but not on systematic surveys (using transects or other survey methodology) of parameters such as IWM, overhead cover, etc. With-project conditions were represented by formulating average conditions over a 50-year period, rather than by assessing conditions at several discrete points in time.

8.3.2 Impact Assessment Results

This preliminary evaluation indicated that the proposed bank treatments would have a relatively small impact on habitat quality of fish species of concern. The treatments are designed to armor the bank toe and only as much of the lower bank as is necessary to arrest channel widening, leaving most of the existing bank vegetation intact. Moreover, a soil body would be created in all but one of the treatments to allow planting of riparian vegetation very near the edge of water. Finally, IWM would be anchored to the surface of the revetment in amounts at least equal to existing amounts and exceeding them at all but one site. These actions apply to both Treatment Types 1 and 2, and the assessment does not show an apparent difference in their habitat effects.

8.3.3 Mitigation Cost Estimate

Based on the results of the impact assessment, costs have been calculated to account for design components in addition to rock and soil placed for bank protection. These components include establishment and maintenance of plantings of riparian species in the soil bench (at all sites but Site D); establishment and maintenance of plantings in existing gaps in existing bank vegetation, estimated to be 0.3-0.6 acre; and installation of IWM. These costs are included in the erosion protection costs by levee reach in Table 7-1 and in the estimated cost of the secondary levee alternative. In both cases an allowance for an offsite mitigation project is included in the environmental mitigation cost. This covers the condition where impacts are significantly greater than estimated herein and mitigation using onsite IWM is not sufficient to provide full mitigation.

9.0 100-YEAR FLOOD PROTECTION

As discussed in the introduction to this report, the Corps concluded in 1998 that as a result of the levee raising and strengthening work accomplished as part of the Sacramento Urban Levee Reconstruction Project and the North Area Local Project, the Natomas area had adequate protection to safely contain a 100-year flood. In rendering this conclusion, the Corps acknowledged that portions of the east levee of the Sacramento River had less than the normally required 3 feet of freeboard on the 100-year water surface elevation. This was considered acceptable because this levee performed well during the 1997 high water event and because the Corps anticipated that the Sacramento River east levee would be raised in the near future as part of the Common Features Project. In addition, the Corps assumed that ongoing erosion in the Sacramento River channel would be addressed either as part of routine local levee maintenance efforts or as part of the Sacramento River Bank Protection Project. The Corps 1998 evaluation focused on levee stability, through-levee seepage, shallow foundation seepage and hydraulic channel capacity, which at the time were recognized as the most serious threats. The threats from erosion, waterside instability and deep underseepage were not as well understood by the Corps and the geotechnical engineering community of practice or by State and local agencies.

The 1997 high water event in the Sacramento Valley and the resulting failure of some of the SRFCP levees started to alter the geotechnical engineering community's understanding and approach to the deep underseepage issue. The Corps' post-flood assessment indicated that deep underseepage was a potentially significant contributor to levee instability and failure during the flood. As a result, in 2000, the Corps, in concert with the State and SAFCA, initiated an evaluation of the underseepage risk in Natomas as part of the authorized Common Features Project. Boring data was collected along the south levee of the Natomas Cross Canal and the east levee of the Sacramento River and an initial assessment of the work needed to address identified problems was completed. Because of the magnitude of the remedial work, and because deep underseepage was a newly identified concern in the Sacramento Valley, the Corps and its non-federal partners determined that before proceeding further, a panel of experts should be convened to establish appropriate guidelines for evaluating the risk of underseepage and to develop appropriate design standards for remedial measures. The panel completed its work in 2004, recommending evaluation and design guidelines that were adopted by the Corps' Sacramento District. The Corps subsequently re-analyzed the boring data that it had earlier collected using these guidelines, summarizing their findings in a report dated November 2005. Assuming water surface elevations in the channels around Natomas produced by a 1/100 AEP flood, the Corps determined that at some locations, calculated exit gradients exceeded the adopted guidelines for seepage and the borings indicated a potential for subsurface permeability that, if not addressed, could threaten the stability of the affected levees.

Although SAFCA's Levee Evaluation Study focused on 1/200 AEP water surface elevations, because of the importance of the Corps' 100-year flood determinations it was decided that SAFCA's underseepage analysis would include evaluations that were based on water surface elevations approximately representing the 1/100 AEP flood event to allow comparison with the results of the Corps' re-analysis. These water surface profiles were developed and the levee sections were evaluated to determine exit gradients and to identify other subsurface indications of risk to the affected levees. This data, which have been provided to the Corps, the Reclamation Board and local flood managers, confirms the Corps' earlier results. At some locations, the calculated exit gradients exceeded the adopted guidelines and the borings showed a potential for subsurface permeability that

could threaten levee stability. The data indicates that the risk of levee failure is greater than was previously thought and underscores the urgency of continuing public education efforts to communicate this risk, reinforcing the importance of flood insurance as a key risk management tool for property owners in the Natomas area, and rapidly implementing the improvements identified in the Levee Evaluation Study.

10.0 CONCLUSIONS

The Levee Evaluation Study indicates that a considerable amount of work is needed along the south levee of the Natomas Cross Canal, the east levee of the Sacramento Levee, and the north levee of the American River in order to provide the Natomas area with at least a 200-year level flood protection and move the area to a 'low' risk status.

The needed improvements would address levee freeboard, levee foundation stability, and streambank erosion problems identified in connection with the 1/200 AEP flood in the Study area.

The Study also indicates that the risk of flooding at the 100-year level is greater than previously assumed, underscoring the urgency of expediting the higher priority improvements.

The estimated cost of addressing the problems identified by the Study is about $300 million.

In determining improvement priorities and developing financing strategies for the identified problems, consideration should also be given to construction of a secondary levee in the upper reach of the Natomas area.

Construction of a new levee set back from the active river channel would reduce erosion concerns and avoid the uncertainties associated with refurbishing a portion of the existing east levee of the Sacramento River. It is estimated that when combined with established levee strengthening and bank protection techniques in the lower reaches of the Natomas area, the secondary levee alternative would add approximately $54 million to $132 million to the total cost of the needed improvements, depending on the source of material used to construct the new levee.

Environmental considerations will significantly affect the timing and cost of constructing the needed levee and streambank protection improvements. In order to reduce project costs and minimize construction delays, the improvement program should include a comprehensive approach to mitigating unavoidable environmental impacts that complements ongoing habitat conservation efforts in the Natomas Basin and the Sacramento River channel.

Natomas Levee Evaluation Study
Final Report *July 14, 2006*

ATTACHMENT A-1
Review Comments from Corps of Engineers
and SAFCA Response to Comments

JAB

SAFCA '06 MAY 30 PM 2:44

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO ATTENTION OF

May 26, 2006

Hydraulic Design Section

Sacramento Area Flood Control Agency
Mr. Stein Buer
1007 7th Street, 7th Floor
Sacramento, CA 95814-3407

Dear Mr. Buer:

The Corps has reviewed the public review draft document entitled "Natomas Levee Evaluation Report" dated March 13, 2006 and the appendices to this document. Our comments on the main document and on the appendices are consolidated in the enclosure titled "U.S. Army Corps of Engineers, Sacramento District, Technical Review Comments on the Public Review Draft Natomas Levee Evaluation Report and Associated Appendices."

In general, the Corps is in agreement with the findings of the report, especially in the areas of erosion, seepage, and freeboard deficiencies for portions of the levee system protecting the Natomas area. However, the Corps is not in complete agreement regarding recommended remedial actions. Our specific concerns are outlined in a number of the review comments.

We commend your ongoing efforts to pursue 200-year level of flood protection for the greater Sacramento area, and look forward to continued cooperation between our agencies in that endeavor. If you have any questions regarding any of our comments, please contact the Project Manager, Ms. Veronica Petrovsky at (916) 557-7245.

Sincerely,

for Thomas E. Traller
Chief, Engineering Division

Enc

US Army Corps of Engineers, Sacramento District
Technical Review Comments on the Public Review Draft – Natomas Levee Evaluation Report and Associated Appendices

The following comments are provided to SAFCA based on technical review of the administrative draft version and the public review draft version of the "Natomas Levee Evaluation Report," dated February 2, 2006 and March 13, 2006, respectively, and its associated appendices. This report and its associated appendices were prepared for SAFCA by MBK Engineers, Kleinfelder, Northwest Hydraulic Consultants (NHC), Parsons Brinckerhoff, EDAW, and Jones and Stokes Associates. The comments are as follows and are broken out by the document or the appendix reviewed.

Main Document Comments

1. Section 4.0 Levee Freeboard, page 4-1. The Corps and SAFCA need to reach agreement on design of the top of levee profile.
2. A cut off wall alternative and specifics of location, length, depth and location should be reviewed as part of subsequent design to insure sufficient depth and proper length and location of the cutoff wall.
3. Executive Summary. Include definitions for 1/200 AEP water surface elevation and explain how this water surface is different than the 200-year flood elevation.
4. Executive Summary, fourth paragraph, last sentence. -Erosion of the existing levee will still need to be prevented.
5. Executive Summary, paragraph 5. The cost estimate does not appear to cover all deficiencies and the report was not a comprehensive look for all potential flaws or deficiencies. During the subsequent analysis, insure that access, encroachments, penetrations, wells, pumping plants, etc are addressed.
6. Section 2.3.3 Levee Foundation Stability, first paragraph. The third sentence states that the study followed the Geotechnical SOP #3 except for the number of soil borings. The SOP #3 covers many aspects of levee evaluation including geomorphology, in situ field tests, performance monitoring, blanket theory, recalibration of seepage models based on performance, etc. It is not clear what guidelines from SOP #3 were followed and which were not followed. Please clarify and indicate if this will be addressed during the design process.
7. Section 2.3.5 Needs Improvements: Request a copy of the site prioritization list.
8. Section Figure 7-6 Secondary Levee - Typical Section. The Corps will not support the use of a borrow area between the existing and new levee. Additionally, erosion protection should be provided on the new levee.
9. Section 10.0 Conclusion. Report should make clear statement on present FEMA certification of the Natomas levees or specific portions of the levees.

General: Comments on the draft appendices were provided earlier to SAFCA, and the resolution will in general be addressed during subsequent analysis and design activities as the project efforts proceed and documents are submitted for our review.

Appendix A Comments – Design Water Surface Profile for the Sacramento River East Levee and Natomas Cross Canal Levees in Natomas

Comments on the subject report (Appendix A) have been previously submitted, discussed and partially addressed. These are outlined in U.S. Army Corps of Engineers, Sacramento District, Memorandum, Subject: Natomas GRR PDT Concerns with SAFCA Natomas Levee Evaluation Project, CESPK-ED-D, 4 October 2005. A number of comments pertaining to hydrologic and hydraulic uncertainties are still pending resolution. These are as follows:

10. Cross Canal tributary concurrent and peak inflow hydrographs. 1997 flood event data provided in the Comp Study UNET model was used in hydraulic modeling in lieu of inflows concurrent to the 1/100 and 1/200 AEP Sacramento River flows. Additionally, 1/100 and 1/200 AEP peak flow hydrographs for these tributaries weren't used with concurrent Sacramento River flows/stages to determine a composite Cross Canal design profile.

11. The sensitivity analysis performed by MBK indicated little likelihood for significant revisions to the Sacramento River design profile based on changes to Cross Canal tributary inflows. However, the Cross Canal design profile was shown to be more sensitive by the same analysis and will therefore vary by more significant amounts with pending changes in hydrology

12. American River concurrent flow hydrographs. The American River and Sacramento River design flood flow concurrency assumption made in previous studies (a 1/200 AEP event on one and a 1/100 AEP event on the other) will be replaced by the composite hydrologic analysis planned for the Folsom Mods and Natomas GRR projects by the Corps. This analysis will produce better estimates of concurrent inflow hydrology for the American River and all of the Sacramento River tributaries within the Natomas project reach vicinity. The concurrent flows developed as part of the composite hydrology will influence stage in the vicinity of their confluence with the Sacramento River. The biggest potential effect would be from the American River. However, its backwater influence does not appear to extend far enough upstream to significantly effect the design profile in the vicinity of expected SAFCA project features.

13. Folsom Dam Operations. The American River inflow hydrographs used do not accurately reflect dam operations under proposed project conditions.

14. Arbitrary UNET model inflows hydrographs. A large number of inflows to the Comp Study UNET model were arbitrary inputs necessary for the model to run. Most of these same inflows remain in the MBK UNET model. Refinement of these inflows is required for local project specific analysis as described in the Comprehensive Study documentation. A number of these arbitrary inflows in the project vicinity will be replaced by the concurrent inflow hydrology to be developed as described in comment 12, above. The effects of the remaining arbitrary inflows have not been investigated, but theoretically will affect results by some unknown amount throughout the model.

Appendix B Comments – American River North Levee, Reclamation District 1000, Sacramento County, California

15. Water Surfaces. Paragraph 1.9 indicates that the 100-year water surface is based on 115,000 cfs from Folsom Dam. Corps has been using a discharge of 145,000 for the 100-year water surface. Comparing water surface elevations it appears that the Kleinfelder report value is a few tenths of a foot higher than what the Corps used. The apparent differences between the 115,000 cfs and the 145,000 cfs flow should be addressed. The Kleinfelder report value for the 200-year water surface is about 2.5 feet higher than their 100-year water surface. The Corps evaluation utilized a 2-foot difference between the 100-year and 200-year water surface used in the 26 January 1998 memo.

16. Past Performance Data. Section 4. LEVEE PERFORMANCE HISTORY cites historical documents 1938 maps and 1963 seepage areas map. To aid in the evaluation of seepage-related levee performance, correlations of river stage to observed "seepage" is required and it appears that these documents do not present this type of information. The 1987 Wahler report provides more recent information on seepage, however no boils were described. The only landside instability noted was in the 1987 Wahler report near the levee crown. It is not likely that levee through seepage was the cause for the instability since the phreatic surface and resulting seepage forces would be below the zone of reported instability.

17. Seepage Analyses. The exit gradients reported appear to be near surface gradients, however the 0.5 exit gradient criterion is for base of blanket gradients. However, it appears that the reported near surface gradients are less than 0.5. A general comment is that the Corps model results (Reference B) show generally lower phreatic surfaces than the Kleinfelder models. No seepage analyses models could be found for the cutoff wall condition. This would be needed to support the conclusions and recommendations for cutoff walls for controlling levee through seepage to provide the required stability by lowering the seepage forces.

18. Slope Stability Analyses. Laboratory direct shear strength tests for consolidated-drained conditions were performed on selected samples. All of the test results indicate apparent cohesion values over 500 psf for clays. The analyses utilized no apparent cohesion. Rationale should be provided explaining why the apparent cohesion values obtained from laboratory test results are ignored. No slope stability models could be found for the cutoff wall condition. This would be needed to support the conclusions and recommendations that resulting seepage forces due to the presence of the cutoff walls will result in meeting or exceeding the minimum factor of safety.

19. Report Conclusions and Recommendations. The report concludes that the potential for through seepage slope instability exists for the American River north levee. The report recommends cutoff walls, however no discussion could be found where alternatives to stabilizing the slope were discussed such as stability berms or drains, solutions that would be less disruptive to traffic and public convenience.

20. General Summary. Risk assessment of the American River north levee is recommended. The levee crown width along reaches where Garden Highway is located is at least 30 feet wide and would be considered an overbuilt levee. How far the failure surface extends into the levee crown and slope would provide some indication of the severity of the slope failure for the overbuilt levee. The past performance data has only one documented observation of slope instability, and that was noted near the levee crown, and not near the levee toe.

Appendix C Comments – Problem Identification Report, Sacramento River East Levee, Reclamation District 1000, Sacramento and Sutter Counties, California

21. Seismic Stability - Seismic stability and deformation analyses are not part of the current Corps standard of practice in levee evaluation and design.

22. Appendix D a minor point: The selected target minimum Factor of safety with respect to seepage was identified as 1.7. This appears to be in slight conflict with Corps guidance. However, the corresponding threshold exit gradient of 0.5 is in accordance with Corps practice. The difference occurs because the critical exit gradient was calculated to be 0.85, based on an assumed soil unit weight of 115 pcf.

23. SAFCA, the State and the Corps would be well served if the following documents were evaluated and compared to the findings in this study. These are only some of the most recent reports produced. Previous reports may also contain valuable information.

- URS Final Waterside Stability Report, American River Watershed Project (Common Features), Sacramento River East Side Levee Modifications, 22 January 2002.
- URS Final Geotechnical Waterside Stability / Erosion Report, LM 0.1 to 1.6, American River Watershed Project (Common Features), California Sacramento River East Side Levee and Berm Raising, 7 February 2002.
- URS Final Remediation Alternatives Report, American River Watershed project (Common Features), California, Sacramento River East Side Levee South of Powerline, 4 January 2002
- MWH Sacramento River East Side Levee Strengthening Project, Final On-Site Alternative Preliminary Design report Waterside Stability / Erosion Mitigation River Mile (RM) 78.0L, Sacramento and Sutter Counties, California, 26 July 2002.
- URS Final Supplemental Geotechnical Report for Reach North of Powerline Road, American River Watershed Project (Common Features), California, Sacramento River Levee and Berm, Sacramento CA, 6 December 2002.
- URS Final Geotechnical Report for Reach South of Powerline Road, American River Watershed Project (Common Features), California, Sacramento River Levee and Berm Strengthening, 17 September 2002.
- URS Final Geotechnical Report - Volume 1 and Volume 2, For Sacramento River East Levee and Natomas Cross Canal South Levee, Natomas General Reevaluation Report, American River Watershed Project (Common Features), California, 29 November 2005.

24. Both the URS and Kleinfelder studies used an exit gradient threshold value of 0.5 to assess performance even though the level of field explorations is not equivalent to the level recommended to support the use of 0.5. The URS report recommends an exploration and laboratory test program sufficient to bring the work into agreement with Sacramento District SOP #3 guidance.

25. Overall it appears that Kleinfelder has taken an appropriate conservative approach in their study.

26. On average the URS modeling predicted exit gradients slightly lower than the Kleinfelder modeling. However, at some locations / reaches the difference in calculated exit gradient is significant.

27. In the Kleinfelder study the exit gradients calculated for the 200-year WS for the most part were just slightly above the exit gradient calculated for the 100-year WS. For some reaches the models predict increases in exit gradient between .1 and .2. These reaches should receive a closer look.

28. It is not clear why the study selected the cutoff wall alternative for problem remediation. There are at least two other alternatives (relief wells and seepage berms) which should be evaluated. (See previous URS reports on alternative evaluation)

29. Cutoff wall construction will likely require excavation of the top of levee to build a working platform. Access and utilities will be disrupted. It is also likely the cut off wall will have to be constructed with a method other than by open trench "slurry wall" technique to reduce the risk of hydrofracture / blowout and subsequent excavation and rebuilding of an entire levee section.

30. A detailed evaluation is needed to confirm individual model results and confirm the proposed cut off wall selection as the best geotechnical alternative. Considerable technical discussion will be needed to arrive at an agreement on cutoff wall depth.

31. Based on our knowledge to date it appears there are several reaches of the Sacramento River east bank that need immediate attention to ensure the levee meets FEMA criteria for the 100-year event. These reaches are:

Reach	Seepage Model Station
2 - Station 48+00 to 100+00	70
4 - Station 110+00 to 228+00	195 & 217 Include Pumping Plant #2
5 - Station 228+00 to 280+00	249
10 - Station 468+00 to 495+00	486
13 - Station 667+00 to 700+00	687
15 - Station 732+00 to 780+00	768

Confirmatory explorations and testing and engineering analyses should proceed expeditiously.

32. The exploratory holes for the set back levee option appear to support a conclusion that subsurface conditions in this geologic environment are quite variable. The interpretation of subsurface conditions and seepage models for the existing levee should take into consideration the findings at the set back levee sites.

33. Assuming the existing array of piezometers along the Sacramento River levee were read during the high water of January 2006, the seepage models should be updated utilizing this new information.

34. I recommend that a Natomas Geotechnical Committee be formed (similar to what we had for the GRR) to assist SAFCA in moving forward with their work. The committee should include Geotechnical Engineers from SAFCA, the State, and the Corps. This Committee can resolve technical issues concerning subsurface interpretations, selected engineering parameters, and modeling results on a continuing basis.

Appendix D Comments -- Problem Identification Report, Natomas Cross Canal South Levee, Reclamation District 1000, Sutter County, California

35. Soil Design Section is in general agreement with Kleinfelder's conclusions that segments of the Natomas Cross Canal south levee require underseepage mitigation at the 100-year and 200-year water surfaces. There are underseepage concerns between Sta 0+00 and 105+00, between Sta 123+00 and 173+00, and between Sta 195+00 and 280+00. Exit gradients in these reaches exceed the maximum allowable gradient of 0.5 and/or seepage and boils were observed during previous high water events. Ditches are located about 100 feet from the levee toe along a majority of the levee. Gradients calculated at the bottom of ditches are very high (gradients on the order of 0.55 to 1.9).

36. Kleinfelder's seepage models are generally more conservative than the Corps' models. Exit gradients calculated by Kleinfelder were from 30% to 50% higher than gradients calculated by the Corps. The higher gradients can be attributed to Kleinfelder's assignment of a lower permeability of the foundation blanket material. The permeability Kleinfelder selected for the blanket is four times lower than the Corps' value. Even though Kleinfelder's seepage models are more conservative, they do appear reasonable. Observation wells are located at four locations along the Natomas Cross Canal. The wells were read frequently during this last January's high water event. The high water in January was about 5 feet lower than the 100-year water surface. Data from the wells should be used to calibrate the seepage models.

37. Kleinfelder recommends slurry cutoff walls 40 feet to 80 feet deep along 63% of the NCC levee to mitigate for underseepage at the 200-year water surface. Recommendations for the 100-year water surface were not provided. Depths of the slurry walls appear reasonable, based on the current subsurface data, except for the 40-foot slurry wall between Sta 105+00 and 123+00. No evidence was provided to ensure that the proposed slurry will intersect the sand layers in the foundation that produces the excessive exit gradients. Based upon the data provided the 40-foot deep slurry wall should be at least 70 feet deep to completely mitigate underseepage concerns. Kleinfelder has concluded that underseepage criteria are met between Sta 19+00 and 97+00 and that underseepage mitigation is therefore not required. Soil Design Section does not concur with this conclusion. A 10-foot deep ditch is located approximately 100 feet away from the landside levee toe along this segment of the NCC levee. The Corps and Kleinfelder have both calculated gradients in excess of 0.8 at the bottom of ditch. As a minimum, the ditch should be relocated further from the levee or a slurry wall be installed through here to mitigate against adverse underseepage conditions.

38. Kleinfelder developed recommendations for repairing the levee at the 200-year water surface only. Recommendations were not provided for the 100-year water surface. If the most pressing objective is for the Natomas basin to retain FEMA certification, then recommendations for repairing the levees at the 100-year water surface should be developed.

39. Below are specific comments Soil Design Section has for the NCC levee report:

a. Paragraph 4.2.6: The Corps has observed light seepage between the landside levee toe and ditch between Sta 198+00 and 218+00 during high water events in January 2002, January 2003, February 2004, and January 2006.
b. Paragraph 5.11.6: Analysis by Kleinfelder and the Corps are indicating excessive exit gradients at bottom of the ditch between Sta 19+00 and 97+00. Underseepage mitigation is required. Relocating the ditch further from the levee is one option to mitigate for underseepage. Kleinfelder states that the ditch is currently in compliance with the Corps guidance of locating a ditches 10 times their depth from the levee toe. This guidance is the minimum distance. Greater distances are required if seepage or stability models indicate that unsatisfactory performance may occur.
c. Paragraph 5.12.6: A 40-foot deep slurry wall does not intersect the pervious sand layers located approximately 60 feet deep. The 40-foot cutoff wall appears to do little to lower exit gradients if the sand layers are not intersected. The slurry wall should be at least 70 feet deep.
d. Kleinfelder recommends an 80-foot deep slurry wall between Sta 195+00 and 280+00. A segment of the slurry wall will be installed under Highway 99, which has approximately 20 feet of vertical clearance under the bridge. Constructing the slurry wall with low overhead clearance excavation equipment or jet grouting is required. In any event, construction cost should reflect the difficulty of installing a slurry wall under the bridge.

Appendix E Comments – Preliminary Geotechnical Evaluation – Proposed Secondary Levee for the Sacramento River East Levee, Reclamation District 1000, Sacramento and Sutter Counties, California

40. Based on what we know now about the foundation conditions, a borrow area / pit should not be located between the existing levee and the new setback levee. Given these geologic / geomorphic conditions, a borrow pits should be no closer than 500 ft to a levee.

41. The design of a new levee should include provisions for waterside erosion protection.

42. A new levee should be designed for flood fighting and access. The top of levee road section should be designed for construction traffic, turnouts should be located at regular intervals, and ramps down to the waterside and landside toes should be included.

43. The set back alignment appears to be somewhat arbitrary at this point. Consideration should be given to foundation conditions, hydraulics, land use, and environment in the selection of the alignment.

44. The question of what to do with the existing levee should be answered before proceeding with the evaluation of the setback levee. Can the existing levee be abandoned or de-authorized? Will the existing levee still need to be maintained?

45. With respect to the seepage analyses the following should be carefully reviewed by Kleinfelder:

- The location and depth of the proposed borrow pit,
- The location and depth of the cut off wall
- The seepage berm alternative

- The assumed Kh vs. Kv permeability for the engineered fill.

46. With respect to the stability analyses the following should be carefully reviewed by Kleinfelder:

    - Selected foundation strength. (At some locations the foundation strength appears to be very low. Sampler blow counts of 0 to 2 near surface were recorded.)

47. SAFCA, the State, and the Corps would be well served if the following documents are evaluated and utilized in conjunction with this Preliminary Geotechnical Evaluation.

    - URS Final Waterside Stability Report, American River Watershed Project (Common Features), Sacramento River East Side Levee Modifications, 22 January 2002.
    - URS Final Geotechnical Waterside Stability / Erosion Report, LM 0.1 to 1.6, American River Watershed Project (Common Features), California Sacramento River East Side Levee and Berm Raising, 7 February 2002.
    - MWH Sacramento River East Side Levee Strengthening Project, Final On-Site Alternative Preliminary Design report Waterside Stability / Erosion Mitigation River Mile (RM) 78.0L, Sacramento and Sutter Counties, California, 26 July 2002.

48. The exploratory holes for the set back levee option appear to support a conclusion that subsurface conditions in this geologic environment are quite variable. The interpretation of subsurface conditions and seepage models for the existing levee should take into consideration the findings at the set back levee sites.

Appendix F Comments – Natomas Levee Evaluation Program, Erosion Assessment, Draft Report

49. Boat and Wind waves were not specifically included in the bank protection analysis and design. A design was developed for bank protection considering wind and boat waves in the pocket reach of the Sacramento River downstream. It could be used for the Natomas reach.

50. Sediment transport was not considered in developing the future trends for the bed profile. Historical bed profiles are not appropriate due to changes in channel maintenance (dredging) and reservoir construction upstream. Scour estimates are based on specific events with long term sediment transport in equilibrium. We do not think this is the case.

51. It was not clear how private landowner bank protection can be included in a maintenance plan for a governmental project. How is existing bank protection evaluated and what is used to estimate the future practices?

52. The profile shown on Figure 16 in the report is different than the profile using ELMIN from the hydraulic Comp Study cross sections for 1997 **(see attachment 1)**. Not sure what the significance of this is.

Appendix G Comments – Natomas Levee Evaluation Program, Preliminary Cost Estimate

Document Not Reviewed

July 7, 2006

Sacramento Area Flood Control Agency Responses to
US Army Corps of Engineers, Sacramento District
Technical Review Comments on the Public Review Draft – Natomas Levee Evaluation Report and Associated Appendices

The following comments are provided to SAFCA based on technical review of the administrative draft version and the public review draft version of the "Natomas Levee Evaluation Report," dated February 2, 2006 and March 13, 2006, respectively, and its associated appendices. This report and its associated appendices were prepared for SAFCA by MBK Engineers, Kleinfelder, Northwest Hydraulic Consultants (NHC), Parsons Brinckerhoff, EDAW, and Jones and Stokes Associates. The comments are as follows and are broken out by the document or the appendix reviewed.

Main Document Comments

Number	Comment	Response	SAFCA/MBK	
REP-1	Section 4.0 Levee Freeboard, page 4-1. For future projects with the Corps, R&U will likely be required in lieu of freeboard. The Corps and SAFCA need to reach agreement on design of the top of levee profile; possibilities include traditional FEMA criteria of 3 feet or R&U.	SAFCA's design criteria for the project is to provide 3 feet of freeboard on a conservative estimate of the 200-year water surface profile. During the design process, the project will also evaluate wind and wave height concerns and make a determination whether the design profile should be adjusted accordingly. R&U would then be used as part of the Corps' GRR to evaluate the economics and performance of the project.	SAFCA/MBK	
REP-2	A cut off wall alternative and specifics of location, length, depth and location should be reviewed as part of subsequent design to insure sufficient depth and proper length and location of the cutoff wall.	The report adopted a cutoff wall as the preliminary remediation alternative to allow development of a representative cost of providing 200-year level of flood protection to the Natomas basin. Additional geotechnical explorations will be conducted during the design process to refine the depth, length and location of the cutoff wall as well as to consider other remediation alternatives.	SAFCA	

REP-3	Executive Summary. Include definitions for 1/200 AEP water surface elevation and explain how this water surface is different than the 200-year flood elevation.	They are the same.	MBK	
REP-4	Executive Summary, fourth paragraph, last sentence. - Erosion of the existing levee will still need to be prevented.	The disposition and remediation of the existing levee, should a secondary levee be selected, will be addressed during the alternatives analysis conducted during the design process. See also Response to SEC-45.	SAFCA	
REP-5	Executive Summary, paragraph 5. The cost estimate does not appear to cover all deficiencies and the report was not a comprehensive look for all potential flaws or deficiencies. During the subsequent analysis, insure that access, encroachments, penetrations, wells, pumping plants, etc are addressed.	These items will be addressed during the design process.	SAFCA	
REP-6	Section 2.3.3 Levee Foundation Stability, first paragraph. The third sentence states that the study followed the Geotechnical SOP #3 except for the number of soil borings. The SOP #3 covers many aspects of levee evaluation including geomorphology, in situ field tests, performance monitoring, blanket theory, recalibration of seepage models based on performance, etc. It is not clear what guidelines from SOP #3 were followed and which were not followed. Please clarify and indicate if this will be addressed during the design process.	Each of the geotechnical design considerations were covered on at least a preliminary basis in the PIRs. The final design process will include consideration of all of the factors in more depth and clearly identify how they were implemented into the final design analysis. The primary diversion from SOP #3 in the NLEP Study was that only one boring at a spacing of 1000 feet was included in the preliminary geotechnical investigation effort. Additional borings will be conducted during the design process to obtain three borings at each drilling location.	KF	

REP-7	Section 2.3.5 Needs Improvements: Request a copy of the site prioritization list.	A site prioritization list will be developed based on early improvement of levee reaches that require remediation to assure performance against the 100-year water surface profile. SAFCA will work with the Corps and State to develop this list.	SAFCA	
REP-8	Section Figure 7-6 Secondary Levee - Typical Section. The Corps will not support the use of a borrow area between the existing and new levee. Additionally, erosion protection should be provided on the new levee.	Any proposal to use borrow material from between the current and future secondary levee will contain the proper exploration and technical analysis to support this alternative. Erosion protection will be provided as necessary to protect the new embankment from anticipated current velocities as well as potential wind generated wave action.	KF/SAFCA	
REP-9	Section 10.0 Conclusion. Report should make clear statement on present FEMA certification of the Natomas levees or specific portions of the levees.	The purpose of the report is to develop and characterize the likely magnitude and cost of improvements needed to provide a 200-year level of flood protection to the Natomas basin. A supplemental report, utilizing FEMA 100-year water surface profiles will be developed to address specific needs and prioritization to assure performance against the 100-year water surface profile.	SAFCA	

General: Comments on the draft appendices were provided earlier to SAFCA, and the resolution will in general be addressed during subsequent analysis and design activities as the project efforts proceed and documents are submitted for our review.

Appendix A Comments – Design Water Surface Profile for the Sacramento River East Levee and Natomas Cross Canal Levees in Natomas

Comments on the subject report (Appendix A) have been previously submitted, discussed and partially addressed. These are outlined in U.S. Army Corps of Engineers, Sacramento District, Memorandum, Subject: Natomas GRR PDT Concerns with SAFCA Natomas Levee Evaluation Project, CESPK-ED-D, 4 October 2005. A number of comments pertaining to hydrologic and hydraulic uncertainties are still pending resolution. These are as follows:

Number	Comment	Response		
HYD-10	Cross Canal tributary concurrent and peak inflow hydrographs. 1997 flood event data provided in the Comp Study UNET model was used in hydraulic modeling in lieu of inflows concurrent to the 1/100 and 1/200 AEP Sacramento River flows. Additionally, 1/100 and 1/200 AEP peak flow hydrographs for these tributaries weren't used with concurrent Sacramento River flows/stages to determine a composite Cross Canal design profile. -	This issue is been addressed in the NLIP preliminary design phase by modifying the NLEP Study water surface profile on the NCC as follows: - utilize a starting WSEL at the mouth of the NCC from the Corps/MBK combined model - use the slope of the NCC profile from the Schaaf and Wheeler modeling of the NCC - add 1 foot This will allow the geotechnical analyses and design to be accomplished without worry about minor changes in water surfaces changing the reaches that require geotechnical remediation Construction of the raise component of the NCC improvements will likely be implemented in 2008 or later. This will allow time for the Corps to complete the revisions to the hydrology for the NCC as part of their GRR effort. The results can then be incorporated into the final design of SAFCA's improvements.	MBK		
HYD-11	The sensitivity analysis performed by MBK indicated little likelihood for significant revisions to the Sacramento River design	See response to comment HYD-10.	MBK	

Number	Comment	Response		
ARN-16	Water Surfaces. Paragraph 1.9 indicates that the 100-year water surface is based on 115,000 cfs from Folsom Dam. Corps has	The long range 100-year release from Folsom is anticipated to be 115K cfs. This outflow will be realized once the Folsom Dam Outlet Modifications	MBK	

	profile based on changes to Cross Canal tributary inflows. However, the Cross Canal design profile was shown to be more sensitive by the same analysis and will therefore vary by more significant amounts with pending changes in hydrology			
HYD-12	American River concurrent flow hydrographs. The American River and Sacramento River design flood flow concurrency assumption made in previous studies (a 1/200 AEP event on one and a 1/100 AEP event on the other) will be replaced by the composite hydrologic analysis planned for the Folsom Mods and Natomas GRR projects by the Corps. This analysis will produce better estimates of concurrent inflow hydrology for the American River and all of the Sacramento River tributaries within the Natomas project reach vicinity. The concurrent flows developed as part of the composite hydrology will influence stage in the vicinity of their confluence with the Sacramento River. The biggest potential effect would be from the American River. However, its backwater influence does not appear to extend far enough upstream to significantly effect the design profile in the vicinity of expected SAFCA project features.	The design of the American River levee component of the NLIP is projected to be in the later part of 2007 or 2008. The design water surface profile can be modified based on the Corps' revisions to the American River and Sacramento River hydrology. The American River water surface profile utilized in the NLEP Study indicated that it will likely not be necessary to raise this section of the levee.	MBK	
HYD-13	Folsom Dam Operations. The American River inflow hydrographs used do not accurately reflect dam operations under proposed project conditions.	See response to comment HYD-12.	MBK	

HYD-14	Arbitrary UNET model inflows hydrographs. A large number of inflows to the Comp Study UNET model were arbitrary inputs necessary for the model to run. Most of these same inflows remain in the MBK UNET model. Refinement of these inflows is required for local project specific analysis as described in the Comprehensive Study documentation. A number of these arbitrary inflows in the project vicinity will be replaced by the concurrent inflow hydrology to be developed as described in comment 12, above. The effects of the remaining arbitrary inflows have not been investigated, but theoretically will affect results by some unknown amount throughout the model.	Subsequent to this comment, the Corps has indicated (see attached email from John Carroll) that the Corps has agreed to allow SAFCA to move forward with SAFCA's (MBK model) design profile with the common understanding that this profile may be modified in the future following the Corps' refinement of the inflow hydrology or creation of a new HEC-RAS model. See response to comment HYD-10. See response to comment HYD-12.	MBK	
HYD-15	Model Differences. Despite including higher roughness coefficients in the project reach, MBK's UNET model produces significantly lower stages than the Corps model in the project reach. The sources of a majority of these differences have been identified, but their resolution is still pending for the purpose of project design.	See response to comment HYD-14.	MBK	

	been using a discharge of 145,000 for the 100-year water surface. Comparing water surface elevations it appears that the Kleinfelder report value is a few tenths of a foot higher than what the Corps used. The apparent differences between the 115,000 cfs and the 145,000 cfs flow should be addressed. The Kleinfelder report value for the 200-year water surface is about 2.5 feet higher than their 100-year water surface. The Corps evaluation utilized a 2-foot difference between the 100-year and 200-year water surface used in the 26 January 1998 memo.	(or the combined federal project) is constructed. The current outflow for FEMA certification is 145k cfs. A FEMA 100 -year water surface profile will be developed with the intent that this profile will be used to ensure SAFCA's improvement efforts will meet FEMA certification criteria during the process of constructing the Folsom improvements. The Corps and the State will be provided this profile for review.		
ARN-17	Past Performance Data. Section 4, LEVEE PERFORMANCE HISTORY cites historical documents 1938 maps and 1963 seepage areas map. To aid in the evaluation of seepage-related levee performance, correlations of river stage to observed "seepage" is required and it appears that these documents do not present this type of information. The 1987 Walter report provides more recent information on seepage, however no bolls were described. The only landside instability noted was in the 1987 Walter report near the levee crown. It is not likely that levee through seepage was the cause for the instability since the phreatic surface and resulting seepage forces would be below the zone of reported instability.	MBK has developed stage/duration information for the rivers during the periods indicated on the 1938, 1963 and 1965 maps (see attached table). This data indicates that the rivers remained high for extended periods during the time that seepage and surface water was observed on the area landward of the levee. This information is useful to review historic trends in observed seepage compared to predicted performance based on the geotechnical study. As noted elsewhere in these responses to comments, the concept of through seepage related distress requires more investigation/analysis along this reach. This will be included in the final design study.	KF/MBK	
ARN-18	Seepage Analyses. The exit gradients reported appear to be near surface gradients, however the 0.5 exit gradient criterion is for base of blanket gradients. However, it	Detailed through seepage analyses were not performed as part of the PIR for the post cutoff wall construction condition. Rather, Kleinfelder relied upon staff experience with this condition as evaluated	KF	

	appears that the reported near surface gradients are less than 0.5. A general comment is that the Corps model results (Reference B) show generally lower phreatic surfaces than the Kleinfelder models. No seepage analyses models could be found for the cutoff wall condition. This would be needed to support the conclusions and recommendations for cutoff walls for controlling levee through seepage to provide the required stability by lowering the seepage forces.	within the Greenhaven/Pocket area and Sacramento River east levee (Nations) on previous projects where cutoff walls were installed. The through seepage condition will be further jointly evaluated by Kleinfelder, USACE, and DWR. Seepage analyses for the remediated condition will be included in the final design documentation Kleinfelder reported underseepage analysis results for both the base of blanket condition and the surface exit gradient. Preliminary recommendations for remediation were based on the base of blanket condition as required by the USACE SOP-03.		
ARN-19	Slope Stability Analyses. Laboratory direct shear strength tests for consolidated-drained conditions were performed on selected samples. All of the test results indicate apparent cohesion values over 500 psf for clays. The analyses utilized no apparent cohesion. Rationale should be provided explaining why the apparent cohesion values obtained from laboratory test results are ignored. No slope stability models could be found for the cutoff wall condition. This would be needed to support the conclusions and recommendations that resulting seepage forces due to the presence of the cutoff walls will result in meeting or exceeding the minimum factor of safety.	The concept of apparent cohesion for fine grain soils is the subject of academic discussion. Kleinfelder used the conservative approach that cohesion does not practically exist for these materials. Confirmation slope stability analyses will be included in final design for any cutoff walls or other remediation measures proposed for through seepage control.	KF	
ARN-20	Report Conclusions and Recommendations. The report concludes that the potential for through seepage slope instability exists for the American River north levee. The report recommends cutoff walls, however no	Alternatives to the recommended cutoff walls will be developed during the alternatives analysis conducted during design. Because development is close to the landside levee toe, there is limited room for stability berms or drains.	KF/SAFCA	

	discussion could be found where alternatives to stabilizing the slope were discussed such as stability berms or drains, solutions that would be less disruptive to traffic and public convenience.				
ARN-21	General Summary. Risk assessment of the American River north levee is recommended. The levee crown width along reaches where Garden Highway is located is at least 30 feet wide and would be considered an overbuilt levee. How far the failure surface extends into the levee crown and slope would provide some indication of the severity of the slope failure for the overbuilt levee. The past performance data has only one documented observation of slope instability, and that was noted near the levee crown, and not near the levee toe.	Additional borings and investigations, such as backhoe explorations of the landside levee slope, will be conducted during the design process. The data obtained from these investigations will be used to refine the analysis of the potential for slope instability.	KF/SAFCA		

Appendix C Comments – Problem Identification Report, Sacramento River East Levee, Reclamation District 1000, Sacramento and Sutter Counties, California

Number	Comment	Response			
SRE-22	Seismic Stability - Seismic stability and deformation analyses are not part of the current Corps standard of practice in levee evaluation and design.	It is agreed that the simultaneous occurrence of the design water surface elevation and the maximum seismic event is considered remote and, as a result, is not generally analyzed. However, due to the importance of the levees for protection of an urban area, the final design will include an analysis of liquefaction potential during normal river level conditions and the potential for slope deformation and loss of freeboard.			

SRE-23	Appendix D a minor point: The selected target minimum Factor of safety with respect to seepage was identified as 1.7. This appears to be in slight conflict with Corps guidance. However, the corresponding threshold exit gradient of 0.5 is in accordance with Corps practice. The difference occurs because the critical exit gradient was calculated to be 0.85, based on an assumed soil unit weight of 115 pcf.	It is agreed that the minimum factor of safety used by Kleinfelder (fos = 1.7) was based on a critical gradient of 0.85 corresponding to a soil unit weight of at least 115 pcf. A better validation of this assessment will be included in the final design.	KF		
SRE-24	SAFCA, the State and the Corps would be well served if the following documents were evaluated and compared to the findings in this study. These are only some of the most recent reports produced. Previous reports may also contain valuable information. a. URS Final Waterside Stability Report, American River Watershed Project (Common Features), Sacramento River East Side Levee Modifications, 22 January 2002. b. URS Final Geotechnical Waterside Stability / Erosion Report, L.M 0.1 to 1.6, American River Watershed Project (Common Features), California Sacramento River East Side Levee and Berm Raising, 7 February 2002. c. URS Final Remediation Alternatives Report, American River Watershed project (Common Features), California, Sacramento River East Side Levee South of Powerline, 4 January 2002 d. MWH Sacramento River East Side Levee Strengthening Project, Final On-Site Alternative Preliminary Design report Waterside Stability / Erosion Mitigation River Mile (RM) 78.0L, Sacramento and Sutter Counties, California, 26 July 2002.	SAFCA has obtained all of these reports and will consider them during the alternatives analysis and design processes.	KF/SAFCA		

	e. URS Final Supplemental Geotechnical Report for Reach North of Powerline Road, American River Watershed Project (Common Features), California, Sacramento River Levee and Berm, Sacramento CA, 6 December 2002. f. URS Final Geotechnical Report for Reach South of Powerline Road, American River Watershed Project (Common Features), California, Sacramento River Levee and Berm Strengthening, 17 September 2002. g. URS Final Geotechnical Report - Volume 1 and Volume 2, For Sacramento River East Levee and Natomas Cross Canal South Levee, Natomas General Reevaluation Report, American River Watershed Project (Common Features), California, 29 November 2005.			
SRE-25	Both the URS and Kleinfelder studies used an exit gradient threshold value of 0.5 to assess performance even though the level of field explorations is not equivalent to the level recommended to support the use of 0.5. The URS report recommends an exploration and laboratory test program sufficient to bring the work into agreement with Sacramento District SOP #3 guidance.	SAFCA will undertake additional explorations, geomorphic analysis, geophysical studies, etc. in order to use the 0.5 exit gradient criteria. This additional information will be gathered during the detailed design process.	KF	
SRE-26	Overall it appears that Kleinfelder has taken an appropriate conservative approach in their study.	The approach utilized by Kleinfelder appears consistent with the level of care required for protection of the urban Natomas area.	KF	
SRE-27	On average the URS modeling predicted exit gradients slightly lower than the Kleinfelder modeling. However, at some locations / reaches the difference in calculated exit gradient is significant.	Kleinfelder has reviewed the URS report and is aware of the differences in results obtained by URS. It appears the differences are primarily the results of interpretation of stratigraphy among borings. Additionally, URS included	KF	

		some provisions for the "damaged blanket" concept. It is anticipated that final analyses will be based on an agency agreement of soil stratigraphy, soil parameter values, and analysis methods to be utilized.		
SRE-28	In the Kleinfelder study the exit gradients calculated for the 200-year WS for the most part were just slightly above the exit gradient calculated for the 100-year WS. For some reaches the models predict increases in exit gradient between .1 and .2. These reaches should receive a closer look.	Comment noted. The differences between the model results will be checked and substantiated during the detailed design process.	KF	
SRE-29	It is not clear why the study selected the cutoff wall alternative for problem remediation. There are at least two other alternatives (relief wells and seepage berms) which should be evaluated. (See previous URS reports on alternative evaluation)	The report adopted a cutoff wall as the preliminary remediation alternative to allow development of a representative cost of providing 200-year level of flood protection to the Natomas basin. Alternatives to the recommended cutoff walls, such as seepage berms or relief wells, will be developed during the alternatives analysis conducted during design.	SAFCA/KF	
SRE-30	Cutoff wall construction will likely require excavation of the top of levee to build a working platform. Access and utilities will be disrupted. It is also likely the cut off wall will have to be constructed with a method other than by open trench "slurry wall" technique to reduce the risk of hydrofracture / blowout and subsequent excavation and rebuilding of an entire levee section.	SAFCA anticipates using "conventional" slurry wall construction techniques (long-arm excavators) for slurry walls that are up to 80 ft deep. For deeper walls, deep soil mixing (triple auger) equipment or the full-depth soil mixing (chainsaw) equipment will be used. Each of these techniques will require some degree of top of levee degrade. Blowout considerations will also drive the requirements for degrading the levees to construct the cutoff walls. In addition, in the areas where the levee will be raised, utilities will also need to be modified to accommodate the increased top of levee elevation. These issues will be addressed during the design of the improvements.	SAFCA	

SRE-31	A detailed evaluation is needed to confirm individual model results and confirm the proposed cut off wall selection as the best geotechnical alternative. Considerable technical discussion will be needed to arrive at an agreement on cutoff wall depth.	Additional geotechnical explorations will be conducted during the design process to refine the depth, length and location of the cutoff wall as well as to consider other remediation alternatives.	SAFCA	
SRE-32	Based on our knowledge to date it appears there are several reaches of the Sacramento River east bank that need immediate attention to ensure the levee meets FEMA criteria for the 100-year event. These reaches are: Reach Seepage Model Station 2 - Station 48+00 to 100+00 4 - Station 110+00 to 228+00 5 - Station 228+00 to 280+00 10 - Station 468+00 to 495+00 13 - Station 667+00 to 700+00 15 - Station 732+00 to 780+00 Confirmatory explorations and testing and engineering analyses should proceed expeditiously.	A site prioritization list will be developed based on levee reaches that require remediation to assure performance against the 100-year water surface profile. SAFCA will work with the Corps and State to develop this list. In general, the list provided with the comment agrees with SAFCA' review of the Study's modeling results.	SAFCA/KF	
SRE-33	The exploratory holes for the set back levee option appear to support a conclusion that subsurface conditions in this geologic environment are quite variable. The interpretation of subsurface conditions and seepage models for the existing levee should take into consideration the findings at the set back levee sites.	It is agreed that conditions are highly variable in this fluvial deposition environment. Additional explorations will be performed during the detailed design process along and perpendicular to the levee to better understand soil stratigraphy conditions.	KF	
SRE-34	Assuming the existing array of piezometers along the Sacramento River levee were read during the high water of January 2006, the seepage models should be updated utilizing this new information.	Piezometer levels were monitored during the 2006 high river stage events. This information will be used to help calibrate the results of seepage modeling.	KF	

SRE-35	I recommend that a Natomas Geotechnical Committee be formed (similar to what we had for the GRR) to assist SAFCA in moving forward with their work. The committee should include Geotechnical Engineers from SAFCA, the State, and the Corps. This Committee can resolve technical issues concerning subsurface interpretations, selected engineering parameters, and modeling results on a continuing basis.	SAFCA has initiated a discussion with the Corps and State to develop a Natomas Geotechnical Committee, as well as other technical committees to provide independent technical review of SAFCA's design documents and coordinate the efforts on the Natomas GRR.	SAFCA	

Appendix D Comments -- Problem Identification Report, Natomas Cross Canal South Levee, Reclamation District 1000, Sutter County, California

Number	Comment	Response		
NCC-36	Soil Design Section is in general agreement with Kleinfelder's conclusions that segments of the Natomas Cross Canal south levee require underseepage mitigation at the 100-year and 200-year water surfaces. There are underseepage concerns between Sta 0+00 and 105+00, between Sta 123+00 and 173+00, and between Sta 195+00 and 280+00. Exit gradients in these reaches exceed the maximum allowable gradient of 0.5 and/or seepage and boils were observed during previous high water events. Ditches are located about 100 feet from the levee toe along a majority of the levee. Gradients calculated at the bottom of ditches are very high (gradients on the order of 0.55 to 1.9).	Agreed	KF	
NCC-37	Kleinfelder's seepage models are generally more conservative than the Corps' models. Exit gradients calculated by Kleinfelder were from 30% to 50%	It is agreed that Kleinfelder's seepage models at comparable locations generally have resulted in higher calculated exit gradients than those determined by USACE and URS.	KF	

	higher than gradients calculated by the Corps. The higher gradients can be attributed to Kleinfelder's assignment of a lower permeability of the foundation blanket material. The permeability Kleinfelder selected for the blanket is four times lower than the Corps' value. Even though Kleinfelder's seepage models are more conservative, they do appear reasonable. Observation wells are located at four locations along the Natomas Cross Canal. The wells were read frequently during this last January's high water event. The high water in January was about 5 feet lower than the 100-year water surface. Data from the wells should be used to calibrate the seepage models.	Differences in blanket permeability seem to be the main difference in the models which have resulted in the higher Kleinfelder exit gradients. Piezometer reading data obtained during the high river stage in 2006 will be used to better calibrate both the Kleinfelder and USACE models.		
NCC-38	Kleinfelder recommends slurry cutoff walls 40 feet to 80 feet deep along 63% of the NCC levee to mitigate for underseepage at the 200-year water surface. Recommendations for the 100-year water surface were not provided. Depths of the slurry walls appear reasonable, based on the current subsurface data, except for the 40-foot slurry wall between Sta 105+00 and 123+00. No evidence was provided to ensure that the proposed slurry will intersect the sand layers in the foundation that produces the excessive exit gradients. Based upon the data provided the 40-foot deep slurry wall should be at least 70 feet deep to completely mitigate underseepage concerns. Kleinfelder has concluded that underseepage criteria are met between Sta 19+00 and 97+00 and that underseepage mitigation is therefore not required. Soil Design Section does not concur with this conclusion. A 10-foot deep ditch is located approximately 100 feet away from the landside levee toe along this segment of the NCC levee. The Corps and Kleinfelder have both	This comment was received prior to issuance of the public review draft report. The main report and the NCC Geotechnical PIR document were revised to include the recommendations in this comment. Additional geotechnical explorations will be conducted during the design process to refine the depth, length and location of the cutoff wall as well as to consider other remediation alternatives.	SAFCA/KF	

	calculated gradients in excess of 0.8 at the bottom of ditch. As a minimum, the ditch should be relocated further from the levee or a slurry wall be installed through here to mitigate against adverse underseepage conditions.			
NCC-39	Kleinfelder developed recommendations for repairing the levee at the 200-year water surface only. Recommendations were not provided for the 100-year water surface. If the most pressing objective is for the Natomas basin to retain FEMA certification, then recommendations for repairing the levees at the 100-year water surface should be developed.	The purpose of the report is to develop and characterize the likely magnitude and cost of improvements needed to provide a 200-year level of flood protection to the Natomas basin. A supplemental report, utilizing FEMA 100-year water surface profiles will be developed to address specific needs and prioritization to assure performance against the 100-year water surface profile.	SAFCA	
NCC-40	Below are specific comments Soil Design Section has for the NCC levee report: a. Paragraph 4.2.6: The Corps has observed light seepage between the landside levee toe and ditch between Sta 198+00 and 218+00 during high water events in January 2002, January 2003, February 2004, and January 2006. b. Paragraph 5.11.6: Analysis by Kleinfelder and the Corps are indicating excessive exit gradients at bottom of the ditch between Sta 19+00 and 97+00. Underseepage mitigation is required. Relocating the ditch further from the levee is one option to mitigate for underseepage. Kleinfelder states that the ditch is currently in compliance with the Corps guidance of locating a ditches 10 times their depth from the levee toe. This guidance is the minimum distance. Greater distances are required if seepage or stability	a. This condition will be evaluated further in the detailed design process. Kleinfelder is also aware of seepage at various locations along the NCC during high river stage conditions. However, in each case the seepage observed was traced to discharge of the drainage layer/piping contained within the constructed seepage/stability berm. b. Further analysis of ditch conditions will be performed during the detailed design process.	KF	

	models indicate that unsatisfactory performance may occur. c. Paragraph 5.12.6: A 40-foot deep slurry wall does not intersect the pervious sand layers located approximately 60 feet deep. The 40-foot cutoff wall appears to do little to lower exit gradients if the sand layers are not intersected. The slurry wall should be at least 70 feet deep. d. Kleinfelder recommends an 80-foot deep slurry wall between Sta 195+00 and 280+00. A segment of the slurry wall will be installed under Highway 99, which has approximately 20 feet of vertical clearance under the bridge. Constructing the slurry wall with low overhead clearance excavation equipment or jet grouting is required. In any event, construction cost should reflect the difficulty of installing a slurry wall under the bridge.	c. The PIR has been revised to include a 70 ft deep cutoff wall along this reach. d. It is agreed that construction of a cutoff wall below/across the Highway 99 levee crossing will present construction logistics challenges. Other alternatives such as strategic placement of relief wells and/or a steel sheet pile cutoff across this reach will be investigated during the detailed design process.		

Appendix E Comments – Preliminary Geotechnical Evaluation – Proposed Secondary Levee for the Sacramento River East Levee, Reclamation District 1000, Sacramento and Sutter Counties, California

Number	Comment	Response		
SEC-41	Based on what we know now about the foundation conditions, a borrow area / pit should not be located between the existing levee and the new setback levee. Given these geologic / geomorphic conditions, a borrow pits should be no closer than 500 ft to a levee.	Proposals to use borrow material from between the current and future secondary levee will contain the proper exploration and technical analysis to support this alternative.	KF	

SEC-42	The design of a new levee should include provisions for waterside erosion protection.	Should this option be selected, the design of the new secondary levee will address this design issue.	KF/NHC/SAFCA	
SEC-43	A new levee should be designed for flood fighting and access. The top of levee road section should be designed for construction traffic, turnouts should be located at regular intervals, and ramps down to the waterside and landside toes should be included.	Should this option be selected, the design of the new secondary levee will address these design issues.	SAFCA	
SEC-44	The set back alignment appears to be somewhat arbitrary at this point. Consideration should be given to foundation conditions, hydraulics, land use, and environment in the selection of the alignment.	Several alignments and lengths for the secondary levee were considered during SAFCA's preliminary study. The configuration will be further refined during the alternatives analysis and will be developed more fully if this alternative is chosen for the remediation of the northern section of the Sacramento River east levee in the study area.	SAFCA	
SEC-45	The question of what to do with the existing levee should be answered before proceeding with the evaluation of the setback levee. Can the existing levee be abandoned or de-authorized? Will the existing levee still need to be maintained?	This issue will be further refined during the alternatives analysis, environmental review and public outreach processes.	SAFCA	
SEC-46	With respect to the seepage analyses the following should be carefully reviewed by Kleinfelder: a. The location and depth of the proposed borrow pit, b. The location and depth of the cut off wall c. The seepage berm alternative d. The assumed Kh vs. Kv permeability for the engineered fill.	These issues will be further refined during the alternatives analysis and will be developed more fully if this alternative is chosen for the remediation of the northern section of the Sacramento River east levee in the study area.	KF/SAFCA	
SEC-47	With respect to the stability analyses the following should be carefully reviewed by Kleinfelder:	Should this alternative be selected, this issue will be further reviewed during the detailed design process. Some over-excavation and recompaction of foundation soils has been	KF	

Number	Comment	Response		
ERO-50	Boat and Wind waves were not specifically included in the bank protection analysis and design. A design was developed for bank protection considering wind and boat waves in the pocket reach of the Sacramento River downstream. It could be used for the Natomas reach.	The configurations of the proposed bank protection treatments were developed to prevent erosion from boat wakes and wind generated wave during the spring/summer/fall low water periods. During design, the water surface elevations and rock sizing will be further refined to address these failure mechanisms, while maintaining habitat mitigation. NHC and SAFCA have copies of the draft report for the Pocket design. We will contact the Corps to obtain the final design report.	NHC/SAFCA	
ERO-51	Sediment transport was not considered in developing the future trends for the bed profile. Historical bed profiles are not appropriate due to changes in channel maintenance (dredging) and reservoir construction upstream. Scour estimates are based on specific events with long term sediment transport in equilibrium. We do not think this is the case.	The scour estimates for the design concepts were calculated for the current channel conditions and design water levels. These estimates will be re-evaluated during preliminary design and consideration will be given as to whether some additional allowance to account for long-term changes in the bed profile is warranted. Given the difficulty of accurately representing bed material transport in the lower Sacramento River, reliance on a sediment model may not be appropriate and other methods may be required to predict future trends in the bed profile.	NHC	
ERO-52	It was not clear how private landowner bank protection can be included in a maintenance plan for a governmental project. How is existing bank protection evaluated and what is used to estimate the future practices?	The erosion sites evaluated in this report are those where levee performance may be threatened by continued erosion. They all lack bank protection works. Landowner bank protection works are typically constructed at the edge of a wide berm that provides considerable protection to the levee, where the threat of	NHC/SAFCA	

	a. Selected foundation strength. (At some locations the foundation strength appears to be very low. Sampler blow counts of 0 to 2 near surface were recorded.)	included in the current analysis.		
SEC-48	SAFCA, the State, and the Corps would be well served if the following documents are evaluated and utilized in conjunction with this Preliminary Geotechnical Evaluation. a. URS Final Waterside Stability Report, American River Watershed Project (Common Features), Sacramento River East Side Levee Modifications, 22 January 2002 b. URS Final Geotechnical Waterside Stability / Erosion Report, LM 0.1 to 1.6, American River Watershed Project (Common Features), California Sacramento River East Side Levee and Berm Raising, 7 February 2002. c. MWH Sacramento River East Side Levee Strengthening Project, Final On-Site Alternative Preliminary Design report Waterside Stability / Erosion Mitigation River Mile (RM) 78.0L, Sacramento and Sutter Counties, California, 26 July 2002.	SAFCA has obtained all of these reports and will consider them during the alternatives analysis and design processes.	KF/SAFCA	
SEC-49	The exploratory holes for the set back levee option appear to support a conclusion that subsurface conditions in this geologic environment are quite variable. The interpretation of subsurface conditions and seepage models for the existing levee should take into consideration the findings at the set back levee sites.	It is agreed that subsurface variability was encountered along the proposed secondary alignment. Should this alternative be selected, additional explorations in concept with the USACE SOP-03 requirements will be performed.	KF	

		levee erosion is minimal. These sites were not treated as priority sites given the very low potential for erosion to compromise levee performance. The assumption that the owners will continue to place bank protection to protect the berm is reasonable given that the berm supports their residential structures. Such erosion sites, where the threat to the levee is minimal, will be evaluated further under the Comprehensive River Corridor Management Plan.		
ERO-53	The profile shown on Figure 16 in the report is different than the profile using ELMIN from the hydraulic Comp Study cross sections for 1997 (see attachment 1). Not sure what the significance of this is.	The 1997 thalweg profile was derived from the bathymetric dataset from the 1997 USACE Comprehensive study, as provided by MBK Engineers. Riverbed elevations from the 1997 dataset were selected at the locations of the 1933 cross sections in order to prepare the profile shown on Figure 16.	NHC	

ATTACHMENT A-2
Review Comments from State Department of Water Resources and SAFCA Response to Comments

STATE OF CALIFORNIA – THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Gc

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 942360001
(916) 653-5791

SAFCA '06 JUN 21 PM3:49

June 14, 2006

Mr. Stein Buer
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

Dear Mr. Buer:

Enclosed please find the technical comments of the Department of Water Resources on the Natomas Levee Evaluation Report, Public Review Draft, dated March 13, 2006. These same comments were previously provided to you via e-mail. Thank you for the opportunity to comment.

If you have any questions, please contact Pal Sandhu, Chief, Flood Project Integrity and Inspection Branch, at (916) 574-1212.

Sincerely,

Keith E. Swanson /for

Rodney G. Mayer
Acting Chief
Division of Flood Management

Enclosure

Natomas Levee Evaluation Report, Public Review Draft, March 13, 2006, prepared for SAFCA in support of the American River Common Features Project.
DWR Flood Management Review Comments

(DFM Flood Project Integrity Branch Comments, prepared by Robert Crane)

Hydrology and Hydraulics

1. The Public Review Draft (Figures 4-2 and 4-3) contains a comparison of the existing top of levee, the 1/200 Annual Exceedence Probability (AEP) water surface profile, and the design top of levee to provide three feet of freeboard for the 1/200 AEP. These figures indicate approximately seventeen miles of proposed levee height increases up to three feet, not including the additional height allowance needed for wind and wave run-up. Figure 7-1 shows an increase in levee crown width of eight feet. Do the construction cost estimates include land acquisition costs to accommodate the increase in levee footprint?

2. The Executive Summary of the Public Review Draft indicates that a key modeling assumption is made regarding the outflow from Folsom Dam, based on implementation of Variable Space Storage Operation and the Folsom Outlet Modifications Project. Given the uncertainty with implementation of the Outlet Modifications Project, is any consideration being assigned to develop water surface profiles based on existing baseline conditions and those authorized projects already in construction?

3. Levee height increases above the original design for the 1957 profile will need to address adverse hydraulic impacts to adjacent and downstream areas. For the extent of levee raises being proposed, this could propose a significant challenge to demonstrate that no adverse impacts would occur. A statement was made at the Corps' Technical Meeting on 4/10/06 that the re-operation of Folsom Dam would mitigate adverse hydraulic impacts from increased levee height, but this would require additional analysis and confirmation.

4. MBK indicated at the Corps' Technical Meeting on 4/10/06 that their current 100-year water surface profiles do not directly correlate to the Corps' 100-year water surface profiles used in 1998 to certify Natomas for the 100-year flood event. It is our understanding that SAFCA will addend their Natomas Levee Evaluation Report with a 100-year flood protection plan when these profiles have been revised.

Design

1. Section 2.3.3 of the Public Review Draft indicates that the Levee Evaluation Study generally followed the guidelines of the "CESPK Geotechnical Levee Practice SOP-03 dated 2004 with the primary exception being that the number of soil borings called for at each levee cross section was reduced to minimize Study

costs. Please clarify how the recommended number of soil borings was reduced. Section 5.0 indicates that existing levees have at least one point of deep exploration at 1,000 foot intervals and the proposed setback levee alignment has 2,000 foot intervals. Is the reduction due to the 2,000 foot interval, or not having three borings for each cross section (waterside, crown, and landside)?

2. SAFCA's proposed design and construction schedule and the Corps' General Reevaluation Report (GRR) completion for the Natomas region do not agree with each other. Although SAFCA can proceed with advance work under a Section 104 request, there is a risk that certain features may not become part of the Federal Natomas Basin project. Has any consideration been given to proceeding with repairs that specifically address FEMA 100-year protection deficiencies, or those repairs with a high likelihood of being included in the Corps' NED plan and the Federal project configuration, prior to 200-year flood protection features?

3. Section 5.0 of the Public Review Draft (Tables 5-1 through 5-4) contains recommended cutoff wall depths for each reach of the four levees analyzed, based mainly on computed exit gradients from somewhat limited soil borings (see Design section comment #1 above). Did the soil boring analysis include a review of the depths of impervious layers or bedrock material? As the computed water surface elevations are revised and the calculated exit gradients change, the recommended cutoff wall depths will also change. Is any consideration being given to applying a contingency factor to the recommended depths, due to variations between computed and actual water surface levels? It would seem more cost-effective to anticipate slightly higher exit gradients, given the uncertainties with water surface profile calculations, than to remediate newly constructed improvements with deeper cutoff wall construction.

General

1. Section 1.5 of the Public Review Draft references a November 2005 report by the Corps which summarizes the re-analysis of soil boring data using the criteria contained in the CESPK Geotechnical Levee Practice SOP-03 dated 2004. This Corps report was not available to this reviewer. How does this November 2005 report correspond to the March 2006 SAFCA report? Is there general concurrence between the two reports?

(DFM Flood Project Development Branch Comments, prepared by Tim Kerr)

General Comment – Include a discussion of hydraulic impacts resulting from the completed project. Discussion should quantify the impacts and list methodologies envisioned of how to mitigate the impacts. Consider including Figure 6 from the August 9, 2005 MBK report that determined the design profile for the project in this discussion. Figure 6 shows the design profile relative to the existing top of levee elevation for the Sacramento East and West Levees.

General Comment – Include a discussion of the potential for growth inducing impacts resulting from this project. Future studies will require a discussion of residual risk and damages resulting from the project.

Executive Summary – The study's assumption that the flows on the American River will be controlled to 160,000 cfs relies on multiple improvements being completed upstream. There is some risk that the 160,000 target flow may change by the time the upstream improvements are completed.

Executive Summary – The study makes the conclusion that cut-off walls will be the only solution to the seepage and underseepage stability problems in the project reach. The parallel effort to study the Natomas Basin by the Corps, State, and SAFCA will be required to study all reasonable alternatives; such as cut-off walls, seepage/stability berms, and relief wells. There is some risk that complete credit may not be afforded under the Common Features Project if the General Re-evaluation Report determines that measures other than cut-off walls are more suitable.

Executive Summary – The Summary does not indicate the number of construction seasons required to complete the project. This information would be helpful to understand the cumulative impacts.

Section 5.0 – This section states that the seepage models were ran at steady state. Is there sufficient duration of Sacramento and American River flood events to drive the steady state condition? Consider including a discussion of the time required to reach the steady state condition and the expected duration of the peak flow.

Section 5.0, Page 5-1 – This section states that the approximate depth of the cut-off wall to reduce exit gradients to an acceptable level was identified. Did the depth insure full cut-off by tying into an impermeable layer? Was a safety factor or contingency used to insure that the depth sufficiently reduced the exit gradient?

Section 5.0, Page 5-1 – This section needs to discuss continuity of the chosen repair plan. Previous planning efforts of the Natomas seepage problem placed a high priority on insuring continuity of the repair scheme. A patchwork of repairs throughout the basin may exacerbate seepage problems at the transition zones between cut-off sections.

Figure 7-2, Location of Improvements – Consider showing some stations or river miles on the map. Also, this map shows gaps in the planned location of the cut-off wall that seem short relative to the total length of the repair. Has consideration been given to omitting the small gaps and having a more continuous wall? Consider explaining why the gaps do not need repair (impermeable layer, thick blanket, high landside elevation etc.)

Figure 7-3, Erosion Treatment Type 1 – This style of bank protection is still experimental at this time. There is risk that the Corps would not recommend certification of levees with this style of bank protection repair. Consider using a Sac Bank style repair from Contract 42E.

July 7, 2006

Sacramento Area Flood Control Agency response to
California State Department of Water Resources - Division of Flood Management review comments
Natomas Levee Evaluation Report, Public Review Draft, March 13, 2006, prepared for SAFCA in support of the American River Common Features Project.

DFM Flood Project Integrity Branch Comments, prepared by Robert Crane (574-1729).

Hydrology and Hydraulics

Number	Comment	Response	Responder	
HYD-1	The Public Review Draft (Figures 4-2 and 4-3) contains a comparison of the existing top of levee, the 1/200 Annual Exceedence Probability (AEP) water surface profile, and the design top of levee to provide three feet of freeboard for the 1/200 AEP. These figures indicate approximately seventeen miles of proposed levee height increases up to three feet, not including the additional height allowance needed for wind and wave run-up. Figure 7-1 shows an increase in levee crown width of eight feet. Do the construction cost estimates include land acquisition costs to accommodate the increase in levee footprint?	The construction costs estimates include an allowance for right of way acquisition.	SAFCA/PB	
HYD-2	The Executive Summary of the Public Review Draft indicates that a key modeling assumption is made regarding the outflow from Folsom Dam, based on implementation of Variable Space Storage Operation and the Folsom Outlet Modifications Project. Given the uncertainty with implementation of the Outlet Modifications	The Natomas improvements are being planned as part of the American River Watershed Program as a way of ensuring compatibility of the various elements. The pASS II report indicates that the Folsom Dam Outlet Modification Project is feasible in the modified condition and will likely be	SAFCA/MBK	

	Project, is any consideration being assigned to develop water surface profiles based on existing baseline conditions and those authorized projects already in construction?	capable of containing the 200-year outflow from Folsom Dam to 160,000 cfs. If the modifications to Folsom Dam do not achieve this objective, it may result in a slightly lower level of protection to Natomas.		
HYD-3	Levee height increases above the original design for the 1957 profile will need to address adverse hydraulic impacts to adjacent and downstream areas. For the extent of levee raises being proposed, this could propose a significant challenge to demonstrate that no adverse impacts would occur. A statement was made at the Corps' Technical Meeting on 4/10/06 that the re-operation of Folsom Dam would mitigate adverse hydraulic impacts from increased levee height, but this would require additional analysis and confirmation.	The levee raising has been authorized by Congress as part of WRDA 1996 and WRDA 1999 and the State legislature as part of Water Code Section 12670.14(c). This issue will be discussed in more detail during the alternatives analysis and environmental review process.	SAFCA/MBK	
HYD-4	MBK indicated at the Corps' Technical Meeting on 4/10/06 that their current 100-year water surface profiles do not directly correlate to the Corps' 100-year water surface profiles used in 1998 to certify Natomas for the 100-year flood event. It is our understanding that SAFCA will addend their Natomas Levee Evaluation Report with a 100-year flood protection plan when these profiles have been revised.	The purpose of the report is to develop and characterize the likely magnitude and cost of improvements needed to provide a 200-year level of flood protection to the Natomas basin. A supplemental report, utilizing our estimate of the water surface profile that should be used for FEMA 100-year certification will be developed to address specific needs and prioritization of the construction program.	MBK/SAFCA	

Number	Comment	Response	Responder	
DES-1	Section 2.3.3 of the Public Review Draft indicates that the Levee Evaluation Study generally followed the guidelines of the "CESPK Geotechnical Levee Practice SOP-03 dated 2004 with the primary exception being that the number of soil borings called for at each levee cross section was reduced to minimize Study costs. Please clarify how the recommended number of soil borings was reduced. Section 5.0 indicates that existing levees have at least one point of deep exploration at 1,000 foot intervals and the proposed setback levee alignment has 2,000 foot intervals. Is the reduction due to the 2,000 foot interval, or not having three borings for each cross section (waterside, crown, and landside)?	It was the goal of the study to realize at least one primary exploration point along each of the Sacramento River, Natomas Cross Canal, and lower American River levees. This has been interpreted as the current minimum FEMA requirement for levee certification. Previous borings performed by USACE, URS, and Kleinfelder were used in this compilation. Where existing boring spacing exceeded this criteria, additional borings were performed. Borings were also added where previous information was deemed insufficient for the PIR level analysis by Kleinfelder. It is recognized this boring layout plan does not meet the requirements of the CESPK SOP-03 document. Additional borings to meet the intent of this document will be performed during the detailed design process. For the secondary levee alignment, no attempt was made to perform an exhaustive either FEMA or USACE level investigation. The studies performed were made to develop conceptual cost estimate comparisons. Should this alternative merit additional consideration, supplemental borings will be performed as needed.	KF	

DES-2	SAFCA's proposed design and construction schedule and the Corps' General Reevaluation Report (GRR) completion for the Natomas region do not agree with each other. Although SAFCA can proceed with advance work under a Section 104 request, there is a risk that certain features may not become part of the Federal Natomas Basin project. Has any consideration been given to proceeding with repairs that specifically address FEMA 100-year protection deficiencies, or those repairs with a high likelihood of being included in the Corps' NED plan and the Federal project configuration, prior to 200-year flood protection features?	The report adopted a cutoff wall as the preliminary remediation alternative to allow development of a representative cost of providing 200-year level of flood protection to the Natomas basin. Additional geotechnical explorations will be conducted during the design process to refine the depth, length and location of the cutoff wall as well as to consider other remediation alternatives. A site prioritization list will be developed based on levee reaches that require remediation to assure performance against the 100-year water surface profile. SAFCA will work with the Corps and State to develop this list.	SAFCA/KF	
DES-3	Section 5.0 of the Public Review Draft (Tables 5-1 through 5-4) contains recommended cutoff wall depths for each reach of the four levees analyzed, based mainly on computed exit gradients from somewhat limited soil borings (see Design section comment #1 above). Did the soil boring analysis include a review of the depths of impervious layers or bedrock material? As the computed water surface elevations are revised and the calculated exit gradients change, the recommended cutoff wall depths will also change. Is any consideration being given to applying a contingency factor to the recommended depths, due to variations between computed and actual water surface levels? It would seem more cost-effective to anticipate slightly	In all cases where cutoff wall recommendations were provided, Kleinfelder recommended cutoff wall depths where the feature would penetrate into an underlying low permeability layer. No partially penetrating cutoff wall configurations were selected. In general, the concept of complete cutoff sufficiently reduces the seepage gradients such that additional minor changes in river stage do not result in material adverse effects. However, this will be confirmed in final design for the appropriate design water surface stage condition selected.	KF	

	higher exit gradients, given the uncertainties with water surface profile calculations, than to remediate newly constructed improvements with deeper cutoff wall construction.				

General

Number	Comment	Response	Responder	
	Section 1.5 of the Public Review Draft references a November 2005 report by the Corps which summarizes the re-analysis of soil boring data using the criteria contained in the CESPK Geotechnical Levee Practice SOP-03 dated 2004. This Corps report was not available to this reviewer. How does this November 2005 report correspond to the March 2006 SAFCA report? Is there general concurrence between the two reports?	The reports generally agree on the reaches of levee that require remediation. There are, however, some differences in the exit gradient calculated at similar locations by the two reports. It is anticipated that these differences will be reduced during the design phase as additional boring data is obtained and the seepage models are revised to reflect data gleaned from piezometer readings during the recent highwater period.	KF/SAFCA	

(DFM Flood Project Development Branch Comments, prepared by Tim Kerr)

Number	Comment	Response	Responder	
FPDB-1	General Comment – Include a discussion of hydraulic impacts resulting from the completed project. Discussion should quantify the impacts and list methodologies envisioned of how to mitigate the impacts. Consider including Figure 6 from the August 9, 2005 MBK report that determined the design profile for the project in this discussion. Figure 6 shows the design profile relative to the existing top of levee elevation for the Sacramento East and West Levees.	This issue will be discussed during the alternatives analysis and environmental review process.	SAFCA/MBK	
FPDB-2	General Comment – Include a discussion of the potential for growth inducing impacts resulting from this project. Future studies will require a discussion of residual risk and damages resulting from the project.	This issue will be discussed during the alternatives analysis and environmental review process.	SAFCA	
FPDB-3	Executive Summary – The study's assumption that the flows on the American River will be controlled to 160,000 cfs relies on multiple improvements being completed upstream. There is some risk that the 160,000 target flow may change by the time the upstream improvements are completed.	See response to Comment HYD-2 above.	SAFCA/MBK	
FPDB-4	Executive Summary – The study makes the conclusion that cut-off walls will be the only solution to the seepage and underseepage stability problems in the project reach. The parallel effort to study the Natomas Basin by the Corps, State, and	The report adopted a cutoff wall as the preliminary remediation alternative to allow development of a representative cost of providing 200-year level of flood protection to the Natomas basin.	SAFCA	

	SAFCA will be required to study all reasonable alternatives; such as cut-off walls, seepage/stability berms, and relief wells. There is some risk that complete credit may not be afforded under the Common Features Project if the General Re-evaluation Report determines that measures other than cut-off walls are more suitable.	Additional geotechnical explorations will be conducted during the design process to refine the depth, length and location of the cutoff wall as well as to consider other remediation alternatives.		
FPDB-5	Executive Summary – The Summary does not indicate the number of construction seasons required to complete the project. This information would be helpful to understand the cumulative impacts.	The construction process and schedule will be dependent on available funding and the ability of the construction industry to absorb the project's construction activity. It is anticipated that the project will take four to six years to complete.	SAFCA	
FPDB-6	Section 5.0 – This section states that the seepage models were ran at steady state. Is there sufficient duration of Sacramento and American River flood events to drive the steady state condition? Consider including a discussion of the time required to reach the steady state condition and the expected duration of the peak flow.	The Sacramento River remained at high stages from January to April 2006. During this period, steady state seepage conditions were evidenced in the piezometers along the Sacramento River and Natomas Cross Canal levees. CESPK Geotechnical Levee Practice SOP-03 dated 2004 recommends that seepage analysis be conducted using steady state conditions.	MBK/SAFCA	
FPDB-7	Section 5.0, Page 5-1 – This section states that the approximate depth of the cut-off wall to reduce exit gradients to an acceptable level was identified. Did the depth insure full cut-off by tying into an impermeable layer? Was a safety factor or contingency used to insure that the depth	As stated in the response to DES-3, above, all cutoff wall depths recommended by Kleinfelder used the full cutoff concept. No partially penetrating cutoff walls were used. When evaluating cutoff depths,	KF	

	sufficiently reduced the exit gradient?	Kleinfelder attempted to include some allowance for depth variations in each estimated cutoff wall depth.		
FPDB-8	Section 5.0, Page 5-1 – This section needs to discuss continuity of the chosen repair plan. Previous planning efforts of the Natomas seepage problem placed a high priority on insuring continuity of the repair scheme. A patchwork of repairs throughout the basin may exacerbate seepage problems at the transition zones between cut-off sections.	The report adopted a cutoff wall as the preliminary remediation alternative. The extents of the walls were selected to provide overlap between areas that indicated the need for remediation and areas that did not indicate a need. Additional geotechnical explorations will be conducted during the design process to refine the depth, length and location of the cutoff wall as well as to consider other remediation alternatives.	KF/SAFCA	
FPDB-9	Figure 7-2, Location of Improvements – Consider showing some stations or river miles on the map. Also, this map shows gaps in the planned location of the cut-off wall that seem short relative to the total length of the repair. Has consideration been given to omitting the small gaps and having a more continuous wall? Consider explaining why the gaps do not need repair (impermeable layer, thick blanket, high landside elevation etc.)	The gaps between the reaches that require underseepage remediation and those that do not range from 1,000 to 6,600 ft long (see Table 5-1). Including seepage remediation in these reaches could add another $60 million to the project cost. Many of the gap areas, particularly those levee reaches north of Powerline Road, will be improved (landside slope flattened and ditches relocated) as part of	KF/SAFCA	

ATTACHMENT A-3
Email Message from John Carroll, Hydraulic Design Section, Corps of Engineers

		the levee raising component. The alternatives analysis and basis of design reports that will be developed as part of the design process will contain additional information as to the selection of treatment alternatives and the conclusion that treatment may not be needed in a particular reach.		
FPDB-10	Figure 7-3, Erosion Treatment Type 1 – This style of bank protection is still experimental at this time. There is risk that the Corps would not recommend certification of levees with this style of bank protection repair. Consider using a Sac Bank style repair from Contract 42E.	The development of site designs based on recommended treatment types will be coordinated with the Corps to ensure that criteria for certification of levees with respect to erosion risk are met. Note that Treatment Type 1 in Figure 7-3 restores the 3:1 waterside levee design slope and includes rock toe protection for the area where erosion has encroached into this slope.	NHC/SAFCA	

From: Carroll, John M SPK
Sent: Tuesday, June 13, 2006 4:25 PM
To: ghelfip@SacCounty.NET; reinhardt@mbkengineers.com
Cc: archer@mbkengineers.com; Twiss, Donald E SPK; Tibbitts, Dan P SPK; Whitin, Brett J SPK; Redeen, Randall G SPK; Townsley, Edwin S SPK
Subject: Use of MBK UNET Model for Design

Pete, John, Ric - Met yesterday morning (Monday, June 12th) with Ric, Mike Archer, Don Twiss, Dan Tibbitts, & Brett Whitin to discuss subject model and its application for ongoing design purposes.

The Corps' Hydraulic Design Section and MBK have worked closely together reviewing the MBK UNET model of the Sac River basin over the past year plus. We have good general agreement between this model and our version of the same modeled reach, with the resulting 200-year water surface profiles not varying by more than 0.4 feet between the models in the reach of the Sacramento River extending from the American River through the Natomas project area to Verona.

We (the Corps) anticipate updating our hydraulic modeling efforts in this reach, by migrating our Comp Study model to the HEC-RAS Unsteady platform. We also plan to prepare additional "composite hydrology" and plan on updating top of levee elevations in the model with survey data we plan on requesting from the State Reclamation Board. However, the results of these efforts will not be available until Fiscal Year 07.

Based on our review of the MBK model, it is acceptable to use this tool for your ongoing design purposes for remediation work on the Natomas Area Levee Project. The SAFCA Natomas Area Levee Project report indicates a design levee profile based on this model's 200-year water surface profile plus 3 feet. We concur in the application and recommend addition of this freeboard value to the 200-year water surface profile to determine the minimum design top of levee profile.

We also discussed in general our parallel modeling efforts in the Sacramento River Basin, and agreed that we should continue to work closely and share information. To that end, Ric suggested a "working group" type meeting. This is a suggestion I would like to follow up on in the future. MBK has existing top of levee profile data for several Reclamation Districts for which they are working. The Corps will likely request the same type of data (through the Rec Board) for our mutual use and the benefit of the public.

It was a very fruitful meeting. We look forward to continuing these effective interactions. I had wanted to send this to John Bassett as well, but do not have his e-mail. Please forward to him. Thanks.

John

John M. Carroll Jr., P.E.
Chief, Hydraulic Design Section
US Army Corps of Engineers
Sacramento District
(916) 557-6885
(916) 557-7846 (fax)
John.M.Carroll@usace.army.mil

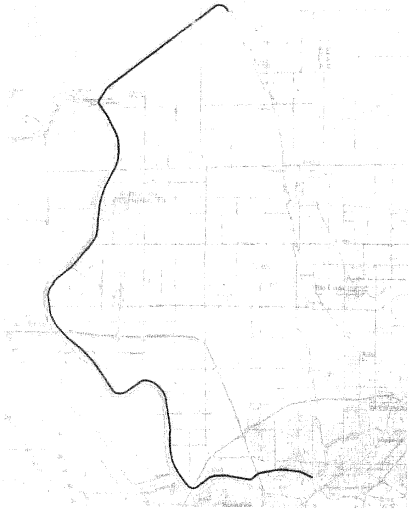
ATTACHMENT A-4
Summary of Historic Water Levels, Natomas Basin

Sacramento River and American River					
Natomas Basin Area					
Summary of Historic Water Levels					
Corresponding to Historic Landside Seepage Maps					
		River	Stage		
		High	Low	Duration	
1938					
	Sac River at Verona	33	31	60 days	
	Sac River at Sac Weir	26	25	60 days	
	Sac River @ American River	25	25	60 days	
1963					
	Sac River at Verona	32.5	31	30 days	
	Sac River at Sac Weir	25.5	21	30 days	
	Sac River @ American River	24	19	15 days	
1965					
	Sac River at Verona	30.4	28		
	Sac River at Sac Weir	25.3	22	10 days	Feb
	Sac River @ American River	21.1	19		
Note: river stage is feet NGVD					

NATOMAS LEVEE EVALUATION REPORT

Prepared for SAFCA in Support of the Natomas Basin Components of the American River Common Features Project

Public Review Draft



Prepared for:
SAFCA

Prepared by:
MBK Engineers
Kleinfelder
Northwest Hydraulics Consultants
Parsons Brinckerhoff
EDAW
Jones & Stokes Associates

March 13, 2006

EXHIBIT NINE

Greenbriar Draft EIR Comments
James P. Pachl, 9/5/06
Exhibit Nine

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EXECUTIVE SUMMARY

This report summarizes the preliminary conclusions and recommendations of the Natomas Levee Evaluation Study (Levee Evaluation Study or Study) that is contained in a series of technical reports commissioned by SAFCA. This Study, which was initiated in 2005, follows more than a decade of levee improvement activity aimed at safely containing a 200-year flood in the Lower Sacramento and American Rivers and the diversion channels around the perimeter of the Natomas Basin. The improvements have significantly reduced the risk of flooding in Natomas, particularly along the eastern flank of the basin. However, recent experience has persuaded flood managers that levees throughout the Lower Sacramento Valley may be subject to an unacceptable risk of failure due to deep underseepage and continuing erosion. One of the principal aims of the Levee Evaluation Study was to assess this risk in the Natomas area using new guidelines adopted by the Sacramento District of the U.S. Army Corps of Engineers (Corps). The Study also addressed levee freeboard and streambank erosion issues in order to identify the scope of the improvements needed to reduce the annual risk of flooding to less than 1/200 in any given year.

Conditions along the south levee of the Natomas Cross Canal, the east levee of the Sacramento River, and the north levee of the American River were assessed in relation to water surface elevations produced by a hypothetical flood with a 1/200 Annual Exceedence Probability (AEP). The size of this flood was determined based on hydrology developed by the Corps as part of the Sacramento and San Joaquin River Basins Comprehensive Study. This flood was routed through the flood control system using a hydraulic model developed by MBK Engineers (MBK). The resulting water surface elevations reflected two key modeling assumptions. First, it was assumed that levees upstream of Natomas would not fail when overtopped, but would act as weirs, thus only slightly diminishing peak flows in the channels around Natomas. Second, it was assumed that flows in the Lower American River would be controlled to 160,000 cfs during the modeled event.

The Natomas levees were evaluated based on the following engineering criteria. For freeboard, levees were deemed deficient if they did not have at least three feet above the 1/200 AEP water surface elevations. Levee foundations were deemed problematic if seepage analyses indicated exit gradients at or above the Corps adopted guideline for underseepage and other indicia of subsurface permeability (such as the presence of standing water at the landside toe of levee) were present in the affected levee reach. The risk of bank erosion was classified as 'high', 'moderate', or 'low' based on evidence of recent erosion and slope failure, the width of the bank (or "berm") between the levee and the active river channel, encroachment into the projected waterside levee slope, the steepness of the bank, the potential for scour along the waterside toe of the bank, and the cohesiveness of the soils comprising the bank.

Remedies for identified problems were developed based on established levee improvement and bank protection techniques. It was assumed that levee freeboard deficiencies would be addressed through levee raising; foundation seepage issues would be addressed through construction of cutoff walls; and erosion risks would be addressed through minimum impact toe rock and bank re-vegetation techniques commonly in use along the Lower American and Sacramento Rivers. The Study also raised the possibility of addressing identified deficiencies in the upper 5 miles of the east levee of the Sacramento River through construction of a new secondary levee set back about 1,000 feet from the existing levee. Under this alternative, the existing levee would continue to confine the river channel and serve as the Garden Highway. The new levee would eliminate the uncertainties

associated with refurbishing the existing levee, reduce erosion concerns, and ensure safe containment of the 1/200 AEP flood if the existing levee were to fail.

Based on the preliminary conclusions and recommendations of the Levee Evaluation Study, the cost of the improvements needed to address the problems identified in the Study would be approximately $300 million. The cost of the secondary levee alternative would range from approximately $354 million to $432 million depending on the source of material used to construct the new levee.

The Study notes that environmental considerations will affect the timing and cost of constructing the needed levee and streambank protection improvements. In order to minimize construction delays and avoid unnecessary project cost increases, the improvement program should include a comprehensive approach to mitigating unavoidable environmental impacts that complements ongoing habitat conservation efforts in the Natomas Basin and the Sacramento River channel.

The Study also indicates that the risk of flooding at the 100-year level is greater than previously assumed, underscoring the urgency of expediting the needed improvements.

SAFCA will utilize the results of the Study to support the Corps' continued work on the Natomas Basin Components of the American River Common Features Project and to evaluate the potential to move forward with the identified flood control improvements using local and state funds.

1.0 BACKGROUND

1.1 STORMS OF 1986

The Sacramento River Flood Control Project (SRFCP) is an integrated system of levees, overflow bypass channels, and dams that was designed and constructed by federal, state and local interests over several decades of the 20th Century to protect farmlands, towns and cities in the Sacramento Valley from large floods. The record storms of 1986 tested the limits of the SRFCP's storage and conveyance capacity, causing levee failures in many areas of the Valley that resulted in millions of dollars of property damage. The flood exposed numerous deficiencies in the SRFCP. In the Sacramento area, these deficiencies included: (1) unstable levees along the east bank of the Sacramento River that were susceptible to failure due to the porous nature of the material used in their construction; (2) inadequate conveyance capacity in the drainage channels around the Natomas Basin that serve to divert runoff from the foothills into the Sacramento and American Rivers; and (3) inadequate reservoir storage capacity for controlling large floods in the American River watershed. The Natomas Basin levees that are part of the SRFCP are shown in Figure 1-1

Prior to 1986, the Federal Emergency Management Agency (FEMA) judged that the SRFCP could safely contain a 100-year flood event along the Sacramento and American Rivers. This judgment informed Sacramento's entry into the National Flood Insurance Program (NFIP) in the late 1970's and allowed property owners in the protected Sacramento and American River floodplains to obtain flood insurance on a voluntary basis at favorable rates. After 1986, the U.S. Army Corps of Engineers (Corps) concluded that the SRFCP's deficiencies rendered Sacramento vulnerable to about a 70-year flood. This conclusion caused the FEMA, administrator of the NFIP, to issue new floodplain maps indicating that most of the City of Sacramento and portions of Sacramento and Sutter Counties were in the 100-year floodplain. These new maps were issued in November 1989 and had the effect of raising the cost of flood insurance and making property owner participation in the insurance program mandatory.

1.2 LOCAL-STATE-FEDERAL RESPONSE

SAFCA was formed in September 1989 to work with the Corps and the State of California (State) through the California Reclamation Board (Reclamation Board) to provide all of Sacramento's SRFCP protected floodplains with at least a 100-year level of flood protection as quickly as possible while working to achieve a 200-year level of flood protection over time. The rationale for this flood risk reduction program was that an uncontrolled flood would expose Sacramento's low-lying, heavily urbanized floodplains to a potentially catastrophic loss of life and property. A 100-year level of flood protection is the minimum national standard for protecting urban areas and it was essential to meet this standard as quickly as possible. However, given the likely consequences of an uncontrolled flood, it was also necessary to work toward the higher standard of protecting Sacramento from at least a 200-year flood, since this was considered to be representative of the most severe flood that could be reasonably expected to occur along the Sacramento and American Rivers. A 200-year level of flood protection was also consistent with the minimum level of protection enjoyed by other urban areas in the United States with substantial development in protected floodplains. This flood risk reduction program was subsequently characterized as progressing from

high risk (less than 100-year protection) through moderate risk (greater than 100-year but less than 200-year protection) to low risk (greater than 200-year protection).

1.3 SACRAMENTO URBAN LEVEE RECONSTRUCTION PROJECT

In order to achieve the goals of the flood risk reduction program, the Corps proposed to quickly implement a levee stabilization project along the 33-mile reach of the Sacramento River east levee that protects Natomas, downtown Sacramento, and the Pocket area, and to pursue a comprehensive program of levee improvements along the diversion channels around Natomas combined with construction of a flood control dam near Auburn to control flows in the Lower American River. The levee stabilization effort focused on the two segments of the east levee of the Sacramento River upstream and downstream of the American River: the downstream segment connecting the American River south levee to the North Beach Lake levee near the town of Freeport and the upstream segment connecting the American River north levee to the south levee of the Natomas Cross Canal near Verona. These levees were constructed in the early part of the 20th Century using materials dredged from the river channel that contained significant amounts of sand and silt dislodged from the foothills and mountains along the east side of the Sacramento Valley during the hydraulic mining era. These materials proved to be extremely porous when subjected to the prolonged high flows produced by the storms of 1986, particularly in the Natomas area where levee failure due to seepage through the levee was avoided only through a massive effort to shore up the levee during the height of the flood.

The stabilization effort, which was referred to as the Sacramento Urban Levee Reconstruction Project, employed two measures to address this seepage problem. Where space permitted, as in much of the upper Natomas Basin, the plan called for construction of a seepage stability berm along the landside of the levee to intercept any water seeping through the levee and discharge it into a drainage ditch to be pumped back into the river. Where space was limited, as in the Pocket area and the lower Natomas Basin, the plan called for construction of a slurry cutoff wall excavated through the levee and into less permeable ground below. This cutoff wall serves as a barrier to seepage through the permeable levee embankment soils. Construction of these improvements, covering approximately 33 miles of the Sacramento River east levee, was initiated in 1990 and completed in 1993.

1.4 NORTH AREA LOCAL PROJECT

With the completion of the Sacramento Urban Levee Reconstruction Project, attention shifted to the American River and the diversion channels around the Natomas Basin. Here the plan was to raise the diversion channel levees and control water surface elevations in the channels and the Lower American River by constructing a flood detention dam at Auburn. This plan was presented to Congress in 1992. However, in the face of opposition to the detention dam, Congress authorized only the levee improvements around Natomas and directed that these improvements should proceed while the Corps re-evaluated the options for controlling high flow along the remainder of the Lower American River. The legislation left open the possibility that the authorized improvements could be constructed by non-federal interests in exchange for future credits or reimbursements.

Taking advantage of this provision, SAFCA opted to move forward with a slightly redesigned plan that would protect the Natomas Basin from a 200-year flood along the American River without the benefit of the Auburn flood detention dam. This plan was feasible because of the design of the

American River levee system upstream of Natomas. The last segment of this system was constructed in 1958, after the completion of Folsom Dam. Believing that the dam afforded protection against extremely large floods, the Corps permitted the American River north levee to be extended upstream from Cal Expo to the Carmichael Bluffs along an alignment very near to the north bank of the river channel, thus cutting off a historic overflow area and creating a relatively narrow river channel. This channel cannot contain very high flows discharged from Folsom Dam. Instead, such flows are likely to trigger a levee failure upstream of Natomas, thus causing large volumes of flood water to flow into the surrounding floodplains of the American River outside of Natomas. Levee failures such as this would actually result in a reduction of water surface elevations in the vicinity of Natomas.

With this knowledge, SAFCA revised the design of the diversion channel levee improvements to contain the maximum water surface elevation likely to be produced by a 200-year flood along the southeastern flank of the Natomas Basin, combining foothill runoff with American River flows, reflecting the effects of upstream levee failures. Based on this design, SAFCA raised the east and west levees of the Natomas East Main Drainage Canal (NEMDC), the north and south levees of Arcade Creek, and the south levee of Dry/Robla Creek. In addition, SAFCA constructed a new levee along the north side of Dry Creek, extended the south Robla Creek levee, and installed a new pumping plant in the NEMDC channel connecting the new Dry Creek north levee to the raised NEMDC west levee. Finally, SAFCA strengthened the south levee of the Natomas Cross Canal (Cross Canal) and portions of the Pleasant Grove Creek Canal levee in Sutter County to control flooding along the northern perimeter of the Natomas Basin.

This North Area Local Project (NALP) was substantially completed in 1996. That same year, the Corps issued a Supplemental Information Report (SIR) to Congress that concluded the project provided Natomas with enough protection to control at least a 200-year flood along the American River and about a 140-year flood along the Sacramento River. Judged by the standards of the adopted flood risk reduction program, Natomas had progressed from a high-risk to a moderate-risk status. The SIR indicated that with a slight increase in the height of the Sacramento River east levee just downstream from its junction with the south levee of the Cross Canal, the area could be secured from a 200-year flood along the Sacramento River, thus attaining the low-risk goal of the program. In response to the SIR, which also addressed the ongoing risk of flooding in the Sacramento area outside Natomas, Congress directed the Corps to initiate extensive improvements to the levees along the American River upstream of the Natomas Basin and to address the residual risk of flooding along the east levee of the Sacramento River downstream of the Cross Canal. These improvements were considered a common element of any long-term effort to provide Sacramento with at least a 200-year level of flood protection, and the project was referred to as the American River Common Features Project (Common Features Project). Figure 1-2 illustrates the Natomas improvements constructed as part of the Sacramento Urban Levee Reconstruction Project, North Area Local Project, and Common Features Project.

1.5 NATOMAS BASIN COMPONENTS OF THE AMERICAN RIVER COMMON FEATURES PROJECT

Shortly after the conclusion of the 1996 federal legislative session, the Sacramento Valley was again visited by a flood of record magnitude. The storms of 1997 produced flows in the Lower Sacramento and American Rivers comparable to those of the storms of 1986. Nevertheless, the

levees around the Natomas Basin, improved by the NALP and the levee stabilization work that preceded it, passed these flows without the significant signs of stress that occurred in 1986. On the other hand, the flood did cause failures of some SRFCP levees along the Feather River and Sutter Bypass upstream of Natomas. The Corps' post-flood assessment concluded that underseepage may have contributed to these levee failures. As shown in Figure 1-3, underseepage can act as a levee failure mechanism where the soils in the ground beneath a levee contain materials that are sufficiently permeable to transmit water under high pressure from the riverside to the landside of the levee. During a flood event, these high-pressure flows can create a strong upward force. If the soil mantle on the landside of the levee is not able to withstand or safely release this uplift force, the result can be a rupture of the soil mantle allowing seepage to erode and remove the soils below the levee. In severe cases the levee can collapse into the void that is created and be overtopped by flood water.

In order to address the risk of underseepage, the Corps recommended a broader scope for the Common Features Project, advocating that deep seepage cutoff walls be inserted through the levees along the Lower American River and calling for an assessment of the need for similar measures along the east levee of the Sacramento River in the Natomas area. These recommendations were adopted by Congress in 1999.

After initiating the design of the project to raise the east levee of the Sacramento River, engineers reviewed the conditions observed at the Pritchard Lake canals during the Storm of 1997. Based on this review, deep underseepage was identified as a possible concern. The Corps formed a levee review panel composed of experts in soil mechanics and geotechnical exploration and evaluation. The panel met periodically to review the investigation plan, conclusions and to provide guidance on alternative remediation measures. As the investigation proceeded, it became apparent that more information on subsurface conditions was needed. A program of soil borings and samplings began in 2000 and was completed in late 2001. Analysis of the accumulated data indicated that there is a threat of underseepage-induced failures along the Sacramento River east bank levee and the Natomas Cross Canal south bank levee during high water conditions. Preliminary identification of alternatives was completed and the Corps and its partners began a public involvement program to identify issues of concern of the local community before developing a final design for congressional approval.

Public Scoping meetings were held in July 2002 to present information on the preliminary levee modifications and receive comments from the public. It was anticipated that information obtained in these scoping meetings would be used to assist in plan selection and to complete the draft environmental documents necessary to meet both Federal and State requirements.

Because of the magnitude and anticipated cost of the recommended work, and because deep underseepage was a newly recognized concern in the Sacramento Valley, the Corps and its non-Federal partners, the State and SAFCA, determined that a panel of experts should be convened to review and refine the Corps' guidelines for evaluating the risk of underseepage and for designing remedial measures.

The Corps' Levee Seepage Task Force was convened in early 2003 and completed its work in July 2003. Based on its findings, the Corps developed a new Standard Operating Procedure Engineering Design Guidance 2003 (SOP EDG-03) for Geotechnical Levee Practice, recommending guidelines for evaluation, design, and maintenance, which were adopted by the Corps' Sacramento District in August 2004. The most important recommendation embodied in the new SOP EDG-03 was that

additional resources should be used in the evaluation, feasibility and design phases of a project so that less conservative and more cost effective remedial measures could be recommended for construction.

With the new SOP EDG-03 as a guide, the Corps, the State, and SAFCA staffs collaborated to develop a plan for moving forward with the Natomas levee improvements needed to achieve 200-year flood protection, while at the same time addressing priority levee deficiencies which might be identified. Given the limited funding available to the Corps through the Common Features Project, it was agreed that SAFCA would take the lead in conducting a Natomas levee evaluation study which would be the basis for planning additional levee improvements. In addition, it was agreed that the Corps would conduct a re-evaluation of data collected from earlier studies in light of the new SOP, using the 100-year flood profile as a basis for evaluation.

The Corps re-analyzed the boring data that it had earlier collected using the new guidelines, summarizing its findings in a report dated November 2005. For water surface elevations produced by a 100-year flood, the Corps determined that, at some locations, calculated exit gradients exceeded the adopted guideline for levee stability and the borings indicated a potential for subsurface permeability that could threaten the stability of the affected levees if not addressed.

SAFCA initiated the Natomas Levee Evaluation Study (Levee Evaluation Study) in June 2005, including extensive additional geotechnical explorations along the existing Natomas levees and along a proposed setback levee alignment for the northern 5.5 miles of the Sacramento River east levee. SAFCA's study focused on the potential for seepage failure in a 200-year flood event along the south levee of the Natomas Cross Canal, the east levee of the Sacramento River and the north levee of the American River. Unresolved levee freeboard and streambank erosion issues affecting these levees were also evaluated in order to identify the scope of the improvements needed to reduce the annual risk of flooding to less than 1/200. Lastly, in order to identify the magnitude of the problems and prioritize remedial activities, the potential for seepage failure was also assessed for a 100-year flood event.

The results of the Corps' November 2005 report and SAFCA's Levee Evaluation Study reconfirmed the Corps' post-1997 flood concerns regarding underseepage and underscore the need for a substantial expansion of the scope of the Common Features Project in Natomas. The current Corps and SAFCA studies will contribute to the ongoing Corps General Re-evaluation Report (GRR) process, which is documenting the extent of the underseepage problem and identifying a range of solutions to this problem, as well as other levee concerns. However, this GRR will not likely be completed until 2009.

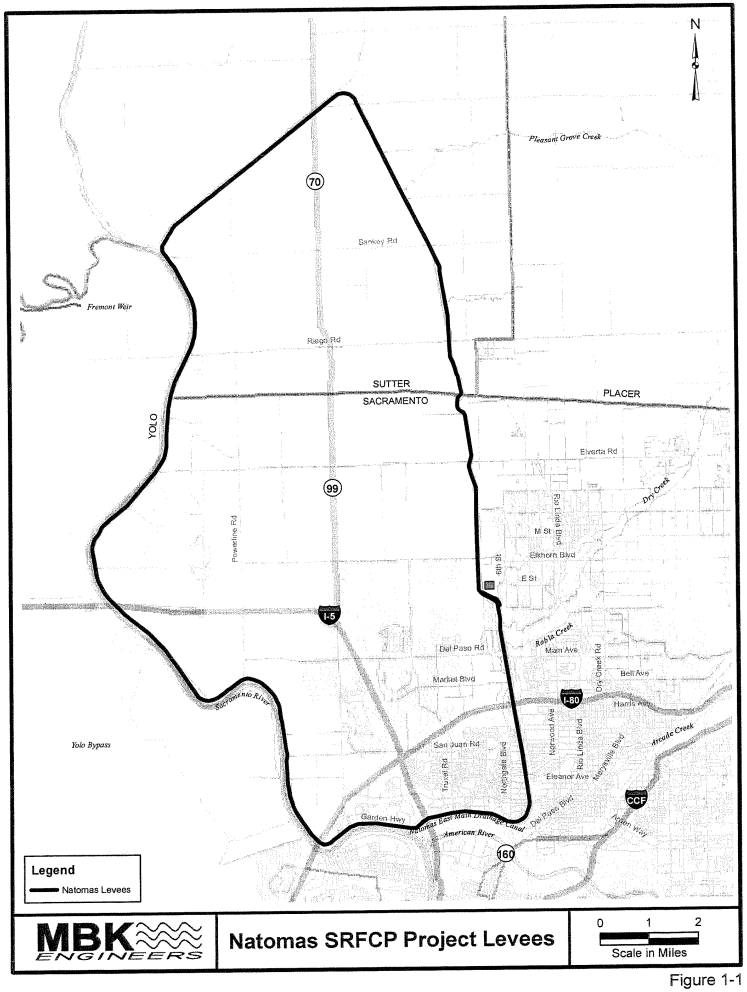

Figure 1-1

Sacramento River Under-Seepage and Through-Seepage Levee Risks

Figure 1-3

Figure 1-2

2.0 PURPOSE, SCOPE, AND METHODS AND CRITERIA

2.1 PURPOSE

SAFCA initiated the Levee Evaluation Study in order to (1) expedite application of the new underseepage guidelines to the Natomas area, (2) address residual streambank erosion and levee freeboard issues, and (3) consistent with the goal of moving Natomas to a low-risk status, identify the improvements needed to protect the Natomas area from a flood event that has a 1/200 chance of occurring in any given year (1/200 Annual Exceedence Probability or AEP). The Study will serve as a complement to the Natomas General Re-evaluation Report (GRR) that has been initiated by the Corps as part of the ongoing Common Features Project and will allow the SAFCA Board to determine whether or not to initiate work in the Natomas area in advance of congressional action on the GRR, which is expected to occur in 2009.

2.2 SCOPE

As discussed above, the Levee Evaluation Study is part of an ongoing effort to reduce the risk of flooding in the Sacramento area that commenced following the storms of 1986. The improvements completed in the decade after this event, including levee raising and strengthening around Natomas, improved operation of Folsom Dam, and erosion protection along the Lower American River, significantly contributed to the levee system's capacity to safely contain the high water stages and flows experienced in 1997. Since 1997, additional improvements have been authorized and substantial upgrades to the levees along the Lower American and Sacramento Rivers have been completed.

Reflecting these accomplishments, the initial phase of the Levee Evaluation Study does not include an evaluation of the levee along the east side of the Natomas basin south of the NEMDC Stormwater Pumping Station. This levee was improved as part of the NALP. Subsequent phases of the Levee Evaluation Study will evaluate whether the NALP improvements are sufficient to protect urban development in Natomas from a 1/200 AEP flood event. Accordingly, the initial phase of the Study focuses on the Natomas Cross Canal south levee from Howsley Road to the Sacramento River, the Sacramento River east levee from the Natomas Cross Canal to the American River and the American River north levee from the Arden Garden Connector to the Sacramento River.

The Pleasant Grove Creek Canal levee and NEMDC levee north of the NEMDC Stormwater Pumping Station were also not evaluated in the initial phase of the Study because the volume of water that can enter the Natomas Basin due to a failure of these levees will not result in deep flooding. These levee reaches will be evaluated once work for the other levee reaches is underway. A conceptual level cost estimate has been included in the Study cost estimate based on knowledge that there are as many as 30 historic stream channels that cross under the Pleasant Grove Creek Canal and NEMDC levees. The purpose of this estimate is to serve as a place holder until more detailed study can be performed.

In addition, the Study assumes that congressionally authorized operational and structural modifications to Folsom Dam will be implemented and will control the 1/200 AEP flood event to 160,000 cfs. As discussed below, this flow was assumed in the modeling of water surface elevations that guided the problem identification process.

2.3 METHODS AND CRITERIA

Each of the Study levees was evaluated for performance in a hypothetical 1/200 AEP flood based on established criteria for levee freeboard, levee foundation stability, and streambank erosion. The methods used to establish 1/200 AEP water surface elevations in the Study area, the engineering criteria used to identify acceptable performance, and the improvements needed to address identified problems are briefly described below and discussed more fully in the sections that follow.

2.3.1 Hydrology and Hydraulics

The profile for the 1/200 AEP flood used to derive water surface elevations in the river channels around Natomas was developed by MBK Engineers (MBK) using a modified version of the Corps' Sacramento and San Joaquin River Basins Comprehensive Study UNET model. This flood profile was routed through the SRFCP levee system upstream of Natomas and combined with flows in the Lower American River. In creating these routings, MBK made two key assumptions. First, it was assumed that the SRFCP levees upstream of Natomas would not fail when overtopped by flows in their respective channels, but would function as weirs, diverting much less water from the channel than would be the case if overtopping triggered a breach of the levee and induced a much larger discharge of flood water into the adjacent flood basin. This assumption had the effect of keeping more water in the system and moving downstream and produced higher modeled water surface elevations in the channels around Natomas than if the levees had been assumed to fail when overtopped. Second, MBK assumed that major improvements to Folsom Dam and the American River levee system would be completed, allowing dam operators to control the maximum safe release from the dam to 160,000 cfs for the 1/200 AEP event.

Levee performance was measured against the resulting water surface elevations around Natomas so as to assess the relative magnitude of the identified levee freeboard, foundation stability and streambank erosion problems, and to develop appropriate design improvements.

2.3.2 Levee Freeboard

Levee freeboard is a measure of the distance between the top of a levee and the water surface elevation produced by a given flow in the river channel confined by the levee. Raising portions of the Sacramento River east levee to increase levee freeboard was authorized by Congress as part of the Common Features Project in 1996. This authority was broadened in 1999 to include raising portions of the Natomas Cross Canal levees. The Levee Evaluation Study assumed that the top of the levees around Natomas should be at least three feet above the 1/200 AEP water surface elevation in order to provide adequate protection against such a flood. It is recognized that additional levee height may be needed to address wind and wave run-up. This analysis will be included as part of the design process.

2.3.3 Levee Foundation Stability

As discussed in the previous sections, the potential for levee failures due to foundation problems has received increased attention in the California Central Valley after an investigation of levees that failed during the 1997 storms. The task force assembled to review levee design practices produced guidelines that were adopted by the Corps' Sacramento District in "CESPK Geotechnical Levee Practice SOP-03" in late 2004. The Levee Evaluation Study generally followed these guidelines with the primary exception that the number of soil borings called for at each levee cross section location was minimized to reduce Study costs. Additional borings will be conducted during the design phase of the project.

A key criterion used in the Study to evaluate seepage was the exit gradient produced by the modeled water surface elevation interacting with the soil types identified through borings beneath and adjacent to the landside toe of the levee. SAFCA's geotechnical engineering consultant, Kleinfelder, used these data along with other indicia of subsurface permeability to identify Study area levees requiring improvements to protect against potential underseepage.

2.3.4 Bank Erosion

The Study addressed the potential for streambank erosion in the Study area by identifying the sites where erosion is most likely to occur based on a review of historical data, the findings of recently published reports, and field investigations. Bank failure mechanisms considered both longitudinal erosion during high and moderate flow events and wind and boat generated waves during lower stage periods. The risk of levee-threatening erosion at each of the identified sites was assessed based on bank geometry, berm width, bank slope stability, bed scour, and the composition of the soil material comprising the streambank. Using these criteria, SAFCA's geomorphology consultant, Northwest Hydraulic Consultants, determined the likelihood that erosion could threaten the levee in the next ten years and classified the risk as 'high', 'moderate', or 'low'. Sites classified as high risk also indicate current conditions that could threaten the levee in a single severe flood season or erosion episode. These designations were used to prioritize improvement efforts.

2.3.5 Needed Improvements

The Study assumed that the principal method of addressing identified problems in Study 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. One of the purposes of the Study was to characterize the likely magnitude, cost and prioritization of the needed improvements. While there is room for consideration of alternative techniques, particularly for treating underseepage deficiencies, assuming that established techniques would be used has expedited this effort. At the same time, the Study has pointedly included a conceptual assessment of the option of constructing a new secondary levee in the upper reach of the Natomas area set back about 1,000 feet from the existing Sacramento River east levee. This option would address identified problems in a limited portion of the Study area and could be combined with the established techniques in the remainder of the area depending on environmental, permitting, and cost considerations.

3.0 HYDROLOGY AND HYDRAULICS

3.1 BACKGROUND AND PURPOSE

An essential element of the Levee Evaluation Study was the development of an appropriate 1/200 AEP water surface elevation for purposes of assessing the performance of the levees in the Study area and developing a program of improvements to address identified deficiencies. Toward this end, MBK developed flood profiles using a modified version of the Corps' Comprehensive Study UNET model. A summary of the approach taken to accomplish this work is described below. Detailed supporting information is contained in the "Design Water Surface Profile for the Sacramento River East Levee and Natomas Cross Canal Levees in Natomas" dated August 9, 2005 prepared by MBK Engineers.

3.2 HYDROLOGY

The profile for the 1/200 AEP flood was developed based on the Comprehensive Study Sacramento River Basin UNET hydraulic simulation model for twelve hypothetical storm centerings in the Sacramento Valley. These centerings relied on historical flood patterns to define the shape and magnitude of the flow contributions from each of the major basins in the Valley, and were designed to stress specific locations in the SRFCP system. For example, the Sacramento River at Latitude of Sacramento centering was designed to place the most stress on the system at the latitude of Sacramento. A review of preliminary simulations made with the various centerings indicated that the Sacramento River at Latitude of Sacramento centering (Sac Centering) and the Feather River at Shanghai Bend centering (Shanghai Centering) produced the most flow and the highest water surface elevations in the Study area.

3.3 HYDRAULIC MODEL

The MBK version of the Comprehensive Study UNET model adopted for SAFCA's Lower Sacramento River Regional Plan study effort (MBK model) was used to route the selected flood profile through the flood control system so as to establish appropriate water surface elevations in the channels around the Natomas area. UNET is a one-dimensional unsteady open-channel flow model that was developed by, and is supported by, the Corps' Hydrologic Engineering Center. The downstream boundary of the Comprehensive Study UNET model is the Sacramento River at Collinsville, and the upstream boundaries on the major rivers are:

Sacramento River	Woodson Bridge (River Mile 215.5)
Feather River	Thermalito Afterbay Outlet (River Mile 58.6)
Yuba River	Engelbright Reservoir (River Mile 22.0)
Bear River	Wheatland Gage (River Mile 12.5)
American River	Fair Oaks Gage (River Mile 22.0)

The topographic information in the model was surveyed by the Corps in 1998.

3.4 WATER SURFACE ELEVATION VARIABLES

In order to develop appropriate 1/200 AEP water surface elevations for the channels around the Natomas area, the MBK model had to account for the following variables:

- The effect of authorized American River projects on outflows from Folsom Dam;
- Potential levee failures along the Sacramento and Feather River systems upstream of Natomas;
- Potential failure of the Sacramento River west levee into Upper Elkhorn (RD 1600); and
- Future modifications to the SRFCP.

3.4.1 American River

Peak flows in the Lower American River affect the 1/200 AEP water surface elevations in the Study area along the north levee of the American River and the lower reach of the east levee of the Sacramento River. These flows are controlled by the operation of Folsom Dam and the condition of the levees along the American River upstream of Natomas. Several projects have been completed or are underway to improve these facilities. These projects include:

- Lower American River Common Features FEMA Certification – Completed in 2004.
- Lower American River Common Features – Anticipated completion in 2008.
- Folsom Dam Variable Space Storage Operation (400-670) – Implemented in 1994.
- Folsom Dam Outlet Modifications Project – Anticipated completion in 2013.
- Folsom Dam Revised Variable Space Storage Operation (400-600) – Anticipated implementation in 2013.
- Folsom Dam Forecast Based Operation – Anticipated implementation in 2013.
- Folsom Dam Raise Project – Anticipated completion in 2021.

Collectively, these projects will significantly reduce peak flood flows on the Lower American River. The MBK model assumed that all of these projects were in place, with the exception of the Folsom Dam Raise Project.

3.4.2 Upstream Levee Overtopping

Table 3-1 shows the locations of upstream levees where the water surface elevation of the selected 1/200 AEP flood profile exceeds the top of levee elevation. The MBK model has been calibrated to treat the effect of overtopping as creating a weir that allows a limited volume of flood water to flow over the levee and into the adjacent flood basin but without creating a breach.

TABLE 3-1: UPSTREAM LEVEE OVERTOPPING LOCATIONS FOR THE 1/200 AEP EVENT

Location	Bank	Mile	Design Deficient? (Yes/No)[1]
Sutter Bypass	Left	85.1-89.0	Yes
Wadsworth Canal	Right	3.0	Yes
Sutter Bypass	Right	78.7-84.1	Yes
Sacramento River	Left	92.3; 174.3-184.0	Yes (92.3)
Sacramento River	Right	74.5-77.0	Yes
Jack Slough	Right	5.5	NA
Yuba River	Left	6.5-6.8	Yes
Bear River	Right	1.8	Yes
Angel Slough	Right	16.0-23.0	NA
Best Slough	Right	0.5-4.5	NA
Yankee Slough	Left	7.3	NA
Yankee Slough	Right	7.3	NA
Auburn Ravine	Left	1.7	NA
Auburn Ravine	Right	1.7	NA
King Slough	Left	0.80	NA
King Slough	Right	0.99	NA
Curry Creek - Pleasant Grove Canal	Left	0.5-0.9	NA
Curry Creek - Pleasant Grove Canal	Right	0.5-0.9	NA
Pleasant Grove Creek	Left	0.8	NA
Pleasant Grove Creek	Right	0.8	NA
Pleasant Grove Canal	Right	0.5-1.5	NA
Pierce Roberts Drain	Right	0.6-0.8	NA

[1] *This is intended to show if existing top of levee elevation is deficient of the freeboard specified for the 1957 design profile.*
NA denotes 1957 design profile information not available.

3.4.3 Sacramento River West Levee Overtopping

All SRFCP levees were constructed and are maintained to provide a minimum freeboard between the levee crown and the water surface elevation corresponding to the "Federal Flood Control Project Design", which is commonly referred to as the "1957 Profile". The SRFCP design freeboard varies from reach to reach, but in general is 3 feet on the rivers and 6 feet on the bypasses. The Sacramento River west levee in Upper Elkhorn across the river from Natomas does not currently meet this standard because it has a low spot at River Mile (RM) 76.5 (roughly across the river from the westerly end of Riego Road in Natomas). Under existing conditions, this low spot is likely to be overtopped in flood events greater than the 1/100 AEP event, depending on the performance of upstream levees. Consistent with the approach taken to the overtopping of other SRFCP levees upstream of Natomas, the MBK model was calibrated to treat the overtopping of the RD 1600 Sacramento River west levee as a weir.

3.4.4 Future Modifications to the Sacramento River Flood Control Project

Several projects are currently being considered that will affect flows in the Feather River and the performance of the SRFCP levees upstream of Natomas. However, the likelihood of these projects being constructed and the timing of construction are uncertain. Accordingly, the only improvements incorporated in the MBK model are those necessary to correct the "design deficiencies" noted in Table 3-1. The model thus reflects the top-of-levee elevations from the Corps' Comprehensive Study UNET model.

3.5 1/200 AEP WATER SURFACE PROFILES

In the MBK model, the selected 1/200 AEP flood event is derived from a common profile representing a Shanghai Centering and Sac Centering storm. This profile produces the highest flows in the Study area compared to the other centerings. In order to establish these flows, the MBK model assumes that outflows from Folsom Dam will be 160,000 cfs and that neither the Sacramento River west levee in Upper Elkhorn nor the SRFCP levees upstream of Natomas will fail when overtopped. These assumptions produce water surface profiles that are conservative and exceed water surface elevations that are likely to ever reach the Study area. However, this scenario serves as an appropriate standard for identifying the long-term design requirements for the levees in the Study area given the health and safety consequences of an uncontrolled flood in Natomas.

3.5.1 Comparison of 1/200 AEP Profile to Gage Data

There are three gages in the vicinity of the Study area that can be used to compare the 1/200 AEP water surface profiles to other important flood profiles. Tables 3-2, 3-3 and 3-4 compare data at these gages.

Sacramento River at Verona (USGS 11425500) – This gage is located at Sacramento River UNET RM 78.75 (USGS RM 78.35) and is within the Study area.

TABLE 3-2: PEAK STAGES AND FLOWS AT THE VERONA GAGE

	Stage (ft, NGVD)	Flow (cfs)
1986 Flood	39.11	N/A
1997 Flood	39.09	N/A
1957 Profile	37.95	107,000
1/200 AEP profile	42.05	127,700

Sacramento River at I Street (DWR) – This gage is located at Sacramento River UNET RM 59.75 (USGS RM 59.4) and is just downstream of the Study area.

TABLE 3-3: PEAK STAGES AND FLOWS AT THE I STREET GAGE

	Stage (ft, NGVD)	Flow (cfs)
1986 Flood	30.68	115,000[1]
1997 Flood	30.38	107,520[2]
1957 Profile	31.15	110,000
1/200 AEP profile	33.46	141,600

[1] *The 1986 flow was taken from the Sac Metro EIS.*
[2] *The 1997 flow is from a CDEC rating table and probably underestimates the discharge.*

Yolo Bypass near Woodland (USGS 11453000) – This gage is located at Yolo Bypass UNET RM 51.1 and is adjacent to the Study area in the Yolo Bypass.

TABLE 3-4: PEAK STAGES AND FLOWS AT THE WOODLAND GAGE

	Stage (ft, NGVD)	Flow (cfs)
1986 Flood	31.46	374,000
1997 Flood	31.43	357,000
1957 Profile	31.00	377,000
1/200 AEP profile	34.10	469,800

Figure 4-1: Comparison of Top of Levee and 1 / 200 AEP Water Surface Profile (with Levee Freeboard)

4.0 LEVEE FREEBOARD

Levee freeboard is an essential design consideration that addresses the potential uncertainties associated with modeled water surface elevations and levee performance for targeted flood events. These uncertainties include variance in hydrologic estimates, unanticipated channel roughness, and unknown soil conditions in the levee foundation and cross section. In order to account for these uncertainties, the design criteria for flood control levees include varying provisions for levee freeboard depending on the design objective and the uncertainties affecting the performance of the levee.

The freeboard criterion used for this study is to obtain a minimum top-of-levee elevation three feet above the 1/200 AEP water surface profile. This criterion is similar to the standard used to evaluate freeboard for FEMA certification. It is recognized that additional levee height may be needed to address wind and wave run-up. This analysis will be included as part of the design process.

A comparison of the top-of-levee profiles in the Study area to the 1/200 AEP water surface elevations indicated there are no levee freeboard problems along the north levee of the American River as shown in Figure 4-1. Figure 4-2 compare the 1/200 AEP water surface profile to the top-of-levee profile for the east levee of the Sacramento River between the Natomas Cross Canal and the American River and Figure 4-3 provides a similar comparison for the south levee of the Natomas Cross Canal. These comparisons indicate freeboard problems in the upper 12 miles of the Sacramento River east levee and at nearly all locations along the Natomas Cross Canal south levee.

Figure 4-3: Comparison of Top of Levee and 1 / 200 AEP Water Surface Profile (with Levee Freeboard)
Natomas Cross Canal

Figure 4-2: Comparison of Top of Levee and 1 / 200 AEP Water Surface Profile (with Levee Freeboard)
Sacramento River East Levee

5.0 LEVEE FOUNDATION AND SLOPE STABILITY

One of the main purposes of the Levee Evaluation Study was to evaluate how application of the new underseepage guidelines adopted by the Sacramento District of the Corps would impact the improvement of flood protection for the Natomas basin. Toward this end, a total of 86 borings were drilled to a maximum depth of about 170 feet along the Sacramento River east levee, Natomas Cross Canal south levee, and American River north levee. These additional borings supplemented the 286 explorations completed by others along these same levees. In addition to the borings drilled along the existing levees, 23 borings were drilled along the proposed alignment of the secondary levee option in the northern reach of the Natomas area. This supplemental drilling program resulted in at least one point of deep exploration completed for about every 1,000 linear feet of existing levee and 2,000 feet of the secondary levee alignment.

Laboratory testing on the boring samples was performed by Kleinfelder to further characterize the strength and permeability properties of both levee embankment and foundation soils. This information was used to create representative cross sections of levee embankments/foundations at multiple locations. Based on groupings of similar soil properties and levee configurations, each levee alignment was divided into discrete reaches. Analytical models were used to analyze seepage and stability conditions for various water surface conditions within each reach. The 1/200 AEP water surface elevations were used in combination with the new underseepage guidelines, including computed exit gradients, to identify levee foundation/stability deficiencies.

Historical levee performance documentation was also accumulated and reviewed to compare calculated seepage conditions to recorded observations. River geomorphology was used to identify reaches most likely to have permeable levee foundation deposits. Where computed exit gradients equaled or exceeded 0.50, or where exit gradients were slightly less than 0.50 but past observations indicated adverse conditions have in fact been present, the reach was rated as needing improvement. In those instances, the approximate depth of the cutoff wall needed to reduce exit gradients was identified. Other stabilization techniques such as seepage berms and/or relief wells could potentially be used. However, the cutoff wall option is considered appropriate for developing preliminary cost estimates and prioritizing the needed improvements.

The Tables 5-1 through 5-4 summarize the recommended remediation for identified seepage or stability problems for each of the levee reaches in the Study area.

TABLE 5-1: SACRAMENTO RIVER CUTOFF WALL SUMMARY BY REACH

Levee Reach	Station	Length of Reach (feet)	Cutoff Wall Depth (feet)
1	0+00 to 48+00	4,800	
2	48+00 to 100+00	5,200	65
3	100+00 to 110+00	1,000	
4A	110+00 to 190+00	8,000	110
4B	190+00 to 228+00	3,800	110
5A	228+00 to 263+00	3,500	70
5B	263+00 to 280+00	1,700	70
6	280+00 to 330+00	5,000	110
7	330+00 to 362+00	3,200	
8	362+00 to 402+00	4,000	100
9	402+00 to 468+00	6,600	
10	468+00 to 495+00	2,700	50
11	495+00 to 635+00	14,000	30
12	635+00 to 667+00	3,200	
13	667+00 to 700+00	3,300	60
14	700+00 to 732+00	3,200	
15	732+00 to 780+00	4,800	50
16	780+00 to 832+00	5,200	
17	832+00 to 842+00	1,000	55
18	842+00 to 857+00	1,500	
19A	857+00 to 875+00	1,800	65
19B	875+00 to 925+00	5,000	65
20	925+00 to 960+00	3,500	

TABLE 5-2: NATOMAS CROSS CANAL CUTOFF WALL SUMMARY BY REACH

Levee Reach	Station	Length of Reach (feet)	Cutoff Wall Depth (feet)
1	0+00 to 5+70	570	75
2	5+70 to 105+00	9,930	70
3	105+00 to 123+00	1,800	70
4	123+00 to 173+00	5,000	80
5	173+00 to 195+00	2,200	80
6	195+00 to 280+00	8,500	80
7	280+00 to 287+00	700	

TABLE 5-3: AMERICAN RIVER CUTOFF WALL SUMMARY BY REACH

Levee Reach	Station	Length of Reach (feet)	Cutoff Wall Depth (feet)
1	34+42 to 48+00	1,358	25
2	48+00 to 95+00	4,700	30
3	95+00 to 105+00	1,000	35
4	105+00 to 153+00	4,800	30

TABLE 5-4: PROPOSED SECONDARY LEVEE CUTOFF WALL SUMMARY BY REACH

Levee Reach	Station	Length of Reach (feet)	Cutoff Wall Depth (feet)
1S	12+00 to 42+00	3,000	27
2S	42+00 to 85+00	4,300	42
3S	85+00 to 137+00	5,200	45
4S	137+00 to 215+00	7,800	87
5S	215+00 to 280+00	6,500	57
6S	280+00 to 297+00	1,700	105

6.0 STREAMBANK EROSION

6.1 PURPOSE AND SCOPE

The Levee Evaluation Study included an assessment of the potential for levee-threatening erosion along the east bank of the Sacramento River and the south bank of the Natomas Cross Canal. The north bank of the American River was not included in this assessment because of the extensive width of the berm between the levee and the low-flow river channel in this reach. The objectives of the assessment were to identify locations where high flows in the affected channels up to and including the flows generated by the 1/200 AEP event could trigger a level of erosion sufficient to compromise the flood protection performance and integrity of the levee system. Potential erosion sites were identified based on historical data, the results of recently completed reports, and field inspections. The risk of erosion at each of the identified sites was evaluated based on the width of the berm between the levee and the low-flow river channel, the stability of the berm slope, the potential for scour along the toe of the berm, and the general character of the soil material comprising the berm. The risk of erosion was classified as 'high' where erosion was considered likely to compromise the levee system within a 10 year period, with emphasis on sites where a single severe flood season or erosion episode could threaten the levee; 'moderate' where erosion was considered likely to threaten the levee system within a 10 to 50 year period; and 'low' where the risk of erosion was considered a long-term concern.

6.2 EROSION SITE IDENTIFICATION

Erosion sites of concern were identified primarily by field assessment supplemented by a review of relevant historical data and the results of recent reports prepared by the Corps, MBK and others. Early on it was determined that the risk of erosion was greatest along the east bank of the Sacramento River and the effort focused primarily on this reach.

6.2.1 Historical Review

The site identification process included a brief review of historical information on land use, flood control system construction, and channel maintenance. This review focused on changes in hydrologic and sediment supply conditions that could affect bank stability. Historical aerial photographs and maps were examined to estimate changes in river planform and profile at erosion sites. Historical bathymetric and topographic maps from 1908, 1933, and 1997 (USACE) were used to estimate changes in channel depth. Historical aerial photographs from 1938, 1965, 1972, 1982, and 1986 were compared to current aerial photographs. The profile comparisons indicate that the channel bottom (or thalweg) in the project reach lowered (degraded) 0 to 10 feet in the period between 1908 and 1933, but significant general degradation between 1933 and 1997 is not evident. The degradation between 1908 and 1933 may be associated with transport of accumulated sediments from hydraulic mining downstream into San Francisco Bay. The aerial photograph comparison showed generally minor changes in planform and berm width over time in the Study area. Although specific changes were noted, general rates of bank migration appeared to be low.

6.2.2 Previous Reports

Bank erosion in the Study area has been monitored and assessed by a number of agencies and organizations, including the Corps through its "Sacramento River Bank Protection Project", the Department of Water Resources (DWR), and Reclamation District 1000 (RD 1000). Recent reports prepared by these agencies were reviewed to identify significant erosion sites along the east bank of the Sacramento River and also to provide some history of conditions at these sites. These reports identify high-priority sites where an actively eroding bank could reach a 30-foot buffer strip on the riverside levee toe within a 50-year period, based on projecting historical bank erosion or migration rates.

6.2.3 Field Inspections

Northwest Hydraulic Consultants (NHC) reviewed these previous erosion assessments and conducted a field inspection of the area on March 17, 2005. Only sites with a berm width between the top of bank and outboard toe of levee of less than 150 feet were inspected. As indicated in Table 6-1, fifteen sites were identified for further evaluation. These sites, which are shown in Figure 6-1, largely corresponded to sites previously identified by the Corps, MBK and others. In August and September of 2005, NHC conducted additional field inspections by boat and by vehicle in order to compile more detailed information at the identified sites.

TABLE 6-1: LIST OF IDENTIFIED EROSION SITES

Site	Station	Site Length, feet	Berm Width, feet
A	7+00 to 13+00	410	40 – 45
B	25+00 to 32+00	640	25 – 45
C	40+00 to 51+00	980	17 – 50
D	79+50 to 85+50	520	50 – 100
E	152+00 to 164+50	560	50
F	225+00 to 239+00	1360	85 – 90
G	278+00 to 294+00	1430	30 – 70
H	451+00 to 456+50	480	70 – 100
I	458+00 to 463+00	400	90 – 100
J	477+50 to 486+50	690	30 – 70
K	486+50 to 498+50	1170	0 – 50*
L	498+50 to 512+50	660	30 – 70
M	512+50 to 537+50	2490	35 – 70
N	545+00 to 556+00	1390	70 – 75
O	577+00 to 581+00	370	70 – 75

**Site K has a wide levee top; centerline of levee to top of bank is never less than 70 feet. Sacramento River Erosion Risk Assessment*

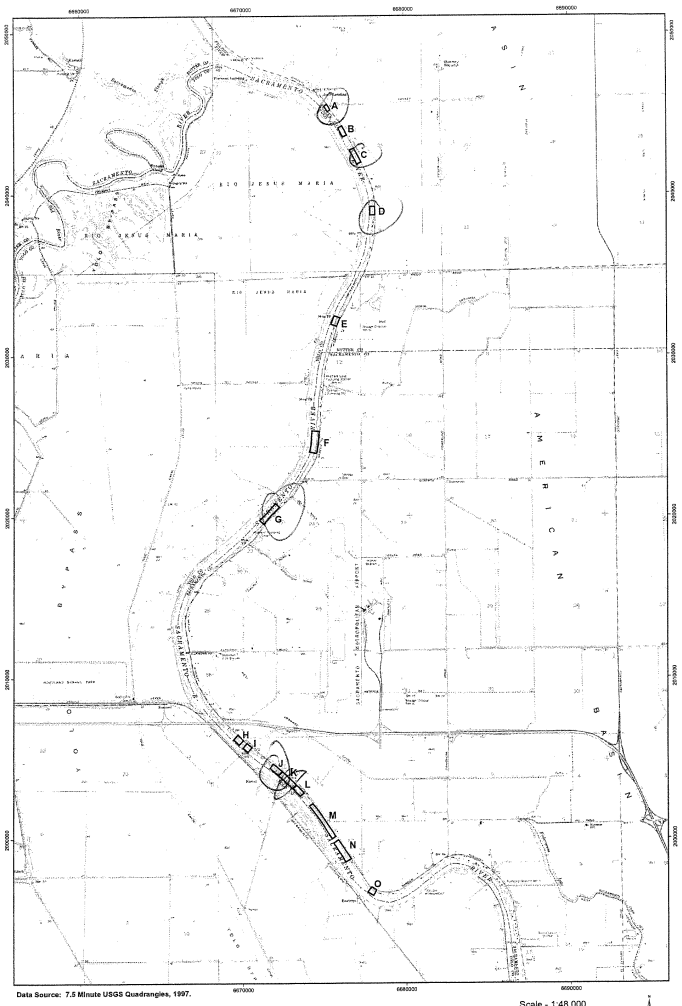

Figure 6 - 1 Erosion Site Locations

6.3 EROSION RISK ASSESSMENT

6.3.1 Risk Factors

A critical factor for evaluating the risk of levee failure at each erosion site was encroachment of the most critical cross section at the site on the levee template, defined as a projection of a 3 horizontal to 1 vertical slope from the waterside hinge point of the levee crown. Encroachment was typically observed either at the toe of the bank or near the low water elevation where bank retreat from wave and river erosion had resulted in steepening that part of the profile. Levee stability was considered most likely to be threatened at locations with potential for slope failure and erosion with encroachment at the toe of the bank. Slope failure associated with encroachment on the levee template at the low water elevation may or may not result in levee failure. At some sites, a failure of the toe at the low water elevation might erode only part of the berm; at other sites, with different geometries, the slope failure might erode the levee prism.

Other significant risk factors were the steepness of the bank slope above and below the low-flow waterline (steeper slopes are more likely to result in a failure of the entire embankment and may indicate bed scour), the composition of the soils comprising the bank and scour as evidenced by the deepening of the bed so that slopes encroach on the levee template, the steepening of already steep slopes, or signs of recent bed adjustments. Finally, active bank erosion, particularly wave erosion generated by wind and boat wakes during low flow periods, sparse vegetation, and trees that have fallen into the river or unstable trees that are likely to fall, were considered risk factors for erosion. Well-vegetated banks reduce the risk of fluvial erosion on the upper bank, but do not affect potential erosion and failure at the toe of the bank.

6.3.2 Site Priorities

The basic approach to assigning risk priorities was to assign an initial priority based on the apparent risk of slope failure and then adjust it by considering other factors. Consequently, high priorities were assigned to those sites where:

- the toe of the bank lay inside or very near to the levee template and the slope below the waterline was reasonably steep, scour depths were below bed elevations at the toe, or the local bed had been observed to be lowering; or
- the toe of the bank lay outside the levee template but there was a risk of cantilever failure based on the estimated stratigraphy; or
- the bank at the low water elevation (the contact between the floodbasin deposits and the alluvial deposits) lay inside the levee template and there was a potential for a failure originating at the contact to intersect the levee prism. If the failure seemed unlikely to intersect the levee prism, the site was ranked as moderate.

Moderate priorities were assigned to sites where:

- the toe of the bank lay reasonably close to the levee template but the slope below the waterline was moderate and general scour elevations were not very far beneath the local bed level; or
- the bank at the low water elevation (the contact between the floodbasin deposits and the alluvial deposits) lay inside the levee template but a individual failure is unlikely to intersect the levee prism; or

- the toe of the bank lay from 20 to 50 feet from the levee template and the risk of slope failure was low to moderate but erosion appeared to be very active or specific site factors, such as lack of vegetation, structures, or fallen trees suggested that erosion might proceed very quickly during a large flood.

The remaining sites were assigned a low priority. Their typical characteristics were:

- the toe of the bank lay more than 40 feet from the levee template, slopes below the low water elevation were shallow, banks were vegetated and erosion was not very active and did not appear to have been active historically.

One of the consequences of bank erosion is the shortening of seepage paths and the resulting impacts on levee stability due to underseepage. This was not considered directly in the priority scheme described above. However, at sites where seepage was identified as a concern, the erosion risk priority was altered if it appeared that erosion was active and might affect the potential for underseepage over a typical time frame of 10 years. Sites were reviewed with Kleinfelder to determine sensitivity of underseepage potential to erosion. Only one site was adjusted: Site G was raised from a "moderate" to "high" priority. Table 6-2 summarizes the risk factors and risk priorities assigned to each of the fifteen identified erosion sites. This summary indicates that ten of the fifteen sites qualify as either 'high' or 'moderate' priority sites.

TABLE 6-2: EROSION RISK FACTORS AT THE ASSESSMENT SITES

Site	Encroachment on Levee Template [1]	Stratigraphy [2]	Slope below low water [1]	Slope above low water [1]	Bed Elevation near Toe (ft) [3]	Predicted Scour Elevation (ft) [4]	Previous Observations [5]	2005 Field Visits	Other Factors [6]	Cumulative Erosion Risk [7]
	Slope Stability Factors				Scour		Bank Erosion			
O	Toe of bank 100 feet outside template	Silty clay over silty sand	Shallow bench; shallow slope	Moderate	0 (deepest on right bank)	-10	N/A	Sparse vegetation; shelf near water line	Inside of bend	Low
N	Toe of bank 75 feet outside template	Silty clay over silty sand	Shallow	Moderate	0	-10	MBK noted no change since 1999 d/s of site	Bank heavily vegetated; local erosion at wing dams	Wing dams at ends and middle of site	Low
M	Toe of bank and low water line near levee template	Silty clay over silty sand	3H:1V	Moderate to steep	-5	-10	MBK noted active erosion; WET moderate retreat rate	Sparse vegetation extends to w/l; active erosion along part of bank	Active erosion at water intake; now repaired	High
L	Toe of bank 50 feet outside template	Silty clay over silty sand	3H:1V	Steep	-8 (deepest on left bank)	-10	MBK noted active erosion; WET moderate retreat rate	A few large trees undercut; steep in city; wave cut	Tree fall is a local erosion issue	Moderate
K	Toe of bank 20 feet outside template	Silty clay over silty sand	4H:1V	Moderate to steep	-8 (deepest on left bank)	-10	WET notes moderate retreat rate	Abundant bank vegetation; 10-15 trees fallen; causing scour	Tree fall is a local erosion issue	Moderate
J	Toe of bank and low water line just outside template	Silty clay over silty sand	3H:1V	Moderately steep; failure may encroach on levee	-5 (section flat near left bank)	-10	WET notes moderate retreat rate	Slumps on bank; steep slopes in cemented silt, narrow beach	Discharge point and bank protection at d/s end. No shelf or bench observed off shore	High
I	Toe of bank 60 feet outside template	Silty clay to below toe	2-3H:1V	Moderate at u/s end; steep d/s	-5	-10	MBK noted no change since 1999	Sloughing on steep slopes in d/s half; small terraces	Active slumping of bank	Moderate
H	Toe of bank 90 to 100 feet outside template	Silty clay to below toe	4H:1V	Steep	-5	-10	N/A	Bank mostly unvegetated; a few cottonwoods	Rock on levee slope	Low
G	Toe of bank near sand and silty template	Sand and silty sand to depth	3H:1V	Very steep behind beach; failure may encroach on levee	-8	-12	MBK noted site is longer than in 1999 to upstream	Bank near vertical; mostly unvegetated; shelf extends out 15 feet	Bank vegetation on d/s half of site	High
F	Toe of bank 75 ft outside template	Silty clay extends to below toe	Shallow	Moderately steep; near-vertical at d/s end; narrow beach	-5 (shallow slope near toe)	-12	MBK noted no change since 1999	Bank heavily vegetated; fallen trees at d/s end	Fallen trees	Low
E	Toe of bank 40 ft outside template	Silty clay extends to below toe	Shallow	Steep slopes above low water	+2 (deeper on opposite bank)	-12	MBK noted erosion began after 1999	Bank well-vegetated, trees fallen; slump scars above low water	Small bank failures	Low
D	Toe of bank 10 ft outside template	Silty clay extends to below toe	2H:1V	Shelf; steep above, failure may encroach on levee	-8 (8 feet lower than mid channel)	-15	MBK and Ayres noted no change since 1999	Erosion above vertical silty clay layer exposing roots of shrubs	High	High
C	Toe of bank and low water shelf within levee template	Silty clay extends to below toe	4H:1V	Steep above low water; shelf extends to 10 ft on part of site	-2 or -3 (bed roughly flat)	-15	MBK noted erosion is extending since 1997. WET low historic retreat rates	Fallen trees is at u/s end; vegetation characteristic of moisture	Riprap u/s and d/s; wing walls opposite; tree collapse from bank retreat at lower end of site	High
B	Toe of bank 30 ft outside template; low water shelf close	Silty clay extends to below toe	4H:1V	Moderately steep; low water shelf about 5-15 feet wide	-13	-15	MBK noted erosion extending d/s; WET low historic retreat rates	Sparser vegetation than at Sites A or C	Riprap u/s and d/s	Moderate
A	Toe of bank encroaches on levee template	Silty clay extends to below toe	2H:1V	Moderately steep; low water shelf on part of site	-8 (5 feet lower than mid channel)	-15	MBK noted no change since 1999; Ayres slow retreat; WET low historic rates	Very steep at w/l; roots of shrubs exposed	Riprap u/s and d/s; toes of rock at this site	High

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Site	Encroachment on Levee Template [1]	Stratigraphy [2]	Slope below low water [1]	Slope above low water [1]	Bed Elevation near Toe (ft) [3]	Predicted Scour Elevation (ft) [4]	Previous Observations [5]	2005 Field Visits	Other Factors [6]	Cumulative Erosion Risk [7]
	Slope Stability Factors				Scour		Bank Erosion			
O	Toe of bank 100 feet outside template	Silty clay over silty sand	Shallow bench; shallow slope	Moderate	0 (deepest on right bank)	-10	N/A	Sparse vegetation; shelf near water line	Inside of bend	Low
N	Toe of bank 75 feet outside template	Silty clay over silty sand	Shallow	Moderate	0	-10	MBK noted no change since 1999 d/s of site	Bank heavily vegetated; local erosion at wing dams	Wing dams at ends and middle of site	Low
M	Toe of bank and low water line near levee template	Silty clay over silty sand	3H:1V	Moderate to steep	-5	-10	MBK noted active erosion; WET moderate retreat rate	Sparse vegetation extends to w/l; active erosion along part of bank	Active erosion at water intake; now repaired	High
L	Toe of bank 50 feet outside template	Silty clay over silty sand	3H:1V	Steep	-8 (deepest on left bank)	-10	MBK noted active erosion; WET moderate retreat rate	A few large trees undercut; steep in city; wave cut	Tree fall is a local erosion issue	Moderate
K	Toe of bank 20 feet outside template	Silty clay over silty sand	4H:1V	Moderate to steep	-8 (deepest on left bank)	-10	WET notes moderate retreat rate	Abundant bank vegetation; 10-15 trees fallen; causing scour	Tree fall is a local erosion issue	Moderate
J	Toe of bank and low water line just outside template	Silty clay over silty sand	3H:1V	Moderately steep; failure may encroach on levee	-5 (section flat near left bank)	-10	WET notes moderate retreat rate	Slumps on bank; steep slopes in cemented silt, narrow beach	Discharge point and bank protection at d/s end. No shelf or bench observed off shore	High
I	Toe of bank 60 feet outside template	Silty clay to below toe	2-3H:1V	Moderate at u/s end; steep d/s	-5	-10	MBK noted no change since 1999	Sloughing on steep slopes in d/s half; small terraces	Active slumping of bank	Moderate
H	Toe of bank 90 to 100 feet outside template	Silty clay to below toe	4H:1V	Steep	-5	-10	N/A	Bank mostly unvegetated; a few cottonwoods	Rock on levee slope	Low
G	Toe of bank near sand and silty template	Sand and silty sand to depth	3H:1V	Very steep behind beach; failure may encroach on levee	-8	-12	MBK noted site is longer than in 1999 to upstream	Bank near vertical; mostly unvegetated; shelf extends out 15 feet	Bank vegetation on d/s half of site	High
F	Toe of bank 75 ft outside template	Silty clay extends to below toe	Shallow	Moderately steep; near-vertical at d/s end; narrow beach	-5 (shallow slope near toe)	-12	MBK noted no change since 1999	Bank heavily vegetated; fallen trees at d/s end	Fallen trees	Low
E	Toe of bank 40 ft outside template	Silty clay extends to below toe	Shallow	Steep slopes above low water	+2 (deeper on opposite bank)	-12	MBK noted erosion began after 1999	Bank well-vegetated, trees fallen; slump scars above low water	Small bank failures	Low
D	Toe of bank 10 ft outside template	Silty clay extends to below toe	2H:1V	Shelf; steep above, failure may encroach on levee	-8 (8 feet lower than mid channel)	-15	MBK and Ayres noted no change since 1999	Erosion above vertical silty clay layer exposing roots of shrubs	High	High
C	Toe of bank and low water shelf within levee template	Silty clay extends to below toe	4H:1V	Steep above low water; shelf extends to 10 ft on part of site	-2 or -3 (bed roughly flat)	-15	MBK noted erosion is extending since 1997. WET low historic retreat rates	Fallen trees is at u/s end; vegetation characteristic of moisture	Riprap u/s and d/s; wing walls opposite; tree collapse from bank retreat at lower end of site	High
B	Toe of bank 30 ft outside template; low water shelf close	Silty clay extends to below toe	4H:1V	Moderately steep; low water shelf about 5-15 feet wide	-13	-15	MBK noted erosion extending d/s; WET low historic retreat rates	Sparser vegetation than at Sites A or C	Riprap u/s and d/s	Moderate
A	Toe of bank encroaches on levee template	Silty clay extends to below toe	2H:1V	Moderately steep; low water shelf on part of site	-8 (5 feet lower than mid channel)	-15	MBK noted no change since 1999; Ayres slow retreat; WET low historic rates	Very steep at w/l; roots of shrubs exposed	Riprap u/s and d/s; toes of rock at this site	High

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[1] Encroachment estimated from typical section for each site extracted from MBK topography and bathymetry and 3H:1V levee template extending from bluff toe at levee crest. Bank slopes also interpreted from these sections

[2] Stratigraphy roughly interpreted from boring results done circa mid 90s. Levee materials and a silty sand overlie the materials described

[3] Elevation of bed and general bed conditions interpreted from cross sections.

[4] Predicted scour elevations are for general scour.

[5] Ayres refers to Ayres Associates (2002); MBK to MBK Engineers (2004); WET to Water Engineering & Technology (1991).

[6] Extracted from field notes and site observations. Refer to factors that might affect erosion, other than those included in the table.

[7] "High" refers to sites where erosion was considered likely to compromise the levee system within a 10-year period, with emphasis on sites where a single severe flood season or erosion episode could threaten the levee; "Moderate" refers to those sites where erosion may threaten the levee over the next 10-50 years. These sites are ones that have a higher priority of requiring repairs or remediation in the near term. "Low" refers to those sites that might threaten the levee over the next 50 years but have little potential to require improvements in the near term.

7.0 NEEDED IMPROVEMENTS

7.1 BACKGROUND AND PURPOSE

One of the principal purposes of the Levee Evaluation Study was to characterize the likely scope and cost of the improvements needed to address identified problems in Study area levees. Toward this end, the Study assumed that identified levee freeboard, levee foundation stability, and streambank erosion problems would be addressed using established techniques previously employed under similar circumstances along the Lower American River and Sacramento River. These techniques include levee raising to address freeboard problems, levee strengthening through the construction of cutoff walls to address underseepage problems, and streambank stabilization through a combination of rock armoring and bank re-vegetation to address erosion problems. Other techniques could be employed, particularly to address underseepage problems. However, because the established techniques are well known and reliable, they were used in this instance to facilitate the scoping and cost estimating tasks.

At the same time, the Study identified construction of a secondary levee as an option to raising and strengthening the existing levee in place along a 5-mile stretch of the east levee of the Sacramento River in the northern portion of the Natomas Basin. This option was included because of the advantages associated with new levee construction along an alignment removed about 1,000 feet from the active river channel versus refurbishment of the existing levee in its current location adjacent to the active river channel. Accordingly, the Study included an initial cost estimate for a secondary levee, while recognizing that this option would be subject to a much wider range of uncertainty regarding environmental constraints, permitting obstacles, and construction timing than the established levee raising and strengthening techniques.

7.2 ESTABLISHED TREATMENTS

7.2.1 Levee Raising and Strengthening in Place

The established treatments for inadequate levee freeboard and unstable levee cross sections and/or foundations are levee raising and levee strengthening through construction of cutoff walls. These treatments have been extensively employed throughout the Lower Sacramento Valley, including along the diversion channels east of Natomas and portions of the Lower American River. In the Study area, the evaluation of levee freeboard problems indicated a need for a relatively minor amount of levee raising along an 12-mile portion of the east levee of the Sacramento River in the upper reach of the Natomas Basin and along most of the length of the Natomas Cross Canal south levee. As shown in Figures 4-2 and 4-3 above, the levee in these reaches would need to be raised to provide at least three feet of freeboard on the 1/200 AEP water surface profile. In order to address identified seepage and stability problems, cutoff walls of varying depths would be needed along several reaches of each of the three Study area levees. These reaches and the relative slurry wall depths needed to maintain levee stability are shown in Tables 5-1, 5-2 and 5-3 above. A conceptual diagram of the levee raise and slurry wall treatment is shown in Figure 7-1. The locations of required levee freeboard raises and seepage cutoff walls are illustrated in Figure 7-2.

The estimated cost of levee raising for freeboard and cutoff walls for seepage, as well as the total cost of all required treatments, is shown by levee reach in Table 7-1. The estimated total cost for all

improvements is approximately $300 million, which includes a contingency, escalation to assumed year of construction (2007), allowance for change orders during construction, and an estimate of non-construction costs (environmental mitigation, planning and engineering, construction management and regulatory permitting).

7.2.2 Erosion Control

The treatments needed to address 'high' and 'moderate' priority erosion sites were designed to stabilize the affected sites and minimize environmental impacts to riparian and fish and aquatic habitats. These treatments reflect the knowledge gained through more than a decade of experience with bank protection projects along the Lower American and Sacramento Rivers. Typically rock riprap was included in the bank protection design for each site to account for scour and to protect the areas that experience the greatest erosive forces, especially at elevations where vegetation is not expected to grow. Cobble or cobble/soil mixtures were used to provide slope protection above the rock riprap. Vegetative features were used where possible to stabilize the bank or proposed fill along the bank, and to enhance the riparian habitat of the site.

Based on the erosion risk assessment discussed above, ten high and moderate-priority sites along the east levee of the Sacramento River were identified for treatment. The locations of these sites are shown in Figure 7-2. The treatment length for each site was adjusted slightly from the lengths identified in the assessment, primarily to account for transitions and extensions in areas adjacent to the sites where bank erosion might be sensitive to construction of the proposed improvements. The ten sites represent a total length of treatment of approximately 11,100 feet. Figure 7-3 illustrates the typical cross section for one of the four erosion treatments that would be used at these sites and Table 7-2 indicates the selected treatment for each of the sites.

Table 7-1 includes the estimated construction cost for erosion treatments by levee reach. These costs were estimated using quantities developed by applying the typical treatments to topographic and bathymetric cross section data at each site. The site designs are intended to be constructed at least partially by barge. This assumption applies especially to the placement of rock and soil material. Barge placement might be supplemented by land-based equipment at some or all sites, and some landside access is assumed.

Unit costs were based on current pricing levels developed from unit costs on previous Sacramento and American River bank protection projects. Reasonably current pricing data is available for several projects that include the items included in the typical treatments. As discussed in Section 8.0, the cost of off-site mitigation was estimated based on past experience and professional judgment informed by the standard assessment methodology that has recently been developed to assess the environmental impacts and required mitigation for Sacramento River bank protection projects.

Table 7-1
COST SUMMARY

		Total	Erosion Protection	Freeboard	Under-seepage
Sacramento East Levee					
	Reach 1- Sta 00+00 to Sta 48+00	$6,576,000	$3,305,000	$3,270,000	$0
	Reach 2- Sta 48+00 to Sta 100+00	$8,083,000	$1,534,000	$956,000	$5,593,000
	Reach 3- Sta 100+00 to Sta 110+00	$571,000	$0	$571,000	$0
	Reach 4- Sta 110+00 to Sta 228+00	$24,120,000	$0	$2,131,000	$21,989,000
	Reach 5- Sta 228+00 to Sta 280+00	$6,160,000	$293,000	$885,000	$4,982,000
	Reach 6- Sta 280+00 to Sta 330+00	$10,860,000	$2,054,000	$817,000	$7,989,000
	Reach 7- Sta 330+00 to Sta 362+00	$1,479,000	$0	$1,479,000	$0
	Reach 8- Sta 362+00 to Sta 402+00	$6,805,000	$0	$739,000	$6,067,000
	Reach 9- Sta 402+00 to Sta 468+00	$2,809,000	$465,000	$2,344,000	$0
	Reach 10- Sta 468+00 to Sta 495+00	$5,337,000	$2,875,000	$456,000	$2,006,000
	Reach 11- Sta 495+00 to Sta 635+00	$14,058,000	$5,563,000	$0	$8,495,000
	Reach 12- Sta 635+00 to Sta 667+00	$5,000	$0	$5,000	$0
	Reach 13- Sta 667+00 to Sta 700+00	$2,906,000	$0	$0	$2,906,000
	Reach 14- Sta 700+00 to Sta 732+00	$5,000	$0	$5,000	$0
	Reach 15- Sta 732+00 to Sta 780+00	$3,687,000	$0	$0	$3,687,000
	Reach 16- Sta 780+00 to Sta 832+00	$5,000	$0	$5,000	$0
	Reach 17- Sta 832+00 to Sta 842+00	$858,000	$0	$0	$858,000
	Reach 18- Sta 842+00 to Sta 857+00	$5,000	$0	$5,000	$0
	Reach 19- Sta 857+00 to Sta 925+00	$6,288,000	$0	$0	$6,288,000
	Reach 20- Sta 925+00 to Sta 960+00	$5,000	$0	$5,000	$0
	Subtotal	$100,622,000	$16,089,000	$13,673,000	$70,860,000
American River Sta 34+42 to 153+00		$6,487,000	$0	$0	$6,487,000
Natomas Cross Canal Sta 0+00 to 280+00		$32,368,000	$0	$4,327,000	$28,041,000
PGCC and NEMDC Levee		$10,610,000	$0	$0	$10,610,000
	Subtotal	**$150,087,000**	**$16,089,000**	**$18,000,000**	**$115,998,000**
25%	Contingency	$37,522,000	$4,022,000	$4,500,000	$29,000,000
6%	Escalation	$9,005,000	$965,000	$1,080,000	$6,960,000
10%	Allowance for Change Orders	$15,009,000	$1,609,000	$1,800,000	$11,600,000
	Construction Subtotal	**$211,623,000**	**$22,685,000**	**$25,380,000**	**$163,558,000**
	Enviromental Mitigation	$3,850,000	$1,000,000	$1,425,000	$1,425,000
25%	Planning and Engineering	$52,906,000	$5,671,000	$6,345,000	$40,890,000
10%	Construction Management	$21,162,000	$2,269,000	$2,538,000	$16,356,000
5%	Regulatory Permitting	$10,581,000	$1,134,000	$1,269,000	$8,178,000
	Total	**$300,122,000**	**$32,759,000**	**$36,957,000**	**$230,407,000**

TABLE 7-2: EROSION SITE TREATMENTS

Site Designation	Risk Category	Approximate Location Levee Stations	Site Construction Length, feet	Typical Treatment Type 1
A	High	07+00 to 13+00	600	1
B	Moderate	25+00 to 32+00	700	2
C	High	40+00 to 51+00	1100	1
D	High	79+50 to 85+50	600	3
G	High	278+00 to 294+00	1600	4
I	Moderate	458+00 to 463+00	500	2
J	High	477+50 to 486+50	900	1
K	Moderate	486+50 to 498+50	1200	1
L	Moderate	498+50 to 512+50	1400	1
M	High	512+50 to 537+50	2500	4 and 1

7.3 SECONDARY LEVEE

As an alternative to levee raising and strengthening and erosion control treatments along the upper 5 miles of the east levee of the Sacramento River, consideration should be given to construction of a new levee set back approximately 1,000 feet to the east of the existing levee. This new levee would be designed to meet the same levee freeboard and underseepage design criteria and would therefore require a cutoff wall at depths specified in Table 5-4. However, through its location away from the active river channel, this alternative would largely avoid any need to address the ongoing erosion problems identified at Sites A through D in this reach of the Study area.

The possible alignment of the new levee is shown in Figures 7-4 and 7-5. This alignment largely occupies land owned by Sacramento International Airport (Airport), but also crosses land owned by The Natomas Basin Conservancy (TNBC) and a few smaller parcels of land currently in private ownership. The affected Airport land was acquired with Federal Aviation Administration (FAA) funds and is held subject to various restrictions on the use of the land, including restrictions on fish and wildlife enhancements that might conflict with Airport operations. Accordingly, the secondary levee alternative anticipates minimal changes to the current land use regime in the area between the new and existing levee alignments. The existing levee would continue to function as a local levee confining flows in the Sacramento River and as the Garden Highway. The new levee would ensure safe containment of the design flood in the event of a failure of the existing levee. A typical cross section showing the secondary (setback) levee and existing levee is provided in Figure 7-6.

The estimated cost of the secondary levee alternative ranges from approximately $354 million to $432 million depending on the source of material used to construct the new levee. This estimate includes a substantial cost for environmental mitigation based on environmental considerations and cost estimates for habitat replacement discussed in Section 8.0.

FIGURE 7-1: Levee Raise and Slurry Wall Treatment

FIGURE 7-4

Secondary Levee Alternative - STA 0+00 to 150+00

Figure 7-3 - Erosion Treatment Type 1

Natomas Levee Evaluation Project

Erosion Assessment

nto

January 2006

Figure 7-6 : Secondary Levee - Typical Section

FIGURE 7-5

Secondary Levee Alternative - STA 150+00 to 300+00

8.0 ENVIRONMENTAL CONSTRAINTS

8.1 BACKGROUND AND PURPOSE

The potential of the needed levee and streambank erosion improvements to cause significant impacts on biological and cultural resources in the Study area was a major consideration in evaluating the likely cost and permitting issues that might be encountered in proceeding with these improvements. Accordingly, as part of the Levee Evaluation Study, EDAW evaluated the potential effects of the identified levee treatments by comparing the footprint of these treatments with the locations of known sensitive resources and made a rough estimate of the scope and cost of the mitigation that might be required. NHC and Jones & Stokes Associates evaluated the potential effects of identified bank treatments using a recently developed Standard Assessment Methodology for bank protection projects along the Sacramento River and estimated the scope and cost of the mitigation that might be required for these treatments. These estimates are reflected in the cost tables provided in Section 7.0. The supporting evaluations are briefly discussed below.

8.2 IMPACTS AND MITIGATION FOR LEVEE TREATMENTS

8.2.1 Giant Garter Snake Habitat

The major biological resource concern raised by the identified levee treatments is the potential for loss of giant garter snake (GGS) habitat. This potential effect was evaluated based on GGS habitat maps prepared by Eric Hansen for TNBC and SAFCA. The most substantial loss of GGS habitat would result from construction of the secondary levee, although similar impacts would result from the need to relocate the ditches and canals near the landside toe of the levees to accommodate raising. The ditches providing habitat along the existing levee toe would need to be relocated, and aquatic habitat within existing rice acreage and along portions of the ditches that run perpendicular to the levee would be cut off inside the levee setback area and would need to be replaced. Ditch relocation would partially mitigate these losses, but it is anticipated that additional compensation would be required. The Natomas Basin Habitat Conservation Plan requires a replacement ratio of 0.5 acre of protected habitat for every 1 acre of GGS habitat affected. However, higher ratios have been required in the past for the loss of ditch habitat in the Natomas area. Accordingly, this evaluation assumed that the required mitigation ratio would be at least 1:1 and could be as high as 3:1. For comparative purposes, GGS mitigation costs were calculated based on a midpoint 2:1 ratio.

This cost estimate is based on the assumption that a traditional mitigation approach to the loss of GGS habitat would be pursued. However, such an approach may be infeasible because (1) it is unlikely that an adequate amount of land suitable for development as GGS habitat can be obtained within the Natomas basin, and (2) continuing to address GGS impacts in the basin on a ditch-by-ditch and reach-by-reach basis may be of limited ecological value and, therefore, not supported by the U.S. Fish and Wildlife Service (USFWS). Therefore, it may be preferable to coordinate with other stakeholders, including TNBC, DFG and USFWS, to develop a basin-wide strategy that compensates for the GGS impacts of the needed levee improvements and other ongoing and planned projects, helps address Airport safety issues (the need to move ditches providing GGS habitat farther from runways), and enhances the connectivity of GGS preserves in the basin. Such an approach

would likely be embraced by USFWS and could provide cost-sharing opportunities that could substantially reduce the cost of mitigation for the needed levee improvements.

In addition to the issues discussed above, potential timing constraints exist in relation to any construction that would occur within 200 feet of GGS aquatic habitat. In general, construction is restricted in these areas to the period of May 1 to October 1, and careful monitoring of construction activities is required during this period.

8.2.2 Swainson's Hawk Habitat

Primary impacts on Swainson's hawk are related to loss of foraging habitat and to nest disturbance during construction. The evaluation of these potential impacts was based on data compiled by Jim Estep during annual surveys for TNBC. Active Swainson's hawk nests have been documented throughout the Natomas Basin in the last 5 years. These data indicate that there is a high potential for active nests to be present within one-quarter mile of the levees in any part of the Natomas Basin, resulting in a need for consultation and coordination with the California Department of Fish and Game (CDFG) regarding any construction timing during the nesting season. Constraints on the timing of work in areas closest to nests are most likely during April through June, when the most nests are active. Some potential exists for the removal of nest trees where the north end of the setback levee alignment crosses a riparian area and at waterside erosion sites. However, it is assumed that such losses will be avoided, and mitigation for loss of nest trees was not factored into the preliminary mitigation cost estimate. There would be a loss of foraging habitat for Swainson's hawk along the secondary levee footprint that could be mitigated through promotion of cropping patterns that enhance foraging opportunities in the area between the levees.

8.2.3 Cultural Resources

There is a high potential for the presence of previously unknown buried prehistoric resources in floodplain areas. Several historic and prehistoric resources have been documented in the project vicinity, and the site documentation indicates that two prehistoric sites may be directly affected by construction activity. In addition, based on EDAW's experience in other riverside areas, it is assumed that 10 archaeological deposits may be discovered during ground-disturbing activities and that half of these may require formal site testing, while half may be addressed with less intensive investigation efforts. Because of the sensitivity of the area for significant cultural resources, much of the levee improvement work will need to be monitored by an archaeological monitor and a Native American monitor.

8.2.4 Cost Estimate

The potential costs associated with mitigation for terrestrial resource impacts of the identified levee improvements are difficult to assess in the absence of information on site-specific footprints, likely construction practices, and coordination with resource agency personnel. Nevertheless, Table 7-1 includes the estimated environmental mitigation costs associated with the identified levee improvements. Similarly, an estimate of the corresponding environmental mitigation costs was included in the estimated costs for the secondary levee alternative. For cost-estimating purposes, it was assumed that no substantial biological resource benefits would be provided by the project. Acreage calculations were based on the footprint of project features only and did not factor in any land use changes, and resulting biological resource effects, that may result from severing existing parcels.

8.3 IMPACTS AND MITIGATION FOR EROSION TREATMENTS

Bank protection projects commonly result in a suite of environmental impacts. However, experience has shown that impacts to habitat used by threatened or endangered fish species generate the most significant mitigation costs and the evaluation of erosion treatments focuses on these impacts.

8.3.1 Impact Assessment Method

The effects of the proposed treatments on fish and aquatic habitat in the Sacramento River were assessed using a simplified version of the Corps' final review draft of the Standard Assessment Methodology (SAM) for the Sacramento River Bank Protection Project (Stillwater Sciences 2004). The methodology permits the comparison of a species response index and total habitat value for both existing and with-project conditions. The methodology also permits the estimation of the amount of instream woody material (IWM) needed to minimize or prevent net impacts on fish habitat at a site.

Given the goals and purposes of the Levee Evaluation Study, the SAM evaluation involved a series of simplifying assumptions. One typical cross section showing the existing bank and the proposed bank protection was assumed to represent each entire bank protection site. The values developed for habitat variables focused only on habitat requirements of juvenile rearing life stages of Chinook salmon, whereas a full assessment would explore requirements of steelhead, as well as salmon adults and smolts. Existing conditions were assessed based on reconnaissance visits via boat and landside access, including extensive site photography, but not on systematic surveys (using transects or other survey methodology) of parameters such as IWM, overhead cover, etc. With-project conditions were represented by formulating average conditions over a 50-year period, rather than by assessing conditions at several discrete points in time.

8.3.2 Impact Assessment Results

This preliminary evaluation indicated that the proposed bank treatments would have a relatively small impact on habitat quality of fish species of concern. The treatments are designed to armor the bank toe and only as much of the lower bank as is necessary to arrest channel widening, leaving most of the existing bank vegetation intact. Moreover, a soil body would be created in all but one of the treatments to allow planting of riparian vegetation very near the edge of water. Finally, IWM would be anchored to the surface of the revetment in amounts at least equal to existing amounts and exceeding them at all but one site. These actions apply to both Treatment Types 1 and 2, and the assessment does not show an apparent difference in their habitat effects.

8.3.3 Mitigation Cost Estimate

Based on the results of the impact assessment, costs have been calculated to account for design components in addition to rock and soil placed for bank protection. These components include establishment and maintenance of plantings of riparian species in the soil bench (at all sites but Site D); establishment and maintenance of plantings in existing gaps in existing bank vegetation, estimated to be 0.3-0.6 acre; and installation of IWM. These costs are included in the erosion protection costs by levee reach in Table 7-1 and in the estimated cost of the secondary levee alternative. In both cases an allowance for an offsite mitigation project is included in the environmental mitigation cost. This covers the condition where impacts are significantly greater than estimated herein and mitigation using onsite IWM is not sufficient to provide full mitigation.

9.0 100-YEAR FLOOD PROTECTION

As discussed in the introduction to this report, the Corps concluded in 1998 that as a result of the levee raising and strengthening work accomplished as part of the Sacramento Urban Levee Reconstruction Project and the North Area Local Project, the Natomas area had adequate protection to safely contain a 100-year flood. In rendering this conclusion, the Corps acknowledged that portions of the east levee of the Sacramento River had less than the normally required 3 feet of freeboard on the 100-year water surface elevation. This was considered acceptable because this levee performed well during the 1997 high water event and because the Corps anticipated that the Sacramento River east levee would be raised in the near future as part of the Common Features Project. In addition, the Corps assumed that ongoing erosion in the Sacramento River channel would be addressed either as part of routine local levee maintenance efforts or as part of the Sacramento River Bank Protection Project. The Corps 1998 evaluation focused on levee stability, through-levee seepage, shallow foundation seepage and hydraulic channel capacity, which at the time were recognized as the most serious threats. The threats from erosion, waterside instability and deep underseepage were not as well understood by the Corps and the geotechnical engineering community of practice or by State and local agencies.

The 1997 high water event in the Sacramento Valley and the resulting failure of some of the SRFCP levees started to alter the geotechnical engineering community's understanding and approach to the deep underseepage issue. The Corps' post-flood assessment indicated that deep underseepage was a potentially significant contributor to levee instability and failure during the flood. As a result, in 2000, the Corps, in concert with the State and SAFCA, initiated an evaluation of the underseepage risk in Natomas as part of the authorized Common Features Project. Boring data was collected along the south levee of the Natomas Cross Canal and the east levee of the Sacramento River and an initial assessment of the work needed to address identified problems was completed. Because of the magnitude of the remedial work, and because deep underseepage was a newly identified concern in the Sacramento Valley, the Corps and its non-federal partners determined that before proceeding further, a panel of experts should be convened to establish appropriate guidelines for evaluating the risk of underseepage and to develop appropriate design standards for remedial measures. The panel completed its work in 2004, recommending evaluation and design guidelines that were adopted by the Corps' Sacramento District. The Corps subsequently re-analyzed the boring data that it had earlier collected using these guidelines, summarizing their findings in a report dated November 2005. Assuming water surface elevations in the channels around Natomas produced by a 1/100 AEP flood, the Corps determined that at some locations, calculated exit gradients exceeded the adopted guidelines for seepage and the borings indicated a potential for subsurface permeability that, if not addressed, could threaten the stability of the affected levees.

Although SAFCA's Levee Evaluation Study focused on 1/200 AEP water surface elevations, because of the importance of the Corps' 100-year flood determinations it was decided that SAFCA's underseepage analysis would include evaluations that were based on water surface elevations approximately representing the 1/100 AEP flood event to allow comparison with the results of the Corps' re-analysis. These water surface profiles were developed and the levee sections were evaluated to determine exit gradients and to identify other subsurface indications of risk to the affected levees. This data, which have been provided to the Corps, the Reclamation Board and local flood managers, confirms the Corps' earlier results. At some locations, the calculated exit gradients exceeded the adopted guidelines and the borings showed a potential for subsurface permeability that

could threaten levee stability. The data indicates that the risk of levee failure is greater than was previously thought and underscores the urgency of continuing public education efforts to communicate this risk, reinforcing the importance of flood insurance as a key risk management tool for property owners in the Natomas area, and rapidly implementing the improvements identified in the Levee Evaluation Study.

10.0 CONCLUSIONS

The Levee Evaluation Study indicates that a considerable amount of work is needed along the south levee of the Natomas Cross Canal, the east levee of the Sacramento Levee, and the north levee of the American River in order to provide the Natomas area with at least a 200-year level flood protection and move the area to a 'low' risk status.

The needed improvements would address levee freeboard, levee foundation stability, and streambank erosion problems identified in connection with the 1/200 AEP flood in the Study area.

The Study also indicates that the risk of flooding at the 100-year level is greater than previously assumed, underscoring the urgency of expediting the higher priority improvements.

The estimated cost of addressing the problems identified by the Study is about $300 million.

In determining improvement priorities and developing financing strategies for the identified problems, consideration should also be given to construction of a secondary levee in the upper reach of the Natomas area.

Construction of a new levee set back from the active river channel would reduce erosion concerns and avoid the uncertainties associated with refurbishing a portion of the existing east levee of the Sacramento River. It is estimated that when combined with established levee strengthening and bank protection techniques in the lower reaches of the Natomas area, the secondary levee alternative would add approximately $54 million to $132 million to the total cost of the needed improvements, depending on the source of material used to construct the new levee.

Environmental considerations will significantly affect the timing and cost of constructing the needed levee and streambank protection improvements. In order to reduce project costs and minimize construction delays, the improvement program should include a comprehensive approach to mitigating unavoidable environmental impacts that complements ongoing habitat conservation efforts in the Natomas Basin and the Sacramento River channel.

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PROBLEM IDENTIFICATION REPORT
SACRAMENTO RIVER EAST LEVEE
NATOMAS BASIN EVALUATION
RECLAMATION DISTRICT 1000
SACRAMENTO AND SUTTER COUNTIES, CA

Appendix C. of Draft & Final
SAFCA Levee Evaluation Study

February 1, 2006

[Technical Charts Omitted]

Greenbriar Draft EIR Comments
James P. Pachl, 9/5/06
Exhibit Ten

EXHIBIT 10

DRAFT

KLEINFELDER
An employee owned company

February 1, 2006
File: 58824-PSRE

Mr. Pete Ghelfi, PE
SAFCA
1007 7th Street, 7th Floor
Sacramento, California 95814

Subject: **Problem Identification Report**
Sacramento River East Levee
Natomas Basin Evaluation
Reclamation District 1000
Sacramento and Sutter Counties, California

Dear Mr. Ghelfi:

Kleinfelder is pleased to present the attached Problem Identification Report (PIR) describing the results of our evaluation of the Sacramento River east levee located within Reclamation District 1000 (RD 1000) in Sacramento and Sutter Counties, California. The purpose of our investigation was to evaluate levee geotechnical conditions in accordance with applicable California Department of Water Resources and US Army Corps of Engineers guidelines.

On the basis of geotechnical data that were available to Kleinfelder and the results of the current investigation, we have developed recommendations for levee strengthening which should result in acceptable factors of safety for stability and seepage for the 200-year design water surface elevation. For purposes of this preliminary analysis, the use of cutoff walls was primarily used as the preferred stabilization treatment. Other stabilization techniques such as seepage berms and/or relief wells could potentially be used. A more detailed analysis of these alternative stabilization options should be considered in final design.

KLEINFELDER 3077 Fite Circle, Sacramento, CA 95827-1815 (916) 366-1701 (916) 366-7013 fax

DRAFT

Kleinfelder appreciates the opportunity to work with you on this project. If you have questions please contact the undersigned.

Sincerely,

KLEINFELDER, INC.

DRAFT

Rebecca L. Money, PE
Project Engineer

DRAFT

Richard M. Stauber, PE
Senior Engineer

DRAFT

Byron C. Anderson, PG, CEG
Senior Engineering Geologist

DRAFT

Raymond Costa, Jr., PE, GE
Principal Engineer

RLM:RMS:BCA:RC:crt

Distribution: Client (25)

KLEINFELDER 3077 Fite Circle, Sacramento, CA 95827-1815 (916) 366-1701 (916) 366-7013 fax

DRAFT

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TABLE OF CONTENTS

PLATES

APPENDIX

1 INTRODUCTION

1.1. GENERAL

Kleinfelder performed this geotechnical investigation for preliminary evaluation of the Sacramento River East Levee (SREL). The goal of this investigation was to perform additional subsurface explorations to achieve one primary exploration through/adjacent to the levee at intervals of about 1,000 feet. This information was combined with previous explorations performed by the US Army Corps of Engineers (USACE) and others and a geomorphic analysis to prepare longitudinal subsurface profiles along the levee. The levee was then divided into 20 reaches with similar geotechnical characteristics. Representative cross sections were then developed for evaluation of stability and seepage in general compliance with applicable USACE guidelines. The levee geometry was also compared to the idealized profile described in California Code of Regulations Title 23.

Conclusions and recommendations presented in this report are based on the subsurface conditions encountered at the locations of our explorations and the provisions and requirements outlined in the LIMITATIONS section of this report. Recommendations presented herein should not be extrapolated to other areas or used for other projects without Kleinfelder's prior review.

1.2. SITE LOCATION

The SREL is located within Reclamation District 1000 (RD 1000) in Sacramento and Sutter Counties, California. The levee is approximately 18.6 miles long. It extends from the Natomas Cross Canal (NCC) south levee to the Natomas East Main Drain Canal (NEMDC) north levee, which is also a portion of the American River north levee. The Natomas Basin Evaluation study completed to date includes the NCC, American River (NEMDC), and the Sacramento River. This report only addresses the Sacramento River segment beginning at Station 0+00 (also Station 0+00 on the NCC) to Station 960+00 (Station 34+42 on the American River north levee). The site location relative to cities, rivers, and existing roadways is shown on Plate 1.

1.3. PURPOSE AND SCOPE OF SERVICES

Kleinfelder investigated the SREL for the purpose of evaluating levee and subsurface conditions and providing recommendations for mitigating identified seepage and stability problems.

Kleinfelder's work scope is described in our proposal dated April 27, 2005, and summarized below:

- A review of readily available subsurface information pertinent to the site
- Drilling and sampling 57 borings along the top of the levee or at the landside levee toe
- Limited laboratory testing of representative soil samples obtained during the field investigation to evaluate relevant engineering parameters
- Engineering analyses to provide the basis for alternatives analysis
- Preparation of this Problem Identification Report (PIR)

1.4. LEVEE PERFORMANCE ISSUES NOT ADDRESSED

This report primarily addresses levee performance issues related to seepage and stability. Other levee performance issues not addressed in this report include the following:

1. Freeboard
2. Erosion
3. Closure Devices
4. Operation and Maintenance
5. Levee Penetrations
6. Internal Drainage

Each of these issues should be addressed as part of an overall levee performance assessment.

1.5. PREVIOUS INVESTIGATIONS

Kleinfelder reviewed the following documents in support of this PIR:

Kleinfelder, Inc., "Geotechnical Data Report, Northern Sacramento River Crossing, Lower Northwest Interceptor, Sacramento and Yolo Counties, California." November 15, 2002.

Kleinfelder, Inc., Cone Penetration Tests for Sacramento River Agricultural Well Investigations performed for SAFCA. February 2002. (Kleinfelder 2002a)

Kleinfelder, Inc., "Preliminary Assessment of Levee Subsidence, Levee Adjacent to Irrigation Well, Garden Highway, Sacramento, California." August 8, 2002. (Kleinfelder 2002b)

Kleinfelder, Inc. "Geotechnical Investigation Report, Proposed American Basin Fish Screens and Habitat Improvement Project, Sankey, Elkhorn, and Riverside Canals, Natomas Mutual Water Company, Sacramento and Sutter Counties, California." July 30, 2004.

Montgomery Watson, "Sacramento River Watershed Project (Common Features), Sacramento East Side Levee and Berm Raising, Facility Inventory and Modification Report, Revised Draft." March 26, 2001.

US Army Corps of Engineers, Sacramento District, "Sacramento River Flood Control System Evaluation, Initial Appraisal Report--Sacramento Urban Area." May 1988.

URS for US Army Corps of Engineers, Sacramento District, "Revised Geotechnical Report, Volume 1 – Main Report: American River Watershed Project (Common Features), California, Sacramento River East Side Levee and Berm Raising." February 28, 2000.

URS for US Army Corps of Engineers, Sacramento District (USACE 2002A), "Landside and Waterside Explorations Report, Volume 1: American River Watershed Project (Common Features), California, Sacramento River East Side Levee and Berm Raising." March 8, 2002.

URS for US Army Corps of Engineers, Sacramento District (USACE 2002B), "Supplemental Explorations Report: American River Watershed Project (Common

Features), California, Sacramento River East Side Levee and Berm Raising, Reach South of Powerline Road." March 15, 2002.

URS for US Army Corps of Engineers, Sacramento District (USACE 2002C), "Final Supplemental Geotechnical Report for Reach North of Powerline Road: American River Watershed Project (Common Features), California, Sacramento River Levee and Berm, Sacramento, CA." December 6, 2002.

URS for US Army Corps of Engineers, Sacramento District (USACE 2005), "Draft Geotechnical Report for Sacramento River East Levee and Natomas Cross Canal South Levee, Natomas General Reevaluation Report, American River Watershed Project (Common Features), California." September 29, 2005. Volumes 1 and 2.

Wahler and Associates, "Levee Investigation, RD 1000, Left Bank Sacramento River, South Bank Natomas Cross Canal, North and West Banks Natomas East Canal, Sacramento and Sutter Counties, California," dated July 1987.

1.6. PROJECT DATUMS AND COORDINATE SYSTEM

Elevation references in this report are in feet and are based on the National Geodetic Vertical Datum of 1929 (NGVD29). Northing and easting coordinates shown in Appendix A are based on the California Coordinate System Zone II and the 1983 North American Datum (NAD83).

1.7. LEVEE ALIGNMENT AND GEOMETRY

Within the study area the SREL is approximately 18.6 miles long and extends from the confluence of the Natomas Cross Canal (NCC) to the Natomas East Main Drainage Canal (NEMDC) along the American River. The Garden Highway is located on top of the levee for the entire length. Crown elevations range between approximately 37 and 43 (NDVD 29), and landside toe elevations range from approximately 19 to 28.

Levee top widths vary between approximately 25 and 45 feet, and average approximately 30 feet. Waterside slopes are generally on the order of 3 horizontal (H) to 1 vertical (V). Landside slopes vary, but are primarily on the order of 2H to 1V (USACE 1988).

Levee and waterside berm widths have been estimated from historic and recent photographs and from topographic maps. On the basis of a comparison of berm widths shown on 1938 photographs to those shown on 2000 photos, the widths in some locales have changed by as much as 65 feet and as little as 3 feet. Berm widths estimated from topographic maps differ from both recent and 1938 photos in most locales examined. The changes include both widening, which suggests maintenance or repair activities, and narrowing, suggesting erosion (USACE 2002). In some locales, the apparent changes may be more attributable to differences in measuring or plotting techniques than to change in field conditions.

1.8. LEVEE TOPOGRAPHIC DRAWINGS AND LEVEE MILE REFERENCE

The following drawings were used to interpret topography on and adjacent to the levee alignments:

- USACE 1997 Sacramento and San Joaquin River Basins Comprehensive Study, topographic and bathymetric survey data

It is our understanding the vertical datum for the above listed drawings was NGVD29. We used these drawings to produce an updated landside levee toe. This profile is shown on Plates 4A through 4E. We used the 1997 Comprehensive Study topographic drawings to produce transverse levee cross sections for use in seepage and slope stability analyses. Top of boring elevations for borings drilled for this study were estimated from the topographic drawings listed above.

Levee subsurface profile drawings received from the USACE included a horizontal axis labeled with project stationing. This stationing is used throughout the project.

1.9. WATER SURFACE PROFILES

MBK Engineers and Tustison Engineering (2005) developed the 1-in-100 annual exceedance probability (1/100 AEP) and 1/200 AEP water surfaces for the SREL, referred to as the 100-year and 200-year water surface elevation (WSE), respectively. The 100-year WSE ranges from approximately 31.5 to 40.6, and the 200-year WSE ranges from approximately 33.9 to 42.3. These water surface profiles are presented on Plates 4A through 4E.

1.10. INVESTIGATION REACH DESIGNATIONS

Based on the results of the field investigation and existing subsurface data, the SREL was divided into 20 reaches, which are identified in the following table.

Table 1.10 - Investigation Reaches

Levee Reach Designation	Approximate Extents and Locations
Reach 1	NCC Station 0+00 to 48+00
Reach 2	Stations 48+00 to 100+00
Reach 3	Stations 100+00 to 110+00
Reach 4	Stations 110+00 to 228+00
Reach 5	Stations 228+00 to 280+00
Reach 6	Stations 280+00 to 330+00
Reach 7	Stations 330+00 to 362+00
Reach 8	Stations 362+00 to 402+00
Reach 9	Stations 402+00 to 468+00
Reach 10	Stations 468+00 to 495+00
Reach 11	Stations 495+00 to 635+00
Reach 12	Stations 635+00 to 667+00
Reach 13	Stations 667+00 to 700+00
Reach 14	Stations 700+00 to 732+00
Reach 15	Stations 732+00 to 780+00
Reach 16	Stations 780+00 to 832+00
Reach 17	Stations 832+00 to 842+00
Reach 18	Stations 842+00 to 857+00
Reach 19	Stations 857+00 to 925+00
Reach 20	Stations 925+00 to 960+00

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1.11. FIELD INVESTIGATION

Spectrum Exploration, under contract to SAFCA, drilled 57 exploratory soil borings along the levee alignment between August 3 and September 30, 2005. The exploratory boring locations are presented on Plates 2A through 2L.

Discussions of the field investigation and laboratory testing program are presented in Appendices A and B of this report. Boring logs and laboratory test results from previous investigations are presented in Appendix C. Boring logs from current and previous investigations are shown on levee profiles presented on Plates 4A through 4E.

2 REGIONAL GEOLOGY AND GEOMORPHOLOGY

2.1. GEOLOGIC SETTING

The subject site is located in the central portion of the Sacramento Valley, the northern portion of California's Great Central Valley. The Sacramento Valley contains thousands of feet of accumulated fluvial, overbank, and fan deposits resulting from erosion of the adjacent Sierra Nevada Mountains to the east, Northern Coast Range to the west, and Klamath Mountains to the north. These deep alluvial deposits pinch out as the boundaries of the basin are approached and bedrock units of the Foothills Metamorphic Belt (FMB) and the basement complex of the Sierra Nevada Batholith are exposed to the east and the sedimentary and mélange bedrock of the Coast Range are exposed to the west.

The Sacramento River is the main drainage of the region, flowing generally south from the Klamath Mountains to its discharge point into the Suisun Bay in the San Francisco Bay area. Within the Sacramento area, the Sacramento and American Rivers have been confined by man-made levees since the turn of the century. Within the study area, these levees were generally constructed on Holocene age alluvial and fluvial sediments deposited by the current and historic Sacramento River and its tributaries. Pleistocene deposits are mapped nearby and underlie Holocene deposits in the study area. These deposits are described in detail below.

The project site has been mapped by a number of geologists at a regional scale, including Jennings (1977), Wagner (1981), and Helley and Harwood (Helley and Harwood 1985). Jennings and Wagner are both compilation maps that reflect mapping by previous authors and thus show geologic interpretation similar to Helley and Harwood. Helley and Harwood mapping focused on Quaternary geologic units based on geomorphology and was performed at a scale of 1:62,500, making this mapping the most beneficial information relative to engineering properties of near-surface deposits. Helley and Harwood map several Quaternary earth units in the region including (from youngest to oldest):

Stream Channel Deposits (Qsc): Recent and often Historic alluvial deposits generally consisting of unconsolidated sand, gravel, and silt contained primarily in active river and tributary channels. Includes material deposited from hydraulic mining activities.

Alluvium (Qa): Recent alluvium mapped adjacent to the active river or tributary channels consists of Holocene high energy fluvial deposits (i.e. sand and gravels) and overbank and fan deposits (i.e. sand, silt, and clay) that are also unconsolidated. The study area is primarily underlain by alluvium with the exception of a section taking up most of Reach 4 that is mapped by Helley and Harwood as being underlain by Basin Deposits (described below).

Basin Deposits (Qb): Helley differentiates basin deposits from alluvium (Qa) on the basis of composition including only those deposits that are finer-grained and frequently organic-rich and suggests these deposits were distal deposits where energy conditions were much lower. Most of Reach 4 is located on deposits mapped as Basin Deposits.

Riverbank Formation (Qrl and Qru): Semi-consolidated alluvial sand, silt, and clay with gravel is mapped about 1,300 feet southwest of the east end of the levee. These deposits are estimated to be 130,000-450,000 years of age (mid-Pleistocene) and contain high pedogenic silt and clay content and reddish hues reflective of its relative age. The Riverbank Formation typically underlies the younger alluvial deposits in the project area and is mapped as close as 200 feet east of the levee in the southern section of Reach 2.

The location of the above geologic units relative to the SREL is depicted on Plate 3A. Plate 3B shows the 1909 American River Basin Features relative to the levee.

2.2. REGIONAL GROUNDWATER

Groundwater elevations and soil moisture conditions within the area fluctuate depending on Sacramento and American Rivers and Natomas Cross Canal stages, rainfall, irrigation practices, and/or runoff conditions. DWR maintains an Internet water data library (http://well.water.ca.gov/) of groundwater depth measurements from numerous monitoring wells throughout the State. According to data for five wells located in the vicinity of the SREL (09N04E27F001M, 09N04E22E001M, 09N04E08L001M, 10N03E35A001M, and 11N04E19E002M), groundwater elevations ranged between

approximately -8 to 23 between the years of 1953 and 2005. Ground surface elevations at these well locations range from 12 to 24. Refer to Appendix G for plots showing the groundwater elevation data for these wells.

2.3. SACRAMENTO RIVER HISTORIC GEOMORPHOLOGY

The filling of the Sacramento Valley with sediments has significantly reduced the gradient of rivers flowing down from the Sierra Nevada and Klamath Mountains (including the Sacramento and American Rivers). This gradient reduction has caused the energy of these rivers to transition from erosional to graded. Graded rivers are characterized by erosion that is less dominant than erosional rivers and directed side to side rather than down-cutting. The lateral energy of the river causes synchronous erosion and deposition in sweeping bands commonly referred to as meanders. The outside of the meander is a zone of erosion. Material removed by the river at this zone is then deposited downstream as point bars in zones of decreased velocity on the inside of other meanders. In this way the river migrates across the flood plain. Often this erosion is slowed where the river encounters more resistant portions of the flood plain. This allows the next closest upstream meander to catch up and gradually erode away the "neck" between the two meanders. Flooding often accelerates this process as the higher energy flows can more easily cut a new thalweg (base of the active channel). The result of the conjoining meanders is the straightening of the river at that point of intersection and the creation of an abandoned bend in the river commonly referred to as an oxbow lake.

Review and comparison of historic topographic maps with current topographic maps, aerial photographs, and geologic and soil maps in the area of the SREL, between the NCC and the American River confluences revealed possible evidence of features and soil characteristics indicative of graded rivers. These maps also indicate some ancient river features have been obliterated over the years by urbanization and agricultural land use.

Mapping by Helley and Harwood indicates the entire levee is underlain by alluvium and basin deposits. These deposits formed by the pre-levee Sacramento River and represent historic river channels that were deposited, incised/eroded and overlain by younger deposits as the rivers meandered across their flood plains. The Map of the American Basin (1908-1909) shown on Plate 3B, indicates there were a number of

bodies of water immediately east of the current Sacramento River alignment. These water bodies included the American, Upper American, and Pritchard Lakes, Jacob's Slough, and Brannan Slough. The American and Upper American Lakes are located east and north of the Sacramento River between Reaches 9 through 20. Jacob's Slough is located southeast of the middle portion of Reach 6 and Pritchard Lake is located east of the southern half of Reach 4. The Brannan Slough is located at the current location of the Main Drain Canal between Reaches 19 and 20. These bodies of water seasonally formed in depressions that likely represent either abandoned channels of the Sacramento River or areas with poor drainage due to build up of natural levees along the river bank. Aerial photographs and topographic maps also reveal linear and sinuous features and depressions that may be remnants of abandoned river channels. These features are shown on Plate 3C. Discontinuous topographic and contrasting landform features viewed in aerial photographs indicate an ancient channel existed immediately east of the existing active river channel from at least Reach 1 through Reach 4 and Reach 9 through Reach 11. Other possible river channel or tributary features mapped east of the river as part of this study are located at the north end of Reach 5 and the south end of Reach 16 through Reach 18. Mapping of historic river features by URS (2002) shown on Plate 3D, indicates there are a number of oxbow features and ancient channels within or adjacent to Reaches 1 through 5 (some mapped consistently with Kleinfelder's mapped channels). In addition, a large channel is shown on their map extending from Reach 9 to Reach 11. A number of oxbow channels are also mapped north of Reach 19. These remnant river features and alluvial deposits are typically filled with loose granular sediments deposited by the rivers when they flowed through the historic channels. It should be noted that often the coarse grained alluvium is "capped" by a relatively thin layer of silt and/or clay deposited from the river during more recent (post abandonment) flood stages. During these flood events, the river overtopped its then current channels and carried with it finer grained materials that were deposited outside of the channels as the river receded. Eventually these lower energy deposits accumulate and can eliminate evidence of the older, abandoned river channels.

3 SITE CONDITIONS

3.1. GENERAL

We understand the SREL was constructed in the early 1900s by excavating a trench along the levee centerline and depositing the excavated material on both sides of the trench, forming small dikes. The area between the small dikes was filled with sand fill hydraulically dredged from the river bottom. The final levee configuration was achieved by covering the dredged sand with adjacent dike materials. As a result, sand extends to a greater depth beneath the center of the levee than beneath the flanks. In addition, the sand levee fill is generally loose. Most of the levee material was dredged from the river and piled or scraped into place with no mechanical compaction.

3.2. EXISTING CUTOFF WALLS

In 1991, the SREL was strengthened under the Sacramento Urban Levee Reconstruction Project. A slurry cutoff wall was constructed from Station 635+00 near Powerline Road to the Natomas Main Drainage Pumping Plant (Station 925+00). The cutoff wall bottom extends to between approximately Elevation 9 and 14. Beginning at Station 930+00, a deeper cutoff wall was constructed to Station 960+00 in 2000 as part of the American River Common Features Project. The bottom of this cutoff wall extends approximately to Elevation -7 within this area. The cutoff wall upstream of the Main Drain is a soil, cement, and bentonite (SCB) mixture. Downstream of the Main Drain, the cutoff wall was constructed using self hardening slurry. Refer to Plates 4D and 4E for the location of these cutoff walls.

3.3. EXISTING STABILITY BERMS AND DRAINS

In 1991, the landside slope of the levee north of Powerline Road to the Natomas Cross Canal was strengthened under the Sacramento Urban Area Levee Reconstruction Project. A stability berm with chimney drain and horizontal drainage blankets was constructed along the landside slope/toe. The stability berm is approximately 10 feet wide and extends to about the height of the 1957 design water surface elevation. The chimney drain, consisting of drain rock between geotextile layers, lies along the inclined

base of the stability berm and extends up the landside levee slope (between the levee and the berm) to a few feet below the top of the berm.

3.4. DITCHES

According to a facility inventory conducted in 2001 (Montgomery Watson), the following ditches lie within 45 feet of the levee toe north of Powerline Road (approximately Station 635+00):

Table 3.4 - Summary of Existing Ditches Adjacent to the Sacramento River East Levee

Stationing	Approximate Levee Mile	Facility	Depth (feet)	Distance from Toe (feet)
177+00 to 195+54	3.35-3.70	Earth ditch	3	10
201+94 to 305+61	3.50-5.80	Earth and concrete ditch	5-6	6-45
312+01 to 366+96	5.92-6.97	Earth ditch	5	6
374+67 to 405+84	7.11-7.71	Concrete ditch	4	12-15
542+81 to 611+22	10.32-11.62	Earth ditch	4-5	12

3.5. DRAINAGE PUMP STATIONS

Three landside drainage pumping stations are located along the levee: the RD 1000 Pumping Plant #2 located near Station 196+85; the RD 1000 Pumping Plant #3, located near Station 678+00; and the Natomas Main Drain Pumping (Plant #1) located near Station 925+00. A URS 2002 report references a "deep gravity drain through the levee" at the RD 1000 Pumping Plant #2.

Elkhorn Reservoir (a Natomas Mutual Water Company (NMWC) Settling Basin) is located between approximately Stations 304+30 and 310+20. NMWC Pritchard Lake Pump Station is located adjacent to RD 1000 Plant #2.

3.6. SETTLEMENT

On the basis of differences in levee crown elevations between 1916 and 2000, the USACE (USACE 2002c) concluded that up to 1.2 feet of settlement was observed at various locations between approximately Stations 0+00 to 600+00. Based on the magnitude of settlement, the elevation differences may also be the result of surveying or plotting inconsistencies (ibid.).

4 PERFORMANCE HISTORY

4.1. HISTORIC SEEPAGE MAP REVIEW

Historical documents and maps reviewed to evaluate the past performance of the SREL included the California Department of Water Resources Bulletin No. 125, "Sacramento Valley Seepage Investigation," dated August 1967, and the Natomas Company's Map of Reclamation Districts Nos. 1000 and 1400 showing "Areas Effected [sic] By Continuous High Water in Sacramento River During Spring of 1938," and "Showing Area Overflowed from Drainage Canals, 1938 - 6,810 Acres Seepage, or Groundwater Showing on Surface in May 1938." It should be noted the 1938 map showing areas affected by high water does not clarify or provide detail of the conditions observed in these areas (Plate 3F). For example, there is no differentiation as to whether the "seepage" is related to either levee through seepage, underseepage, or merely collected surface water at that location. Plate 2-1, the Geomorphology Map of the Sacramento River east levee, prepared by URS in 2002 was also reviewed for this investigation (Plate 3D). This map shows seepage areas reported by landowners and viewed on 1955 Department of Water Resources aerial photographs, seepage boils observed in 1986 and 1997, former channels and oxbows, and eroding and landsliding banks. Details of features presented by these maps within the 20 reaches of the SREL are discussed below and shown graphically on Plates 3E though 3G.

The first of the 1938 maps indicates almost the entire study area was affected by high water (Plate 3E). However, portions of Reach 4 and Reaches 8 through 15 are mapped showing the affected area offset (landward) from the levee as much as several thousand feet. The majority of Reach 14 and half of Reaches 19 and 20 are shown as not affected by high water. The second 1938 map displaying seepage or groundwater showing on the surface indicates seepage was observed along the majority of Reaches 1 through 3, 6 through 9, and 18 (Plate 3F). The approximate northern half of Reach 4, southern half of Reach 5, southern half of Reach 11, middle portion of Reach 12, and eastern section of Reach 19 were also reportedly affected by seepage. Seepage or groundwater showing at the surface was not mapped within Reaches 10, 13, 14, and 20. The Department of Water Resources 1963 seepage areas map indicates seepage was observed during high river flow periods along almost the entire study area (Plate

3G). Seepage was not observed in a number of areas, ranging in size from several hundred to several thousand feet in length. These areas included sections of Reaches 6, 8, 11, 14, 19, and 20. The 1965 map indicates seepage was also observed along almost the entire study area with the exception of several sections up to 300 to 400 feet long within Reaches 6, 8, 11, 13, 15, and 19. The URS map indicates seepage has been observed along portions of Reaches 1 through 4 and 6 through 16. Boils were observed at the southern ends of Reaches 4 and 9, the central portion of Reach 12, and the western end of Reach 19.

Documentation of historic seepage does not differentiate between through seepage and underseepage. Through seepage has been mitigated by constructing either a slurry cutoff wall or stability berm in 1991 along the majority of the study area. Of particular concern is documented evidence of seepage since 1991.

4.2. LEVEE PERFORMANCE HISTORY

Locations of the following levee performance concerns involving seepage and landside sloughing are shown on Plates 4A through 4E and are referenced from Plate 3D and observations recorded by property owners.

4.2.1. Reach 1, Station 0+00, Natomas Cross Canal, to Station 48+00

A persistent seepage area near the intersection of the levee with the Natomas Cross Canal south levee was reported in 2004. Other seepage has been reported along much of this reach.

4.2.2. Reach 2, Stations 48+00 to 100+00

Seepage has been reported in the approximate vicinity of Station 98+00.

4.2.3. Reach 3, Stations 100+00 to 110+00

Seepage has been reported in the approximate vicinity of Station 106+00.

4.2.4. Reach 4, Stations 110+00 to 228+00

Landside sloughing was observed in the vicinity of Station 126+00 and Stations 167+00 to 228+00 during the February 1986 flood. In 1991, the USACE constructed a drained stabilizing berm that extends from the Natomas Cross Canal to Powerline Road.

4.2.5. Reach 5, Stations 228+00 to 280+00

Documentation of past seepage was not identified for this reach.

4.2.6. Reach 6, Stations 280+00 to 330+00

Landside sloughing was observed in several locations between Levee Miles 6 and 7 (approximately Stations 312+00 to 362+00) during the February 1986 flood. In 1991, the USACE constructed a drained stabilizing berm that extends from the Natomas Cross Canal to Powerline Road.

Seepage has been reported in the approximate vicinity of Station 315+00.

4.2.7. Reach 7, Stations 330+00 to 362+00

Landside sloughing was observed in several locations between Levee Miles 6 and 7 (approximately Stations 312+00 to 362+00) during the February 1986 flood. In 1991, the USACE constructed a drained stabilizing berm that extends from the Natomas Cross Canal to Powerline Road.

4.2.8. Reach 8, Stations 362+00 to 402+00

Seepage has been reported in the approximate vicinity of Station 363+00 and from Stations 374+00 to 402+00.

4.2.9. Reach 9, Stations 402+00 to 468+00

Seepage has been reported for the entire length of this reach and seepage boils were observed in 1986 in the vicinity of Stations 466+00 to 468+00.

4.2.10. Reach 10, Stations 468+00 to 495+00

Seepage has been reported for this entire reach and seepage boils were observed in 1986 in the vicinity of Stations 468+00 to approximately 470+00. The seepage area reportedly corresponds with a former channel that is apparent on 1938 aerial photographs.

4.2.11. Reach 11, Stations 495+00 to 635+00

Seepage has been reported for the middle of the reach, approximately Stations 530+00 to 570+00.

4.2.12. Reach 12, Stations 635+00 to 667+00

Seepage has been reported for the entire length of this reach. Landside sloughing was observed in the vicinity of Station 645+00 during the February 1986 flood. In 1991, the USACE constructed a slurry cutoff wall that extends from Powerline Road to the Natomas Main Drainage Pumping Plant.

4.2.13. Reach 13, Stations 667+00 to 700+00

Seepage has been reported for the entire length of this reach.

4.2.14. Reach 14, Stations 700+00 to 732+00

Seepage has been reported for the entire length of this reach.

4.2.15. Reach 15, Stations 732+00 to 780+00

Seepage has been reported for the entire length of this reach.

4.2.16. Reach 16, Stations 780+00 to 832+00

Landside sloughing was observed in the vicinity of Station 820+00 during the February 1986 flood. In 1991, the USACE constructed a slurry cutoff wall that extends from Powerline Road to the Natomas Main Drainage Pumping Plant.

4.2.17. Reach 17, Stations 832+00 to 842+00

Documentation of past seepage was not identified for this reach.

4.2.18. Reach 18, Stations 842+00 to 857+00

Documentation of past seepage was not identified for this reach.

4.2.19. Reach 19, Stations 857+00 to 925+00

Past seepage has been observed along this reach. Landside sloughing was observed in the vicinities of Station 920+00 during the February 1986 flood. In 1991, the USACE constructed a slurry cutoff wall that extends from Powerline Road to the Natomas Main Drainage Pumping Plant.

4.2.20. Reach 20, Stations 925+00 to 960+00

Documentation of past seepage was not identified for this reach.

5 FINDINGS AND PRELIMINARY RECOMMENDATIONS

5.1. GEOTECHNICAL REQUIREMENTS FOR LEVEE EVALUATION

In order to provide a specific level of protection the entire length of levee must be able to withstand the design water surface for the duration of the design flood event. Uniform standards for levee geometry have been codified by the State of California DWR. With regards to levee integrity, we have relied upon engineering design manuals prepared by USACE. Specifically, with respect to geotechnical seepage and levee stability requirements, our evaluation is based upon compliance with the guidelines contained in the USACE Levee Design Manual (EM 1110-2-1913) and Engineering Technical Letter Design Guidance for Levee Underseepage (ETL 1110-2-569). Where problems are identified, we have identified mitigation measures we believe comply with the prescribed levee design procedures.

5.2. THROUGH SEEPAGE AND STEADY STATE STABILITY

Levee through seepage has been a significant problem along many reaches of the Sacramento River. In the Natomas basin during the 1986 flood, many slope failures were observed on the landside levee slope as a result of seepage through the sandy levees. Through seepage was mitigated in 1991 by constructing either a landside drained stability berm or a slurry cutoff wall in the levee along a majority of the levee. Based on a review of through seepage and stability analyses performed for the USACE, the constructed stability berm and cutoff wall provide the minimum factor of safety for through seepage steady state conditions (>1.4) at the 100-year and 200-year WSE.

5.3. SETTLEMENT

Some portions of the alignment are proposed to be raised to increase freeboard in order to meet USACE standards. Minor raises on the order of a few feet may cause settlement. If a levee raise is required, we recommend a settlement analysis be performed based on the project design specifications.

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5.4. RAPID DRAWDOWN STABILITY

The levee along this portion of the Sacramento River is composed primarily of sand. The pore water within the levee is expected to drain relatively quickly as the river level drops. Therefore the prescribed waterside levee slope of 3H:1V is expected to have a factor of safety greater than the required minimum factor of safety of 1.2 for rapid drawdown. To maintain this condition, the prescribed 3H:1V waterside slope should be protected from erosion. A separate erosion analysis is being performed for the study area by others.

5.5. SEISMIC STABILITY

The likelihood of a simultaneous occurrence of the design water stage and the maximum seismic event is considered remote. As a result, the current standard of practice for levee evaluation in the Sacramento area is to analyze the effects of potential loss of freeboard or other damage to levees due to seismic shaking (and resulting settlement) based on normal river stage conditions. It is accepted that if minor damage to the levees occurs during a seismic event, the damage can be repaired prior to a subsequent flood event. We have not evaluated the influence of seismic shaking on the levee embankments. However, cohesionless soils with relatively low Standard Penetration Test blow counts were encountered in our exploratory borings. These soils may be susceptible to liquefaction, settlement, and lateral spreading. Operation and maintenance plans should anticipate that a design level earthquake may result in movement and loss of freeboard and lateral spreading. These plans should envision expeditious restoration of levee integrity should seismic settlement occur. In order to estimate the amount of settlement and lateral spreading, a deformation analysis would be needed.

5.6. END OF CONSTRUCTION STABILITY

While minor raises on the order of a few feet may not cause increases in pore pressure within the levee or foundation soils, if design of a levee raise is considered we recommend the End of Construction stability condition be evaluated. Raises and/or excavations at the levee toe (such as key or inspection trenches) may temporarily reduce levee stability. Such modifications should be carefully evaluated prior to construction of levee improvements.

5.7. GEOTECHNICAL SEEPAGE AND LEVEE STABILITY

For this evaluation we divided the levee into reaches based on subsurface conditions encountered in exploratory soil borings along with anticipated variability based on the geomorphic setting. The results of our seepage analyses, URS seepage analyses, and past performance were used to decide which reaches met the USACE guidelines. In general, if one seepage analysis within a reach (either URS or Kleinfelder) did not meet criteria or several were near the criteria, the reach was deemed inadequate. In some cases variability was addressed in the seepage model or by performing a sensitivity analysis. In other cases the models were faithful to a specific boring location and the influence of variability was considered separately. Where the reach was deemed inadequate, mitigation measures that would permit safe performance against the 200-year WSE have been identified. These measures are summarized in Table 5.28 at the end of this chapter.

The following sections summarize, for each of the designated reaches, the geomorphology, performance history, levee topography, subsurface conditions, and seepage and slope stability analyses for the 100-year and 200-year WSE, and recommend mitigation measures by reach where appropriate. Additional information regarding descriptions and results of the seepage and slope stability analyses can be found in Appendices D and E, respectively.

5.8. REACH 1 - STATION 0+00, NATOMAS CROSS CANAL, to STATION 48+00

5.8.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes this entire reach. The 1938 map displaying seepage or groundwater showing on the surface indicates seepage was observed along the majority of this reach. The Department of Water Resources 1963 and 1965 seepage areas maps indicate seepage was observed during high river flow periods along the entire reach. The URS map indicates seepage has been observed along portions of this reach.

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A persistent seepage area near the intersection of the levee with the Natomas Cross Canal south levee was reported in 2004. It is not known if this seepage is through seepage or underseepage (or a combination of both).

A drained stability berm has been constructed along the landside slope of the levee along this reach to mitigate potential adverse through seepage conditions.

5.8.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 42.5 to 43.0. The ground surface elevation near the landside levee toe ranges between approximately 22 and 28.

The 100-year WSE ranges from approximately 40.2 to 40.7, and the 200-year WSE ranges from approximately 41.7 to 42.3.

5.8.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Borings 2F-01-01, 2F-01-02, 2F-01-03, 2F-01-05, 2F-01-06, 2F-01-08, and 2F-01-12; Wahler 1987 Borings DH-15, DH-14-2, and DH-14-3; Wahler 1997 Boring B-97-1; and Kleinfelder 2005 Boring SRB-1.

- A levee embankment consisting primarily of sand, silty sand, and clayey sand,
- A sand layer below the levee that may be continuous to the landside toe,
- A fine-grained blanket layer at least 30 feet thick consisting primarily of clay and silt, and
- No significant layers of sand or gravel below the fine-grained blanket layer.

5.8.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.8 – Summary of Seepage Gradients for Reach 1

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
1	13+50	0.19	0.19	0.11
	27+00	0.29	0.32	0.07
	42+00	--	--	0.20

Notes: -- Not analyzed

5.8.5. Stability Analysis

Based on a stability analysis performed within Reach 11 at Station 516+00, with the existing stability berm, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, based on the similarity of the levee and berm geometry, the levee and constructed berm in this reach exceeds the minimum factor of safety (1.4).

5.8.6. Preliminary Conclusions and Recommendations

The seepage and stability analyses indicate that this reach meets USACE guidelines for the 100-year or 200-year WSE. An additional investigation should be performed at the landside toe of the levee near Boring DH-14-2 to confirm the sand layer encountered below the levee centerline is not continuous to the landside toe.

5.9. REACH 2 – STATIONS 48+00 to 100+00

5.9.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes this entire reach. The 1938 map displaying seepage or groundwater showing on the surface indicates seepage was observed along the majority of this reach. The Department of Water Resources 1963 and 1965 seepage areas maps indicate seepage was observed during high river flow periods along the entire reach. The URS map indicates seepage has been observed along portions of this reach.

A drained stability berm has been constructed along the landside slope of the levee along this reach to mitigate potential adverse through seepage conditions.

5.9.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 42.5 to 43.0. The ground surface elevation near the landside levee toe ranges between approximately 26 and 28.

The 100-year WSE ranges from approximately 39.7 to 40.2, and the 200-year WSE ranges from approximately 41.4 to 41.7.

5.9.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Borings 2F-01-04, 2F-01-12, and 2F-01-15; Wahler Borings DH-14, DH-14-1, and DH-13-2; Wahler 2000 Boring B00-1; and Kleinfelder 2005 Borings SRB-2 through SRB-4.

- A levee embankment consisting primarily of sand, with lesser amounts of silty sand and silt,
- Significant sand layers from 5 to 20 feet thick with less than 20 feet of blanket, and
- An apparently continuous fine-grained layer below about Elevation –25.

5.9.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.9 – Summary of Seepage Gradients for Reach 2

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
2	70+00	0.65	0.72	0.66
	84+00	0.15	0.16	0.28
	91+00	0.50	0.56	--

Notes: -- Not analyzed

5.9.5. Stability Analysis

Based on a stability analysis performed within Reach 11 at Station 516+00, with the existing stability berm, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, based on the similarity of the levee and berm geometry, the levee and constructed berm in this reach provides the minimum factor of safety (1.4).

5.9.6. Preliminary Conclusions and Recommendations

The seepage analyses performed by Kleinfelder and URS indicate that both the 100-year and 200-year WSE could produce gradients in excess of 0.5 at several boring locations in this reach. Elevated gradients are considered likely to be present in the vicinity of these boring locations. Therefore, we conclude that this reach does not meet USACE underseepage guidelines. Accordingly, construction of a SCB slurry cutoff wall through the levee to Elevation –25, 65 feet deep, is recommended to mitigate underseepage for the 200-year WSE.

5.10. REACH 3 – STATIONS 100+00 to 110+00

5.10.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes this entire reach. The 1938 map displaying seepage or groundwater showing on the surface indicates seepage was observed along the majority of this reach. The Department of Water

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Resources 1963 and 1965 seepage areas maps indicate seepage was observed during high river flow periods along the entire reach. The URS map indicates seepage has been observed along portions of this reach.

A drained stability berm has been constructed along the landside slope of the levee along this reach to mitigate potential adverse through seepage conditions.

5.10.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 42.5 to 44.0. The ground surface elevation near the landside levee toe is approximately 26.

The 100-year WSE ranges from approximately 39.6 to 39.7, and the 200-year WSE ranges from approximately 41.0 to 41.1.

5.10.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the Wahler 1987 Boring DH-13-1; and Kleinfelder 2005 Borings SRB-5 and SRB-6.

- A levee embankment consisting primarily of sand, with lesser amounts of silty sand and silt,
- A sand layer below the levee that may be continuous to the landside toe,
- A fine-grained blanket layer at least 30 feet thick consisting primarily of clay and silt, and
- No significant layers of sand or gravel below the fine-grained blanket layer.

5.10.4. Seepage Analysis

No seepage analysis was performed within this reach. By inspection and comparison with seepage analyses conducted in other areas, the soil stratigraphy within this reach should not result in an underseepage gradient condition greater than the USACE criteria (0.5) for the 100-year or 200-year WSE.

5.10.5. Stability Analysis

Based on a stability analysis performed within Reach 11 at Station 516+00, with the existing stability berm, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, based on the similarity of the levee and berm geometry, the levee and constructed berm in this reach exceeds the minimum factor of safety (1.4).

5.10.6. Preliminary Conclusions and Recommendations

The seepage and stability analyses indicate that this reach meets USACE guidelines for the 100-year and 200-year WSE. Additional investigations should be performed at the landside toe of the levee near Borings SRB-5 and D-13-1 to confirm the sand layer encountered below the levee centerline is not continuous to the landside toe.

5.11. REACH 4 –STATIONS 110+00 to 228+00

5.11.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes a majority of this reach. The 1938 map displaying seepage or groundwater showing on the surface indicates seepage was observed along the approximate northern half of this reach. The Department of Water Resources 1963 and 1965 seepage areas maps indicate seepage was observed during high river flow periods along the entire reach. The URS map indicates seepage has been observed along portions of this reach and that boils were observed at the southern end of this reach.

Landside sloughing was observed in the vicinity of Station 126+00 and Stations 167+00 to 228+00 during the February 1986 flood.

A drained stability berm has been constructed along the landside slope of the levee along this reach to mitigate potential adverse through seepage conditions.

5.11.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 41.0 to 43.0. The ground surface elevation near the landside levee toe ranges between approximately 24 and 26.

The 100-year WSE ranges from approximately 38.5 to 39.6, and the 200-year WSE ranges from approximately 40.0 to 41.0.

5.11.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Borings 2F-01-18, 2F-01-20, 2F-01-22, 2F-01-23, 2F-01-25 through 2F-01-27, 2F-01-30, and 2F-01-31; Wahler 1987 Boring DH-13-1; Wahler 1986 Borings DH-1-86, DH-2-86, and DH-3-86; Wahler 1997 Boring B97-2; Wahler 1999 Borings B99-2 and B99-3; Wahler 2000 Borings B00-2 and B00-3; and Kleinfelder 2005 Borings SRB-7 through SRB-14.

- A levee embankment consisting primarily of sand, with lesser amounts of silty sand and silt,
- A highly variable blanket layer including significant amounts of silty sand with 20 to 40 percent fines,
- A substantial, apparently continuous layer of sand and gravel from 40 to 60 feet thick, and
- No apparently continuous fine-grained layer within 100 feet of the levee crown.

5.11.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.11– Summary of Seepage Gradients for Reach 4

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
4	124+00	0.51	0.56	0.36
	141+00	0.46	0.50	0.35
	168+00	--	--	0.37
	171+00	0.42	0.45	--
	180+00	0.29	0.33	--
	195+00	0.63	0.73	0.42
	217+00	0.58	0.67	0.90

Notes: -- Not analyzed

5.11.5. Stability Analysis

Based on a stability analysis performed within Reach 11 at Station 516+00, with the existing stability berm, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, based on the similarity of the levee and berm geometry, the levee and constructed berm in this reach exceeds the minimum factor of safety (1.4).

5.11.6. Preliminary Conclusions and Recommendations

The seepage analyses performed by Kleinfelder and URS indicate that both the 100-year and 200-year WSE could produce gradients in excess of 0.5 at several boring locations in this reach. Elevated gradients are considered likely to be present in the vicinity of these boring locations. Therefore, we conclude that this reach does not meet USACE underseepage guidelines. Accordingly, construction of a DSM wall through the

levee to Elevation –70, 110 feet deep, is recommended to mitigate underseepage for the 200-year WSE.

Alternative Mitigation. As an alternative mitigation option to a cutoff wall, a minimum width seepage berm, 80 feet wide, is recommended to mitigate underseepage for the 200-year WSE. The seepage berm should be constructed as required in the USACE "Design and Construction of Levees" EM 1110-2-1913 and the USACE Sacramento District SOP EDG-03 for "Geotechnical Levee Practice". The berm should be designed and constructed to provide continuity of the existing stability berm drainage system.

Pumping Plant #2 – Proposed Mitigation. During periods of high river stage this pumping facility has experienced severe boils and slope stability distress along the unlined intake channel/sump. This facility has previously been designated by USACE as requiring remedial construction. We agree with this recommendation.

5.12. REACH 5 – Stations 228+00 to 280+00

5.12.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes this entire reach. The 1938 map displaying seepage or groundwater showing on the surface indicates seepage was observed along the approximate southern half of this reach. The Department of Water Resources 1963 and 1965 seepage areas maps indicate seepage was observed during high river flow periods along the entire reach. The URS map did not indicate any seepage or boils within this reach.

A drained stability berm has been constructed along the landside slope of the levee along this reach to mitigate potential adverse through seepage conditions.

5.12.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 41.0 to 41.8. The ground surface elevation near the landside levee toe ranges between approximately 24 and 26.

The 100-year WSE ranges from approximately 38.0 to 38.5, and the 200-year WSE ranges from approximately 39.5 to 40.0.

5.12.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Borings 2F-01-33 through 2F-01-35; Wahler 1986 Borings DH-4-86 and DH-5-86; Wahler 1997 Boring B-97-3; Wahler 2000 Borings B00-3 and B00-4; and Kleinfelder 2005 Borings SRB-15 through SRB-17.

- A levee embankment consisting primarily of sand, and
- A highly variable blanket layer including significant amounts of sand and silty sand.

5.12.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.12 – Summary of Seepage Gradients for Reach 5

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
5	232+00	0.11	0.13	0.42
	249+00	0.62	0.69	--
	250+00	--	--	0.13
	252+50	0.25	0.29	--
	271+00	0.04	0.05	0.20

Notes: -- Not analyzed

5.12.5. Stability Analysis

Based on a stability analysis performed within Reach 11 at Station 516+00, with the existing stability berm, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, based on the similarity of the levee and berm geometry, the levee and constructed berm in this reach provides the minimum factor of safety (1.4).

5.12.6. Preliminary Conclusions and Recommendations

The seepage analyses performed by Kleinfelder indicates that both the 100-year and 200-year WSE could produce gradients in excess of 0.5 at a boring location in this reach. Elevated gradients are considered likely to be present in the vicinity of this boring location. Therefore, we conclude that this reach does not meet USACE underseepage guidelines. Accordingly, construction of a SCB slurry cutoff wall to Elevation –30, 70 feet deep, is recommended within this reach to mitigate underseepage for the 200-year WSE.

5.13. REACH 6 – STATIONS 280+00 to 330+00

5.13.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes this entire reach. The 1938 map displaying seepage or groundwater showing on the surface indicates seepage was observed along the majority of this reach. The Department of Water Resources 1963 and 1965 seepage areas maps indicate seepage was not observed in the middle portion of this reach. The URS map indicates seepage has been observed along portions of this reach.

Landside sloughing was observed in several locations between approximate Stations 312+00 to 362+00 during the February 1986 flood.

A drained stability berm has been constructed along the landside slope of the levee along this reach to mitigate potential adverse through seepage conditions.

5.13.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 40.0 to 41.0. The ground surface elevation near the landside levee toe is approximately 26.

The 100-year WSE ranges from approximately 37.5 to 38.0, and the 200-year WSE ranges from approximately 39.2 to 39.5.

5.13.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Borings 2F-01-38 and 2F-01-39; Wahler 1986 Borings DH-6-86 and DH-7-86; Wahler 1997 Boring B97-4; and Kleinfelder 2005 Borings SRB-17 through SRB-21.

- A levee embankment consisting primarily of sand,
- A blanket layer including significant amounts of silty sand with 20 to 40 percent fines,
- A substantial, apparently continuous layer of sand and gravel up to 80 feet thick, and
- No apparently continuous fine-grained layer within 100 feet of the levee crown.

5.13.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.13 – Summary of Seepage Gradients for Reach 6

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
6	287+00	0.05	0.20	1.03
	305+00	0.16	0.17	--
	311+50	0.36	0.41	>2.00
	320+00	0.51	0.59	--

Notes: -- Not analyzed

5.13.5. Stability Analysis

Based on a stability analysis performed within Reach 11 at Station 516+00, with the existing stability berm, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, based on the similarity of the levee and berm geometry, the levee and constructed berm in this reach exceeds the minimum factor of safety (1.4).

5.13.6. Preliminary Conclusions and Recommendations

Scour Feature. A scour feature at the Elkhorn Reservoir, approximately Stations 304+00 to 310+00, is evident in old topographic maps. This scour feature may be the result of a breach in the natural levee that formed along the river bank prior to levee construction.

The seepage analyses performed by Kleinfelder and URS indicate that both the 100-year and 200-year WSE could produce gradients in excess of 0.5 at several boring locations in this reach. Elevated gradients are considered likely to be present in the vicinity of these boring locations. Therefore, we conclude that this reach does not meet USACE underseepage guidelines. Accordingly, construction of a DSM wall through the levee to Elevation –70, 110 feet deep, is recommended within this reach to mitigate underseepage for the 200-year WSE. Additional investigations should be performed to

confirm the deep clay layer is continuous and to refine the upstream and downstream limits of the DSM wall.

Alternative Mitigation. As an alternative mitigation option to a DSM cutoff wall, a full width seepage berm 300 feet wide is recommended within this reach to mitigate underseepage for the 200-year WSE. The seepage berm should be constructed as required in the USACE "Design and Construction of Levees" EM 1110-2-1913 and the USACE Sacramento District SOP EDG-03 for "Geotechnical Levee Practice".

5.14. REACH 7 – STATIONS 330+00 to 362+00

5.14.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes this entire reach. The 1938 map displaying seepage or groundwater showing on the surface indicates seepage was observed along the majority of this reach. The Department of Water Resources 1963 and 1965 seepage areas maps indicate seepage was observed during high river flow periods along the entire reach. The URS map indicates seepage has been observed along portions of this reach.

Landside sloughing was observed in several locations between Levee Miles 6 and 7 (approximately Stations 312+00 to 362+00) during the February 1986 flood.

A drained stability berm has been constructed along the landside slope of the levee along this reach to mitigate potential adverse through seepage conditions.

5.14.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 39.8 to 40.0. The ground surface elevation near the landside levee toe is approximately 26.

The 100-year WSE ranges from approximately 37.2 to 37.5, and the 200-year WSE ranges from approximately 38.9 to 39.2.

5.14.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Borings 2F-01-42 and 2F-01-44; Wahler 1986 Borings DH-8-86 and DH-9-86; Wahler 2000 Boring B00-5; and Kleinfelder 2005 Borings SRB-21 and SRB-22.

- A levee embankment consisting primarily of sand,
- A sand layer below the levee that may be continuous to the landside toe,
- A blanket layer at least 25 feet thick consisting of silt, clay, and silty sand with at least 40 percent fines (assuming the sand in the levee foundation does not extend to the levee toe), and
- A substantial, apparently continuous layer of sand and gravel from 20 to 40 feet thick.

5.14.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.14 – Summary of Seepage Gradients for Reach 7

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
7	338+00	0.32	0.37	0.29
	353+00	0.39	0.44	<0.05

Notes: -- Not analyzed

5.14.5. Stability Analysis

Based on a stability analysis performed within Reach 11 at Station 516+00, with the existing stability berm, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, based on the similarity of the levee and berm geometry, the levee and constructed berm in this reach exceeds the minimum factor of safety (1.4).

5.14.6. Preliminary Conclusions and Recommendations

The seepage and stability analyses indicate that this reach meets USACE guidelines for the 100-year and 200-year WSE. Additional investigations should be performed at the landside toe of the levee near Borings SRB-21, SRB-22, B-00-5, DH-8-96, DH-9-86, and DH-10-86 to confirm that the sand layer encountered below the levee centerline is not continuous to the landside toe.

5.15. REACH 8 – STATIONS 362+00 to 402+00

5.15.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes the area offset (landward) from the levee as much as several thousand feet for this entire reach. The 1938 map displaying seepage or groundwater showing on the surface indicates seepage was observed along the majority of this reach. The Department of Water Resources 1963 and 1965 seepage areas maps indicate seepage was not observed in the middle portion of this reach. The URS map indicates seepage has been observed along portions of this reach.

A drained stability berm has been constructed along the landside slope of the levee along this reach to mitigate potential adverse through seepage conditions.

5.15.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 39.5 to 39.8. The ground surface elevation near the landside levee toe is approximately 26.

The 100-year WSE ranges from approximately 36.7 to 37.2, and the 200-year WSE ranges from approximately 38.4 to 38.9.

5.15.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Borings 2F-01-46, 2F-01-47, and 2F-01-49; Wahler 1986 Boring DH-10-86;

Wahler 1987 Borings DH-13 and DH-39; Wahler 1997 Boring B97-5; and Kleinfelder 2005 Borings SRB-22 through SRB-24.

- A levee embankment consisting primarily of sand,
- A 25 to 35 foot thick blanket layer including significant amounts of silty sand with 20 to 40 percent fines, and
- A substantial, apparently continuous layer of sand and gravel 20 to 35 feet thick.

5.15.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.15 – Summary of Seepage Gradients for Reach 8

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
8	369+00	0.46	0.52	0.90
	394+00	0.46	0.53	--
	400+00	--	--	0.60
	402+00	0.25	0.29	--

Notes: -- Not analyzed

5.15.5. Stability Analysis

Based on a stability analysis performed within Reach 11 at Station 516+00, with the existing stability berm, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, based on the similarity of the levee and berm geometry, the levee and constructed berm in this reach exceeds the minimum factor of safety (1.4).

5.15.6. Preliminary Conclusions and Recommendations

The seepage analyses performed by URS indicates that both the 100-year and 200-year WSE could produce gradients in excess of 0.5 at several boring locations in this reach. Elevated gradients are considered likely to be present in the vicinity of these boring locations. Therefore, we conclude that this reach does not meet USACE underseepage guidelines. Accordingly, construction of a DSM slurry wall through the levee to Elevation –60, 100 feet deep, is recommended within this reach to mitigate underseepage for the 200-year WSE. Additional investigations should be performed to confirm the deep clay layer is continuous at Elevation –45.

Alternative Mitigation. As an alternative mitigation option to a cutoff wall, a full width seepage berm 300 feet wide is recommended within this reach to mitigate underseepage for the 200-year WSE. The seepage berm should be constructed as required in the USACE "Design and Construction of Levees" EM 1110-2-1913 and the USACE Sacramento District SOP EDG-03 for "Geotechnical Levee Practice".

5.16. REACH 9 – STATIONS 402+00 to 468+00

5.16.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes the area offset (landward) from the levee as much as several thousand feet for this entire reach. The 1938 map displaying seepage or groundwater showing on the surface indicates seepage was observed along the majority of this reach. The Department of Water Resources 1963 and 1965 seepage areas maps indicate seepage was not observed in the middle portion of this reach. The URS map indicates seepage has been observed along portions of this reach and that boils were observed at the southern end of this reach.

Seepage boils were observed in 1986 in the vicinity of Stations 466+00 to 468+00.

A drained stability berm has been constructed along the landside slope of the levee along this reach to mitigate potential adverse through seepage conditions.

5.16.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 39.2 to 40. The ground surface elevation near the landside levee toe ranges between approximately 24 and 28.

The 100-year WSE ranges from approximately 36.0 to 36.7, and the 200-year WSE ranges from approximately 37.6 to 38.4.

5.16.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Borings 2F-01-49 and 2F-01-52; Wahler 1987 Borings DH-11-2, DH-12, and DH-12-1; Wahler 1997 Boring B97-6; Wahler 2000 Boring B00-6; and Kleinfelder 2005 Borings SRB-25 through SRB-28.

- A levee embankment consisting primarily of sand,
- A sand layer below the levee that may be continuous to the landside toe,
- A fine-grained blanket layer at least 25 feet thick consisting primarily of clay, silt, and silty sand, and
- A substantial, apparently continuous layer of sand and gravel 20 to over 30 feet thick, below the fine-grained blanket layer.

5.16.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.16 – Summary of Seepage Gradients for Reach 9

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
9	420+00	0.03	0.04	0.21
	438+00	0.34	0.40	<0.05
	467+00	0.24	0.27	<0.05

Notes: -- Not analyzed

5.16.5. Stability Analysis

Based on a stability analysis performed within Reach 11 at Station 516+00, with the existing stability berm, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, based on the similarity of the levee and berm geometry, the levee and constructed berm in this reach exceeds the minimum factor of safety (1.4).

5.16.6. Preliminary Conclusions and Recommendations

The seepage and stability analyses indicate that this reach meets USACE guidelines for the 100-year or 200-year WSE. Additional investigations should be performed to refine the boundary between Reach 9 and 10 in light of observed seepage boils at the downstream end of Reach 9. Additional investigations should be performed at the landside toe of the levee near Borings SRB-26 and SRB-27 to confirm the sand layer encountered below the levee centerline is not continuous to the landside toe. The fines content within the silty sand blanket soils need to be confirmed within this reach with additional laboratory testing.

5.17. REACH 10 – STATIONS 468+00 to 495+00

5.17.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes the area offset (landward) from the levee as much as several thousand feet for this entire reach. Seepage or groundwater showing at the surface was not mapped within this reach. The Department of Water Resources 1963 and 1965 seepage areas maps indicate seepage was observed during high river flow periods along the entire reach. The URS map indicates seepage has been observed along portions of this reach.

Seepage boils were observed in 1986 in the vicinity of Stations 468+00 to approximately 470+00. The seepage area reportedly corresponds with an apparent former channel that is visible on 1938 aerial photographs.

A drained stability berm has been constructed along the landside slope of the levee along this reach to mitigate potential adverse through seepage conditions.

5.17.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 39.1 to 39.5. The ground surface elevation near the landside levee toe ranges between approximately 24 and 26.

The 100-year WSE ranges from approximately 35.8 to 36.0, and the 200-year WSE ranges from approximately 37.5 to 37.6.

5.17.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Boring 2F-01-58; Wahler 1987 Borings DH-11, DH-11-1, and DH-14-3; Wahler 2000 Boring B00-7; and Kleinfelder 2005 Borings SRB-28 through SRB-30.

- A levee embankment consisting primarily of sand,
- A blanket layer 40 to 50 feet thick including significant amounts of silty sand with 20 to 40 percent fines, and
- A substantial, apparently continuous layer of sand and gravel at least 30 feet thick, below the blanket layer.

5.17.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.17 – Summary of Seepage Gradients for Reach 10

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
10	478+00	--	--	0.69
	486+00	0.92	1.01	0.12

Notes: -- Not analyzed

5.17.5. Stability Analysis

Based on a stability analysis performed within Reach 11 at Station 516+00, with the existing stability berm, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, based on the similarity of the levee and berm geometry, the levee and constructed berm in this reach exceeds the minimum factor of safety (1.4).

5.17.6. Preliminary Conclusions and Recommendations

The seepage analyses performed by Kleinfelder and URS indicate that both the 100-year and 200-year WSE could produce gradients in excess of 0.5 at several boring locations in this reach. Elevated gradients are considered likely to be present in the vicinity of these boring locations. Therefore, we conclude that this reach does not meet USACE underseepage guidelines. Accordingly, construction of a SCB slurry cutoff wall constructed through the levee to Elevation –10, 50 feet deep, is recommended within this reach to mitigate underseepage for the 200-year WSE.

5.18. REACH 11 – STATIONS 495+00 to 635+00

5.18.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes the area offset (landward) from the levee as much as several thousand feet for this entire reach. The 1938 map displaying seepage or groundwater showing on the surface indicates seepage was observed along the approximate southern half of this reach. The Department of Water Resources 1963 and 1965 seepage areas maps indicate seepage was not observed in the southern portion of this reach. The URS map indicates seepage has been observed along portions of this reach.

A drained stability berm has been constructed along the landside slope of the levee along this reach to mitigate potential adverse through seepage conditions.

5.18.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 38.8 to 39.1. The ground surface elevation near the landside levee toe ranges between approximately 23 and 26.

The 100-year WSE ranges from approximately 33.8 to 35.8, and the 200-year WSE ranges from approximately 35.7 to 37.5.

5.18.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Borings 2F-01-62, 2F-01-66, 2F-01-68, 2F-01-70, and 2F-00-01; USACE 2000 explorations CPT-00-1A, CPT-00-1B, and CPT-00-2; Wahler 1987 Borings DH-8-1, DH-8-2, DH-9, DH-9-1, DH-9-2, DH-10, DH-11-86, and DH-38; Wahler 1997 Borings B97-7, B97-8, and B97-9; Wahler 2000 Boring B00-8; and Kleinfelder 2005 Borings SRB-30 through SRB-39.

- A levee embankment consisting primarily of sand,
- Significant amounts of sand in the upper 5 to 10 feet of the foundation layer,
- A highly variable blanket layer consisting of, silt, silty sand, clay, and sandy clay 20 to 30 feet thick, and
- A substantial, apparently continuous layer of sand and gravel at least 30 feet thick, below the blanket layer.

5.18.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.18 – Summary of Seepage Gradients for Reach 11

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
11	516+00	0.32	0.40	0.22
	542+00	0.44	0.50	0.13
	571+00	0.13	0.15	<0.05
	592+00	0.47	0.59	0.06
	611+00	0.04	0.05	0.11
	617+00	0.20	0.24	--
	635+00	0.21	0.24	0.15

Notes: -- Not analyzed

5.18.5. Stability Analysis (Station 516+00)

Based on a stability analysis performed within this reach at Station 516+00 with the existing stability berm, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, the levee and constructed berm in this reach exceeds the minimum factor of safety (1.4).

5.18.6. Preliminary Conclusions and Recommendations

The seepage analyses performed by Kleinfelder and URS indicate that the 200-year WSE could produce gradients in excess of 0.5 at several boring locations in this reach. Elevated gradients are considered likely to be present in the vicinity of these boring locations. Therefore, we conclude that this reach does not meet USACE underseepage guidelines. Accordingly, construction of a SCB slurry cutoff wall constructed through the levee to Elevation 10, 30 feet deep, is recommended within this reach for the 200-year WSE. Additional investigations should be performed at the landside toe of the levee near Borings SRB-30, SRB-31, SRB-32, SRB-33, SRB-34, and SRB-37 to confirm the sand layer encountered below the levee centerline is not continuous to the landside toe.

5.19. REACH 12 – STATIONS 635+00 to 667+00

5.19.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes the area offset (landward) from the levee as much as several thousand feet for this entire reach. The 1938 map displaying seepage or groundwater showing on the surface indicates seepage was observed along the approximate middle portion of this reach. The Department of Water Resources 1963 and 1965 seepage areas maps indicate seepage was observed during high river flow periods offset from the levee along the entire reach. The URS map indicates seepage has been observed along portions of this reach and that boils were observed in the central portion of this reach.

Landside sloughing was observed in the vicinity of Station 645+00 during the February 1986 flood.

A slurry cutoff wall has been constructed through the levee crown to Elevation 14, approximately 26 feet deep, along this reach to mitigate potential adverse through seepage conditions.

5.19.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 38.5 to 39.2. The ground surface elevation near the landside levee toe ranges between approximately 22 and 23.

The 100-year WSE ranges from approximately 33.3 to 33.8, and the 200-year WSE ranges from approximately 35.2 to 35.7.

5.19.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Boring 2F-01-70; USACE 2000 exploration CPT-N13; Wahler 1987 Borings DH-7-3 and DH-8; and Kleinfelder 2005 Borings SRB-41 through SRB-43.

- A levee embankment consisting primarily of sand,

- A fine-grained blanket layer at least 25 feet thick consisting primarily of clay, silt, and silty sand, and
- An apparently continuous layer of sand and gravel 10 to 20 feet thick below the fine-grained blanket layer.

5.19.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.19 – Summary of Seepage Gradients for Reach 12

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
12	662+00	--	--	0.26
	663+50	0.32	0.37	--

Note: -- Not Analyzed

5.19.5. Stability Analysis (Station 663+50)

Based on a stability analysis performed within this reach at Station 663+50 with the existing slurry cutoff wall, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, the levee and constructed cutoff wall in this reach exceeds the minimum factor of safety (1.4).

5.19.6. Preliminary Conclusions and Recommendations

The seepage and stability analyses performed indicate that this reach meets USACE guidelines for the 100-year and 200-year WSE.

5.20. REACH 13 – STATIONS 667+00 to 700+00

5.20.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes the area offset (landward) from the levee as much as several thousand feet for this entire reach. Seepage or groundwater showing at the surface was not mapped within this reach. The Department of Water Resources 1963 seepage areas map indicates seepage was observed during high river flow periods offset from the levee along the entire reach. The Department of Water Resources 1965 seepage areas map indicates seepage was observed during high river flow periods offset from the levee along the entire reach. The URS map indicates seepage has been observed along portions of this reach.

A slurry cutoff wall has been constructed through the levee crown to between Elevations 11 and 14, approximately 29 to 26 feet deep, respectively, along this reach to mitigate potential adverse through seepage conditions.

5.20.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 39.0 to 39.9. The ground surface elevation near the landside levee toe ranges between approximately 20 and 22.

The 100-year WSE ranges from approximately 32.8 to 33.3, and the 200-year WSE ranges from approximately 34.6 to 35.2.

5.20.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE 2000 Boring 2F-00-02; USACE 2000 exploration CPT-00-4; Wahler 1987 Boring DH-7; Wahler 1990 exploration CPT-N12; and Kleinfelder 2005 Borings SRB-43 and SRB-44.

- A levee embankment consisting primarily of sand with lesser amounts of silt and clay, and
- A shallow sand lens within the blanket between Elevations 10 and –10.

5.20.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.20 – Summary of Seepage Gradients for Reach 13

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
13	678+00	--	--	0.51
	679+50	0.30	0.35	--
	687+00	0.80	0.91	--
	699+50	0.23	0.29	--
	700+00	--	--	0.10

Note: -- Not Analyzed

5.20.5. Stability Analysis

Based on a stability analysis performed within Reach 12 at Station 663+50 with the existing slurry cutoff wall, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, the levee and constructed cutoff wall in this reach exceeds the minimum factor of safety (1.4).

5.20.6. Preliminary Conclusions and Recommendations

The seepage analyses performed by Kleinfelder and URS indicate that the 100-year and 200-year WSE could produce gradients in excess of 0.5 at several boring locations in this reach. Elevated gradients are considered likely to be present in the vicinity of these boring locations. Therefore, we conclude that this reach does not meet USACE underseepage guidelines. Accordingly, construction of a SCB wall through the levee to Elevation –20, 60 feet deep, is recommended within this reach to mitigate underseepage for the 200-year WSE. Additional investigations should be performed at the landside toe of the levee between Stations 690+00 and 700+00 to confirm data obtained in CPT soundings.

Pumping Plant #3 – Proposed Mitigation. This pumping plant was reconstructed within the past 5 years. Kleinfelder was the geotechnical consultant for this project. In order to mitigate potential piping/boil conditions within the intake channel, the channel was lined with a geotextile filter fabric and covered with stone protection for a distance of about 80 feet from the pumping plant. No additional mitigation is recommended.

5.21. REACH 14 – STATIONS 700+00 to 732 +00

5.21.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes the area offset (landward) from the levee as much as several thousand feet for this entire reach. The majority of this reach is shown not to have been affected by high water. Seepage or groundwater showing at the surface was not mapped within this reach. The Department of Water Resources 1963 seepage areas map indicates seepage was observed during high river flow periods offset from the levee along the entire reach. The Department of Water Resources 1965 seepage areas map indicates seepage was observed during high river flow periods along the entire reach. The URS map indicates seepage has been observed along portions of this reach.

A slurry cutoff wall has been constructed through the levee crown to Elevation 14, approximately 26 feet deep, along this reach with the exception of Station 715+50 where the wall extends to Elevation 29, approximately 11 feet deep, most likely where a utility is present within the levee embankment. The purpose of this cutoff wall is to mitigate potential adverse through seepage conditions. We did not perform an assessment of whether this utility "window" should be closed.

5.21.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 39.0 and 39.9. The ground surface elevation near the landside levee toe ranges between approximately 22 and 23.

The 100-year WSE ranges from approximately 32.5 to 32.8, and the 200-year WSE ranges from approximately 34.4 to 34.6.

5.21.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE 2000 Boring 2F-00-03; USACE 2000 explorations CPT-00-4, CPT-00-5, and CPT-00-6; Wahler 1987 Boring DH-7-1; Wahler 1990 explorations CPT-N9, CPT-N10, and CPT-N11; and Kleinfelder 2005 Boring SRB-45.

- A levee embankment consisting primarily of sand with lesser amounts of silty sand and silt, and
- A fine-grained blanket layer at least 25 feet thick consisting primarily of clay, silt, and silty sand.

5.21.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.21 – Summary of Seepage Gradients for Reach 14

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
14	718+00	0.21	0.28	0.42

5.21.5. Stability Analysis

Based on a stability analysis performed within Reach 12 at Station 663+50 with the existing slurry cutoff wall, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, the levee and constructed cutoff wall in this reach exceeds the minimum factor of safety (1.4).

5.21.6. Preliminary Conclusions and Recommendations

The seepage and stability analyses performed indicate that this reach meets the USACE guidelines for the 100-year or 200-year WSE. Additional investigations should

be performed at the landside toe of the levee between Stations 700+00 and 720+00 to confirm data obtained in CPT soundings.

5.22. REACH 15 – STATIONS 732+00 to 780+00

5.22.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes the area offset (landward) from the levee as much as several thousand feet for this entire reach. The 1938 map displaying seepage or groundwater showing on the surface includes the area offset (landward) from the levee as much as several thousand feet for this entire reach. The Department of Water Resources 1963 seepage areas map indicates seepage was observed during high river flow periods along a majority of this reach with some areas offset from the levee. The Department of Water Resources 1965 seepage areas map indicates seepage was observed during high river flow periods along the entire reach. The URS map indicates seepage has been observed along portions of this reach.

A slurry cutoff wall has been constructed through the levee crown to between Elevations 9 and 14, approximately 30 and 25 feet deep, respectively, along this reach to mitigate potential adverse through seepage conditions.

5.22.2. Levee Topography and Design Water Surface

The levee crown elevation is approximately 39.0. The ground surface elevation near the landside levee toe ranges between approximately 22 and 23.

The 100-year WSE ranges from approximately 31.6 to 32.5, and the 200-year WSE ranges from approximately 33.6 to 34.4.

5.22.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Borings 2F-01-12 and 2F-00-04; USACE 2000 exploration CPT-00-7; Wahler 1987 Borings DH-6-1, DH-6-2, and DH-7; Wahler 1997 Borings B97-7, B97-8, and B97-9; Wahler 2000 Boring B00-8; Wahler 1990 exploration CPT-N8; and Kleinfelder 2005 Borings SRB-45 through SRB-47.

- A levee embankment consisting primarily of sand,
- A highly variable blanket layer including significant amounts of sand and silty sand, and
- A substantial, apparently continuous layer of sand and gravel at least 30 feet thick.

5.22.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.22 – Summary of Seepage Gradients for Reach 15

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
15	745+00	0.32	0.43	0.50
	754+00	0.01	0.01	--
	755+00	0.46	0.66	--
	760+00	0.05	0.08	0.22
	768+00	0.60	0.72	--

Note: -- Not Analyzed

5.22.5. Stability Analysis

Based on a stability analysis performed within Reach 12 at Station 663+50 with the existing slurry cutoff wall, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, the levee and constructed cutoff wall in this reach exceeds the minimum factor of safety (1.4).

5.22.6. Preliminary Conclusions and Recommendations

The seepage analyses performed by Kleinfelder and URS indicate that the 100-year and 200-year WSE could produce gradients in excess of 0.5 at several boring locations

in this reach. Elevated gradients are considered likely to be present in the vicinity of these boring locations. Therefore, we conclude that this reach does not meet USACE underseepage guidelines. Accordingly, construction of a SCB slurry cutoff wall constructed through the levee to Elevation –10, 50 feet deep, is recommended within this reach to mitigate underseepage for the 200-year WSE.

5.23. REACH 16 – STATIONS 780+00 to 832+00

5.23.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes this entire reach. The 1938 map displaying seepage or groundwater showing on the surface includes the area offset (landward) from the levee as much as several thousand feet for this entire reach. The Department of Water Resources 1963 seepage areas map indicates seepage was observed during high river flow periods along a majority of this reach with some areas offset from the levee. The Department of Water Resources 1965 seepage areas map indicates seepage was observed during high river flow periods along the entire reach. The URS map indicates seepage has been observed along portions of this reach.

Landside sloughing was observed in the vicinities of Station 820+00 during the February 1986 flood.

A slurry cutoff wall has been constructed through the levee crown to Elevation 9, approximately 30 feet deep, along this reach to mitigate potential adverse through seepage conditions.

5.23.2. Levee Topography and Design Water Surface

The levee crown elevation is approximately 39.0. The ground surface elevation near the landside levee toe ranges between approximately 20 and 22.

The 100-year WSE ranges from approximately 31.5 to 31.6, and the 200-year WSE ranges from approximately 33.6 and 33.8.

5.23.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Borings 2F-00-04 and 2F-00-07; USACE 2000 exploration CPT-00-8; Wahler 1987 Borings DH-4, DH-5, and DH-6; Wahler 1990 explorations CPT-N5, CPT-N6, and CPT-N7; and Kleinfelder 2005 Borings SRB-48 through SRB-51.

- A levee embankment consisting primarily of sand with lesser amounts of silty sand and silt, and
- A fine-grained blanket layer at least 25 feet thick consisting primarily of clay, silt, and silty sand.

5.23.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.23 – Summary of Seepage Gradients for Reach 16

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
16	788+00	0.30	0.37	--
	789+00	--	--	0.30
	812+50	0.39	0.48	--

Note: -- Not Analyzed

5.23.5. Stability Analysis

Based on a stability analysis performed within Reach 12 at Station 663+50 with the existing slurry cutoff wall, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, the levee and constructed cutoff wall in this reach exceeds the minimum factor of safety (1.4).

5.23.6. Preliminary Conclusions and Recommendations

The seepage and stability analyses performed indicate that this reach meets USACE guidelines for the 100-year and 200-year WSE.

5.24. REACH 17 – STATIONS 832+00 to 842+00

5.24.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes this entire reach. The 1938 map displaying seepage or groundwater showing on the surface includes the area offset (landward) from the levee as much as several thousand feet for this entire reach. The Department of Water Resources 1963 and 1965 seepage areas maps indicate seepage was observed during high river flow periods along the southern half of this reach. The URS map did not indicate any seepage or boils within this reach.

A slurry cutoff wall has been constructed through the levee crown to Elevation 9, approximately 30 feet deep, along this reach to mitigate potential adverse through seepage conditions.

5.24.2. Levee Topography and Design Water Surface

The levee crown elevation is approximately 39.0. The ground surface elevation near the landside levee toe ranges between approximately 20 and 21.

The 100-year WSE ranges from approximately 31.5 and 31.6, and the 200-year WSE is approximately 33.8.

5.24.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Boring 2F-00-07; USACE 2000 exploration CPT-00-9; and Wahler 1987 boring DH-3.

- A levee embankment consisting primarily of sand with lesser amounts of silty sand, and

- A fine-grained blanket layer penetrated by a sand channel 25 feet thick that daylights at the levee toe.

5.24.4. Seepage Analysis

No seepage analyses were performed within this reach.

5.24.5. Stability Analysis

Based on a stability analysis performed within Reach 12 at Station 663+50 with the existing slurry cutoff wall, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, the levee and constructed cutoff wall in this reach exceeds the minimum factor of safety (1.4).

5.24.6. Preliminary Conclusions and Recommendations

Due to the presence of a sand channel in the levee foundation, underseepage is considered likely to be present in this reach. Therefore, we conclude this reach does not meet USACE through seepage guidelines. Accordingly, construction of a SCB slurry cutoff wall through the levee to Elevation –15, 55 feet deep, is recommended within this reach to mitigate underseepage for the 200-year WSE.

5.25. REACH 18 – STATIONS 842+00 to 857+00

5.25.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes this entire reach. The 1938 map displaying seepage or groundwater showing on the surface indicates seepage was observed along the majority of this reach. The Department of Water Resources 1963 seepage areas map indicates seepage was observed during high river flow periods offset from the levee along the entire reach. The Department of Water Resources 1965 seepage areas map indicates seepage was observed during high river flow periods along the northern majority of this reach. The URS map did not indicate any seepage or boils within this reach.

A slurry cutoff wall has been constructed through the levee crown to Elevation 9, approximately 30 feet deep, along this reach to mitigate potential adverse through seepage conditions.

5.25.2. Levee Topography and Design Water Surface

The levee crown elevation is approximately 39.0. The ground surface elevation near the landside levee toe is approximately 21.

The 100-year WSE is approximately 31.6, and the 200-year WSE is approximately 33.8.

5.25.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE 2000 exploration CPT-00-9; Wahler 1990 Exploration CPT-N4; and Kleinfelder 2000 Explorations KCPT-1 and KCPT-2A.

- A levee embankment consisting primarily of sand, silty sand, silt, and clayey sand, and
- A fine-grained blanket layer at least 20 feet thick consisting primarily of clay, silt, and silty sand.

5.25.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.25 – Summary of Seepage Gradients for Reach 18

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
18	848+00	0.26	0.32	0.26

5.25.5. Stability Analysis

Based on a stability analysis performed within Reach 12 at Station 663+50 with the existing slurry cutoff wall, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, the levee and constructed cutoff wall in this reach exceeds the minimum factor of safety (1.4).

5.25.6. Preliminary Conclusions and Recommendations

The seepage and stability analyses performed indicate that this reach meets the USACE guidelines for the 100-year and 200-year WSE.

5.26. REACH 19 – STATIONS 857+00 to 925+00

5.26.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes the upstream half of this reach. The 1938 map displaying seepage or groundwater showing on the surface indicates seepage was observed along the upstream section of this reach. The Department of Water Resources 1963 and 1965 seepage areas maps indicate seepage was not observed in the southern portion of this reach. The URS map indicates that boils were observed at the southern end of this reach.

Landside sloughing was observed in the vicinities of Station 920+00 during the February 1986 flood.

A slurry cutoff wall has been constructed through the levee crown to Elevation 9, approximately 30 feet deep, along this reach to mitigate potential adverse through seepage conditions.

5.26.2. Levee Topography and Design Water Surface

The levee crown elevation is approximately 39.0. The ground surface elevation near the landside levee toe is approximately 22.

The 100-year WSE is approximately 31.6, and the 200-year WSE is approximately 33.8.

5.26.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Borings 2F-00-6, 2F-01-22, and 2F-01-25; USACE 2000 explorations CPT-00-10 and CPT-00-11; Wahler 1987 Borings DH1-1, DH1-2, DH-2, DH-2-1, and DH-37; Wahler 1990 explorations CPT-N1, CPT-N2, and CPT-N3; Kleinfelder 2000 explorations KCPT-2A, KCPT-6, and KCPT-7; and Kleinfelder 2005 Borings SRB-53 through SRB-55.

- A levee embankment consisting primarily of sand with lesser amounts of silty sand, and
- A highly variable blanket layer including significant amounts of sand and silty sand.

5.26.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach.

Table 5.26 – Summary of Seepage Gradients for Reach 19

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
19A 857+00 to 875+00	862+00	0.46	0.57	--
	867+00	--	--	0.70
19B 875+00 to 925+00	880+00	--	--	<0.05
	896+00	0.19	0.22	--
	901+00	0.25	0.31	--
	902+00	--	--	0.07

Note: -- Not Analyzed

5.26.5. Stability Analysis

Based on a stability analysis performed within Reach 12 at Station 663+50 with the existing slurry cutoff wall, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, the levee and constructed cutoff wall in this reach exceeds the minimum factor of safety (1.4).

5.26.6. Preliminary Conclusions and Recommendations

The seepage analyses performed by URS indicate that the 100-year and 200-year WSE could produce gradients in excess of 0.5 at several boring locations in this reach. Elevated gradients are considered likely to be present in the vicinity of these boring locations. Therefore, we conclude that this reach does not meet USACE underseepage guideline. Accordingly, construction of a SCB slurry cutoff wall through the levee to Elevation –25, 65 feet deep, is recommended within this reach to mitigate underseepage for the 200-year WSE.

5.27. REACH 20 – STATIONS 925+00 to 960+00

5.27.1. Geomorphology and Performance History

The 1938 map showing areas effected by high water includes the downstream half of this reach. Seepage or groundwater showing at the surface was not mapped within this reach. The Department of Water Resources 1963 seepage areas map indicates seepage was not observed in this reach. The Department of Water Resources 1965 seepage areas map indicates seepage was observed during high river flow periods along the entire reach. The URS map did not indicate any seepage or boils within this reach.

A slurry cutoff wall has been constructed through the levee crown to Elevation 9, approximately 24 feet deep, between Stations 925+00 and 925+50 and to Elevation –6, approximately 44 feet deep, between Stations 930+00 and 960+00 to mitigate potential adverse through seepage conditions. There is a gap between the cutoff walls between Stations 925+50 and 930+00.

5.27.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 38.0 to 38.5. The ground surface elevation near the landside levee toe is approximately 22.

The 100-year WSE approximately 31.6, and the 200-year WSE approximately 33.8.

5.27.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Borings 2F-96-1, 2F-96-2, 2F-97-9, and 2F-97-17; Wahler 1987 Boring DH-1; and Kleinfelder 2005 Borings SRB-56 and SRB-57.

- A levee embankment consisting primarily of sand with lesser amounts of silty sand, and
- Significant amounts of sand in the upper 5 to 10 feet of the foundation layer, and
- A fine-grained blanket layer at least 25 feet thick consisting primarily of clay, silt, and silty sand.

5.27.4. Seepage Analysis

The following table summarizes the results of seepage analyses performed by Kleinfelder and URS (URS 2005) for this reach. The existing slurry cutoff wall has mitigated the sandy soil encountered in the foundation layer noted above.

Table 5.27 – Summary of Seepage Gradients for Reach 20

		Kleinfelder		URS
		Average Gradient		Average Gradient
Levee Reach	Section Location	100-yr wse	200-yr wse	100-yr wse
20	925+50	<0.05	0.02	--
	926+00	--	--	0.06

Note: -- Not Analyzed

5.27.5. Stability Analysis

Based on a stability analysis performed within Reach 12 at Station 663+50 with the existing slurry cutoff wall, the levee has a computed factor of safety greater than 1.4 for steady state conditions. Therefore, the levee and constructed cutoff wall in this reach exceeds the minimum factor of safety (1.4).

5.27.6. Preliminary Conclusions and Recommendations

The seepage and stability analyses performed indicate that this reach meets USACE guidelines for the 100-year and 200-year WSE.

Main Drain Pumping Plant #1 – Proposed Mitigation. There have been no reported instances of adverse seepage/piping conditions at this pumping facility. However, the existing configuration of a deep unlined intake channel close to the levee toe is not desirable. Further, there is an existing gap in the slurry wall along this reach due to the outfall pipelines within the levee. We recommend this gap be closed with a suitable cutoff wall construction method such as jet grouting to Elevation -7.

5.28. SUMMARY OF REACH SPECIFIC RECOMMENDATIONS

The following table summarizes the recommendations and limits of mitigation for the 200-year WSE.

Table 5.28 – Summary of Mitigation Recommendations by Reach and Station

Levee Reach	Station	Existing Mitigation	Proposed Cutoff Wall Depth (feet)
1	0+00 to 48+00	Stability berm	None
2	48+00 to 100+00	Stability berm	65
3	100+00 to 110+00	Stability berm	None
4	110+00 to 228+00	Stability berm	110
5	228+00 to 280+00	Stability berm	70
6	280+00 to 330+00	Stability berm	110
7	330+00 to 362+00	Stability berm	None
8	362+00 to 402+00	Stability berm	100
9	402+00 to 468+00	Stability berm	None
10	468+00 to 495+00	Stability berm	50
11	495+00 to 635+00	Stability berm	30
12	635+00 to 667+00	Cutoff wall	None
13	667+00 to 700+00	Cutoff wall	60
14	700+00 to 732+00	Cutoff wall	None
15	732+00 to 780+00	Cutoff wall	50
16	780+00 to 832+00	Cutoff wall	None
17	832+00 to 842+00	Cutoff wall	55
18	842+00 to 857+00	Cutoff wall	None
19	857+00 to 925+00	Cutoff wall	65
20	925+00 to 960+00	Cutoff wall	None

6 LIMITATIONS

Recommendations contained in this report are based on our field observations, subsurface explorations completed by Kleinfelder and others, laboratory tests, and our present knowledge of the existing levee conditions. It is possible that soil conditions could vary between or beyond the points explored.

We have prepared this report in substantial accordance with the generally accepted geotechnical engineering practice as it exists in the site area at the time of our study. No warranty is expressed or implied.

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7 REFERENCES

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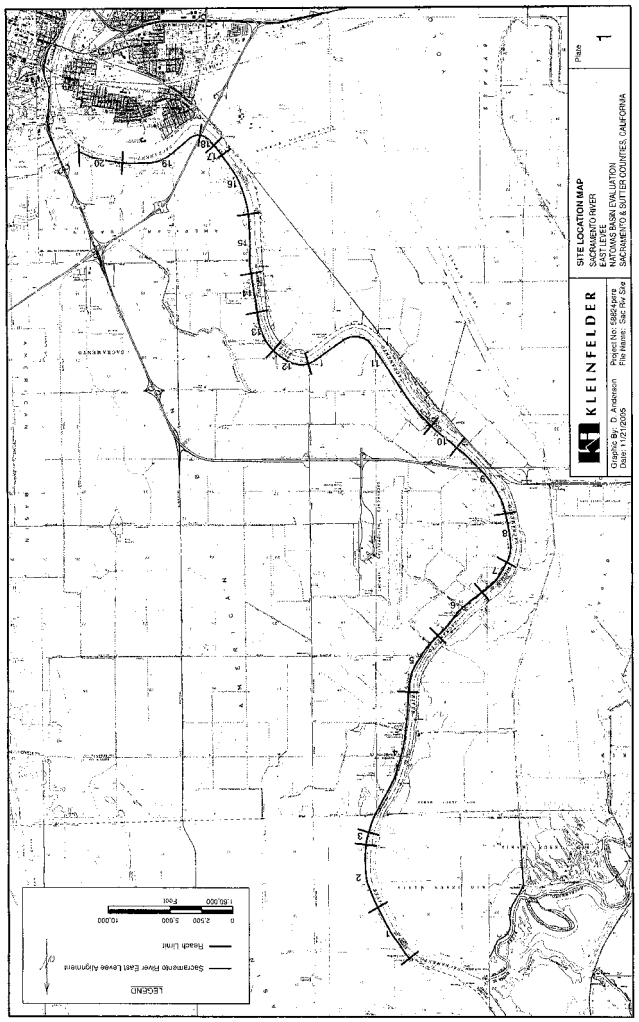

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PROBLEM IDENTIFICATION REPORT
AMERICAN RIVER NORTH LEVEE
NATOMAS BASIN EVALUATION
RECLAMATION DISTRICT 1000
SACRAMENTO COUNTY, CALIFORNIA

Appendix B of Draft & Final
SAFCA Natomas Levee Evaluation
Study,

February 1, 2006

[Technical Charts Omitted]

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Greenbriar Draft EIR Comments
James P. Pachl, 9/5/06
Exhibit Eleven

EXHIBIT 11

KLEINFELDER
An employee owned company

February 1, 2006
File: 58824-PARN

Mr. Pete Ghelfi
SAFCA
1007 7th Street, 7th Floor
Sacramento, California 95814

Subject: **Problem Identification Report**
American River North Levee
Natomas Basin Evaluation
Reclamation District 1000
Sacramento County, California

Dear Mr. Ghelfi:

Kleinfelder is pleased to present the attached Problem Identification Report (PIR) describing the results of our evaluation of the American River North Levee located within Reclamation District 1000 (RD 1000) in Sacramento County, California. The purpose of our investigation was to evaluate levee geotechnical conditions in accordance with applicable California Department of Water Resources and US Army Corps of Engineers guidelines.

On the basis of geotechnical data that were available to Kleinfelder and the results of the current investigation, we have developed recommendations for levee strengthening which should result in acceptable factors of safety for stability and seepage for the 200-year design water surface elevation. For purposes of this preliminary analysis, the use of cutoff walls was primarily used as the preferred stabilization treatment. Other stabilization techniques such as seepage berms and/or relief wells could potentially be used. A more detailed analysis of these alternative stabilization options should be considered in final design.

KLEINFELDER 3077 Fite Circle, Sacramento, CA 95827-1815 (916) 366-1701 (916) 366-7013 fax

DRAFT

Kleinfelder appreciates the opportunity to work with you on this project. If you have questions please contact the undersigned.

Sincerely,

KLEINFELDER, INC.

DRAFT

Rebecca L. Money, PE
Project Engineer

DRAFT

Richard M. Stauber, PE
Project Manager

DRAFT

Byron C. Anderson, PG, CEG
Senior Engineering Geologist

DRAFT

Raymond Costa, Jr., PE, GE
Principal Engineer

RLM:RMS:BCA:RC:crt

Distribution:
Client (25)

KLEINFELDER 3077 Fite Circle, Sacramento, CA 95827-1815 (916) 366-1701 (916) 366-7013 fax

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PLATES

APPENDIX

1 INTRODUCTION

1.1. GENERAL

Kleinfelder performed a feasibility level geotechnical investigation for evaluation of the American River North Levee (ARNL). The goal of this investigation was to perform additional subsurface investigations to achieve one primary exploration through/adjacent to the levee at intervals of about 1,000 feet. This information was combined with previous explorations performed by the US Army Corps of Engineers (USACE) and others and a geomorphic analysis to prepare longitudinal subsurface profiles along the levee. The levee was then divided into 4 reaches based on groupings of similar soil properties and levee configurations. Representative cross sections were then developed for evaluation of stability and seepage in general compliance with applicable USACE guidelines. The levee geometry was also compared to the idealized profile described in California Code of Regulations Title 23.

Conclusions and recommendations presented in this report are based on the subsurface conditions encountered at the locations of our explorations and the provisions and requirements outlined in the LIMITATIONS section of this report. Recommendations presented herein should not be extrapolated to other areas or used for other projects without Kleinfelder's prior review.

1.2. SITE LOCATION

The portion of the ARNL studied is located within Reclamation District 1000 (RD 1000) in Sacramento County, California. The portion of the levee included in this study is approximately 2.3 miles long. It extends from the confluence of the Sacramento River eastward to the Natomas East Main Drainage Canal (NEMDC) near the Northgate Boulevard bridge. This segment is also known as the NEMDC north levee or Steelhead Creek north levee. For this investigation the study area will be referred to as the ARNL. The site location relative to cities, rivers, and existing roadways is shown on Plate 1.

1.3. PURPOSE AND SCOPE OF SERVICES

Kleinfelder investigated the ARNL for the purpose of evaluating levee and subsurface conditions with respect to seepage and stability for the 100-year and 200-year water surface elevations (WSE) provided by MBK Engineers.

Kleinfelder's scope of work is described in our proposal dated April 27, 2005, and summarized below:

- A review of readily available subsurface information pertinent to the site
- Drilling and sampling 13 borings along the top of the levee or at the landside levee toe
- Limited laboratory testing of representative soil samples obtained during the field investigation to evaluate relevant engineering parameters
- Engineering analyses to provide the basis for alternatives analysis
- Preparation of this Problem Identification Report (PIR)

1.4. LEVEE PERFORMANCE ISSUES NOT ADDRESSED

1.4.1. General

This report primarily addresses levee performance issues related to seepage and stability. Other levee performance issues not addressed in this report include the following:

1. Freeboard
2. Erosion
3. Closure Devices
4. Operation and Maintenance
5. Levee Penetrations
6. Internal Drainage

Each of these issues should be addressed as part of an overall levee performance assessment.

1.5. PREVIOUS INVESTIGATIONS

Kleinfelder reviewed the following documents in support of this PIR:

Wahler and Associates, of Palo Alto, California, prepared report entitled "Levee Investigation, RD 1000, Left Bank Sacramento River, South Bank Natomas Cross Canal, North and West Banks Natomas East Canal, Sacramento and Sutter Counties, California," dated July 1987.

Kleinfelder prepared report entitled "Supplemental Evaluation of Levee Improvements, Natomas East Main Drainage Canal West Levee, Sacramento, California," dated December 17, 1993.

Kleinfelder prepared report entitled "Geotechnical Evaluation of Levee Improvements, Natomas East Main Drainage Canal, Units 2A & 2B – West Levee, Sacramento, California," dated April 27, 1995.

Kleinfelder prepared document entitled "CPT Field Exploration Results, Lower American River Levees, Sacramento, California," dated July 23, 1996.

The Sacramento District USACE provided explorations for a project entitled "American River Watershed Project, Lower American River Right (North) Bank Levee Strengthening, American River, California," dated February 8, 1999.

1.6. PROJECT DATUMS AND COORDINATE SYSTEM

Elevation references in this report are in feet and are based on the National Geodetic Vertical Datum of 1929 (NGVD29). Northing and easting coordinates shown in Appendix A are based on the California Coordinate System Zone II and the 1983 North American Datum (NAD83).

1.7. LEVEE ALIGNMENT AND GEOMETRY

This levee alignment is approximately 15,000 feet long and between 7 and 24 feet high, with an average height of 18 feet. Crown elevations vary between approximately 37 and 39 (feet). Landside toe elevations range from approximately 14 to 33. The levee crown

width varies from about 25 feet to 50 feet with an average width of 30 feet. The landside slope ranges between 1.5 and 2.5 horizontal (H) to 1 vertical (V). The waterside slope ranges between 1.5 and 3H to 1V. Interstate 5 intersects the levee near Station 52+00. At Station 69+00 Natomas Park Drive intersect the landside of the levee and an entrance to Discovery Park intersect the waterside of the levee. Truxel Road intersects the landside of the levee near Station 82+00. A private road intersects the levee on the waterside near Station 100+00. Northgate Boulevard intersects the levee near Station 150+00 and has a westbound on-ramp to the Garden Highway that intersects the levee near Station 128+00 at the start of the Arden-Garden Connector.

The Garden Highway is located on top of the ARNL for a majority of this portion of the project approximately between Gateway Oaks Drive and Northgate Boulevard. A portion of the levee just downstream of the Interstate 5 overcrossing has been widened where the Garden Highway transitions from being on top of the levee to passing under Interstate 5. Portions of the landside slope of this reach have been improved with concrete slope facing.

1.8. LEVEE TOPOGRAPHIC DRAWINGS AND LEVEE MILE REFERENCE

The following drawings were used to determine topography on and adjacent to the subject levee alignments:

- USACE 1997 Sacramento and San Joaquin River Basins Comprehensive Study, topographic and bathymetric survey data,
- Montgomery Watson Harza (MWH) 2001 topographic survey data.

It is our understanding the vertical datum for the above listed drawings was NGVD29. Top of boring elevations for borings performed for this study were estimated from the topographic drawings listed above.

Levee subsurface profile drawings received from the USACE included a horizontal axis labeled with project stationing. This stationing is used throughout the project which extends from Station 34+42 (the downstream end of the existing Sacramento River slurry wall) to Station 153+00 at the intersection of the NEMDC west levee.

1.9. WATER SURFACE PROFILES

MBK Engineers and Tustison Engineering (2005) developed the 1-in-100 annual exceedance probability (1/100 AEP) and 1/200 AEP water surfaces for the ARNL, referred to as the 100-year WSE and 200-year WSE, respectively. The 1/100 AEP is based on an outflow of 115,000 cfs from Folsom Dam. The stage ranges from Elevation 31.6 at Station 34+42 to Elevation 33.3 at Station 153+00. The 1/200 AEP is based on an outflow of 160,000 cfs from Folsom Dam. The stage ranges from Elevation 33.8 at Station 34+42 to Elevation 36.1 at Station 153+00.

References in this report to either meeting the 100-year WSE or 200-year WSE indicates we consider the levee to meet the seepage and stability geotechnical requirements for levees as contained in the USACE Levee Design Manual (EM 1110-2-1913) and Technical Letter for Engineering and Design - Design Guidance for Levee Underseepage (ETL 1110-2-569).

The 100-year and 200-year water surface profiles are presented on Plate 4.

1.10. INVESTIGATION REACH DESIGNATIONS

For this investigation, the ARNL was divided into four reaches which are presented in the following table.

Table 1. Investigation Reaches

Levee Reach Designation	Approximate Extents
Reach 1	Stations 34+42 to 48+00
Reach 2	Stations 48+00 to 95+00
Reach 3	Stations 95+00 to 105+00
Reach 4	Stations 105+00 to 153+00

1.11. FIELD INVESTIGATION

Spectrum Exploration, under contract to SAFCA, drilled 13 exploratory soil borings along the levee alignment between July 18 and August 5, 2005. Depths of exploration varied from 60 to 81.5 feet. The exploratory boring locations are presented on Plates 2A and 2B.

Discussions of the field investigation and laboratory testing program are presented in Appendices A and B of this report. Boring logs and laboratory test results from previous investigations are presented in Appendix C of this report. Boring logs from current and previous investigations are shown on a levee profile presented on Plate 4.

2 REGIONAL GEOLOGY AND GEOMORPHOLOGY

2.1. GEOLOGIC SETTING

The subject site is located in the central portion of the Sacramento Valley, the northern portion of California's Great Central Valley. The Sacramento Valley contains thousands of feet of accumulated fluvial, overbank, and fan deposits resulting from erosion of the adjacent Sierra Nevada Mountains to the east and Northern Coast Range to the west. These deep alluvial deposits pinch out as the boundaries of the basin are approached and bedrock units of the Foothills Metamorphic Belt (FMB) and the basement complex of the Sierra Nevada Batholith are exposed to the east and the sandstone and mélange bedrock of the Coast Ranges are exposed to the west.

The Sacramento River is the main drainage of the region, flowing generally south from the Klamath Mountains to its discharge point into the Suisun Bay in the San Francisco Bay area. The American River flows generally west from the Sierra Nevada Mountains until its confluence with the Sacramento River near the northwest limits of the downtown Sacramento area. Within the Sacramento area, the Sacramento and American Rivers have been confined by man made levees since the turn of the last century. The levees within the study area were generally constructed on Holocene age alluvial and fluvial sediments deposited by the current and historic Sacramento and American Rivers. Pleistocene deposits are mapped nearby and underlie Holocene deposits in the study area. These deposits are described in detail below.

The project site has been mapped by a number of geologists at a regional scale, including Jennings (1977), Wagner (1981), and Helley and Harwood (1985). Jennings and Wagner are both compilation maps that reflect mapping by previous authors and thus show geologic interpretation similar to Helley and Harwood. Helley and Harwood mapping focused on Quaternary geologic units based on geomorphology and was performed at a scale of 1:62,500, making this mapping the most beneficial information relative to engineering properties of near-surface deposits. Helley and Harwood map several Quaternary earth units in the region shown including (from youngest to oldest):

Stream Channel Deposits (Qsc): Recent and often Historic alluvial deposits generally consisting of unconsolidated sand, gravel, and silt contained primarily in active river and tributary channels. Includes material deposited from hydraulic mining activities.

Alluvium (Qa): Recent alluvium mapped adjacent to the active river or tributary channels consist of Holocene high energy fluvial deposits (ie sand and gravel) and overbank and fan deposits (i.e. sand, silt, and clay) that are also unconsolidated.

Basin Deposits (Qb): Helley differentiates basin deposits from alluvium (Qa) on the basis of composition including only those deposits that are finer-grained and frequently organic-rich and suggests these deposits were distal deposits where energy conditions were much lower.

Riverbank Formation (Qrl and Qru): Semi-consolidated alluvial sand, silt, and clay with gravel. These deposits are estimated to be 130,000-450,000 years of age (mid-Pleistocene) and contain high pedogenic silt and clay content and reddish hues reflective of their relative age. The Riverbank Formation typically underlies the younger alluvial deposits in the project area.

The location of the above geologic units relative to the ARNL are depicted on Plate 3A.

2.2. REGIONAL GROUNDWATER

Groundwater elevations and soil moisture conditions within the area fluctuate depending on stages within the adjacent Sacramento and American Rivers, rainfall, and/or runoff conditions. DWR maintains an Internet water data library (http://well.water.ca.gov/) of groundwater depth measurements from numerous monitoring wells throughout the State. There are currently no wells located in the immediate vicinity of the ARNL that are monitored by DWR. The Sacramento County regional groundwater map from the Spring and Fall of 2003 show groundwater elevations ranging between approximately 2 and –20. Refer to Appendix G for plots showing the groundwater elevation contours.

2.3. AMERICAN RIVER HISTORIC GEOMORPHOLOGY

The filling of the Sacramento Valley with sediments has significantly reduced the gradient of rivers (including the Sacramento and American Rivers) on the valley floor.

This gradient reduction has caused the energy of these rivers to transition from erosional to graded. Graded rivers are characterized by erosion that is less dominant than erosional rivers and directed side to side rather than down-cutting. The lateral energy of the river causes synchronous erosion and deposition in sweeping bands commonly referred to as meanders. The outside of the meander is a zone of erosion. Material removed from the river at this zone is then deposited downstream as point bars in zones of decreased velocity on the inside of other meanders. In this way the river migrates across the flood plain. Often this erosion is slowed where the river encounters more resistant portions of the flood plain. This allows the next closest upstream meander to catch up and gradually erode away the "neck" between the two meanders. Flooding often accelerates this process as the higher energy flows can more easily cut a new thalweg (base of the active channel). The result of the conjoining meanders is the straightening of the river at that point of intersection and the creation of an abandoned bend in the river commonly referred to as an oxbow lake.

Evidence of ancient river channels representing the migration of the American River have been identified by Shlemon (1967 and 1995) who indicates there are four distinct river terrace deposits in the Sacramento County area. These deposits can be traced as ancestral channels of the American River based on their topographic sequence and relative age range. The oldest channel (Plio-Pleistocene) is located as far south as the Elk Grove area with subsequent, chronologically younger channels mapped toward the north. The youngest channel (Late Pleistocene age), referred to as the Modesto Channel, underlies the present course of the American River to the confluence of the Sacramento River, including the area beneath the ARNL. Shlemon indicates this younger channel is identified by gravels found in borings near Elevation -35. Plate 3B shows the locations of these ancestral channels relative to the site location.

Review and comparison of historic topographic maps with current topographic maps, aerial photographs, and geologic and soil maps in the area of the American River revealed only minor features indicative of graded rivers described above. This is likely due to the urban development and land alteration that has occurred in the vicinity of the project over the last 150 years which has removed most historic river channel features. Exceptions are found in the mapping by Helley and Harwood (1985), which indicates the entire levee is underlain by alluvial deposits. These deposits were formed by the pre-levee American and Sacramento Rivers and represent historic river channels that were deposited, incised/eroded, and overlain by younger deposits as the rivers

meandered across their flood plains. Surface depressions between the levee and the American River and historic lakes north of the north levee may also have been the result of historic flows/channels of the American River. These remnant river features are typically filled with loose granular sediments deposited by the rivers when they flowed through the historic channels. It should be noted that often the coarse grained alluvium is "capped" by a relatively thin layer of silt and/or clay deposited from the river during more recent (post abandonment) flood stages. During these flood events, the river overtopped its channel and carried with it finer grained materials that were deposited outside of the channels as the river receded. Eventually these lower energy deposits accumulate and can eliminate evidence of the older, abandoned river channels. These fine-grained soils, identified by Helley and Harwood (1985) as basin deposits, are mapped several hundred feet east of the east end of the levee as shown on Plate 3A.

Other features of note are several historic south flowing tributaries identified on the 1908-09 Map of the American Basin and the 1894 Geologic Atlas, Sacramento Folio map. These maps indicate the tributaries crossed beneath the current location of the ARNL. The tributary shown on the American Basin map was called Brannans Slough No. 1 and flowed south from American Lake and crossed beneath the levee somewhere between the interval from about Interstate 5 to a point about 500 feet east of Interstate 5. A previous exploration by Kleinfelder, Boring B-3, was performed near this location. The 1894 Geologic Atlas of the Sacramento Folio map shows two channels of Arcade Creek crossed beneath the current levee about 500 and 1,300 feet from the east end of the levee. The locations of these tributaries relative to the ARNL are shown on Plates 3C and 3D.

3 SITE CONDITIONS

3.1. EXISTING SEEPAGE CUTOFF WALL

One seepage cutoff wall is present downstream of this portion of the American River. The end of the cutoff wall, approximately Station 34+42, is the boundary between the American River and Sacramento River study areas. The wall is approximately 45 feet deep and extends through the crown of the levee. The location of the cutoff wall project is shown on Plate 4.

3.2. EXISTING BERMS AND DITCHES

A seepage blanket and v-ditch were constructed in 1999 at the landside toe of the levee between approximate Stations 83+00 and 100+00. The seepage blanket consists of an approximately 15-foot wide, 2-foot thick blanket with an internal drain utilizing drain rock and a geotextile. The drain empties into a v-ditch. Project plans entitled "Reclamation District No. 1000, Garden Highway Levee Landside Slope Modifications Project" prepared by Ensign & Buckley Consulting Engineers, dated November 1998 show these improvements.

A ditch located at the landside levee toe was filled between approximate Stations 102+00 and 119+40 and Stations 123+00 and 124+30. Filling of the ditch included placement of pipes within geotextile encased drain rock at the bottom of the ditch and backfilling to leave only a 1-1/2 to 2-1/2 foot deep swale at the landside levee toe. The drain pipes empty into an existing City of Sacramento storm drain located near Station 121+20. Project plans entitled "Garden Highway Levee Ditch Fill Project" prepared by HDR Engineering, Inc., dated August 1999 show these improvements. The plans do not indicate where this water is conveyed or pumped back into the river system.

3.3. PUMP STATIONS

There are no unlined intake channels extending to pump stations within this levee study area.

4 LEVEE PERFORMANCE HISTORY

4.1. HISTORIC SEEPAGE MAP REVIEW

Historical documents and maps reviewed to evaluate the past performance of the ARNL included the State of California Department of Water Resources Bulletin No. 125, "Sacramento Valley Seepage Investigation," dated August 1967, and the Natomas Company's Map of Reclamation Districts Nos. 1000 and 1400 showing "Areas Effected [sic] By Continuous High Water in Sacramento River During Spring of 1938," and "Showing Area Overflowed from Drainage Canals, 1938 - 6,810 Acres Seepage, or Groundwater Showing on Surface in May 1938." It should be noted the 1938 map showing areas affected by high water does not clarify or provide detail of the seepage conditions observed in these area. For example, there is no differentiation as to whether the "seepage" is related to either levee through seepage, underseepage, or merely collected surface water at that location. Details of features presented by these maps within the four reaches of the ARNL are presented below and shown graphically on Plates 3E through 3G.

4.1.1. Reach 1 (Stations 34+42 to 48+00)

The 1938 maps indicate the area north of the ARNL was affected by high water. The Department of Water Resources 1963 seepage areas map indicates seepage was observed on the north side of the levee extending between about Stations 34+42 and 37+00 during high river flow periods. The 1965 map indicates seepage was observed along this entire reach. The areas described above are presented relative to the ARNL on Plates 3E and 3G.

4.1.2. Reach 2 (Stations 48+00 to 95+00)

The 1938 maps indicate the area north of the ARNL was affected by high water for the entire reach and that seepage was observed in an area about 500 feet long and 200 feet wide near Station 92+00. The Department of Water Resources 1963 seepage areas map indicates seepage was observed on the north side of the levee extending from about Stations 82+00 to 95+00 during high river flow periods. The 1965 map

indicates seepage was observed in an area that extended from about Stations 48+00 to 55+00, Stations 56+00 to 70+00, and Stations 77+00 to 95+00. The areas described above are presented relative to the ARNL on Plates 3E and 3G.

4.1.3. Reach 3 (Stations 95+00 to 105+00)

The 1938 maps indicate the area north of the ARNL was affected by high water for the entire reach. The Department of Water Resources 1963 seepage areas map indicates seepage was observed on the north side of the levee extending from about Stations 95+00 to 98+00 during high river flow periods. The 1965 map indicates seepage was observed in an area that extended from about Stations 95+00 to 98+00. The areas described above are presented relative to the ARNL on Plates 3E and 3F.

4.1.4. Reach 4 (Stations 105+00 to 153+00)

The 1938 maps indicate the area north of the ARNL was affected by high water for the entire reach and that seepage was observed in an area about 500 feet long by 100 feet wide near Station 138+00. Seepage was not documented along this reach in 1963 or 1965. The areas described above are presented relative to the ARNL on Plate 3G.

4.2. LEVEE PERFORMANCE HISTORY

Locations of the following performance deficiencies are shown on Plate 4.

4.2.1. Reach 1 (Stations 34+42 to 48+00)

Documentation of levee deficiencies was not identified within this reach.

4.2.2. Reach 2 (Stations 48+00 to 95+00)

In 1995, seepage and pin boils were observed near Station 88+00 and a slip near the levee crown was observed near Station 78+00 (Wahler 1987).

4.2.3. Reach 3 (Stations 95+00 to 105+00)

Documentation of levee deficiencies were not identified within this reach.

4.2.4. Reach 4 (Stations 105+00 to 153+00)

In 1986, seepage at the landside toe was observed near Station 107+00 (Wahler 1987).

5 FINDINGS AND PRELIMINARY RECOMMENDATIONS

5.1. GEOTECHNICAL REQUIREMENTS FOR LEVEE EVALUATION

In order to provide a specific level of protection the entire length of levee must be able to withstand the design water surface for the duration of the design flood event. Uniform standards for levee geometry and stability have been codified by the State of California DWR. With regards to levee integrity, we have relied upon engineering design manuals prepared by USACE. Specifically, with respect to geotechnical seepage and levee stability requirements, our evaluation is based on compliance with the guidelines contained in the USACE Levee Design Manual (EM 1110-2-1913) and Engineering Technical Letter Design Guidance for Levee Underseepage (ETL 1110-2-569). Where problems are identified, we have identified mitigation measures we believe comply with the prescribed levee design procedures.

5.2. LEVEE GEOMETRY

Title 23 of the California Code of Regulations specifies minimum levee geometry as follows:

- Minimum waterside slope of 3 H to 1 V (3H:1V)
- Minimum landside slope of 2H:1V
- Minimum crown width of 20 feet for a major stream

We reviewed the previously referenced topographic drawings to determine the relationship between reaches that were steeper than this slope configuration and areas that were wider than the 20 foot minimum standard. Based on the topographic drawings available to us the prescribed levee prism (3H:1V waterside, 2H:1V landside, and 20 foot crown width) is present within the existing embankment. While some slopes are steeper and, therefore, do not meet the prescribed geometry requirements, slope failure would not necessarily reduce the level of protection provided by the levee. Slope failure may impact a portion of the levee, however the levee prism mentioned above would remain intact. We recommend further discussion with SAFCA, DWR, and

USACE regarding variances for levees with widened crowns and locally oversteepened side slopes.

5.3. THROUGH SEEPAGE AND STEADY STATE STABILITY

Levee through seepage can occur during periods of elevated river stage. The likelihood of seepage exiting the landside slope of the levee is dependent on such factors as levee embankment composition, geometry (width and landside slope angle), and duration of stage. When performing a rigorous through seepage analysis under steady state conditions (as required in the USACE EM), in practically all cases through seepage results in a free seepage face occurring along the landside slope. In the case of the ARNL, this free seepage face may adversely impact slope stability.

There are few recorded observations of free seepage occurring along the subject levees. However, free seepage (and corresponding adverse slope stability conditions) have been recorded in levees located along the Sacramento River. An important difference in those levees compared to the American River levees is that the Sacramento River levees were primarily comprised of more permeable (clean sand) materials and the river stage was elevated for a sufficient duration that a steady state seepage condition developed. Because of the lower permeability embankment soils predominantly present along the American River, the steady state condition may never have been experienced and, therefore, performance of the levees under steady state conditions might not have been tested. An exception to the profile of lower permeability soil conditions was encountered in Sections 80+00 to 140+00 where silty sand was encountered.

Further discussion/evaluation of the risks involved with a steady state versus transient state analysis condition should be made with DWR, USACE, and SAFCA for this levee reach. At this time we are recommending a through seepage cutoff barrier be constructed for this entire reach of American River levee. This recommendation includes consideration of the likelihood of future operations of the Lower American River system which will include greater discharges of longer duration from Folsom Dam. Because of this, steady state conditions (with corresponding potential for landside slope instability) are more likely to exist. Additionally, embankment materials were sporadically encountered which generally do not possess sufficient plasticity and would likely be erodible should seepage occur.

5.4. STEADY STATE STABILITY WITH SLURRY CUTOFF WALLS

Steady state stability of a levee is influenced to a large degree by the location of the steady state phreatic surface. Factors that influence the location of the phreatic surface include levee geometry, anisotropy of permeability, horizontal layering, lateral zoning of fill, and the presence of defects such as roots, rodent holes, and cracks. In order to significantly lower the phreatic surface within a levee embankment, the permeability of a slurry cutoff wall should be on the order of at least two orders of magnitude lower than the adjacent levee embankment material. Since soil cement bentonite (SCB) slurry cutoff walls are routinely constructed with permeability less than 10^{-6} cm/sec they significantly lower the phreatic surface in levees that exhibit a permeability of at least 10^{-4} cm/sec. Consequently, SCB slurry cutoff walls have been widely used to mitigate through seepage and increase stability for levees in the Sacramento Valley composed of sand and silty sand.

A majority of the ARNL is composed primarily of lean clay. Stability analysis performed by USACE and Kleinfelder suggests these clay levees do not meet flood stage steady state stability requirements (FS>1.4). Because there is no practical space available at the landside toe for construction of a drained stability berm to improve stability, slurry cutoff walls are recommended to improve stability.

We performed stability analyses evaluating a representative clay levee with an SCB slurry cutoff wall. Since the difference in permeability between the levee and the cutoff wall is generally only a factor of 10 (one order of magnitude), the cutoff wall does not significantly decrease the phreatic surface. As a result a free seepage face forms above the levee toe. The factor of safety for failure surfaces that pass through the wall is greater than the required USACE factor of safety of 1.4. However, small failure surfaces at the levee toe exhibit a factor of safety less than 1.

Slope failure beginning at the landside toe and progressing up the levee could eventually reach the hinge point of the levee crown and potentially expose the proposed SCB slurry wall. If no maintenance was performed to reconstruct small surface slides the levee could eventually reach a landside slope equal to about half the soil angle of internal friction, or 15 degrees (based on infinite slope analysis of saturated clay with a friction angle of 30 degrees and no cohesion). Steady state analysis was performed on

a levee with a landside slope of 15 degrees, approximately 3.7H:1V. The location of the new toe was determined by holding the volume of soil on the landside of the wall constant. The SCB wall was assigned a strength of 500 psf (much less than the 30 psi normally specified). The results of the analysis indicate the deformed levee meets steady state stability requirements with a factor of safety greater than 1.4.

While an SCB slurry cutoff wall in a lean clay levee does not significantly lower the phreatic surface it does improve stability to the point that freeboard should not be at risk. The cutoff wall has the added benefit of a seepage barrier through sand layers and other discontinuities. If small slides do occur they should be reconstructed (outside of flood season) with internal drainage at the back and base of the cut.

5.5. RAPID DRAWDOWN STABILITY

Because of localized oversteepening, some levee side slopes do not meet rapid drawdown waterside stability requirements. As stated previously in Section 5.2, we recommend further discussion with SAFCA, DWR and USACE staff regarding variances for wide, steep slope levees. To facilitate the evaluation of variances to waterside slope requirements, a bathymetric survey of the NEMDC channel should be performed along the entire study area.

5.6. SEISMIC STABILITY

The likelihood of a simultaneous occurrence of the design water stage and the maximum seismic event is considered remote. As a result, the current standard of practice for levee evaluation in the Sacramento area is to analyze the effects of potential loss of freeboard or other damage to levees due to seismic shaking (and resulting settlement) based on normal river stage conditions. It is accepted that if minor damage to the levees occurs during a seismic event the damage can be repaired prior to a subsequent flood event. We have not evaluated the influence of seismic shaking on the levee embankments. However, cohesionless soils with relatively low Standard Penetration Test blow counts were encountered in our exploratory borings in Reach 1. These soils may be susceptible to liquefaction, settlement, and lateral spreading. Operation and maintenance plans should anticipate that a design level earthquake may result in loss of freeboard and lateral spreading. O&M plans should envision expeditious restoration of levee integrity should seismic settlement occur. In order to

estimate the amount of settlement and lateral spread, a deformation analysis would be needed.

5.7. END OF CONSTRUCTION STABILITY

While minor raises on the order of a few feet may not cause increases in pore pressure within the levee or foundation soils, if design of a levee raise is considered, we recommend the End of Construction stability condition be evaluated. Raises and/or excavations at the levee toe (such as key or inspection trenches) may temporarily reduce levee stability. Such modifications should be carefully evaluated prior to construction of levee improvements.

5.8. SETTLEMENT

Minor raises on the order of a few feet may cause settlement. For such projects, settlement could be conservatively estimated at 10 percent of the added height. However, if a levee raise is required, we recommend a settlement analysis be performed based on the project design specifications.

5.9. GEOTECHNICAL SEEPAGE AND LEVEE STABILITY

For this evaluation we divided the levee into reaches based on subsurface conditions encountered in exploratory soil borings along with anticipated variability based on the geomorphic setting. The results of our seepage analyses and past performance were used to decide which reaches met the USACE guidelines. In general, if one seepage analysis within a reach did not meet criteria or several were near the criteria, the reach was deemed inadequate. In some cases variability was addressed in the seepage model or by performing a sensitivity analysis. In other cases the models were faithful to a specific boring location and the influence of variability was considered separately. Where the reach was deemed inadequate, mitigation measures that would permit safe performance against the 200-year WSE have been identified. These measures are summarized in Table 5.14 at the end of this chapter.

The following sections summarize, for each of the designated reaches, the geomorphology, performance history, levee topography, subsurface conditions, and seepage and slope stability analyses for the 100-year and 200-year WSE, and

recommend mitigation measures by reach where appropriate. Additional information regarding descriptions and results of the seepage and slope stability analyses can be found in Appendices D and E, respectively.

5.10. REACH 1 - STATIONS 34+42 TO 48+00

5.10.1. Geomorphology and Performance History

The levee along this reach is underlain by recent alluvium (Qa, Plate 3A). The 1938 maps indicate the area north of the American River was affected by high water for the entire reach (Plates 3E and 3F). The Department of Water Resources 1963 seepage areas map indicates seepage was observed during high river flow periods on the north side of the levee extending between about Stations 34+42 to 37+00 (Plate 3G). The 1965 map indicates seepage was observed along this entire reach.

5.10.2. Levee Topography and Design Water Surfaces

The levee crown elevation ranges from approximately 37.5 to 38.5, the landside toe elevation ranges from approximately 18 to 31. The water surface for Stations 34+42 to 48+00 is approximately Elevation 31.6 to 31.8 for the 100-year water level and Elevation 33.8 to 34.0 for the 200-year water level.

5.10.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE Boring 2F-96-2, Kleinfelder's 1994 Cone Penetration Test CPT-29, and Kleinfelder's borings for the current investigation ARB-1, ARB-2, and ARB-3.

- A levee embankment consisting of clay, silt, and sand. Poorly graded sand about 35 and 15 feet thick was found in Borings ARB-1 and ARB-2, respectively,
- An underlying fine-grained layer consisting of clays and silts approximately 25 to 45 feet thick, and
- A deep sand and gravel layer below about Elevation -20 to -30.

5.10.4. Seepage Analysis

Through Seepage. Sand is present in the levee in the vicinity of ARB-2. The levee has been widened at this location. If the sand is present through the entire levee cross section a free seepage face will develop under steady state conditions and landside slope stability will not meet USACE criteria (FS>1.4).

Underseepage. Calculated underseepage gradients within this reach are anticipated to be within USACE criteria (0.5).

Stability. A stability analysis was not performed along this reach. Due to the through seepage potential mentioned above, the landside slope likely does not meet minimum factor of safety requirements (1.4).

5.10.5. Preliminary Conclusions and Recommendations

Similarities between this reach and the analyses performed by Kleinfelder in Reach 4 indicate that this reach meets USACE underseepage guidelines for the 100-year and 200-year WSE. Due to the presence of sand in the levee, through seepage is considered likely to be present in this reach. Therefore, we conclude this reach does not meet USACE through seepage guidelines. Accordingly, construction of a SCB slurry cutoff wall through the levee to Elevation 15, 25 feet deep, is recommended within this reach to mitigate through seepage and instability for the 200-year WSE. This cutoff wall would either need to overlap the existing cutoff wall approximately 200 feet to provide continuous protection or the existing cutoff wall would need to be exposed and tied into the new wall. Additional investigation should be performed near Boring ARB-2 to determine if the sand layer encountered within the levee is continuous across the entire width of the levee. Additional analysis should be performed to evaluate steady state seepage conditions in this widened levee section.

5.11. REACH 2 – STATIONS 48+00 TO 95+00

5.11.1. Geomorphology and Performance History

The levee along this reach is underlain by alluvium (Qa, Plate 3A). The 1908-09 Map of the American Basin shows the Brannan Slough intersecting the levee near Station

57+00 (Plate 3D). The 1938 maps indicate the area north of the American River was affected by high water for the entire reach and that seepage occurred in an area about 500 feet long and 200 feet wide near Station 92+00 (Plates 3E and 3F). The Department of Water Resources 1963 seepage areas map indicates seepage occurred on the north side of the levee extending from about Stations 82+00 to 95+00 during high river flow periods (Plate 3G). The 1965 map indicates seepage occurred in an area that extended from about Stations 48+00 to 55+00, Stations 56+00 to 70+00, and Stations 77+00 to 95+00. In 1995, seepage and pin boils were observed near Station 88+00 and a slip near the levee crown was observed near Station 78+00.

5.11.2. Levee Topography and Design Water Surfaces

The levee crown elevation ranges from approximately 37.5 to 38.5, the landside toe elevation ranges from approximately 14 to 27, the 100-year water surface elevation ranges from approximately 31.8 to 32.4, and the 200-year water surface elevation ranges from approximately 34 to 35.

5.11.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE (1996 and 1997) Borings 2F-96-3, 2F-96-4, 2F-97-33, and 2F-97-34, Kleinfelder (2001) Boring B-3, Kleinfelder 1994 Cone Penetration Tests CPT-27 and CPT-28, and Kleinfelder's borings for the current investigation ARB-4 through ARB-7.

- A levee embankment consisting primarily of clay and silt with some silty sand in the area of Stations 80+00 to 95+00,
- A fine-grained blanket layer 30 to 50 feet thick consisting predominantly of clay and silt with some silty sand,
- A silty sand and clayey sand layer below elevation of -12 feet in ARB-4, ARB-6, and ARB-7, and 2F-97-34, and
- A deep sand and gravel layer below about Elevations -18 to -25.

5.11.4. Seepage and Stability Analysis

Through Seepage. Levee fill materials consist of silty sand in the areas of Stations 80+00 to 95+00. This condition can result in seepage exiting the face of the levee

under steady state conditions and landside slope stability will not meet USACE criteria (FS>1.4).

Underseepage. The blanket layer varies from 30 to 50 feet thick except for a silty sand layer approximately 7 feet thick between Stations 53+00 and 57+00. Calculated underseepage gradients within this reach are anticipated to be within USACE criteria (0.5).

Stability. The USACE performed a slope stability analysis in 2001 that suggested mitigation would be required to meet factor of safety requirements of 1.4 found in EM 1110-2-1913. This analysis was performed for the reach between R.M. 0 and 1.8[1] using a design water surface with a flow of 200,000 cfs from Folsom Dam. As mentioned previously, additional discussion with SAFCA, DWR and USACE staff regarding the stability of wide steep levees is recommended.

5.11.5. Preliminary Conclusions and Recommendations

Similarities between this reach and the analyses performed by Kleinfelder in Reach 4 indicate that this reach meets USACE underseepage guidelines for the 100-year and 200-year WSE. The analysis performed by USACE indicates that the 100-year and 200-year WSE could produce through seepage at a boring location in this reach. Through seepage is considered likely to be present in the vicinity of this boring location. Therefore, we conclude this reach does not meet USACE through seepage guidelines. Accordingly, construction of a SCB cutoff wall through the levee to Elevation 10, approximately 30 feet deep, is recommended to mitigate through seepage and instability for the 200-year WSE. Mitigation along this reach may be reduced based on future discussions with USACE regarding steady state analysis of levees constructed from fine-grained soils.

[1] *R.M. refers to River Miles used by the USACE in their report. Assuming R.M. 0.0 corresponds to approximate Station 30+00 this reach would extend to approximate Station 125+00.*

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5.12. REACH 3 – STATIONS 95+00 TO 105+00

5.12.1. Geomorphology and Performance History

The levee along this reach is underlain by alluvium (Qa, Plate 3A). The 1938 maps indicate the area north of the American River was affected by high water for the entire reach (Plates 3E and 3F). The Department of Water Resources 1963 seepage areas map indicates seepage occurred during high river flow periods on the north side of the levee extending from about Stations 95+00 to 98+00 (Plate 3G). The 1965 map indicates seepage occurred in an area that extended from about Stations 95+00 to 98+00.

5.12.2. Levee Topography and Design Water Surfaces

The levee crown elevation ranges from approximately 38.0 to 38.5, the landside toe elevation ranges from approximately 17 to 22, the 100-year water surface ranges from 32.4 to 32.7, and the 200-year water surface elevation ranges from 35.0 to 35.2.

5.12.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE (1997) Boring 2F-97-35, Wahler 1987 Boring DH-36, and Kleinfelder's boring for the current investigation ARB-8.

- A levee embankment consisting primarily of clayey and silty sand.
- A fine-grained blanket layer 30 to 40 feet thick consisting predominantly of clay and silt. However, a sand lens about 6 feet thick was encountered in DH-36 (Station 102+50) near the elevation of the levee toe.

5.12.4. Seepage and Stability Analysis

Through Seepage. Levee fill materials consist of silty sands in the areas of Stations 95+00 to 105+00. This condition can result in seepage exiting the face of the levee under steady state conditions, and landside slope stability will not meet USACE criteria (FS>1.4).

Underseepage. The blanket layer varies from 30 to 40 feet thick with the exception of a poorly graded sand layer approximately 6 feet thick in Boring DH-36. Except for the identified sand layer, calculated underseepage gradients within this reach are anticipated to be within USACE criteria (0.5). In the vicinity of the sand layer underseepage gradients may exceed the USACE criteria (0.5).

Stability. A stability analysis was not performed along this reach. Due to the through seepage potential mentioned above, the landside slope likely does not meet minimum factor of safety requirements (1.4).

5.12.5. Preliminary Conclusions and Recommendations

Similarities between this reach and the analyses performed by Kleinfelder in Reach 4 indicate that this reach meets USACE underseepage guidelines for the 100-year and 200-year WSE. Due to the presence of sand in the levee, through seepage is considered likely to be present in this reach. Therefore, we conclude this reach does not meet USACE through seepage guidelines. Accordingly, construction of a SCB slurry cutoff wall through the levee to Elevation 5, 35 feet deep, is recommended within this reach to mitigate through seepage and instability for the 200-year WSE.

5.13. REACH 4 – STATIONS 105+00 TO 153+00

5.13.1. Geomorphology and Performance History

The levee along this reach is underlain by alluvium (Qa, Plate 3A). The 1894 Atlas shows the levee crossing two tributaries near the eastern end of the reach (Plate 3C). The 1938 maps indicate the area north of the American River was affected by high water for the entire reach and that seepage occurred in an area about 500 feet long by 100 feet wide near Station 138+00 (Plates 3E and 3F). Seepage near Station 107+00 was observed in 1986 (Wahler 1987).

5.13.2. Levee Topography and Design Water Surfaces

The levee crown elevation ranges from approximately 38.5 to 40.5, the landside toe elevation ranges from approximately 16 to 33, the 100-year water surface ranges from 32.7 to 33.4, and the 200-year water surface ranges from 35.2 to 36.1.

5.13.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE (1996 and 1997) Borings 2F-96-5, 2F-96-6, 2F-96-7, and 2F-97-10, Wahler 1987 Borings DH-35 and DH-46, Kleinfelder (2001) Borings B-1 and B-2, Kleinfelder 1994 Cone Penetration Tests CPT-24 through CPT-26, and Kleinfelder's borings for the current investigation ARB-9 through ARB-13.

- A levee embankment consisting primarily of silt and clay, except a significant amount of silty sand is present between Stations 105+00 and 133+00, and
- A fine-grained blanket layer 15 to 25 feet thick consisting predominantly of clay and silt.

5.13.4. Seepage Analysis (Station 108+00 and 123+00)

Through Seepage. Kleinfelder performed seepage analyses near Stations 108+00 and 123+00 that suggest through seepage will occur. Levee fill materials consisting of silts and clays modeled with a best case anisotropy of 1 can result in seepage exiting the face of the levee under steady state conditions, and landside slope stability will not meet USACE criteria (FS>1.4). This condition will likely be exacerbated if layering is present within the levee fill materials. The portion of the levee embankment consisting of silty sand will be more prone to through seepage.

Underseepage. The blanket layer varies from 15 to 25 feet thick with an underlying silty sand layer approximately 7 feet thick between Stations 107+00 and 120+00. Calculated underseepage gradients within this reach are within USACE criteria (0.5).

5.13.5. Stability Analysis (Station 123+00)

Stability. A stability analysis was performed to confirm results obtained by the USACE. Results of slope stability analyses confirm this reach does not meet USACE minimum Factor of Safety requirements of 1.4 for steady state conditions, but does meet the factor of safety of 1.0 for rapid drawdown.

5.13.6. Preliminary Conclusions and Recommendations

The analyses performed by Kleinfelder indicate that this reach meets USACE underseepage guidelines for the 100-year and 200-year WSE. The presence of isotropic silt and clay in the levee indicates through seepage is considered likely to be present within this reach. Therefore, we conclude this reach does not meet USACE through seepage guidelines. Accordingly, construction of a SCB slurry cutoff wall through the levee to Elevation 10, 30 feet deep, is recommended within this reach to mitigate through seepage and instability for the 200-year WSE. Mitigation along the upstream portion of this reach (above Station 133+00) may be reduced based on future discussions with USACE regarding steady state analysis of levees constructed from fine-grained soils.

5.14. SUMMARY OF REACH SPECIFIC MITIGATION

The following table summarizes recommended mitigation measures based on these general recommendations as well as reach-specific recommendation to mitigate through seepage, underseepage, and landside slope stability conditions. A more detailed discussion of conditions along each reach is presented in following sections of this report.

Table 5.14. Summary of Recommendations by Reach and Station

Levee Reach	Station	Existing Mitigation	Proposed Cutoff Wall Depth (feet)
Reach 1	34+42 to 48+00	None	25
Reach 2	48+00 to 95+00	Seepage blanket and v-ditch, portion of reach	30
Reach 3	95+00 to 105+00	Seepage blanket and v-ditch, portion of reach	35
Reach 4	105+00 to 153+00	None	30

6 LIMITATIONS

Recommendations contained in this report are based on our field observations, subsurface explorations completed by Kleinfelder and others, laboratory tests, and our present knowledge of the existing levee conditions. It is possible that soil conditions could vary between or beyond the points explored.

We have prepared this report in substantial accordance with the generally accepted geotechnical engineering practice as it exists in the site area at the time of our study. No warranty, express or implied, is made.

This report may be used only by the Client and only for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both on site and off site), or other factors may change over time and additional work may be required with the passage of time. Any party other than the Client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the Client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party.

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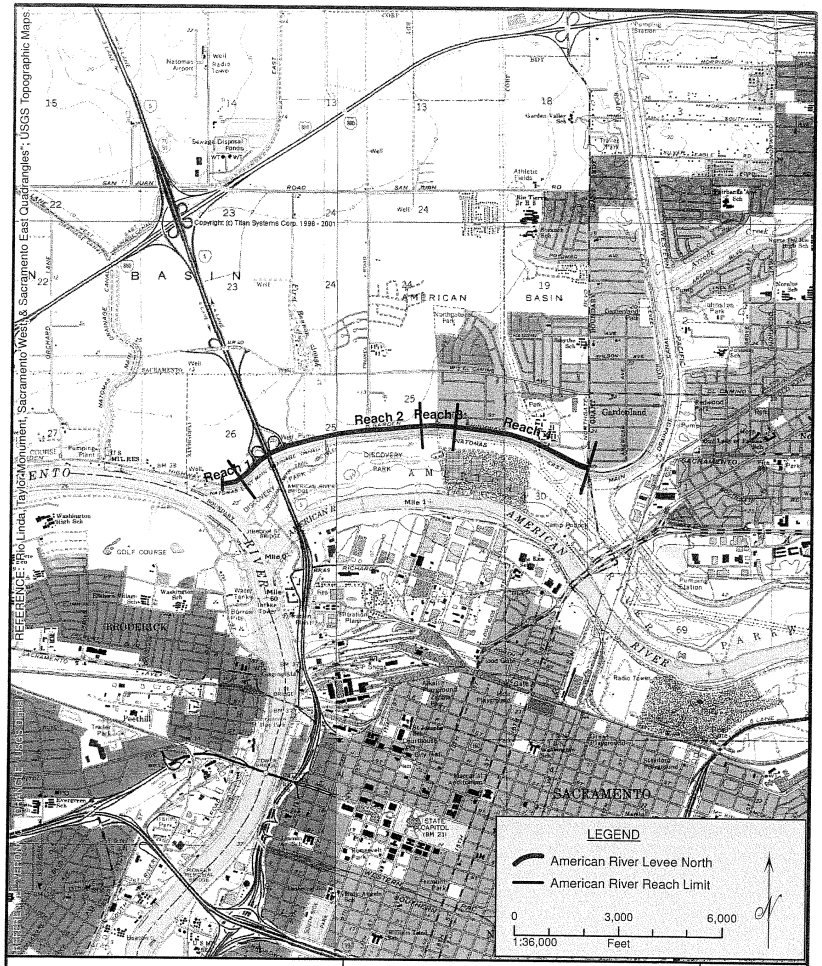

KLEINFELDER

Graphic By: D. Anderson
Date: 10/07/05
Project No: 58824-parn
File Name: Am Riv Site

SITE LOCATION MAP
AMERICAN RIVER
NORTH LEVEE
NATOMAS BASIN EVALUATION
SACRAMENTO COUNTY, CALIFORNIA

Plate
1

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PROBLEM IDENTIFICATION REPORT
NATOMAS CROSS CANAL SOUTH LEVEE
NATOMAS BASIN EVALUATION
RECLAMATION DISTRICT 1000
SUTTER COUNTY, CALIFORNIA

Appendix D of Draft & Final SAFCA Natomas Levee Evaluation Study

March 14, 2006

[Technical Charts Omitted] JMP

Greenbriar Draft EIR Comments
James P. Pachl, 9/5/06
Exhibit Twelve

EXHIBIT 12

DRAFT

March 14, 2006
File: 58824-PNCC

Mr. Pete Ghelfi, PE
SAFCA
1007 7th Street, 7th Floor
Sacramento, California 95814

Subject: **Problem Identification Report**
Natomas Cross Canal South Levee
Natomas Basin Evaluation
Reclamation District 1000
Sutter County, California

Dear Mr. Ghelfi:

Kleinfelder is pleased to present the attached Problem Identification Report (PIR) describing the results of our evaluation of the Natomas Cross Canal South Levee located within Reclamation District 1000 (RD 1000) in Sutter County, California. The purpose of our investigation was to evaluate levee geotechnical conditions in accordance with applicable California Department of Water Resources and US Army Corps of Engineers guidelines.

On the basis of geotechnical data that were available to Kleinfelder and the results of the current investigation, we have developed recommendations for levee strengthening which should result in acceptable factors of safety for stability and seepage for the 200-year design water surface elevation. For purposes of this preliminary analysis, the use of cutoff walls was primarily used as the preferred stabilization treatment. Other stabilization techniques such as seepage berms and/or relief wells could potentially be used. A more detailed analysis of these alternative stabilization options should be considered in final design.

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Kleinfelder appreciates the opportunity to work with you on this project. If you would like to discuss this report or if we may be of further assistance, please contact the undersigned.

Sincerely,

KLEINFELDER, INC.

DRAFT

Rebecca L. Money, PE
Project Engineer

DRAFT

Richard M. Stauber, PE
Project Manager

DRAFT

Byron C. Anderson, PG, CEG
Senior Engineering Geologist

DRAFT

Raymond Costa, Jr., PE, GE
Principal Engineer

RLM:RMS:BCA:RC:crt

Distribution:
Client (25)

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KLEINFELDER

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PLATES

APPENDIX

1 INTRODUCTION

1.1. GENERAL

Kleinfelder performed a feasibility level geotechnical investigation for the south levee of the Natomas Cross Canal (NCCSL). The goal of this investigation was to perform additional subsurface investigation to achieve one primary exploration through/adjacent to the levee at intervals of about 1,000 feet. This information was combined with previous explorations performed by the US Army Corps of Engineers (USACE) and others and a geomorphic analysis to prepare longitudinal subsurface profiles along the levee. The levee was then divided into 7 reaches based on groupings of similar soil properties and levee configurations. Representative cross sections were then developed for evaluation of stability and seepage in general compliance with applicable USACE guidelines. The levee geometry was also compared to the idealized profile described in California Code of Regulations Title 23.

Conclusions and recommendations presented in this report are based on the subsurface conditions encountered at the locations of our explorations and the provisions and requirements outlined in the LIMITATIONS section of this report. Recommendations presented herein should not be extrapolated to other areas or used for other projects without Kleinfelder's prior review.

1.2. SITE LOCATION

The south levee of the NCC is located within Reclamation District 1000 (RD 1000) in Sutter County, California. The levee is approximately 4.4 miles long. It extends from the confluence of the Sacramento River to the Pleasant Grove Creek Canal, approximately 1,600-feet northwest of the Howsley Road bridge. Our investigation was extended to Howsley Road, a convenient match point that has been used for past investigation and projects. The site location relative to cities, rivers, and existing roadways is shown on Plate 1.

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1.3. PURPOSE AND SCOPE OF SERVICES

Kleinfelder investigated the NCCSL for the purpose of evaluating levee and subsurface conditions with respect to seepage and stability for the 100-year and 200-year water surface elevations (WSE) provided by MBK Engineers.

Kleinfelder's scope of work is described in our proposal dated April 27, 2005, and summarized below:

- A review of readily available information pertinent to the site
- Drilling and sampling 16 borings along the top of the levee or at the landside levee toe
- Limited laboratory testing of representative soil samples obtained during the field investigation to evaluate relevant engineering parameters
- Engineering analyses to provide the basis for alternatives analysis
- Preparation of this Problem Identification Report (PIR)

1.4. LEVEE PERFORMANCE ISSUES NOT ADDRESSED

1.4.1. General

This report primarily addresses levee performance issues related to seepage (through and underseepage) and stability. Other levee performance issues not addressed in this report include the following:

1. Freeboard
2. Erosion
3. Closure Devices
4. Operation and Maintenance
5. Levee Penetrations
6. Internal Basin Drainage

Each of these issues should be addressed as part of an overall levee performance assessment.

1.5. PREVIOUS INVESTIGATIONS

Kleinfelder reviewed the following documents in support of this PIR:

Kleinfelder (Kleinfelder 1997), "Geotechnical Evaluation of Proposed Levee Improvements Natomas Cross Canal and Pleasant Grove Creek Canal, Sutter County, California," November 4, 1997.

Kleinfelder (Kleinfelder 2004), "Draft Geotechnical Investigation Report, Proposed American Basin Fish Screen and Habitat Improvement Project, Sankey, Elkhorn, and Riverside Canals, Natomas Mutual Water Company, Sacramento and Sutter Counties, California," July 30, 2004.

US Army Corps of Engineers (USACE 2002), Sacramento District, "Geotechnical Report, American River Watershed, Implementation of WRDA 99 Common Features, Natomas Cross Canal Levees," May 2002.

Wahler and Associates (Wahler 1987), "Levee Investigation, RD 1000, Left Bank Sacramento River, South Bank Natomas Cross Canal, North and West Banks Natomas East Canal, Sacramento and Sutter Counties, California," July 1987.

Wahler and Associates (Wahler 1994), "Preliminary Design of Stabilizing Buttress for South Levee of Natomas Cross Canal," May 1994.

1.6. PROJECT DATUMS AND COORDINATE SYSTEM

Elevation references in this report are in feet and are based on the National Geodetic Vertical Datum of 1929 (NGVD29). Northing and easting coordinates shown in Appendix A are based on the California Coordinate System Zone II and the 1983 North American Datum (NAD83).

1.7. LEVEE ALIGNMENT AND GEOMETRY

The NCCSL is located near the southern end of Sutter County, California between Sankey Road and Howsley Road, west of the town of Pleasant Grove. The NCC is an artificial channel with levees constructed upon native ground on each side. The channel

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does not coincide with the alignment of any pre-existing drainage feature. The levee is primarily constructed of materials that were excavated with a clam shell dredge from the low flow channel located along the waterside levee toe. A gravel patrol road is located on the top of the levee. The levee is approximately 28,700 feet long and between 12 and 25 feet high, with an average height of 18 feet. Crown elevations vary between approximately 42 and 44 (NGVD29 datum). Landside toe elevations range from approximately 18 to 33. The levee crown width varies from 23 to 50 feet with an average width of about 30 feet. The landside slope ranges from between 2 and 3 horizontal (H) to 1 vertical (V). The waterside slope ranges from between 2.5 and 3.3H to 1V. Highway 70/99 intersects the levee near Station 227+50.

1.8. LEVEE TOPOGRAPHIC DRAWINGS AND LEVEE MILE REFERENCE

The following drawings were used to determine topography on and adjacent to the subject levee alignments:

- MHM, Inc. 1996 Record Drawings for construction along the NCC
- USACE 1997 Sacramento and San Joaquin River Basins Comprehensive Study, topographic and bathymetric survey data
- Montgomery Watson Harza (MWH) 2001 topographic survey data.

It is our understanding the vertical datum for the above listed drawings was NGVD29. We used these drawings to produce an "updated" landside levee toe profile. This profile is shown on Plates 4A and 4B. We used the 1997 Comprehensive Study topographic drawings to produce transverse levee cross sections for use in seepage and slope stability analyses. Also for our analyses, surface geometry and elevations of existing berms were obtained from the MHM, Inc. construction drawings. Top of boring elevations for borings performed for this study were estimated from the topographic drawings listed above.

Levee subsurface profile drawings received from the USACE (USACE, 2002) included a horizontal axis labeled with project stationing. This stationing is used throughout the project.

1.9. WATER SURFACE PROFILES

MBK Engineers (2005) developed the 1-in-100 annual exceedance probability (1/100 AEP) and the MBK-Design water surfaces for the NCCSL. We understand the MBK-Design water surface is based on 200-year hydrology combined with very conservative assumptions regarding upstream levee performance. Consequently, the MBK-Design water surface is above the Design Water Surface (400-year) USACE water surface presented on our levee profiles. These water surfaces are herein referred to as the 100-year WSE and the 200-year WSE. The 100-year WSE ranges from Elevation 40.6 at Station 0+00 to Elevation 40.7 at Station 287+00. The 200-year is approximately Elevation 42.4 for the entire length of levee.

References in this report to meeting the 100-year WSE and 200-year WSE indicates we consider the levee to meet the seepage and stability geotechnical requirements for levees as contained in the USACE Levee Design Manual (EM 1110-2-1913) and Technical Letter Design Guidance for Levee Underseepage (ETL 1110-2-569).

The 100-year and 200-year profiles are presented on Plates 4A and 4B.

1.10. INVESTIGATION REACH DESIGNATIONS

For this investigation, the NCCSL was divided into seven reaches, which are presented in the following table.

Table 1.10 - Investigation Reaches

Levee Reach Designation	Approximate Extents and Locations
Reach 1	Stations 0+00 (Garden Highway) to 5+70
Reach 2	Stations 5+70 to 105+00
Reach 3	Stations 105+00 to 123+00
Reach 4	Stations 123+00 to 173+00
Reach 5	Stations 173+00 to 195+00
Reach 6	Stations 195+00 to 280+00
Reach 7	Stations 280+00 to 287+00

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1.11. FIELD INVESTIGATION

Spectrum Exploration, under contract to SAFCA, drilled 16 exploratory soil borings along the levee alignment between July 26 and August 11, 2005. The exploratory boring locations are presented on Plates 2A through 2D.

Discussions of the field investigation and laboratory testing program are presented in Appendices A and B of this report. Boring logs and laboratory test results from previous investigations are presented in Appendix C. Boring logs from current and previous investigations are shown on levee profiles presented on Plates 4A and 4B.

2 REGIONAL GEOLOGY AND GEOMORPHOLOGY

2.1. GEOLOGIC SETTING

The NCCSL is located in the eastern portion of the Sacramento Valley, the northern portion of California's Great Central Valley. The Sacramento Valley contains thousands of feet of accumulated fluvial, overbank, and fan deposits resulting from erosion of the adjacent Sierra Nevada Mountains to the east and Northern Coast Range to the west. These deep alluvial deposits pinch out as the boundaries of the basin are approached and bedrock units of the Foothills Metamorphic Belt (FMB) and the basement complex of the Sierra Nevada Batholith are exposed to the east and sandstone and mélange bedrock of the Coast Range are exposed to the west.

The Sacramento River is the main drainage of the region, flowing generally from the Klamath Mountains south to its discharge point into the Suisun Bay in the San Francisco Bay area. Within the Sacramento area, the Sacramento River has been confined by man-made levees since the early 1900's. These levees were generally constructed on Holocene and Pleistocene age alluvial and fluvial sediments deposited by the current and historic Sacramento River and its tributaries. These deposits are described in detail below.

The project site has been mapped by a number of geologists at a regional scale, including Jennings (1977), Wagner (1981), and Helley and Harwood (1985). Jennings and Wagner are both compilation maps that reflect mapping by previous authors and thus show geologic interpretation similar to Helley and Harwood. Helley and Harwood mapping focused on Quaternary geologic units based on geomorphology and was performed at a scale of 1:62,500, making this mapping the most beneficial information relative to engineering properties of near-surface deposits. Helley and Harwood maps several Quaternary earth units in the region shown including (from youngest to oldest):

Stream Channel Deposits (Qsc): Recent and often Historic alluvial deposits generally consisting of unconsolidated sand, gravel, and silt contained primarily in active river and tributary channels. Includes material deposited from hydraulic mining activities.

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Alluvium (Qa): Pre-levee construction alluvium is mapped adjacent to the active river or tributary channels and consists of Holocene high energy fluvial deposits (i.e. sand and gravels) and overbank and fan deposits (i.e. sand, silt, and clay) that are also unconsolidated. Alluvium is mapped from the southwest end of the NCC (confluence of the NCC channel with the Sacramento River) and extends about 5,000 feet toward the east.

Basin Deposits (Qb): Helley differentiates basin deposits from alluvium (Qa) on the basis of composition including only those deposits that are finer-grained and frequently organic-rich and suggests these deposits were distal deposits where energy conditions were much lower. The majority of the central portion of the NCCSL is located on deposits mapped as basin deposits.

Modesto Formation (Qm): Unconsolidated alluvium (late Pleistocene estimated 12,000-42,000 years of age) is mapped along present day and ancestral tributaries of the Sacramento River and its tributaries. The Modesto Formation is mapped from the east end of the levee and extends about 3,000 feet toward the west.

Riverbank Formation (Qr): Semi-consolidated alluvial sand, silt, and clay with gravel are generally mapped as islands within the basin deposits about 5,000, 7,500, and 14,000 feet east from the west end of the NCCSL. These deposits are estimated to be 130,000-450,000 years of age (mid-Pleistocene) and contain high pedogenic silt and clay content and reddish hues reflective of its relative age.

The location of the above geologic units relative to the site are depicted on Plate 3A. Plate 3C shows the 1909 American Basin Soils relative to the project alignment.

2.2. REGIONAL GROUNDATER

Groundwater elevations and soil moisture conditions within the area fluctuate depending on Sacramento River, Feather River, and NCC stages, rainfall, irrigation practices, and/or runoff conditions. DWR maintains an Internet water data library (http://well.water.ca.gov/) of groundwater depth measurements from numerous monitoring wells throughout the State. According to data for two wells located near the NCCSL (11N04E09D002M and 11N04E19E002M), groundwater elevations ranged

between approximately –5 and 26 from the period between 1958 and 2005. Refer to Appendix G for plots showing the groundwater elevation data for these wells.

The USACE developed three borings into piezometers. These include Borings 2F-01-10, 2F-01-16, and 2F-01-20, which are located at Stations 154+00, 216+00, and 240+00, respectively. Readings from piezometer 2F-01-16 have been recorded by the USACE for the winters of 2001 through 2004. These readings show the head loss between the canal and the piezometer with the canal water surface up to six feet above the landside levee toe. Refer to Appendix G for this data.

2.3. NATOMAS CROSS CANAL HISTORIC GEOMORPHOLOGY

Rising sea levels and the subsequent filling of the Sacramento Valley with sediments has significantly reduced the gradient of rivers (including the Sacramento River) flowing down from the Sierra Nevada and Klamath Mountains. This gradient reduction has caused the energy of these rivers to transition from erosional to graded. Graded rivers are characterized by erosion that is less dominant and directed toward side to side rather than down-cutting. The lateral energy of the river causes synchronous erosion and deposition in sweeping bands commonly referred to as meanders. The outside of the meander is a zone of erosion. Material removed from the river at this zone is then deposited downstream as point bars in zones of decreased velocity on the inside of other meanders. In this way the river migrates across the flood plain. Often this erosion is slowed where the river encounters more resistant portions of the flood plain. This allows the next closest upstream meander to catch up and gradually erode away the "neck" between the two meanders. Flooding often accelerates this process as the higher energy flows can more easily cut a new thalweg (base of the active channel). The result of the conjoining meanders is the straightening of the river at that point of intersection and the creation of an abandoned bend in the river commonly referred to as an oxbow lake.

Review and comparison of historic topographic maps with current topographic maps, aerial photographs, and geologic and soil maps in the area of the NCC reveal features indicative of graded rivers described above. An outside meander erosion scar is represented by the crescent shaped exposure of the Riverbank Formation about 5,000 feet east of the west end of the canal (Plate 3A). In addition, several topographically depressed areas identified on historical maps as lakes in the west and west-central

portion of the levee may be the remnants of historic channels (Plate 3B). These historic remnant river features are evidence that rivers have migrated across the flood plain creating and abandoning channels. These abandoned channels are typically filled with loose granular sediments deposited by the river when it flowed through the channels. However, often the coarse grained alluvium is "capped" by a relatively thin layer of silt and/or clay deposited from the river during more recent (post abandonment) flood stages. During these flood events, the river overtops its current channels and carries with it finer grained materials that are deposited outside of the channels as the river recedes (Plates 3D and 3E). Eventually these lower energy deposits accumulate and can eliminate evidence of the older, abandoned river channels. These fine-grained soils, identified by Helley (1985) as basin deposits, are mapped under the majority of the NCC (Plate 3A). However, as noted above, these fine-grained deposits overlie coarser sized materials (sands and gravels) along portions of the NCC.

As described above, it should also be noted that the NCC is an artificial channel. The deposits mentioned above were not deposited during flood events from the NCC but during flood events of the Sacramento River and other contributing tributaries.

3 SITE CONDITIONS

3.1. EXISTING STABILITY BERMS AND DRAINS

In 1996, three stability berms were constructed by SAFCA along the NCCSL. The easternmost berm extends from the beginning of Reach 2 at Station 5+70 and extends to approximately Station 118+00 in Reach 3. A second berm extends from approximately Station 164+00 in Reach 4 to approximately Station 180+00 in Reach 5. The third berm extends from the beginning of Reach 6 (Station 195+00) to approximately Station 230+00 in Reach 6. According to as-built construction drawings (MHM 1996), the berms are 10 to 15 feet high and 15 feet wide. These features are shown on Plates 4A and 4B.

Approximately 1,900 feet of inclined drain was installed in three portions of these stability berms at Stations 46+00 to 50+00, Stations 174+00 to 178+00, and Stations 264+00 to 275+00. Features proposed for future construction will need to properly interface with existing improvements.

3.2. DITCHES

A 3-foot deep, unlined irrigation ditch is located approximately 10 feet south from the landside levee toe from Stations 0+00 to 4+00. A 10-foot deep, unlined ditch is located approximately 100 feet south from the landside levee toe from Stations 19+00 to 97+00.

Another ditch is located approximately 100 to 130 feet south from the landside levee toe from Stations 120+00 to 246+00. This ditch is 5 to 10 feet deep and unlined except within the Caltrans right-of-way, where it is lined with concrete. This ditch was formerly located closer to the levee. Upon Wahler's recommendation (Wahler, 1994), a section of the ditch between Station 158+00 and 216+00 was relocated by RD1000 in 1991. SAFCA relocated the remaining portions in 1996 as part of the North Area Local Project.

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3.3. PUMP STATIONS

Four pumping stations are located along the NCC south levee:

The Odysseus Farms pump station near Station 4+00 consists of an 18-inch diameter pipe through the levee, approximately 4 feet below the levee crown, with a discharge riser at the landside levee toe.

The Natomas Mutual Water Company Bennett Pumping Plant near Station 58+50 consists of one 36-inch diameter discharge pipe extending through the levee at a depth of about 4 feet below the levee crown.

The RD 1000 Pumping Plant #4 near Station 98+00 consists of an unlined, 15-foot-deep sump located approximately 100 feet from the levee toe. Three 48-inch diameter discharge pipes extend through the levee approximate 2 to 5 feet below the levee crown.

The Natomas Mutual Water Company Northern Pumping Plant near Station 120+50 consists of five 30-inch or 42-inch diameter pipes through the levee at depths ranging between about 1 and 8 feet below the levee crown. The concrete-lined intake sump is about 8 feet deep and located approximately 40 feet from the landside levee toe.

4 LEVEE PERFORMANCE HISTORY

4.1. HISTORIC SEEPAGE MAP REVIEW

Historical documents and maps reviewed to evaluate the past performance of the NCCSL included the State of California Department of Water Resources Bulletin No. 125, "Sacramento Valley Seepage Investigation," dated August 1967, and the Natomas Company's Map of Reclamation Districts Nos. 1,000 and 1,400 showing "Areas Effected [sic] By Continuous High Water in Sacramento River During Spring of 1938," and "Showing Area Overflowed from Drainage Canals, 1938 - 6,810 Acres Seepage, or Groundwater Showing on Surface in May 1938." It should be noted the 1938 map showing areas affected by high water does not clarify or provide detail of the conditions observed in these areas. For example, there is no differentiation as to whether the "seepage" is related to either levee through seepage, underseepage, or merely collected surface water at that location. Details of features presented by these maps within the seven reaches of the NCCSL are presented below and shown graphically on Plates 3D though 3F.

4.1.1. Reach 1 (Stations 0+00, Garden Highway to 5+70)

The 1938 maps indicate the entire area of Reach 1, south of the NCCSL, was affected by continuous high water including seepage (Plates 3D and 3E). The Department of Water Resources 1963 and 1965 seepage area maps indicate seepage along the entire length of Reach 1, south of the NCC (Plate 3F).

4.1.2. Reach 2 (Stations 5+70 to 105+00)

The 1938 maps indicate the area south of the NCCSL between Stations 6+00 and 63+00, and Stations 100+00 to 105+00 were affected by continuous high water including seepage (Plates 3D and 3E). The Department of Water Resources 1963 and 1965 seepage area maps indicate seepage was observed along the entire length of Reach 2, south of the NCC (Plate 3F).

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4.1.3. Reach 3 (Stations 105+00 to 123+00)

The 1938 maps indicate the entire area of Reach 3, south of the NCC, was affected by continuous high water and seepage (Plates 3D and 3E). The Department of Water Resources seepage area maps indicate seepage was observed during 1963 along the entire length of Reach 3, south of the NCC, but did not occur in 1965 (Plate 3F).

4.1.4. Reach 4 (Stations 123+00 to 173+00)

The 1938 maps indicate the entire area of Reach 4, south of the NCC, was affected by continuous high water (Plates 3D and 3E). Seepage was noted in an area about 500 feet wide at its maximum dimension at the west end of the reach as well as along the approximate eastern half of the reach. The Department of Water Resources 1963 and 1965 seepage area maps indicate seepage was not observed along Reach 4 (Plate 3F).

4.1.5. Reach 5 (Stations 173+00 to 195+00)

The 1938 maps indicate the entire area of Reach 5, south of the NCC, was affected by continuous high water, but seepage was not observed (Plates 3D and 3E). The Department of Water Resources 1963 and 1965 seepage area maps indicate seepage was not observed along Reach 5 (Plate 3F).

4.1.6. Reach 6 (Stations 195+00 to 280+00)

The 1938 maps indicate an area extending 3,200 feet northeast from the west end of Reach 6 and south of the NCC was affected by continuous high water (Plates 3D and 3E). However, no seepage was observed. The Department of Water Resources 1963 and 1965 seepage area maps indicate seepage was not observed along Reach 6 (Plate 3F).

4.1.7. Reach 7 (Stations 280+00 to 287+00)

The 1938, 1963, and 1965 maps indicate Reach 7 was not affected by continuous high water including seepage (Plates 3D, 3E, and 3F).

4.2. LEVEE PERFORMANCE HISTORY

In addition to the observations described above, locations of the following historic performance deficiencies are shown on Plates 4A and 4B.

4.2.1. Reach 1 (Stations 0+00, Garden Highway to 5+70)

During high water in 1997, a small pencil boil was observed at approximately Station 3+00.

4.2.2. Reach 2 (Stations 5+70 to 105+00)

No documentation of observed seepage/stability deficiencies was found for this reach.

4.2.3. Reach 3 (Stations 105+00 to 123+00)

No documentation of observed seepage/stability deficiencies was found for this reach.

4.2.4. Reach 4 (Stations 123+00 to 173+00)

No documentation of observed seepage/stability deficiencies was found for this reach.

4.2.5. Reach 5 (Stations 173+00 to 195+00)

According to USACE 2002, the USACE repaired a slide that occurred "approximately 3,500 feet southwest of Highway 99" in 1993. This would be in the approximate location of Station 193+00, where Reach 5 transitions to Reach 6. This slide was repaired by the USACE Sacramento District under emergency repair authority (PL84-99).

4.2.6. Reach 6 (Stations 195+00 to 280+00)

According to the USACE, a slide occurred in 1986, approximately 2,000 feet west of Highway 99, and longitudinal cracks indicative of slope instability were observed in the levee crown approximately 400 feet southwest of the highway.

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Wahler 1987 described Wallace-Van Alstine and Kuhl's 1987 geotechnical investigation of this slide failure. Reportedly, test pits in the landside toe of the damaged area revealed two well-defined layers of levee fill, a possible original soil layer underlying the fill, and a cemented silt or hardpan beneath. No clearly defined slide planes were observed. The slide did not involve the crown. The investigators concluded that seepage forces resulting from spring flooding may have initiated the slide movement. However, Wahler 1987 did not encounter these soil conditions during their 1987 field investigation, and concluded that they were unable to explain the instability that led to the slide.

A repair was performed in 1987 by Borcalli, Ensign & Buckley encompassing approximately 300 linear feet of levee slope. Construction drawings prepared by Borcalli, Ensign & Buckley detail the repair including removal of potential slide debris, excavation of materials at the landside toe of the levee to firm sandy silt, and reconstruction of levee with an internal drain consisting of drain rock wrapped in geotextile fabric with drain pipes at existing ground level.

4.2.7. Reach 7 (Stations 280+00 to 287+00)

No documentation of previous seepage/stability deficiencies was found for this reach.

5 FINDINGS AND PRELIMINARY RECOMMENDATIONS

5.1. GEOTECHNICAL REQUIREMENTS FOR LEVEE EVALUATION

In order to provide a specific level of protection the entire length of levee must be able to withstand the design water surface for the duration of the design flood event. Uniform standards for levee geometry and stability have been codified by the State of California DWR. With regards to levee integrity, we have relied upon engineering design manuals prepared by USACE. Specifically, with respect to geotechnical seepage and levee stability requirements, our evaluation is based on compliance with the guidelines contained in the USACE Levee Design Manual (EM 1110-2-1913) and Engineering Technical Letter Design Guidance for Levee Underseepage (ETL 1110-2-569). Where problems are identified, we have identified mitigation measures we believe comply with the prescribed levee design procedures.

5.2. LEVEE GEOMETRY

Title 23 of the California Code of Regulations specifies minimum levee geometry as follows:

- Minimum waterside slope of 3 to 1 (3H:1V)
- Minimum landside slope of 2H:1V
- Minimum crown width of 20 feet for a major stream

We reviewed the previously referenced topographic drawings to determine the relationship between reaches that were steeper than this slope configuration as well as areas that were wider than the 20 foot minimum standard. Based on the topographic drawings available to us, the prescribed levee prism (3H:1V waterside, 2H:1V landside, and 20 foot crown width) is present through a majority of the levee alignment. However, there are some isolated areas with oversteepened waterside slopes that do not meet the prescribed requirements. We recommend further consideration within these areas be made during future levee raising projects. There may be some opportunity for slope flattening due to the stability berm construction being performed with additional width for future shaping. We recommend further discussion with SAFCA, DWR, and USACE

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regarding variances for levees with widened crowns and locally oversteepened side slopes.

5.3. THROUGH SEEPAGE AND STEADY STATE STABILITY

Levee through seepage can occur during periods of elevated river stage. The likelihood of seepage exiting the landside slope of the levee is dependent on such factors as levee embankment composition, geometry (width and landside slope angle), and duration of stage. When performing a rigorous through seepage analysis under steady state conditions (as required in the USACE EM), in practically all cases through seepage results in a free seepage face occurring along the landside slope. In the case of the NCCSL, this free seepage face may adversely impact slope stability.

Through seepage was at least partially mitigated in 1996 by constructing an internally drained stability berm along a majority of the levee. Based on the results of our stability analyses, the constructed stability berm appears to provide the minimum factor of safety (>1.4) during the full flood stage event. There are no recorded observations of free seepage occurring along the subject levee embankments in areas where the berm is not present. However, free seepage (and corresponding adverse slope stability conditions) has been recorded in levees located along the Sacramento River. An important difference in those levees compared to the NCC levees is that the Sacramento River levees were primarily comprised of more permeable (clean sand) materials and the river stage was elevated for a sufficient duration that a steady state seepage condition actually existed. Because of the lower permeability embankment soils predominantly present along the NCC, the steady state condition has likely never been experienced and, therefore, performance of the levees under steady state conditions has never been tested.

At this time we are not recommending through seepage mitigation along the NCCSL where a seepage berm exists. Further discussion/evaluation of the risks involved with a steady state versus transient state analysis condition should be made with DWR, USACE, and SAFCA for this levee reach.

5.4. STEADY STATE STABILITY WITH SLURRY CUTOFF WALLS

Steady state stability of a levee is influenced to a large degree by the location of the steady state phreatic surface. Factors that influence the location of the phreatic surface include levee geometry, anisotropy of permeability, horizontal layering, lateral zoning of fill, and the presence of defects such as roots, rodent holes, and cracks. In order to significantly lower the phreatic surface within a levee embankment, the permeability of a slurry cutoff wall should be on the order of at least two orders of magnitude lower than the adjacent levee embankment material. Since soil cement bentonite (SCB) slurry cutoff walls are routinely constructed with permeability less than 10^{-6} cm/sec they significantly lower the phreatic surface in levees that exhibit a permeability of at least 10^{-4} cm/sec. Consequently, SCB slurry cutoff walls have been widely used to mitigate through seepage and increase stability for levees in the Sacramento Valley composed of sand and silty sand.

A majority of the NCCSL is composed primarily of clay and silt. Stability analysis performed by USACE and Kleinfelder suggests that in areas where a stability berm is not present these clay levees do not meet flood stage steady state stability requirements (FS>1.4). Therefore, slurry cutoff walls are recommended to improve stability.

We performed stability analyses evaluating a representative clay levee with an SCB slurry cutoff wall. Since the difference in permeability between the levee and the cutoff wall is generally only a factor of 10 (one order of magnitude), the cutoff wall does not significantly decrease the phreatic surface. As a result a free seepage face forms above the levee toe. The factor of safety for failure surfaces that pass through the wall is greater than the required USACE factor of safety of 1.4. However, small failure surfaces at the levee toe exhibit a factor of safety less than 1.

Slope failure beginning at the landside toe and progressing up the levee could eventually reach the hinge point of the levee crown and potentially expose the proposed SCB slurry wall. If no maintenance was performed to reconstruct small surface slides the levee could eventually reach a landside slope equal to about half the soil angle of internal friction, or 15 degrees (based on infinite slope analysis of saturated clay with a friction angle of 30 degrees and no cohesion). Steady state analysis was performed on a levee with a landside slope of 15 degrees, approximately 3.7H:1V. The location of the

new toe was determined by holding the volume of soil on the landside of the wall constant. The SCB wall was assigned a strength of 500 psf (much less than the 30 psi normally specified). The results of the analysis indicate the deformed levee meets steady state stability requirements with a factor of safety greater than 1.4.

While an SCB slurry cutoff wall in a lean clay levee does not significantly lower the phreatic surface it does improve stability to the point that freeboard should not be at risk. The cutoff wall has the added benefit of a seepage barrier through sand layers and other discontinuities. If small slides do occur they should be reconstructed (outside of flood season) with internal drainage at the back and base of the cut.

5.5. RAPID DRAWDOWN STABILITY

The levee along this portion of the NCC is composed primarily of silt and clay. Rapid drawdown analyses for both the 100-year WSE and 200-year WSE were performed at Station 102+00. The waterside slope analyzed at Station 102+00 was 2.4H:1V. The water level was dropped instantaneously from the full flood stage to the waterside toe. Results from these analyses indicate some oversteepened portions of the NCC do not meet USACE rapid drawdown stability criteria (FS>1.2).

As mentioned previously the waterside slope is locally as steep as 1.5H:1V in some locations. At most of these locations the levee is wider than 20 feet such that the 3H:1V slope could be projected up from the waterside toe to the crown leaving at least 20 feet of crown width. Where stability berms were constructed by SAFCA, they were widened to provide room for future raises.

Ideally, 3H:1V waterside slopes should be reestablished during future construction activities. However, in our opinion, the presence of oversteepened slopes that do not meet USACE criteria given a rigorous rapid drawdown analysis does not necessarily indicate the levees do not provide appropriate flood protection for the following reasons:

- The NCC contains backwater from the Sacramento River. Since upstream reservoirs are operated in such a manner as to cause gradual reduction in stage to minimize fish entrapment we feel the NCC is unlikely to drain instantaneously.
- Critical failure surfaces determined by the model are relatively shallow and have little influence on crown width or freeboard.

- Should a slope stability failure occur during drawdown, the slope could be buttressed on a temporary basis and repaired after the flood season.

5.6. SEISMIC STABILITY

The likelihood of a simultaneous occurrence of the design water stage and the maximum seismic event is considered remote. As a result, the current standard of practice for levee evaluation in the Sacramento area is to consider the effects of potential loss of freeboard or other damage to levees due to seismic shaking (and resulting settlement) based on normal river stage conditions. It is accepted that if minor damage to the levees occurs during a seismic event, the damage can be repaired prior to a subsequent flood event. We have not evaluated the influence of seismic shaking on the levee embankments. However, cohesionless soils with relatively low Standard Penetration Test blow counts were encountered in our exploratory borings in Reach 1. These soils may be susceptible to liquefaction, settlement, and lateral spreading. Operation and maintenance plans should anticipate that a design level earthquake may result in some loss of freeboard and lateral spreading. O&M plans should envision expeditious restoration of levee integrity should seismic settlement occur. In order to estimate the amount of settlement and lateral spread, a deformation analysis would be needed.

5.7. END OF CONSTRUCTION STABILITY

While minor raises on the order of a few feet may not cause increases in pore pressure within the levee or foundation soils, if design of a levee raise is considered, we recommend the End of Construction stability condition be evaluated. Raises and/or excavations at the levee toe (such as key or inspection trenches) may temporarily reduce levee stability. Such modifications should be carefully evaluated prior to construction of levee improvements.

5.8. SETTLEMENT

Minor raises on the order of a few feet may cause settlement. For such projects, settlement could be conservatively estimated at 10 percent of the added height. However, if a levee raise is required, we recommend a settlement analysis be performed based on the project design specifications.

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5.9. GEOTECHNICAL SEEPAGE AND LEVEE STABILITY

For this evaluation we divided the levee into reaches based on subsurface conditions encountered in exploratory soil borings along with anticipated variability based on the geomorphic setting. The results of our seepage analyses, URS seepage analyses, and past performance were used to decide which reaches met the USACE guidelines. In general, if one seepage analysis within a reach (either URS or Kleinfelder) did not meet criteria or several were near the criteria, the reach was deemed inadequate. In some cases variability was addressed in the seepage model or by performing a sensitivity analysis. In other cases the models were faithful to a specific boring location and the influence of variability was considered separately. Where the reach was deemed inadequate, mitigation measures that would permit safe performance against the 200-year WSE have been identified. These measures are summarized in Table 5.17 at the end of this chapter.

The following sections summarize, for each of the designated reaches, the geomorphology, performance history, levee topography, subsurface conditions, and seepage and slope stability analyses for the 100-year and 200-year WSE, and recommend mitigation measures by reach where appropriate. Additional information regarding descriptions and results of the seepage and slope stability analyses can be found in Appendices D and E, respectively.

5.10. REACH 1 - STATIONS 0+00, GARDEN HIGHWAY, TO 5+70

5.10.1. Geomorphology and Performance History

The levee along this reach is underlain by alluvium (Qa, Plate 3A). As previously discussed, the 1938 maps indicate the entire area of Reach 1 was affected by continuous high water including seepage (Plates 3D and 3E). The Department of Water Resources 1963 and 1965 seepage area maps also indicate seepage along the entire length of Reach 1 (Plate 3F). During a flood in 1997, a small pencil boil was observed at approximately Station 3+00.

5.10.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 43 to 44, the landside toe Elevation ranges from approximately 22 to 23, the 100-year WSE is 40.6, and the 200-year WSE is 42.4. No previous levee improvements were identified in this reach.

5.10.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE cone penetration test (CPT) CPT-00-1 and Boring 2F-01-01, and Kleinfelder 2004 Boring S-03-05.

- A levee embankment consisting primarily of clay and clayey sand.
- A fine-grained blanket layer approximately 20 to 40 feet thick consisting predominantly of clay and silt.
- An underlying pervious layer consisting predominantly of silty sand and sand.

The URS report (2005) indicates the presence of a thin sand layer at approximately Elevation 20 that is projected to daylight on the waterside of the levee. We were unable to identify the data source for this layer. We did not include this layer in the seepage model described below. We have requested information from URS and the USACE about this reported layer. Kleinfelder will update our analyses when the information is received.

5.10.4. Seepage Analysis (Station 3+00)

Through Seepage. A majority of levee fill in this reach is fine-grained with similar material in the foundation layer. The levee materials were modeled with isotropic permeability of 1H to 1V. Based on the model, seepage may exit the face of the levee up to 10 feet above the levee toe under steady state conditions at the 100-year WSE.

Underseepage. The blanket layer varies from 20 to 40 feet in thickness and contains some localized lenses of sand. Our seepage analysis indicates vertical exit gradients of 0.49 at the 100-year WSE and 0.54 at the 200-year WSE, which are near and in excess, respectively, of the USACE criteria of 0.5.

5.10.5. Stability Analysis (Station 2+00)

Stability. A stability analysis was performed to confirm results obtained by the USACE (USACE, 2002). The soil stratigraphy used by USACE was confirmed to agree with information obtained during our investigation. The levee fill material consists predominately of fine-grained soils with relatively high undrained shear strengths. Using the same internal phreatic surface as the USACE analysis, our calculations confirm this reach should meet USACE minimum Factor of Safety requirements of 1.4 (calculated factor of safety of 1.41). However, our through seepage analysis suggests the steady state phreatic surface may be higher than that used by USACE. A higher phreatic surface could result in a free seepage face along the landside slope of the levee. Seepage analysis with a higher steady state phreatic surface indicates this reach does not meet the minimum stability factor of safety.

5.10.6. Preliminary Conclusions and Recommendations

The seepage analyses performed indicate that the 200-year WSE could produce gradients in excess of 0.5 in this reach. Elevated gradients are considered likely to be present in the vicinity of this boring location. Therefore, we conclude that this reach does not meet USACE underseepage guidelines. Accordingly, construction of a SCB cutoff wall through the levee to Elevation -35, 75 feet deep, is recommended to cut off the shallow sand layers for the 200-year WSE.

Alternate Mitigation. Seepage berms could be used as an alternative to cutoff walls. If seepage berms are used the stability berm should be extended along this entire reach. The seepage berm should be constructed as required in the USACE "Design and Construction of Levees" EM 1110-2-1913 and the USACE Sacramento District SOP EDG-03 for "Geotechnical Levee Practice".

5.11. REACH 2 – STATIONS 5+70 TO 105+00

5.11.1. Geomorphology and Performance History

In the western half of the reach the levee is underlain by alluvium (Qa), in the eastern third of the reach the levee is underlain by basin deposits (Qb), and the middle portion is underlain by Riverbank formation (Qr) (Plate 3A). Two basin features are shown on Plate 3B near Station 28+00 (NCCB-2) and Station 103+00, southwest of NCCB-4. These features are areas with low topographic relief typically associated with lake or basin areas. The 1938 maps indicate the area south of the NCCSL between Stations 6+00 and 63+00 (the portion underlain by alluvium), and between Stations 100+00 and 105+00 were affected by continuous high water including seepage (Plates 3D and 3E). The Department of Water Resources 1963 and 1965 seepage area maps indicate seepage occurred along the entire length of Reach 2 (Plate 3F).

5.11.2. Levee Topography and Design Water Surface

The levee crown elevation ranges from approximately 42 to 43, the landside toe elevation ranges from approximately 18 to 32, the 100-year WSE is 40.6 and the 200-year WSE is 42.4.

A stability berm has been constructed along this entire reach. The MWH topographic drawings developed for the USACE Natomas project are consistent with record drawings prepared by MHM, Inc. The top of the berm is at Elevation 35. The berm is typically 15 feet wide with a 2% cross slope. The landside slope of the berm is estimated to be 2H to 1V.

A 10-foot deep, unlined ditch is located approximately 100 feet south from the levee toe from about Stations 19+00 to 97+00.

5.11.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE explorations CPT-00-2 through CPT-00-11 and Borings 2F-01-02 through 2F-01-07; Wahler 1987 Borings DH-16 and DH-17; Kleinfelder 2004 Borings S-04-1, S-04-2, and S-04-5; Kleinfelder 1996 Test Pits TPNCC-23 and TPNCC-24 and Borings

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BNCC-1, -8, -9, and -10; and Kleinfelder's Borings for the current investigation, NCCB-1 through NCCB–3.

- A levee embankment consisting primarily of clay and silt with minor sand lenses less than about 2 feet in thickness in the area of Station 52+00 and Boring 2F-01-05.
- A fine-grained blanket layer 20 to 30 feet thick consisting predominantly of clay and silt. The blanket layer soils become coarser (more sand content) to the west where silty sand and clayey sand layers are common in the areas of Stations 15+00 to 25+00 (S-04-5, DH-16, 2F-01-02, S-04-2, and NCCB-2) and Station 52+00 (2F-01-05).

5.11.4. Seepage Analysis (Station 73+00)

Through Seepage. Through seepage has been mitigated by constructing a stability berm for the entirety of this reach.

Underseepage. The blanket layer varies from 20 to 30 feet in thickness and contains some localized lenses of sand. The presence of an irrigation ditch on the landside of the levee causes a localized gradient in excess of the 0.5 USACE criteria at the 100-year WSE. These gradients are due to the USACE requirements of assuming the ditch is empty during a flood while also assuming that water levels surrounding the ditch are at the ground surface. Localized seepage is then forced to flow into the empty ditch, leading to high gradients. These gradients are therefore due to ground water flow alone and are essentially independent of flow through the levee itself. Gradients near the landside toe were less than the 0.5 criteria.

5.11.5. Stability Analysis (Station 102+00)

Stability. A stability analysis was performed to confirm results obtained by the USACE. The model was modified to include a higher internal phreatic surface indicated in our nearby seepage analysis model (Station 113+00). The soil stratigraphy used by USACE was confirmed to agree with new information obtained during our investigation. Our calculations indicate this reach exceeds the minimum stability factor of safety (1.4).

5.11.6. Preliminary Conclusions and Recommendations

Localized high gradients in the bottom of the irrigation canal do not meet USACE seepage criteria at the 100-year WSE. Therefore, we conclude that this reach does not meet USACE underseepage guidelines. Accordingly, construction of a SCB cutoff wall through the levee to Elevation –30, 70 feet deep, is recommended within this reach to mitigate underseepage for the 200-year NSE.

5.12. REACH 3 – STATION 105+00 TO STATION 123+00

5.12.1. Geomorphology and Performance History

The levee is underlain by basin deposits (Qb, Plate 3A). The 1938 maps indicate the entire area of Reach 3, south of the Cross Canal, was affected by continuous high water including seepage (Plates 3D and 3E). The Department of Water Resources seepage area maps indicate seepage was observed during 1963 along the entire length of Reach 3, south of the Cross Canal, but was not observed in 1965 (Plate 3F).

5.12.2. Levee Topography and Design Water Surface

The levee crown elevation is approximately 42, the landside toe elevation ranges from approximately 18 to 29, the 100-year WSE is 40.7, and the 200-year WSE is 42.4.

A stability berm has been constructed along most of this reach between stations 105+00 and 118+00. The MWH topographic drawings developed for the USACE Natomas project are consistent with record drawings prepared by MHM, Inc. The top of the berm is at Elevation 35. The berm is typically 15 feet wide with a 2% cross slope. The landside slope of the berm is estimated to be 2H to 1V.

5.12.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE explorations CPT-00-12, CPT-00-13, and Boring 2F-01-08; Kleinfelder 2004 Boring S-03-06; Kleinfelder 1996 test pit TPNCC-22; and Kleinfelder's Boring for the current investigation NCCB-4.

- A levee embankment consisting primarily of clay with some silt.
- A blanket layer in the western half of the reach that consists of 5 to 12 feet of clay and silt, with an isolated lens of poorly graded sand extending between approximately 3 and 12 feet below the surface of the levee toe. In the eastern half of the reach, soils consist of approximately 12 to 25 feet of clayey and poorly graded sands underlain by fat clay to the maximum depth explored, approximate Elevation –59.

A draft report by URS Consultants (2005) indicates the presence of a sand layer shown at approximately Elevation –20, extending from the water to under the levee. We were unable to identify the data source for this layer and it has not been included in the seepage model described below. We have requested information from URS and the USACE about this reported layer. We will update our analyses when the information is received.

5.12.4. Seepage Analysis (Station 113+00)

Through Seepage. Through seepage has been mitigated by constructing a stability berm for a majority of this reach. A seepage analysis was performed in an area without a stability berm and the levee materials were modeled with an isotropic permeability of 1 horizontal to 1 vertical. Based on the model, seepage may exit the landside slope face of the levee under steady state conditions about 10 feet above the toe of the levee for the 100-year WSE. This free seepage will result in landside slope stability not meeting USACE criteria (>1.4 factor of safety).

Underseepage. The blanket layer varies from 5 to 25 feet in thickness and contains some localized lenses of sand, however a blanket 16 feet thick was modeled in this analysis. Gradients near the landside toe were in excess of the 0.5 USACE criteria at the 100-year WSE.

5.12.5. Stability Analysis

Stability. Stability analyses were not performed along this reach. However, based on inspection and comparison with stability analysis performed in Reach 2, slope stability exceeds USACE minimum Factor of Safety requirements for steady state conditions where the stability berm is present. The eastern portion of the reach does not have a stability berm, therefore the landside slope does not meet USACE criteria.

5.12.6. Preliminary Conclusions and Recommendations

The seepage analysis performed indicates that both the 100-year and 200-year WSE could produce gradients in excess of 0.5 in this reach. Elevated gradients are considered likely to be present. Therefore, we conclude this reach does not meet USACE underseepage guidelines. Accordingly, construction of a SCB cutoff wall through the levee to Elevation -30, 70 feet deep, is recommended within this reach to mitigate underseepage for the 200-year WSE.

Alternate Mitigation. Seepage berms could be used as an alternative to cutoff walls. If seepage berms are used the stability berm should be extended through the eastern 500 feet of the reach. The seepage berm should be constructed as required in the USACE "Design and Construction of Levees" EM 1110-2-1913 and the USACE Sacramento District SOP EDG-03 for "Geotechnical Levee Practice".

5.13. REACH 4 – STATIONS 123+00 to 173+00

5.13.1. Geomorphology and Performance History

The middle portion of the reach is underlain by Riverbank formation (Qr) and Basin Deposits (Qb) underlie the levee at each end of the reach (Plate 3A). The 1938 maps indicate the entire area of Reach 4, south of the Cross Canal, was affected by continuous high water (Plates 3D and 3E). Seepage was noted in an area about 500 feet wide at its maximum dimension at the west end of the reach as well as along the approximate eastern half of the reach (Plate 3D). The Department of Water Resources 1963 and 1965 seepage area maps indicate seepage was not observed along Reach 4 (Plate 3F).

5.13.2. Levee Topography and Design Water Surface

The levee crown elevation ranges between approximately 42 and 43, the landside toe elevation ranges from approximately 20 to 27, the 100-year WSE is 40.7, and the 200-year WSE is 42.4.

A stability berm has been constructed along this reach between stations 164+00 and 173+00. The MWH topographic drawings developed for the USACE Natomas project are consistent with record drawings prepared by MHM, Inc. The top of the berm is at Elevation 35. The berm is typically 15 feet wide with a 2% cross slope. The landside slope of the berm is estimated to be 2H to 1V.

An irrigation ditch with an invert Elevation of about 21 is located about 100 feet from the landside toe of the levee.

5.13.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE explorations CPT-00-14 through CPT-00-17 and Borings 2F-01-09, 2F-01-10 and 2F-01-12; Wahler 1986 Boring DH-18; Kleinfelder 1996 Boring BNCC-11 and test pit TPNCC-20; and Kleinfelder's Borings for the current investigation NCCB-5 and NCCB-6.

- A levee embankment consisting primarily of clay and clayey sand.
- A fine-grained blanket layer of clay, clayey sand, and silt that ranges in thickness from approximately 5 to 25 feet and that includes sand lenses as thick as 5 feet.
- An underlying, discontinuous, pervious layer of poorly graded sand that extends from as shallow as approximately 10 feet below the surface of the levee toe to a depth of more than 60 feet below the levee toe.

A draft report by URS Consultants (2005) indicates that strata thin slightly to the south of the levee in this area. We were unable to identify the data source substantiating this inclination and it has not been included in a seepage model. We have requested

information from URS and the USACE about this inclination. Kleinfelder will update our analyses when information is received.

5.13.4. Seepage Analysis (Station 135+00)

Through Seepage. Through seepage has been mitigated by constructing a stability berm for the eastern portion of this reach between Stations 164+00 and 173+00. In areas without a stability berm, a majority of the levee fill is fine-grained with similar material in the foundation layer. A seepage analysis was performed in an area without a stability berm and the levee materials were modeled with an isotropic permeability of 1H:1V. Based on the model, seepage may exit the landside slope face of the levee under steady state conditions about 10 feet above the toe of the levee for the 100-year WSE. This free seepage face will develop under steady state conditions and landside slope stability will not meet USACE criteria in areas without a berm present (>1.4 factor of safety).

Underseepage. The blanket layer varies from 5 to 25 feet in thickness and contains some localized lenses of sand. Analysis produced gradients at the levee toe in excess of the USACE criteria of 0.5 using a blanket thickness of 12 feet. The presence of an irrigation ditch on the landside of the levee causes a localized gradient in excess of the 0.5 at the bottom of the ditch as well at the 100-year WSE. These gradients are due to the USACE requirements of assuming the ditch is empty during a flood while also assuming that water levels surrounding the ditch are at the ground surface. Localized seepage is then forced to flow into the empty ditch, leading to high gradients. These gradients are therefore due to ground water flow alone and are essentially independent of flow through the levee itself.

5.13.5. Stability Analysis

Stability. Stability analyses were not performed along this reach. However, based on inspection and comparison with results obtained in Reach 2, slope stability exceeds the USACE minimum Factor of Safety requirements for steady state conditions where the stability berm is present. In areas where the stability berm is not present the landside slope stability does not meet USACE criteria.

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5.13.6. Preliminary Conclusions and Recommendations

The seepage analysis performed indicates that the 100-year and 200-year WSE could produce gradients in excess of 0.5 in this reach. Elevated gradients are considered likely to be present between boring location. Therefore, we conclude that this reach does not meet USACE underseepage guidelines. Accordingly, construction of a SCB cutoff wall through the levee to Elevation –40, 80 feet deep, is recommended within this reach to mitigate underseepage for the 200-year WSE.

Localized high gradients in the bottom of the irrigation canal do not meet USACE seepage criteria at the 100-year WSE even with modeling a slurry cutoff wall. These results were obtained with the ditch empty in accordance with USACE SOP (2004). As stated previously, these gradients are due to the depth of the ditch and the boundary conditions and are independent of the distance to the levee. The gradient drops significantly if the ditch is full of water. At the 200-year WSE with the ditch full of water the gradient in the bottom of the ditch is not less than 0.7 at a distance of 100 feet from the levee toe, the acceptance criteria for a ditch. If boils appear in the ditch, portions of the ditch could be sand-bagged to raise the water level assuming that the ditch is accessible during or after periods of heavy rain. The ditch is 9 feet deep and 100 feet from the levee toe, which is in compliance with USACE guidelines. However, close monitoring and possibly sandbagging of the ditch is needed to assure this level of protection.

Alternate Mitigation. Seepage berms could be used as an alternative to cutoff walls. If seepage berms are used, the stability berm should be extended through the entire reach.

5.14. REACH 5 – STATION 173+00 TO 195+00

5.14.1. Geomorphology

The levee is underlain by basin deposits (Qb, Plate 3A). The 1938 maps indicate the entire area of Reach 5, south of the Cross Canal, was affected by continuous high water, but seepage was not indicated (Plates 3D and 3E). The Department of Water Resources 1963 and 1965 seepage area maps indicate seepage was not observed along Reach 5 (Plate 3F).

According to USACE 2002, the USACE repaired a slide that occurred "approximately 3,500 feet southwest of Highway 99" in 1983. The slide was triggered by excavation of a key trench at the toe of the levee. This slide was repaired by the USACE Sacramento District under emergency repair authority (PL84-99).

5.14.2. Topography and Design Water Surface

The levee crown elevation ranges between approximately 42 and 43, the landside toe elevation ranges from approximately 27 to 28, the 100-year WSE is 40.7, and the 200-year WSE is 42.4.

A stability berm has been constructed along this reach between stations 173+00 and 184+00. The MWH topographic drawings developed for the USACE Natomas project are consistent with record drawings prepared by MHM, Inc. The top of the berm is at Elevation 35. The berm is typically 15 feet wide with a 2% cross slope. The landside slope of the berm is estimated to be 2H to 1V.

An irrigation ditch with an invert Elevation of about 21 is located about 50 feet from the landside toe of the levee.

5.14.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE explorations CPT-00-18A, CPT-00-19 and CPT-00-20; Wahler 1987 Boring DH-19; Kleinfelder 1996 Borings BNCC-2 and BNCC-12; and Kleinfelder's Borings for the current investigation NCCB-7 through NCCB-9.

- A levee embankment consisting primarily of clay with minor lenses of silty sand less than approximately 3 feet thick.
- A fine grained blanket layer consisting primarily of clay, clayey sand, silt, and silty sand, ranging in thickness from approximately 8 to 30 feet.
- An underlying pervious layer consisting of poorly graded sand and poorly graded gravel, ranging in thickness from approximately 10 to 15 feet.

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5.14.4. Seepage Analysis (Station 183+00)

Through Seepage. Through seepage has been mitigated by constructing a stability berm for a majority of this reach between Stations 173+00 and 184+00. A seepage analysis was performed for a levee section within this reach without a stability berm. Based on the model, seepage may exit the landside slope face of the levee under steady state conditions about 10 feet above the toe of the levee for the 100-year WSE. This free seepage may result in landside slope stability not meeting USACE criteria.

Underseepage. Seepage analyses were performed along this reach. The presence of an irrigation ditch on the landside of the levee causes a localized gradient at the bottom of the ditch in excess of the 0.5 USACE criteria at the 100-year WSE. These gradients are due to the USACE requirements of assuming the ditch is empty during a flood while also assuming that water levels surrounding the ditch are at the ground surface. Localized seepage is then forced to flow into the empty ditch, leading to high gradients. These gradients are therefore due to ground water flow alone and are essentially independent of flow through the levee itself. Gradients near the landside toe were less than the 0.5 criteria at the 100-year WSE.

5.14.5. Stability Analysis

Stability. Stability analyses were not performed along this reach. However, based on inspection and comparison with results obtained in Reach 2, similar results should be obtained within this reach for areas without a stability berm. Based on this comparison, slope stability analyses should exceed USACE minimum Factor of Safety requirements of 1.4 where the stability berm is present and will not meet criteria in areas where the berm is not present.

5.14.6. Preliminary Conclusions and Recommendations

The seepage analysis performed indicates that the 200-year WSE could produce gradients in excess of 0.5 in this reach. Elevated gradients are considered likely to be present in the vicinity of this boring location. Therefore, we conclude that this reach does not meet USACE underseepage guidelines. Accordingly, construction of a SCB

cutoff wall through the levee to Elevation –40, 80 feet deep, is recommended within this reach to mitigate underseepage for the 200-year WSE.

Localized high gradients in the bottom of the irrigation canal do not meet USACE seepage criteria at the 100-year WSE. These results were obtained with the ditch empty in accordance with USACE SOP (2004). As stated previously, these gradients are due to the depth of the ditch and the boundary conditions and are independent of the distance to the levee. The gradient drops significantly if the ditch is full of water. At the 200-year WSE with the ditch full of water the gradient in the bottom of the ditch is less than 0.7 at a distance of 100 feet from the levee toe, the acceptance criteria for a ditch. If boils appear in the ditch, portions of the ditch could be sand-bagged to raise the water level assuming that the ditch is accessible during or after periods of heavy rain. The ditch is 7 feet deep and 100 feet from the levee toe, which is in compliance with USACE guidelines. However, close monitoring and possibly sandbagging of the ditch is needed to assure this level of protection.

Alternate Mitigation. Seepage berms could be used as an alternative to cutoff walls. If seepage berms are used the stability berm should be extended through the entire reach.

5.15. REACH 6 – STATION 195+00 TO 280+00

5.15.1. Geomorphology

The west half of the reach is underlain by Riverbank formation (Qr) and the east half of the reach is underlain by Modesto Formation (Qm) (Plate 3A). One of the 1938 maps indicate an area extending 3,200 feet northeast from the west end of Reach 6 and south of the Cross Canal was affected by continuous high water (Plate 3E). However, no seepage was mapped. The Department of Water Resources 1963 and 1965 seepage area maps indicate seepage was not observed along Reach 6 (Plate 3F).

5.15.2. Topography and Design Water Surface

The levee crown is approximately Elevation 43. The landside toe elevation ranges from approximately 23 to 32, the 100-year WSE is 40.7, and the 200-year WSE is 42.4.

A stability berm has been constructed along the western half of the reach between Stations 196+00 to 225+50 and 228+00 to 230+00. The MWH topographic drawings developed for the USACE Natomas project are consistent with record drawings prepared by MHM, Inc. The top of the berm is at Elevation 35. The berm is typically 15 feet wide with a 2% cross slope. The landside slope of the berm is estimated to be 2H to 1V. Highway 70/99 crosses the levee between Station 225+50 and 228+00.

According to the USACE, a slide occurred in 1986, approximately 2,000 feet west of Highway 99, and longitudinal cracks indicative of slope instability were observed in the levee crown approximately 400 feet southwest of the highway.

5.15.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE explorations CPT-00-21 through CPT-00-26 and Borings 2F-01-15, 2F-01-16, 2F-01-19 and 2F-01-20; Wahler 1987 Borings DH-20, DH-20A, DH-22 and DH-23; Caltrans Boring CT-1987-82; Kleinfelder 1996 Boring BNCC-3 and test pits TPNNC-17 and TPNCC-18; Kleinfelder 2003 Boring S-03-7; and Kleinfelder's Borings for the current investigation: NCCB-10 through NCCB-13.

- A levee embankment consisting primarily of clay and silt.
- A find-grained blanket layer consisting primarily of clay in the western half and clay and silt in the eastern half, and ranging in thickness from approximately 5 feet to 33 feet.
- In the vicinity of Station 270+00, the clay and silt blanket pinches out and is replaced by interbedded poorly graded sand and clayey sand.
- An underlying pervious layer consisting primarily of poorly graded sand, with some silty sand.
- Clayey and poorly graded sand layers 5 to 15 feet thick are interbedded with clays for the entire depth explored along the eastern portion of this reach.

5.15.4. Seepage Analysis (Stations 250+00 and 270+00)

Through Seepage. Through seepage has been mitigated by constructing a stability berm for a portion of this reach roughly between Stations 196+00 and 230+00. In areas without a stability berm, a majority of the levee fill is fine-grained with similar material in the foundation layer. The seepage analysis at Station 250+00 was performed in an area without a stability berm and the analysis performed at Station 270+00 was performed in an area where previous construction has been performed including an internal levee drain. Based on the models, levee through seepage under steady state conditions for the 100-year WSE in areas where a stability berm is present is not a concern. However, in areas where a stability berm is not present, excluding the Highway 70/99 crossing, seepage may exit the landside slope face of the levee under steady state conditions about 10 feet above the toe of the levee for the 100-year WSE. This free seepage may result in landside slope stability not meeting USACE criteria.

Underseepage. The blanket layer varies from 5 to 33 feet in thickness and contains various areas of near surface sands as well as localized lenses of sand. The analysis produced gradients in excess of 0.5 at the landside levee toe where a 10 foot thick blanket was modeled. These gradients do not meet USACE minimum criteria at the 100-year or 200-year WSE.

5.15.5. Stability Analysis

Stability. Stability analyses were not performed along this reach. However, based on inspection and comparison with results obtained in Reach 2, similar results should be obtained within this reach for areas without a stability berm. Based on this comparison, slope stability analyses should exceed USACE minimum Factor of Safety requirements of 1.4 where the stability berm is present and will not meet USACE criteria in areas where the berm is not present.

5.15.6. Preliminary Conclusions and Recommendations

The seepage analyses performed indicate that the 100-year and 200-year WSE could produce gradients in excess of 0.5 at several boring locations in this reach. Elevated gradients are considered likely to be present in the vicinity of these boring locations. Therefore, we conclude that this reach does not meet USACE underseepage

guidelines. Accordingly, construction of a SCB cutoff wall through the levee to Elevation –40, 80 feet deep, is recommended within this reach to mitigate underseepage for the 200-year WSE.

Alternate Mitigation. Seepage berms could be used as an alternative to cutoff walls. If seepage berms are used the stability berm should be extended through the entire reach.

5.16. REACH 7 – STATION 280+00 TO STATION 287+00

5.16.1. Geomorphology and Past Performance

The levee is underlain by the Modesto Formation (Qm, Plate 3A). The 1938, 1963, and 1965 maps indicate Reach 7 was not affected by continuous high water and seepage was not observed (Plates 3D, 3E, and 3F).

5.16.2. Topography and Design Water Surface

The levee crown is approximately Elevation 44. The landside toe elevation ranges from approximately 29 to 32, the 100-year WSE is 40.7, and the 200-year WSE is 42.4.

5.16.3. Subsurface Conditions

The following description of subsurface conditions is based upon soils encountered in the USACE explorations CPT-00-27 and CPT-00-28, and Kleinfelder's Borings for the current investigation: NCCB-14 through NCCB-16.

- A levee embankment consisting primarily of clay.
- A discontinuous blanket layer consisting of a maximum 15 feet of clay and silt at the eastern and western ends of the reach. In the center of the reach, in the vicinity of 270+00, the clay and silt blanket pinches out and is replaced by interbedded poorly graded sand, clayey sand.
- Clayey and poorly graded sand layers 5 to 15 feet thick are interbedded with clays for the entire depth explored.

5.16.4. Seepage and Stability Analysis

Through Seepage. Seepage analysis was not performed for this reach. However, results from other reaches suggest the free seepage face extends about halfway up the levee face, about 10 feet above the levee toe.

Underseepage. Seepage analyses were not performed along this reach. However, based on inspection, presence of thick sand layers in the foundation of the levee, and comparison with results obtained in Reach 2, similar results should be expected within this reach. Based on this comparison, seepage analyses gradients should meet USACE minimum criteria of 0.5 at the 100-year WSE.

Stability. Stability analyses were not performed along this reach. However, based on inspection and comparison with results obtained in Reach 2, similar results should be obtained within this reach. Based on this comparison, slope stability analyses will not meet USACE minimum Factor of Safety requirements of 1.4.

5.16.5. Preliminary Conclusions and Recommendations

Due to similarities found in the seepage analyses performed for Reach 2, we conclude that this reach meets USACE underseepage guidelines for the 200-year WSE. However, based on the stability analysis performed for Reach 2, construction of a stability berm along the landside levee slope is recommended along this reach to mitigate potential through seepage for the 200-year WSE.

5.17. SUMMARY OF REACH SPECIFIC RECOMMENDATIONS

The following table summarizes the recommendations and limits of mitigation for the 200-year WSE.

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Table 5.17 - Summary of Mitigation Recommendations by Reach and Station

Levee Reach	Station	Existing Mitigation	Proposed Cutoff Wall Depth (feet)
Reach 1	0+00 to 5+70	None	75
Reach 2	5+70 to 105+00	Drained stability berm, entire reach	70
Reach 3	105+00 to 123+00	Drained stability berm, Stations 105+00 to 118+00	70
Reach 4	123+00 to 173+00	Drained stability berm, Stations 164+00 to 173+00	80
Reach 5	173+00 to 195+00	Drained stability berm, Stations 173+00 to 184+00	80
Reach 6	195+00 to 280+00	Drained stability berm, Stations 196+00 to 225+50 and 228+00 to 230+00	80
Reach 7	280+00 to 287+00	None	Stability berm*

*For through seepage only

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6 LIMITATIONS

Recommendations contained in this report are based on our field observations, subsurface explorations completed by Kleinfelder and others, laboratory tests, and our present knowledge of the existing levee conditions. It is possible that soil conditions could vary between or beyond the points explored.

We have prepared this report in substantial accordance with the generally accepted geotechnical engineering practice as it exists in the site area at the time of our study. No warranty, express or implied, is made.

This report may be used only by the Client and only for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both on site and off site), or other factors may change over time and additional work may be required with the passage of time. Any party other than the Client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the Client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party.

DRAFT

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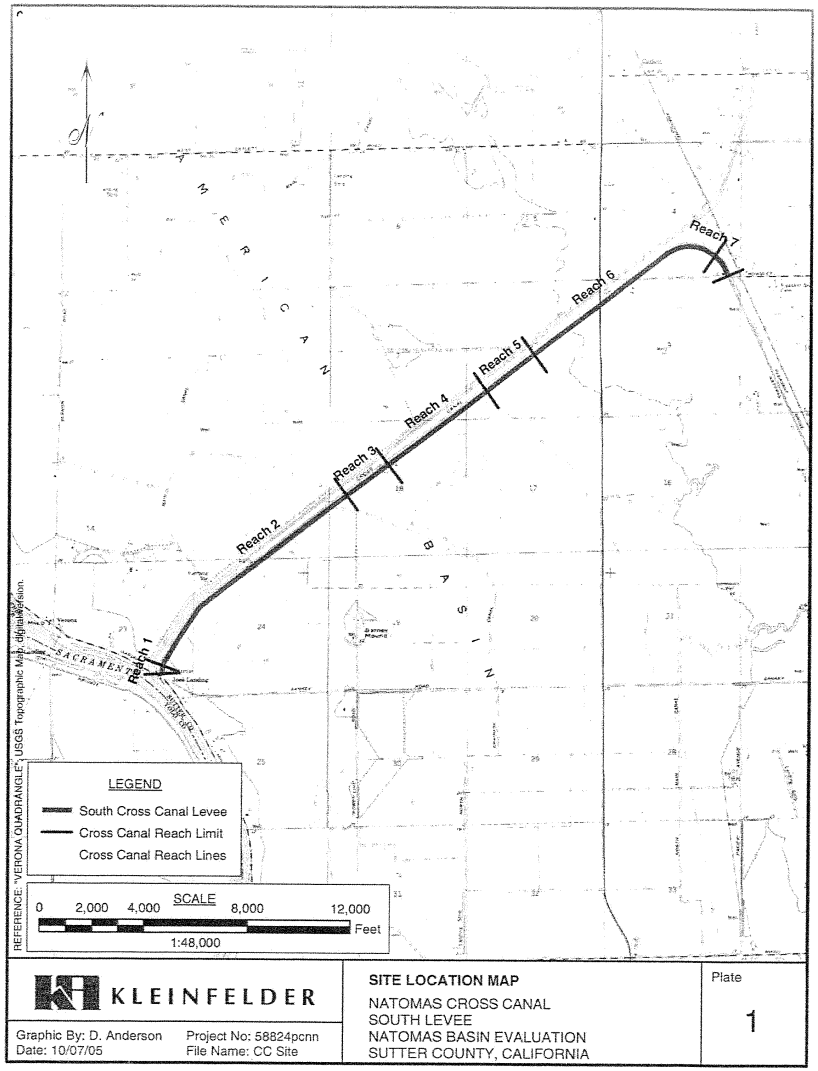


U.S. Department of Homeland Security
FEMA - Region IX - FI&M Division
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

FEMA

To: All Community Floodplain Administrators and their staff

From: Les Sakumoto, P.E., Civil Engineer
FEMA, Region IX, Mitigation Division, NFIP

Date: April 17, 2006

Re: Status of the Digital Flood Insurance Rate Map (DFIRM)

This memo is to inform you of changes that will be made in the processing of the Digital Flood Insurance Rate Maps (DFIRMs) that are being prepared for your community. This will directly affect the final "effective" dates of any DFIRMs that are being currently processed for your community.

Prior to August 2005, FEMA-Region IX had begun the process of converting paper FIRMs to digital. The end product is called the DFIRM. This was a part of FEMA's Map Modernization program. The primary goals of the DFIRM production were to:

- Incorporate the latest updates (LOMRs),
- Utilize community supplied data,
- Verify the currency of the floodplains and refit them to community supplied basemaps,
- Upgrade the FIRMs to a GIS database format to set the stage for follow on updates and to enable support for GIS analyses and other digital applications, and
- Solicit community participation.

We have successfully managed to meet all those goals. Many communities stepped up and provided us their updated high accuracy basemaps and participated in the review of the mapping products. FEMA is thankful to all of the communities that have participated.

In August 2005, FEMA Headquarters' issued Memo 34, *Interim Guidance for Studies Including Levees*. This memo recognizes the risk and vulnerability of communities with levees. Hurricane Katrina, in September 2005, and its resulting levee failures only heightened the awareness. The memo mandates the inclusion of levee evaluations for those communities that are undergoing map changes such as the conversion to DFIRMs. No maps could become effective without an evaluation of all levees within a community against the criteria set forth in 44 CFR 65.10 *Mapping of Areas Protected by Levee Systems*. In order to carry out this mandate for all maps in production, we will take a two phased approach. The two phases are as follows:

> **Phase I.** For communities that have already received Preliminary Flood Insurance Rate Maps (Prelims) during the August-September 2005 period, we will issue new revised Prelims which have the levee evaluation based on approximate analyses. Approximate analyses will most likely result in an "A" zone designation behind a levee which did not

Greenbriar Draft EIR Comments
James P. Pachl, 9/5/06
Exhibit Thirteen

EXHIBIT 13

meet the criteria set forth in 44 CFR 65.10. For communities that are currently in the production phase of DFIRM Prelims, we will merge the levee evaluations, based on an approximate analysis, into the Prelims. Any Prelims issued will also include the vertical datum conversion to NAVD88. Note that for communities with coastal structures such as levees and breakwaters, they will also be evaluated at this time. Based on our internal databases and information collected to date, if the levees do not meet our present 44 CFR 65.10 criteria, we will note them as failed and will re-delineate the Special Flood Hazard Area (SFHA). For the Prelims, the new SFHAs can be considered to be "advisory". Attached are the FEMA memos on the use of Advisory Flood Hazard Data, Memo 34, and the vertical datum conversions. We anticipate the following schedule for the release of these revised or new Prelims.

***September-October 2006 - New Prelims by Counties:**
California: Kings, Fresno, Madera, Merced, Stanislaus, San Joaquin, El Dorado, Placer, Yolo, and Butte.
Nevada: Washoe.

***June-July 2007 - Revised Prelims by Counties:**
California: Marin, Sonoma, Napa, Solano, Contra Costa, Alameda, Santa Clara, San Mateo, San Francisco, Sacramento, Monterey, and Tulare.

***June-July 2007 - New Prelims by Counties:**
California: Lake and Santa Cruz.

***Note 1:** The above schedules are dependent on the availability of funds for FY2006 and FY2007 but we will do our best to hold to these schedules.

***Note 2:** The communities and levee owners will be afforded the opportunity to submit data and documentation per 44 CFR 65.10 to support their recertification documentation.

Phase II. All communities that have received Prelims or revised preliminary maps during Phase I will have the levees evaluated and restudied using more rigorous, detailed engineering study methods, beginning in FY2007. This will be done before these maps are processed into final "effective" maps that will be legally binding for floodplain management and flood insurance purposes. At the conclusion of the detailed studies, FEMA will again issue revised Prelims followed by our standard post processing procedures. Some of the post processing procedures that many of you are already familiar with are the 90 day community comment and appeal period, the resolution of any appeals, and the six month compliance period. The detailed studies will use a combination of the best available information and high resolution topographic data. A FEMA contractor will be contacting all of the communities requesting any high resolution topographic data that you may have to enable us to increase the accuracy when defining the depths and widths of the flood risks. We will also be contacting the community, the levee owners, levee districts, and various state and federal agencies for recertification of the levees. We cannot give you a definite schedule for this phase as detailed studies with levee evaluations are very costly and are dependent upon our funding in the latter years. Other factors that will affect the scheduling are the level of risk, and other economic and demographic factors.

The above schedule gives the communities the advantage of time before these maps become legally effective. The Prelims and detailed studies will take more than a few years to complete, during the intervening period, the communities should put their best efforts towards rehabilitating and recertifying their levees. Prudent floodplain management includes good maintenance and FEMA would like nothing better than to issue an effective map with minimized risks behind levees that are certified to meet our present 44 CFR 65.10 criteria.

I know that this may be a lot to digest. Therefore, FEMA has appointed a contact person to provide answers on any questions that you may have concerning:

- DFIRM schedules,
- Levee evaluations,
- Vertical datum conversions,
- "Advisory" status of the Prelims,
- Effective maps, and
- Any other questions related to this memo.

The contact person is:

Jack Eldridge
(707) 495-9533 Cell
(510) 879-0956 Office

I am also available to answer your questions at (510) 627-7183.

Thank you for your attention in this matter.

Attachments:

1. Memo 34, "Interim Guidance for Studies Including Levees".
2. Advisory Flood Hazard Data
3. 44 CFR 65.10, "Mapping of Areas Protected by Levee Systems"
4. "Guidance for converting to the North American Vertical Datum of 1988". This is a 13 page document. Because of its size, it was not reproduced. It is available at this web address: http://www.fema.gov/pdf/fhm/frm_gsab02.pdf

Attachment 1: Memo 34

Federal Emergency Management Agency
Washington, D.C. 20472

August 22, 2005

MEMORANDUM FOR: Regional Directors
Regions I - X

FROM: David I. Maurstad, Acting Director
Mitigation Division

SUBJECT: Procedure Memorandum 34 – Interim Guidance for Studies Including Levees

Background: Throughout the United States, levees protect numerous communities and large expanses of agricultural land from floods. Their importance in mitigating flood hazards and their relevance to the National Flood Insurance Program (NFIP) are indisputable. However, riverine and coastal levees, in the aggregate, stretch for tens of thousands of miles, and information on their location, structural integrity, and certification often is outdated or missing altogether.

Issue: To address this challenge, a Levee Coordination Committee—including representatives from FEMA, other Federal agencies, and States—is examining current levee regulations and assisting in the development of a long-term policy that protects citizens and property, while accommodating the needs of the NFIP. This memorandum helps to clarify the entities responsible for providing information on levees identified during a mapping project.

Action Taken: Until the new policy is developed, this memo provides interim guidance to minimize delays in near-term mapping studies. The attached flow chart supplements FEMA's procedure memorandums 30 and 32. This information is in conformance with Section 65.10 of the NFIP regulations.

Supplement to Procedure Memo 30—FEMA Levee Inventory System.
Mapping partners – CTPs, IDIQs, OFAs, etc. -- should continue providing information about levees located in or adjacent to study areas. Information should be provided via the FEMA Levee Inventory System (FLIS) according to Procedure Memorandum 30 and the instructions available on the FLIS Web site located at http://flis.pbsjdfirm.com. The FLIS will be accessed via the MIP after release 3.0.

Levee coordinates should be gathered at a level of detail consistent with GIS accuracy and digital Flood Insurance Rate Map (FIRM) standards. Mapping partners who do not already have access to the FLIS can contact the National Service Provider at (703) 960-8800.

Supplement to Procedure Memo 32—Levee Review Protocol.
The protocol for levee reviews, particularly the details provided in Table 1 of Procedure Memorandum 32, is revised according to the attached flow chart.

Identification of Levees
It is critical that all levees within the scope of the mapping project be identified early in the mapping project, ideally no later than the scoping meeting. The role of all mapping partners, including coordination with the State and other Federal partners (e.g., U.S. Army Corps of Engineers), related to review of levee certification should be clearly identified as part of the scoping process. When levees are identified at the scoping meeting the community must be informed of the data requirements for FEMA to recognize a levee as providing protection from the 1-percent-annual-chance flood (base flood) on the FIRM. In accordance with 44 CFR Section 65.10(a), it is the responsibility of the community or other party seeking recognition of a levee system at the time of a flood risk study or restudy to provide the data outlined in 44 CFR Section 65.10. FEMA will not be conducting detailed examinations of levees to determine how a structure or system will perform in a flood event. In addition, the community or party seeking recognition should be provided with a deadline for submitting the data and informed that if the data are not submitted by the deadline, the levee cannot be recognized as providing protection from the base flood as part of the current mapping effort. However, a revision could be initiated once data are available.

Early identification of levees allows the mapping partner to outline to the community, or party seeking recognition, their responsibilities and FEMA's expectations to minimize study delays. In order to aid our mapping partners in properly assessing how to handle levee mapping issues, we have generated the below flowchart.

cc: See Distribution List

Distribution List (electronic distribution only):

Office of the Mitigation Division Director
Risk Assessment Branch
Risk Identification Branch
Flood Insurance and Mitigation Divisions in FEMA Regional Offices
Office of Legislative Affairs
Office of General Counsel
National Service Provider
Systems Engineering and Technical Assistance Contractor
Map Service Center

Attachment 2: Advisory Flood Hazard Data

Reference: Floodplain Management Bulletin 1-98
Use of Flood Insurance Study Data As Available Data

Page 6:

Advisory Flood Hazard Data:

FEMA may issue advisory flood hazard data in certain situations. A major flood disaster, such as from a coastal storm or from a failure of a flood protection system, may result in a community's effective FIS and FIRMs underestimating the extent of the flood hazard and the risk of flooding. FEMA may undertake a post-flood survey to document additional areas of the community subject to the base flood (1% annual chance) and to develop estimated flood elevations which will be used to reanalyze and revise the effective FIS and FIRMs. The information from the post-flood survey will be provided to communities as advisory information when the analyses indicates that the effective FIS and FIRMs are inaccurate. Also, communities may obtain or develop flood hazard data that indicates existing flood hazard areas that shows a greater risk than what is in the effective FIS and on the FIRM.

Communities are advised to prudently use this information for regulating floodplain development. When communities receive advisory flood hazard information or have evidence that there is an increased flood hazard risk, communities have a responsibility to evaluate and prudently use this information for actions in the floodplain to ensure that structures are not vulnerable to flood damage. If a community chooses to use this information, it is advised that the community formally adopt the information. Neglecting to take into consideration advisory or other flood hazard information and not taking reasonable actions to ensure that the health, safety, and property of their citizens are protected may subject the community to potential liability when flooding occurs.

Attachment 3: 44 CFR 65.10 Mapping of areas protected by levee systems.

water surface profile of the original hydraulic computer model. The alternate model must be then modified to include all encroachments that have occurred since the existing floodway was developed.

(ii) The floodway analysis must be performed with the modified computer model using the desired floodway limits.

(iii) The floodway limits must be set so that combined effects of the past encroachments and the new floodway limits do not increase the effective base flood elevations by more than the amount specified in §60.3(d)(2). Copies of the input and output data from the original and modified computer models must be submitted.

(3) Delineation of the revised floodway on a copy of the effective NFIP map and a suitable topographic map.

(d) *Certification requirements.* All analyses submitted shall be certified by a registered professional engineer. All topographic data shall be certified by a registered professional engineer or licensed land surveyor. Certifications are subject to the definition given at §65.2 of this subchapter.

(e) *Submission procedures.* All requests that involve changes to floodways shall be submitted to the appropriate FEMA Regional Office servicing the community's geographic area.

[51 FR 30315, Aug. 25, 1986]

§65.8 Review of proposed projects.

A community, or an individual through the community, may request FEMA's comments on whether a proposed project, if built as proposed, would justify a map revision. FEMA's comments will be issued in the form of a letter, termed a Conditional Letter of Map Revision, in accordance with 44 CFR part 72. The data required to support such requests are the same as those required for final revisions under §§65.5, 65.6, and 65.7, except as-built certification is not required. All such requests shall be submitted to the FEMA Headquarters Office in Washington, DC, and shall be accompanied by the appropriate payment, in accordance with 44 CFR part 72.

[62 FR 5736, Feb. 6, 1997]

§65.9 Review and response by the Administrator.

If any questions or problems arise during review, FEMA will consult the Chief Executive Officer of the community (CEO), the community official designated by the CEO, and/or the requester for resolution. Upon receipt of a revision request, the Administrator shall mail an acknowledgment of receipt of such request to the CEO. Within 90 days of receiving the request with all necessary information, the Administrator shall notify the CEO of one or more of the following:

(a) The effective map(s) shall not be modified;

(b) The base flood elevations on the effective FIRM shall be modified and new base flood elevations shall be established under the provisions of part 67 of this subchapter;

(c) The changes requested are approved and the map(s) amended by Letter of Map Revision (LOMR);

(d) The changes requested are approved and a revised map(s) will be printed and distributed;

(e) The changes requested are not of such a significant nature as to warrant a reissuance or revision of the flood insurance study or maps and will be deferred until such time as a significant change occurs;

(f) An additional 90 days is required to evaluate the scientific or technical data submitted; or

(g) Additional data are required to support the revision request.

(h) The required payment has not been submitted in accordance with 44 CFR part 72, no review will be conducted and no determination will be issued until payment is received.

[51 FR 30315, Aug. 25, 1986; 61 FR 46331, Aug. 30, 1996, as amended at 62 FR 5736, Feb. 6, 1997]

§65.10 Mapping of areas protected by levee systems.

65.10

(a) *General.* For purposes of the NFIP, FEMA will only recognize in its flood hazard and risk mapping effort those levee systems that meet, and continue to meet, minimum design, operation, and maintenance standards that are consistent with the level of protection sought through the comprehensive

flood plain management criteria established by §60.3 of this subchapter. Accordingly, this section describes the types of information FEMA needs to recognize, on NFIP maps, that a levee system provides protection from the base flood. This information must be supplied to FEMA by the community or other party seeking recognition of such a levee system at the time a flood risk study or restudy is conducted, when a map revision under the provisions of part 65 of this subchapter is sought based on a levee system, and upon request by the Administrator during the review of previously recognized structures. The FEMA review will be for the sole purpose of establishing appropriate risk zone determinations for NFIP maps and shall not constitute a determination by FEMA as to how a structure or system will perform in a flood event.

(b) *Design criteria.* For levees to be recognized by FEMA, evidence that adequate design and operation and maintenance systems are in place to provide reasonable assurance that protection from the base flood exists must be provided. The following requirements must be met:

(1) *Freeboard.* (i) Riverine levees must provide a minimum freeboard of three feet above the water-surface level of the base flood. An additional one foot above the minimum is required within 100 feet in either side of structures (such as bridges) riverward of the levee or wherever the flow is constricted. An additional one-half foot above the minimum at the upstream end of the levee, tapering to not less than the minimum at the downstream end of the levee, is also required.

(ii) Occasionally, exceptions to the minimum riverine freeboard requirement described in paragraph (b)(1)(i) of this section, may be approved. Appropriate engineering analyses demonstrating adequate protection with a lesser freeboard must be submitted to support a request for such an exception. The material presented must evaluate the uncertainty in the estimated base flood elevation profile and include, but not limited to: Expected flow velocities (especially in constricted areas); expected wind and wave action; ice loading; impact of debris; slope protection techniques; duration of flooding at various stages and velocities; embankment and foundation materials; levee alignment, bends, and transitions; and levee side slopes.

(iii) For coastal levees, the freeboard must be established at one foot above the height of the one percent wave or the maximum wave runup (whichever is greater) associated with the 100-year stillwater surge elevation at the site.

(iv) Occasionally, exceptions to the minimum coastal levee freeboard requirement described in paragraph (b)(1)(iii) of this section, may be approved. Appropriate engineering analyses demonstrating adequate protection with a lesser freeboard must be submitted to support a request for such an exception. The material presented must evaluate the uncertainty in the estimated base flood loading conditions. Particular emphasis must be placed on the effects of wave attack and overtopping on the stability of the levee. Under no circumstances, however, will a freeboard of less than two feet above the 100-year stillwater surge elevation be accepted.

(2) *Closures.* All openings must be provided with closure devices that are structural parts of the system during operation and design according to sound engineering practice.

(3) *Embankment protection.* Engineering analyses must be submitted that demonstrate that no appreciable erosion of the levee embankment can be expected during the base flood, as a result of either currents or waves, and that anticipated erosion will not result in failure of the levee embankment or foundation directly or indirectly through reduction of the seepage path and subsequent instability. The factors to be addressed in such analyses include, but are not limited to: Expected flow velocities (especially in constricted areas); expected wind and wave action; ice loading; impact of debris; slope protection techniques; duration of flooding at various stages and velocities; embankment and foundation materials; levee alignment, bends, and transitions; and levee side slopes.

(4) *Embankment and foundation stability.* Engineering analyses that evaluate levee embankment stability must be submitted. The analyses provided shall evaluate expected seepage during loading conditions associated with the base flood and shall demonstrate that seepage into or through the levee foundation and embankment will not jeopardize embankment or foundation stability. An alternative analysis demonstrating that the levee is designed and constructed for stability against loading conditions for Case IV as defined in the U.S. Army Corps of Engineers (COE) manual, ''Design and Construction of Levees'' (EM 1110–2–1913, Chapter 6, Section II), may be used. The factors that shall be addressed in the analyses include: Depth of flooding, duration of flooding, embankment geometry and length of seepage path at critical locations, embankment and foundation materials, embankment compaction, penetrations, other design factors affecting seepage (such as drainage layers), and other design factors affecting embankment and foundation stability (such as berms).

(5) *Settlement.* Engineering analyses must be submitted that assess the potential and magnitude of future losses of freeboard as a result of levee settlement and demonstrate that freeboard will be maintained within the minimum standards set forth in paragraph (b)(1) of this section. This analysis must address embankment loads, compressibility of embankment soils, compressibility of foundation soils, age of the levee system, and construction compaction methods. In addition, detailed settlement analysis using procedures such as those described in the COE manual, ''Soil Mechanics Design—Settlement Analysis'' (EM 1100–2–1904) must be submitted.

(6) *Interior drainage.* An analysis must be submitted that identifies the source(s) of such flooding, the extent of the flooded area, and, if the average depth is greater than one foot, the water-surface elevation(s) of the base flood. This analysis must be based on the joint probability of interior and exterior flooding and the capacity of facilities (such as drainage lines and pumps) for evacuating interior floodwaters.

(7) *Other design criteria.* In unique situations, such as those where the levee system has relatively high vulnerability, FEMA may require that other design criteria and analyses be submitted to show that the levees provide adequate protection. In such situations, sound engineering practice will be the standard on which FEMA will base its determinations. FEMA will also provide the rationale for requiring this additional information.

(c) *Operation plans and criteria.* For a levee system to be recognized, the operational criteria must be as described below. All closure devices or mechanical systems for internal drainage, whether manual or automatic, must be operated in accordance with an officially adopted operation manual, a copy of which must be provided to FEMA by the operator when levee or drainage system recognition is being sought or when the manual for a previously recognized system is revised in any manner. All operations must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP.

(1) *Closures.* Operation plans for closures must include the following:

(i) Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials, that will be used to trigger emergency operation activities and demonstration that sufficient flood warning time exists for the completed operation of all closure structures, including necessary sealing, before floodwaters reach the base of the closure.

(ii) A formal plan of operation including specific actions and assignments of responsibility by individual name or title.

(iii) Provisions for periodic operation, at not less than one-year intervals, of the closure structure for testing and training purposes.

(2) *Interior drainage systems.* Interior drainage systems associated with levee systems usually include storage areas, gravity outlets, pumping stations, or a combination thereof. These drainage systems will be recognized by FEMA on NFIP maps for flood protection purposes only if the following minimum

criteria are included in the operation plan:

(i) Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials, that will be used to trigger emergency operation activities and demonstration that sufficient flood warning time exists to permit activation of mechanized portions of the drainage system.

(ii) A formal plan of operation including specific actions and assignments of responsibility by individual name or title.

(iii) Provision for manual backup for the activation of automatic systems.

(iv) Provisions for periodic inspection of interior drainage systems and periodic operation of any mechanized portions for testing and training purposes. No more than one year shall elapse between either the inspections or the operations.

(3) *Other operation plans and criteria.* Other operating plans and criteria may be required by FEMA to ensure that adequate protection is provided in specific situations. In such cases, sound emergency management practice will be the standard upon which FEMA determinations will be based.

(d) *Maintenance plans and criteria.* For levee systems to be recognized as providing protection from the base flood, the maintenance criteria must be as described herein. Levee systems must be maintained in accordance with an officially adopted maintenance plan, and a copy of this plan must be provided to FEMA by the owner of the levee system when recognition is being sought or when the plan for a previously recognized system is revised in any manner. All maintenance activities must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP that must assume ultimate responsibility for maintenance. This plan must document the formal procedure that ensures that the stability, height, and overall integrity of the levee and its associated structures and systems are maintained. At a minimum, maintenance plans shall specify the maintenance activities to be performed, the frequency of their performance, and the person by name or title responsible for their performance.

(e) *Certification requirements.* Data submitted to support that a given levee system complies with the structural requirements set forth in paragraphs (b)(1) through (7) of this section must be certified by a registered professional engineer. Also, certified as-built plans of the levee must be submitted. Certifications are subject to the definition given at §65.2 of this subchapter. In lieu of these structural requirements, a Federal agency with responsibility for levee design may certify that the levee has been adequately designed and constructed to provide protection against the base flood.

[51 FR 30316, Aug. 25, 1986]

§ 65.11 Evaluation of sand dunes in mapping coastal flood hazard areas.

(a) *General conditions.* For purposes of the NFIP, FEMA will consider storm-induced dune erosion potential in its determination of coastal flood hazards and risk mapping efforts. The criterion to be used in the evaluation of dune erosion will apply to primary frontal dunes as defined in §59.1, but does not apply to artificially designed and constructed dunes that are not well-established with long-standing vegetative cover, such as the placement of sand materials in a dune-like formation.

(b) *Evaluation criterion.* Primary frontal dunes will not be considered as effective barriers to base flood storm surges and associated wave action where the cross-sectional area of the primary frontal dune, as measured perpendicular to the shoreline and above the 100-year stillwater flood elevation and seaward of the dune crest, is equal to, or less than, 540 square feet.

(c) *Exceptions.* Exceptions to the evaluation criterion may be granted where it can be demonstrated through authoritative historical documentation that the primary frontal dunes at a specific site withstood previous base flood storm surges and associated wave action.

[53 FR 16279, May 6, 1988]

LETTER 29

James P. Pachl
September 5, 2006

29-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

29-2 Regarding the project's flooding impacts and the current state of flood certification and the ongoing actions to improve flood safety in the Natomas area please refer to Master Response 1. The commenter does not provide specifics on how the analysis in the DEIR is inadequate, therefore no further response can be provided.

29-3 In response to new information that became available during the public review period of the DEIR regarding the flood safety status of the levees in the Natomas area, the City and LAFCo recirculated the DEIR to incorporate this new information. As described in the RDEIR, the project would result in a new significant and unavoidable temporary flooding impact as a result of new evidence indicating that the Natomas area levees are subject to flooding risks. Essentially, the City has agreed to comply with any development limitations on or flood insurance requirements imposed by FEMA as a result of the impending remap. Please refer to Master Response 1 for a detailed discussion of the project's flooding impacts and the current state of flood certification and the ongoing actions to improve flood safety in the Natomas area.

29-4 Please refer to response to comment 29-3 and Master Response 1.

29-5 Please refer to response to comment 29-3 and Master Response 1. A full description of the information contained within referenced documents addressing the stability of the Natomas Levees is described in Master Response 1 and Section 6.10, " Hydrology, Drainage, and Water Quality," of the RDEIR.

With regard to the various studies cited in the comment, they were prepared at the same time as the DEIR, and were considered in the SAFCA studies cited in the DEIR and addressing the adequacy of the levees. As cited in the comment, information concerning the adequacy of levee protection in the Natomas Basin was released after the DEIR was released, and indicating the levees might not adequately protect the project site (and North Natomas) in a 100-year flood. Consequently, the DEIR was recirculated to update the DEIR analysis.

29-6 Please refer to response to comment 29-3 and Master Response 1. A full description of the information contained within referenced documents addressing the stability of the Natomas Levees is described in Master Response 1 and Section 6.10, " Hydrology, Drainage, and Water Quality," of the RDEIR.

29-7 Because the comment does not raise any issues related to the environmental analysis presented in the DEIR, no further response is necessary. It should be noted that the Notice of Preparation was released on June 28, 2005 and July 13, 2005. The City and LAFCo have engaged in two recirculations to assure that adequate and pertinent information is presented to the public.

29-8 Regarding the project's flooding impacts and the current state of flood certification and the ongoing actions to improve flood safety in the Natomas area please refer to Master Response 1. As described therein, SAFCA has certified its EIR and approved the *Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area* project in February 2007. Construction activities to correct existing flood protection deficiencies have commenced and SAFCA anticipates completing the flood protection improvements that would provide a minimum of 100-year flood protection by 2010 (SAFCA 2007).

29-9 Regarding the project's flooding impacts and the current state of flood certification and the ongoing actions to improve flood safety in the Natomas area please refer to Master Response 1. As described therein, the Natomas area levees have been determined by the USACE to no longer meet 100-year flood certification requirements. Further, the Department of Homeland Security's Federal Emergency Management Agency (FEMA) has indicated that it will be changing the flood status designation for the Natomas Basin and will be preparing a revised Flood Insurance Rate Map (FIRM). FEMA intends to revise the FIRM through the Physical Map Revision (PMR) process and will place the Natomas Basin in the Special Flood Hazard Area (SFHA). A preliminary FIRM revision is expected to be issued by summer 2007 with a final FIRM effective date of fall 2007 or winter/spring 2008.

29-10 The likelihood of a 100-year flood event occurring during any one period at the project site is 1% (1 year/100 [recurrence interval] = 0.01). The likelihood of a flood event to occur during a 30-year period is 26% ($1-[1-.01]^{30} = 0.26$).

29-11 Please refer to response to comment 29-3, 29-9, and Master Response 1.

29-12 The lowest elevation on the project site is 10.5 feet above mean sea level (msl). The 100-year on-site water surface elevations are not known, but are estimated to be greater than elevation 10.5 feet and flows would spill off the site at the southwestern corner of the site where the elevation is 11 feet. The project includes a 39-acre lake/detention basin that will be excavated to 3 feet above mean sea level (7.5 feet lower than the lowest elevation). With this basin in place, the 100-year water surface elevations are calculated to be at 14.9 feet with minimum building pad elevations at 17 feet (approximately 2 feet above the 100-year water surface elevation). Flows from the 100-year storm event would be completely contained within the lake/detention basin with metered discharge to off-site drainage facilities.

29-13 Please refer to response to comment 29-12.

29-14 Regarding the current state of flood certification and the ongoing actions to improve flood safety in the Natomas area please refer to Master Response 1. SAFCA has indicated that the cost of providing improvements as part of the Natomas Levee Improvement Project (NLIP), which would provide 200-year flood protection along the Natomas area levees would be approximately $414,000,000 (SAFCA 2006).

29-15 Regarding the current state of flood certification and the ongoing actions to improve flood safety in the Natomas area please refer to Master Response 1. As noted, partial funding for these improvements has been approved. This comment does not address the environmental analysis presented in the DEIR, therefore, no further response can be provided.

29-16 Regarding the current state of flood certification and the ongoing actions to improve flood safety in the Natomas area please refer to Master Response 1. Funding has been approved for these improvements. This comment does not address the environmental analysis presented in the DEIR, therefore, no further response can be provided.

29-17 Regarding the current state of flood certification and the ongoing actions to improve flood safety in the Natomas area please refer to Master Response 1. This comment does not address the environmental analysis presented in the DEIR, therefore, no further response can be provided.

29-18 As described in Master Response 1, the Federal Emergency Management Agency (FEMA) is in process of re-mapping the FIRM for the Natomas area to reflect new information available regarding the flood safety of the Natomas area levees. FEMA has not issued a preliminary FIRM as of the publication of this report. At this time, the City has not changed its procedures for processing new development applications within the Natomas area. Please refer to Section 3.1.4, "City of Sacramento Procedures for Processing New Developments in the Natomas Area," for a discussion of the standards by which new development can be approved within the Natomas area.

29-19 The City and LAFCo recirculated the DEIR for the Greenbriar project to address new information that became available during the public review period of the DEIR regarding the stability of the levee system within the Natomas area. As a result of this new information, a RDEIR was prepared and concluded that there would be a new significant and unavoidable interim flooding impact. Mitigation recommended in the RDEIR was enhanced from that presented in the DEIR and recommended that the project applicant participate in a funding mechanism established by the Sacramento Area Flood Control Agency (SAFCA) to provide no less than 100-year flood protection for the project site. This mitigation measure has been further amplified (see Master Response 1) to indicate that any development approved at the site would need to comply with all applicable building and design regulations identified by FEMA and by the City of Sacramento's Floodplain Management Ordinance in existence at the date of issuance of building permits. Please refer to Master Response 1 for a full discussion of this mitigation measure. The comment correctly notes that flood protection is only provided by upgraded levees. This is why the City has agreed to rely on the expertise of FEMA and to impose on the developer any restriction created by the FEMA remap designation.

29-20 Regarding the current state of flood certification and the ongoing actions to improve flood safety in the Natomas area please refer to Master Response 1 and response to comment 29-14 and 29-15.

29-21 Please refer to response to comment 29-18 and Master Response 1. At this time, the City has not changed its procedures for processing new development applications within the Natomas area and is not requiring written disclosures to new tenants or residents in the Natomas area.

29-22 Please refer to response to comment 29-18 and Master Response 1.

29-23 Please refer to response to comment 29-19 and Master Response 1 for a discussion of how the City and LAFCo have clarified Mitigation Measure 6.10-3 which requires all development at the Greenbriar site to comply with all applicable building and design regulations identified by FEMA and by the City of Sacramento's Floodplain Management Ordinance in existence at the date of issuance of building permits. Deferral of consideration of the expansion of the City's SOI, annexation, and development of the project would not be required as all development would comply with relevant building, health, and safety standards prescribed by the City and FEMA.

29-24 Please refer to response to comment 29-18 and Master Response 1.

29-25 The City and LAFCo recirculated Section 6.10, "Hydrology, Drainage, and Water Quality," of the DEIR to address new information that became available regarding the flood protection level of the Natomas area levee system. Included within the recirculated section was a discussion of the potential impacts that could occur from the effects of global climate change. Please see page 6.10-2 and Impact 6.10-3 of the RDEIR for discussion of potential impacts associated with global climate change as they relate to flood elevations on the Sacramento and American rivers. Please also refer to response to comment 29-93 below.

29-26 Please refer to response to comment 29-25.

29-27 Regarding the current state of flood certification and the ongoing actions to improve flood safety in the Natomas area please refer to Master Response 1. Regarding knowledge of the current status of levees, the DEIR, RDEIR, and these and other comments and their responses clearly inform the City and LAFCo of the current condition of levees, necessary repairs, the timing of the repairs, funding mechanisms needed and in place, and other relevant issues. Because the comment does not raise any issues related to the environmental analysis conducted in the DEIR, no further response is necessary.

29-28 The City has adopted General Plan Health and Safety Element Policy Goal A, Policy 1 which states that the City should "prohibit development of areas subject to unreasonable risk of flooding unless measures can be implemented to eliminate or reduce the risk of flooding." As described in Master Response 1, FEMA is currently in the process of redesignating the flood protection status of the project site. In response, the City and LAFCo have amplified mitigation measure 6.10-3 of the RDEIR that requires all development at the Greenbriar site to comply with all applicable building and design regulations identified by FEMA and by the City of Sacramento's Floodplain Management Ordinance in existence at the date of issuance of building permits. With implementation of this mitigation measure, the City would sufficiently limit risks associated with flooding at the Greenbriar site consistent with federal flood protection requirements.

29-29 The project includes the installation of a comprehensive drainage system (e.g., detention basin, pipes, and outfalls) that would adequately convey the project's stormwater. This system has been designed based on standard engineering practices and assumptions approved by the City of Sacramento and RD-1000. Post-project drainage during large storm events would be mitigated so that they are the same or less than current conditions; consequently, even if overflows did occur, the project would not alter the existing condition.

29-30 Regarding the assumptions used in the design of the proposed drainage system as they relate to the approved Metro Air Park development project, the drainage study prepared for the project evaluated the capacity of the system to accommodate project stormwater demands with and without the improvements proposed by the Metro Air Park project. The results indicated that the project would continue to meet performance standards established by the City and RD-1000 without Metro Air Park's proposed downstream improvements. Peak flows from the project site under this scenario would be less than or equal to existing peak flows from the site (Wood Rodger 2005).

29-31 RD 1000 has reviewed the proposed drainage system for the Greenbriar site and has determined that it is consistent with its requirements. RD 1000 has incorporated the project's post-project runoff volumes into their regional drainage model to ensure that existing facilities would be able to accommodate flows from the project. The results of that analysis revealed that the project would need to contribute to a capacity increase at Pumping Plant No. 3 (see Mitigation Measure 6.4-5 in the DEIR). No other upgrades to RD 1000's system would be needed.

29-32 The proposed lake/detention basin would discharge water off the site at a maximum rate of 62 cubic feet per second (cfs) as required by RD 1000. This rate is equal to or less than existing peak flows discharged from the site. Therefore, the stormwater flows from the project site would not substantially change flows at downstream locations including Fisherman's Lake. Regarding water quality, the proposed lake/detention basin would also serve as a water quality feature that would ensure that stormwater discharged from the site would meet the Regional Water Quality Control Board (RWQCB) and City of Sacramento Stormwater Quality Standard (see Impact 6.10-1 in the DEIR and RDEIR). Therefore, the project would not result in any adverse water quality impacts that could contribute to adverse biological impacts at downstream locations.

29-33 Regarding discharge volumes from the project site, please refer to response to comments 29-29 through 29-32. The project's peak stormwater flows discharged off-site would not exceed existing peak stormwater flows discharged off-site. Therefore, the project would not contribute to downstream flooding impacts at off-site locations.

29-34 The commenter correctly summarizes projects that were included in the cumulative traffic impact analysis. Because the comment does not raise any issues related to the environmental analysis conducted in the DEIR, no further response is necessary.

29-35 Regarding Sacramento Regional Transit's plans for construction of the Downtown-Natomas-Airport (DNA) light rail line, please refer to response to comment 8-2 and 29-48. Regarding the inclusion of the 11% trip reduction assumption in the project's trip generation estimates, the City and LAFCo have recirculated the traffic section of the DEIR in the Second RDEIR (published April 10, 2007). Please refer to Master Response 2 for a discussion of the City and LAFCo's reasons for recirculation. As stated in Section 6.1, "Transportation and Circulation," of the Second RDEIR, the City acknowledges that construction of the DNA line would not likely occur before buildout of the Greenbriar project (see p. 6.1-1 of the Second RDEIR); Therefore, the trip generation estimates for the project were revised to remove this 11% reduction assumption. While in the process of revising the trip generation estimates, an error in the trip generation calculation formula presented in the DEIR was discovered. This error resulted in the overestimation of traffic trips associated with the residential linked trips to the school land uses on the project site. Therefore, this error was also corrected and new trip estimates presented in the Second RDEIR. The new trip generation estimate (even with removal of the 11% light rail transit discount) indicates that the project would generate

approximately 1,200 fewer daily trips (i.e., 2.8%) than those assumed in the DEIR. As a result, the analysis presented in the DEIR slightly overestimates the traffic generated by the project and impacts would be virtually the same as that described in the DEIR.

29-36 Please refer to response to comments 29-35 and 8-2. The trip reduction assumed for light rail transit has been removed from the trip generation estimates for the project as part of the analysis circulated in the Second RDEIR.

29-37 As described in Master Response 2, the transportation and circulation analysis was revised in the Second RDEIR to incorporate several regional projects in the Sacramento Area. Projects included within the analysis consist of: Meister Way – SR 70/99 overcrossing; Metro Air Park development; Placer Vineyards Specific Plan; Placer Ranch Specific Plan; Regional University and Community Specific Plan; West Roseville Specific Plan; Sutter County Measure M; Elverta Specific Plan; and the Plumas Lakes Specific Plan. All projects requested by the commenter have been incorporated into the revised analysis. Please refer to Section 6.1, "Transportation and Circulation," of the Second RDEIR for specific details regarding impacts associated with inclusion of these projects.

29-38 Please refer to response to comment 29-37.

29-39 The traffic modeling presented in the DEIR and Second RDEIR included a standard assumption that 2% of the traffic along I-5 and SR 70/99 would be regional truck traffic. Further, in the modeling performed for the freeway mainline segments (see Impacts 6.1-4 and 6.1-8 of the Second RDEIR), 15% of the vehicles using I-5 and SR 70/99 were assumed to be trucks, which is consistent with Caltrans' published guidelines, as incorporated into the *Caltrans Route Concept Report* (dated April 1997) as incorporated into the *SACOG I-5 Corridor in Sacramento and Yolo Counties Existing Conditions Report* (dated May 2001). The Caltrans document is the most recent and up to date document describing truck trips that occur along I-5 and SR 70-99.

29-40 Because the comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

29-41 The assumptions for the traffic analysis presented in the DEIR and Second RDEIR were determined in coordination with the City, which has jurisdiction over the local roads and intersections, and Caltrans, which has jurisdiction over freeways, interchanges, and on-/off-ramp facilities. The facilities included within the study area of project effects were determined based on knowledge of local traffic patterns, the residential and employment-generating land uses proposed for the Greenbriar site, and nearby land uses that would support residents at Greenbriar. The facilities requested by the commenter for analysis (I-5/SR 99 interchange and the segment of I-5 between I-5/SR 99 interchange and I-5/I-80 interchange) are over 8-10 miles south of the project site. Traffic from a project diminishes with increasing distance from the project site. Because of the substantial distance of these facilities from the project site, the project's traffic trips would become indistinguishable from existing traffic.

29-42 The City, LAFCo, and the applicant met with representatives of Caltrans on October 13, 2006 to discuss the feasibility of mitigation options for study area freeway segments, interchanges, and ramp facilities. Caltrans indicated that the following improvements are scheduled for implementation to alleviate unacceptable traffic conditions along I-5 and SR70/99: re-construction of the I-5/SR 70/99 interchange, widening of I-5, and widening of SR 70/99. Caltrans staff indicated that mitigation for the proposed project should be directed toward the improvements listed above as these improvements have been identified to improve the overall

operations of I-5 and SR 70/99 near the project site. Further, Caltrans staff indicated that the project applicants should contribute a proportionate share towards the improvements identified above as these improvements are most needed to address congestion issues along I-5 and SR 70/99.

On July 20, 2007, the City, LAFCo, and the applicant again met with representatives of Caltrans to finalize the project's mitigation program for impacts to highway facilities. Please refer to response to comment 3-3. With implementation of the mitigation described in response to comment 3-3, the project's contribution to impacts along regional highway facilities would be reduced, but not to a less-than-significant level. While the applicant is providing its fair share of funding towards the City's Traffic Congestion Relief Fund, this fund would not ensure that the project's impacts to regional facilities would be reduced to a less-than-significant level.

29-43 Regarding addition of regional cumulative projects to the traffic modeling, please refer to response to comment 29-37 and Master Response 2.

29-44 Regarding impacts to commuters to the Sacramento International Airport, the DEIR and Second RDEIR provide a comprehensive level of service analysis of freeway operations including I-5 and SR 70/99. Under cumulative conditions (with or without the project), operation of I-5 east of Powerline Road (the segment of I-5 west of the project site and that carries traffic to the Sacramento International Airport) would operate at LOS D during peak hours (see Table 6.1-35 in the Second RDEIR). While other freeway segments including I-5 North of Del Paso Road, I-5 North of I-5/I80 Interchanges between I-80 and Arena Boulevard Exit, and SR 70/99 between Elkhorn Boulevard and I-5/SR 70/99 Interchange would operate unacceptably during peak hours, these unacceptable operating conditions would occur with or without the project. There is no published information available that documents a correlation to congested traffic patterns and an increase in the number of passengers that miss their scheduled flights. As such, it would be speculative to draw a conclusion that the project would or would not contribute to an increased in the number of missed flights. The CEQA Guidelines offer specific guidance for the impacts to be evaluated for projects located near public airports. This guidance requires only an evaluation of the potential noise and safety hazard impacts that would occur with placement of a project near an airport (see CEQA Guidelines Section 15154; Public Resources Code Section 21096). Further, an increase in the number of travelers missing scheduled flights would not result in a significant environmental effect as defined by CEQA (see Public Resources Code 21083 and CEQA Guidelines Section 15002) as it would not result in a physical environmental change. Finally, while CEQA allows some degree of forecasting to identify potential impacts, CEQA does not require lead agencies to engage in speculation to determine whether an impact would occur (see CEQA Guidelines 15144 and 15145). In the case of impacts resulting from increased missed flights, no evidence is available to suggest that the project would have a substantial effect.

29-45 The DEIR and Second DEIR evaluate the project's impacts on local roadways where the majority of traffic from the project is expected to occur. The City selected the roadways for analysis based on its knowledge of traffic patterns near the project site, the roadways that would carry traffic from the project, and comments received on the Notice of Preparation for the EIR. The traffic consultant, in consultation with the City, then prepared a trip generation estimate for the project based on the land uses proposed (see Table 6.1-20 of the Second RDEIR). The a.m. and p.m. peak hour trips generated by the project were then assigned to the local roadway and freeway system based on the travel demand forecasts included in the City's SACMET transportation model. The trip distribution assumptions for the project are described on page 6.1-30 of the Second RDEIR and Exhibits 6.1-8 through 6.1-11. As shown on those

exhibits, the roadways selected by the commenter (e.g., Powerline Road, Del Paso Road, Garden Highway) would not be anticipated to receive a substantial portion of project-related traffic trips (i.e., less than 10%). Further, these roadways are currently operating acceptably during peak hours. For example, the intersection of Powerline Road and Del Paso Road would operate at LOS A during the a.m. and p.m. peak hours under baseline plus project conditions (see Table 6.1-30 of the Second RDEIR) and LOS D in the a.m. and LOS A in the p.m. peak hours under cumulative plus project conditions (see Table 6.1-37 of the Second RDEIR). Other roadways and intersections along Del Paso Road and Garden Highway were not evaluated because they would only receive less than 2% of project-related trips (less than 800 daily trips: 49 a.m. and 81 p.m. peak hour trips), which is not substantial in relation to the volume capacity of these roadways, and these roadways currently operate acceptably.

29-46 Regarding the roadways selected for detailed analysis in the traffic study, please refer to response to comment 29-45. Regarding impacts to Garden Highway and Del Paso Road, please refer to response to comment 29-45.

The commenter suggest that Bayou Road be widened to 4-lanes, a barrier be constructed at Del Paso Road near Fisherman's lake, and that through traffic between I-5 and Garden Highway via Powerline Road be discouraged. As described above, there is no evidence to suggest that traffic conditions along these roadways would be unacceptable and would warrant implementation of the mitigation suggested by the commenter. However, the commenter's suggestion is noted for City and LAFCo consideration.

29-47 Regarding the funding available to construct and operate the DNA light rail transit line, please refer to response to comment 8-2. Additionally, the project applicants as an element of the project have proposed to dedicate an easement for the light-rail line along Meister Way. This easement would be transferred to the Sacramento Regional Transit District (SRTD) and would eliminate the need for SRTD to purchase land for the DNA alignment. Regarding the project's current assumption for the DNA line, please refer to response to comment 29-35.

29-48 Regarding the feasibility of implementing the DNA light rail line, the City and LAFCo believe that significant progress has been made to secure funding, study, and design the DNA line. Staff of the SRTD has indicated that they are continuing to prepare environmental documents for the DNA line and aggressively seek out Federal, state, and other local funding sources to implement the DNA line as well as work with private parties to secure the necessary easements to implement the project (please refer to response to comment 8-2). There is no indication that SRTD is intending to abandon implementation of the DNA line, and, in fact, staff of SRTD has expressed their continued support of the Greenbriar project because it contributes to its feasibility. For additional details regarding the status of the DNA line, please refer to response to comment 8-2 and 29-35.

29-49 Regarding dedication of the easement along Meister Way, please refer to response to comment 29-47. Because the comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

29-50 Because the comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

29-51 Please refer to response to comments 8-2 and 29-47. Because the comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

29-52 These comments all address the potential future feasibility of the DNA line. This will be subject to further study by RT, and is outside the City's jurisdiction. Because the comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

29-53 Regarding evaluation of the environmental impacts associated with the DNA line, a detailed evaluation of the potential construction and operation impacts associated with the DNA line along its Meister Way alignment was provided in the DEIR. Specifically, the DEIR evaluated the habitat and resource-related impacts associated with construction of the track (e.g., biological resources, water quality, air quality, noise, hazards, circulation) and the operational impacts associated with operating a transit station and rail line (e.g., noise impacts from the train and transit station, air emissions). Further, mitigation is recommended in some instances to address potential land use compatibility impacts associated with operating a transit line near sensitive receptors (see Impact and Mitigation Measure 6.3-4). Regarding the status of the DNA EIR please refer to response to comment 8-2.

In preparing the EIR, the CEQA Guidelines define "project" to mean the "whole of the action" that may result in either a direct or reasonably foreseeable indirect physical change in the environment (CEQA Guidelines Section 15378[a]). In performing its analysis, the lead agency should not "piecemeal" or "segment" a project by splitting into two or more segments. In the case of the Greenbriar project and the DNA line project, these are two separate and distinct projects under the jurisdiction of separate lead agencies and project applicants. To the degree that the DNA line would result in impacts to residents at the Greenbriar site, these impacts have been evaluated in the EIR prepared for the project. Each of the projects is a stand-alone project, and would operate irrespective of the other project moving forward. While Greenbriar may make the DNA line more financially feasible, and while the DNA line would make transportation to and from the Greenbriar project more efficient, neither project requires the other project to move forward. The EIR prepared for the Greenbriar project considers the project and cumulative impacts associated with implementation of the DNA line consistent with the requirements of CEQA and the CEQA Guidelines.

29-54 Please refer to response to comment 29-53. Because the comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

29-55 Please refer to response to comment 8-2 and 29-47. Because the comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

29-56 Regarding the status of the DNA line, please refer to response to comment 8-2. The DEIR for the project has thoroughly evaluated the cumulative impacts of past, present, and future projects in combination with the project (see Section 7.2, "Cumulative Impacts," of the DEIR). To the degree that the project would result in cumulative impacts (e.g., the project would support an alignment of the DNA line and regional growth) those impacts have been described in the project and cumulative analysis of the DEIR.

29-57 The commenter does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

29-58 Regarding the assumptions used in preparing traffic trip generation estimates, please refer to Master Response 2 and response to comment 29-35. As described therein, the Second RDEIR removed the 11% trip reduction assumption from the trip generation estimates. Please refer to the Second RDEIR for a detailed discussion of the traffic impacts associated with the project.

29-59 Interim transit service will be funded through a community facilities district (CFD) assessment or by the developer. It has yet to be determined whether or not the Greenbriar project will annex into an existing CFD administered by the North Natomas Transit Management Association or whether the applicant will establish a separate independent CFD for the purpose of funding interim transit service to serve the project. The applicants are coordinating with the City regarding the final funding plan for interim transit services.

Regarding providing transit services to/from Greenbriar and other Natomas community areas, the Greenbriar interim transit services will be operated to provide transit services for resident traveling to downtown Sacramento where commuters can access other regional transportation services that provide access throughout the greater Sacramento Region including the North Natomas Community. The interim transit service will remain in operation until such time that Regional Transit's DNA light rail line is completed. Once completed, the DNA line will provide access to other areas of the Natomas community. Regional Transit is also the agency responsible for establishing local bus transit services within the Natomas area. It is currently unknown when bus transit services will be established for the Greenbriar site. However, because mitigation recommended in the Second RDEIR would require the establishment of interim transit services, the project's impact to public transportation services would be reduced to a less-than-significant level and adequate transit services would be provided.

Regarding funding for the DNA line, please refer to response to comment 8-2.

29-60 Regarding the current status of the DNA project, please refer to response to comment 8-2. Regarding consideration of the cumulative impacts of the DNA line, please refer to response to comment 29-56. Regarding evaluation of the DNA project and Greenbriar project in one document, please refer to response to comment 29-53.

29-61 The project has been designed to be consistent with the principles of the Sacramento Area Council of Governments (SACOG) Preferred Blueprint plan, which is a vision for growth in the Sacramento region that promotes compact, mixed-use development and more transit choices as an alternative to low density development. Further, the objectives of the project have been established to "create a transit-oriented, pedestrian-friendly development" and "develop the project site in a manner consistent with and supportive of SACOG's Blueprint plan." Section 15126.6(a) of the CEQA Guidelines states that the EIR must discuss a range of reasonable alternatives that would feasibly attain most of the basis objectives of the project. The purpose of the analysis is to identify alternatives that would reduce some or all of the project's significant impacts. Consistent with the requirements of CEQA, the DEIR evaluated a range of alternatives that included: Offsite Alternative; Dispersed Development Alternative; Reduced Size Alternative; and the No Project Alternative – Continuation of Existing Land Uses.

The commenter suggests that an additional alternative should consider reducing the development footprint of the site and construction of a transit-oriented village around a light rail station. This alternative would then be timed to develop at the time when the DNA line is constructed. The commenter's suggestion to create a transit-oriented development around a light rail station is substantially similar to the objective of existing proposed project. Therefore, impacts of such a development have been evaluated throughout the EIR. The reduction in the developable footprint of the site is substantially similar to the Reduced Size Alternative evaluated in the EIR (see Section 8.3). As described therein, development would be reduced by 20% leaving additional land as open space. The Reduced Size Alternative was determined to be environmentally superior to the project. Therefore, the DEIR has evaluated an alternative that is substantially similar to the alternative suggested by the commenter.

29-62 Regarding the requirements associated with complying with the Natomas Basin Habitat Conservation Plan (NBHCP), please refer to response to comments 1-4 and 1-5.

29-63 The EIR is not an applicant-produced document. It was prepared by an independent environmental consultant, under the direction and with the content requirements of the City of Sacramento and the Sacramento County LAFCo. Comments from the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (DFG) are included in this document as comment letters 1 and R1. Please refer to responses to those letters. Regarding the need to have an approved effects analysis, please refer to response to comments 1-4 and 1-5.

29-64 Please refer to response to comments 1-4 and 1-5.

29-65 The City and LAFCo acknowledge that USFWS and DFG have not issued ITPs for the project. The City, LAFCo, and the applicant have initiated consultation with the agencies regarding the proposed mitigation program which will be included in the HCP for the project. The ratio of mitigation and, more importantly, the functionality of mitigation, will need to be agreed to by USFWS and DFG before development of the Greenbriar site can occur. It is fully acknowledged that the mitigation ratios for the Greenbriar project will exceed the ratios found in the NBHCP. The HCP developed for the site would be subject to review under CEQA and NEPA. Please refer to response to comments 1-4 and 1-5.

29-66 Regarding the mitigation measures identified in the EIR, CEQA Section 15126.4 requires that feasible mitigation measures be identified to minimize or reduce significant adverse effects of the project and that the mitigation must be fully enforceable through "permit conditions, agreements, or other legally binding instruments." CEQA section 15126.4 (a)(1)(B) states that mitigation must not be deferred until some future time, but that measures can identify performance standards which may mitigate the impact in more than one way. The program of mitigation identified for the project's biological impacts are identified in Section 6.12, "Biological Resources," of the DEIR. Mitigation Measure 6.12-1 describes the requirement that the applicants must prepare a HCP, including the required environmental review) and obtain ITPs from USFWS and DFG. More importantly, the mitigation measures described therein, as well as in mitigation measure 6.12-2 and in other mitigation provide specific programs, acreage set asides, and standards to be used in mitigation plans, and identify the location of mitigation sites. In addition to describing this requirement, this mitigation also provides a program of performance standards that must be met in order to mitigate the impacts of the project. These performance standards would be legally enforceable through the Mitigation Monitoring Plan adopted by the City and LAFCo and would become the basis of the mitigation strategy outlined in the HCP prepared for the project.

The City, LAFCo, and the applicant have initiated consultation with USFWS and DFG to prepare the HCP and associated environmental documentation for the project. Lastly, the EIR identifies that additional mitigation land may be needed, which would be identified with USFWS and DFG, and likely administered by the Natomas Basin Conservancy. The commenter offers no evidence that the project has not provided adequate performance standards within its program of mitigation; therefore, no further response can be provided.

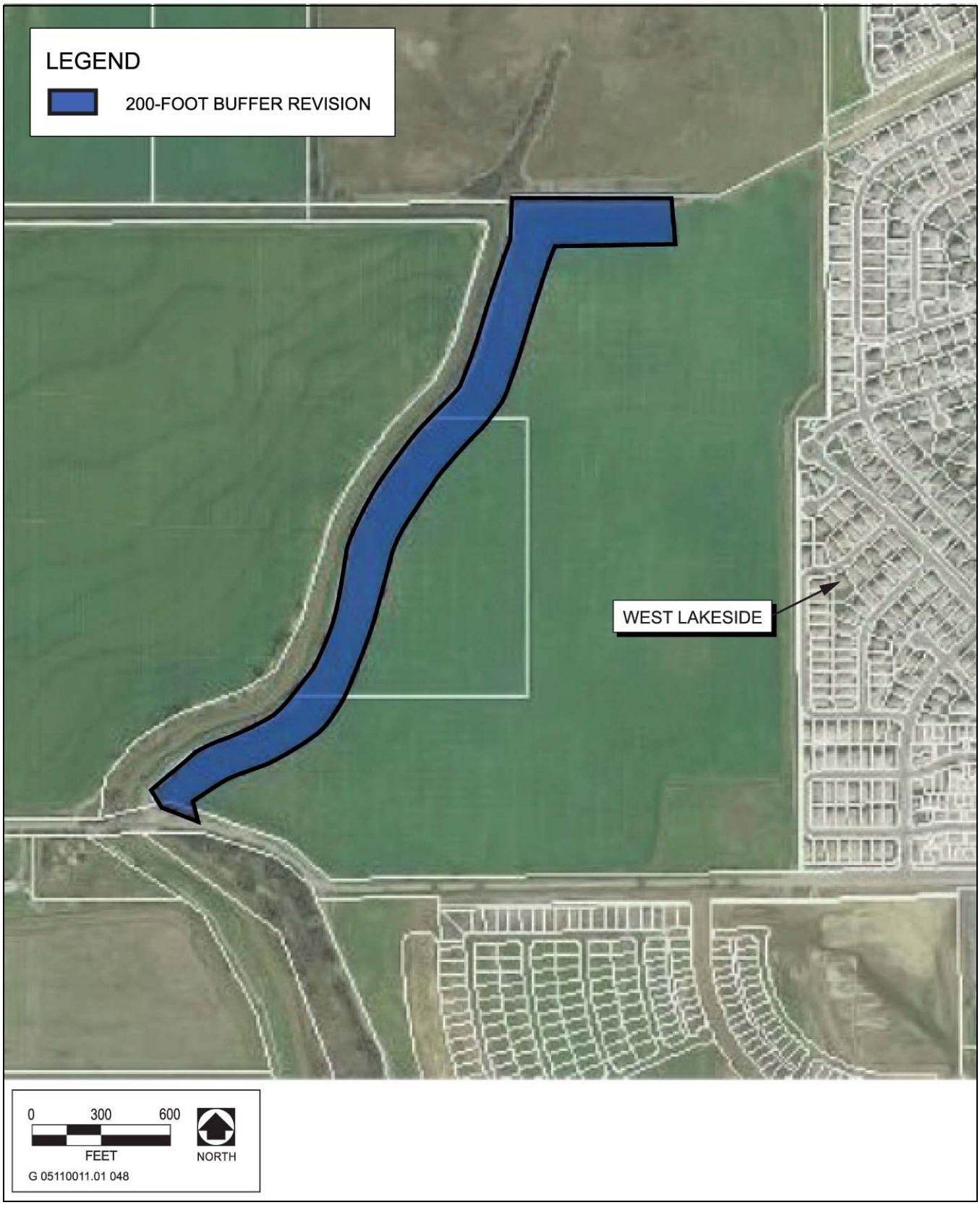
29-67 The commenter suggests that a 200-foot buffer should be provided on the north side of the project site and an 800-foot buffer on the east side of the Lone Tree Canal. The commenter offers no evidence or nexus to support why a buffer on the north or a buffer of this proposed size on the west is required. Regarding the buffer on the west side of the project site, the project applicant has prepared a detailed effects analysis (see Appendix P of the DEIR) outlining the proposed preservation and conservation strategy for habitat along Lone Tree Canal, and has submitted those plans to USFWS and DFG for consideration. As described therein and summarized in Impact 6.12-1 and 6.12-9, the proposed buffer would meet habitat and species requirements to maintain connectivity for species along the canal to the north and south of the project site. It is noted that, as part of the MAP HCP, the MAP project is required to maintain a buffer of only 25 feet from Lone Tree Canal to protect against impacts to giant garter snake. The Greenbriar project mitigation includes a buffer approximately 10 times that size.

To further increase connectivity, the applicant is proposing to conserve (with no improvements) an additional stretch of land along the canal south of the project site (see the following exhibit).

29-68 Please refer to response to comment 29-67. The commenter offers no evidence support that the 250-foot buffer proposed along Lone Tree Canal (with the tule bench) would not provide adequate habitat for giant garter snake; therefore, no further response can be provided.

29-69 The Greenbriar project is currently being processed because the applicant has submitted an application to the City of Sacramento, and the City is required to act upon development applications. The Joint Vision area is a City-initiated planning project, and is not being supported by development applications. The Greenbriar and Joint Vision projects are separate projects, being proposed on separate schedules. The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

29-70 The cumulative impact analysis provide in the DEIR (see Section 7.2) provides an evaluation of cumulative impacts that would occur for each resource area evaluated with implementation of regional projects including the North Natomas Joint Vision Plan and the Sutter County Measure M project. CEQA does not require lead agencies to provide a development plan for all potential projects that could occur within their jurisdiction. Rather, CEQA Section 15130 (b)(1) requires a lead agency to consider and provide an evaluation all past, present, or reasonably foreseeable future project or provide a summary of projections in an adopted general plan. The DEIR prepared for the project has done both. The commenter offers no evidence that the cumulative analysis in the DEIR is inadequate; therefore, no further response can be provided.



Source: Wood Rogers 2007

200-Foot Buffer Near West Lakeside

29-71 The commenter offers no evidence to support that the proposed mitigation strategy for biological habitat is inadequate. A detailed effects analysis (see Appendix P of the DEIR) evaluating the impacts of the project on the implementation and efficacy of the NBHCP including an evaluation of the proposed mitigation, preservation, and conservation program has been prepared. As described in Impact 6.12-9 of the DEIR, the project would not reduce the viability of populations of covered species using the Natomas Basin and would not reduce the effectiveness of the conservation strategy of the NBHCP. Further, the project applicant is in consultation with USFWS and DFG to prepare an HCP for the project and a separate Environmental Impact Statement. Implementation of the HCP (which is a requirement of Mitigation Measure 6.12-1 of the DEIR) would ensure that adequate habitat lands are preserved or conserved, and that the conservation strategy of the NBHCP is not jeopardized.

29-72 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

29-73 The commenter offers no evidence to support that the proposed mitigation strategy for biological habitat is inadequate. Please refer to response to comments 29-66 and 29-71.

29-74 The commenter offers no evidence to support that the proposed mitigation strategy for biological habitat is inadequate. The mitigation proposed in the EIR is extensive, and the Effects Analysis thoroughly evaluates whether the mitigation would be sufficient. Please refer to response to comment 29-66 and 29-71.

29-75 The commenter's suggestion for a mitigation ratio is noted, but there is no substantial evidence provided to support this ratio of mitigation. Please refer to response to comment 29-66 and 29-71.

29-76 The commenter's suggestion for alternate mitigation lands is noted. Please refer to response to comments 29-66, 29-67, and 29-71. Other land not identified in the DEIR or this response to comments memo are not subject to the control of the applicant. The mitigation lands described in DEIR would adequately mitigate the project's impacts to sensitive biological resources. The commenter offers no evidence that the mitigation provided in the DEIR would be inadequate; therefore, no further response can be provided.

29-77 The *Analysis of the Effects on the Natomas Basin Habitat Conservation Plan Report* (Appendix P of the DEIR) provides a detailed evaluation of the proposed mitigation lands and their ability to mitigate impacts to identified species. In preparation of that analysis, the Natomas Basin Conservancy (TNBC) was consulted on several occasions regarding the proposed mitigation program and has been actively engaged in the mitigation program for Greenbriar, including reviewing mitigation plans and providing suggestions, which are included in the mitigation measures presented in the DEIR. Regarding the adequacy of the proposed mitigation lands, please refer to response to comment 19-6.

29-78 The off-site mitigation lands proposed for the project are located near or adjacent to existing TNBC preserves and would contribute to the establishment of large tracts of land that would be permanently conserved. The efficacy of these lands in implementing the NBHCP was evaluated in the effects analysis (Appendix P) of the DEIR. Please refer to response to comment 29-71.

29-79 The Sacramento Air Quality Management District's (SMAQMD) Air Quality Attainment Plan (AQAP) is described on page 6.2-11 of the DEIR. Impact 6.2.2 in the DEIR (pages 6.2-19 through 6.2-22) discusses long-term project emissions and the fact that the project may conflict with SMAQMD's planning efforts.

29-80 The project site is located outside the North Natomas Community Plan (NNCP) area. Although the boundaries of the NNCP are proposed to be amended to include the project site, the project is proposed to be designated within a special planning area (SPA) and would not be subject to NNCP policies. See Section 5.2.2 of the DEIR.

29-81 With regard to emissions reductions, the project uses the same type of mitigation programs as those found in the NNCP. However, the reduction in emissions was calculated using factors provided by SMAQMD. SMAQMD factors provide less credit for emissions reduction than the same factors used to calculate emissions reductions in the NNCP. Although the calculations of potential emissions reductions are different, it is expected that the project would achieve a similar level of emissions reduction as projects within the NNCP.

29-82 The comment mischaracterizes the DEIR. Impacts to several air quality factors are listed as significant and unavoidable, but that is *after* application of all feasible mitigation. The proposed project includes extensive air quality impact mitigation, and this mitigation substantially reduces significant impacts, but not to a less-than-significant level. As to so-called SIP measures, the SMAQMD measures, which are included in the EIR, are those measures (plus more) that are required for compliance with the State Implementation Plan (SIP).

29-83 The comment does not acknowledge the mitigation offset requirements imposed by SMAQMD for construction emissions. Please see mitigation measure 6.2-1(c), as modified by these responses to comments; as shown, the applicant would be required to pay over $1.5 million to offset certain construction emissions. As to mitigation requirements of the San Joaquin Valley Joint Unified Air Pollution Control District, the proposed project is located in a different air district (the SMAQMD) and is subject to the rules and mitigation measures developed to address impacts unique to the Sacramento area. Because no specific comments pertaining to the adequacy of specific measures are provided, no further response can be given.

29-84 It is not reasonable to delay projects in consideration of plans that may or may not be adopted on a date certain, with plans and programs that may or may not be relevant to the project. The comment does not describe why the measures included in the DEIR are not adequate, nor are any new mitigation measures suggested, so no further response can be provided. As to conditioning the project to comply with feasible measures that are within the as yet unadopted AQAP, LAFCo may in their discretion choose to request that the City prior to rezoning consider the request to require that the project meet all feasible measures identified in the 2007 Ozone and PM2.5 State Implementation Plans. Please also refer to response to comment R9-33.

29-85 The commenter appears to be requesting responses to comments from SMAQMD. Please refer to responses to comment letter 22 and R5. Also, please see page 6.2-19 of the DEIR, which describes the mitigation fees as well as the requirement to comply with all applicable SMAQMD rules and regulations.

29-86 Temperatures used in the modeling are based on default settings provided by SMAQMD. As to using a temperature of 85 degrees rather than 95 or 100 degrees, the temperature setting is based on the average ambient temperature, which includes the low and high temperatures of the day. According to records kept by the National Weather Service, July is the month with the highest average temperature, at 77.6 degrees, with the highest single-year average temperature (for the period between 1877 and 2005) of 81.6 degrees, which occurred in 2003. Thus, using a temperature of 85 degrees is conservative, as a representative of the average temperatures in the hottest part of the summer during the times when most vehicles are on the road (between 7:00 AM and 7:00 PM).

29-87 Mitigation fees are established by the SMAQMD, based on modeled emissions and using models approved for this use by the SMAQMD. At the time the DEIR was prepared, and as of this writing, SMAQMD specified that URBEMIS 2002 (Version 8.7.0) was the model to be used to calculate construction emissions and to establish fees. If a model with a higher emissions factor was used and the fee per unit weight was held constant, then mitigation fees would be higher. However, this is not what the agency responsible for establishing the mitigation fees has done. It is not known, and would be speculative to indicate, if SMAQMD would hold the per unit weight fees the same if a higher emissions factor was used. With regard to exposure to toxic air contaminants, the analysis of exposure from traffic on I-5 and SR 99 took into account current and projected emissions, in 5 year increments, based on current emissions controls and controls expected to be in place over the next several years in response to regulatory requirements. Please refer to responses to comment R7.

The traffic modeling presented in the DEIR and Second RDEIR included a standard assumption that 2% of the traffic along project roadways would be regional truck traffic. Further, in the modeling performed for the freeway mainline segments (see Impacts 6.1-4 and 6.1-8 of the Second RDEIR), 15% of the vehicles using I-5 and SR 70/99 were assumed to be trucks, which is consistent with Caltrans' published guidelines, Caltrans I-5 Route Concept Report (Cite date of publication). Please refer to response to comments 29-39 and S4-1.

As contained in Phase 1 of the Goods Movement Action Plan, California port container volumes are estimated to increase by 44.9% from 2005 to 2010 and by 151.5% from 2005 to 2020 (ARB 2005). According to the Phase 1 plan, most of these forecasts by the ports are unconstrained (i.e., not limited by port terminal capacity, landside access, or environmental consideration), making it difficult to determine actual throughput capabilities. In the Central Valley Region, annual truck VMT is projected to increase from 4,677 billion miles to 7,758 billion miles, or 60%. However, the Goods Movement Action Plan, released January 2007, identifies numerous immediate and short-, intermediate-, and long-term candidate actions regarding public health and environmental mitigation. These include, but are not limited to, utilizing California low sulfur diesel trucks, implementing incentives for cleaner trucks, accelerating software upgrade for trucks, adopting and implementing ARB rules to modernize (replace and/or retrofit) private truck fleets, modernizing port trucks, implementing CA/US 2007 truck emission standards, adopting and implanting ARB rules to require that international trucks meet US emission standards, and restricting entry of trucks new to port service unless equipped with diesel PM control. The ARB has also set forth five specific goals for addressing the air pollution associated with goods movement including, but not limited to, reducing total statewide international and domestic goods movement emissions to the greatest extent possible and at least back to 2001 levels by year 2010, reducing the statewide diesel PM health risk from international and domestic movement by 85% by year 2020, and making every feasible effort to reduce localized risk in communities adjacent to goods movement facilities as expeditiously as possible. To achieve these goals the ARB has developed an emission reduction plan which entails emission reduction targets and strategies. Specific

actions to reduce goods movement emissions are already underway. ARB has adopted rules for sources under ARB direct regulatory authority and will adopt additional rule sin the future.

The Goods Movement Plan does not specify the projected increase in truck travel along those roadways near the project site. Given the population of people in the Sacramento region and throughout California that are proximate to freeways, these emissions controls and strategies have broad public health implications that extend beyond individual projects. The emissions associated with such increase would be highly dependent on the future actions taken by the ARB and EPA as discussed above. For instance, increasing the fraction of container traffic that moves by rail is a critical strategy to reducing congestion and emissions by trucks. Thus, because the future vehicle mix on roads adjacent to the site has not been estimated, and because a number of actions are being pursued to reduce emissions associated with truck traffic, it is not known, and would be speculative to indicate, the emissions due to the potential increase in truck travel along those roadways adjacent to the project The analysis in the EIR contains an estimate, based on currently approved air pollution control regulations and the only currently available predictions of future truck traffic along roads adjacent to the site, of toxic air contaminants that could affect future onsite residents.

29-88 Please refer to Response to Comment 29-87 above. Because there are not data available to estimate the potential future truck/vehicle mix near the site because the ARB/EPA are developing actions to control future truck emissions, it would be speculative to re-calculate TAC emissions at Greenbriar.

29-89 Please refer to response to comments 29-84 and 29-87 above.

29-90 When a proposed project's operational emissions are estimated to exceed SMAQMD's threshold of significance of 65 lb/day of ROG or NO_X, a significant impact would result. It has been SMAQMD's practice to work with project proponents as they choose from a list of SMAQMD recommended operational measures in order to craft an Air Quality Mitigation Plan which reduces the operational emissions of the proposed project by a minimum of 15%. Historically, the 15% emission reduction target came from the County of Sacramento's General Plan Policy AQ-15 which requires a 15% reduction of emissions for significant projects. Since then, this type of plan has been used as feasible mitigation for significant projects in most jurisdictions in Sacramento County. The measures in the Air Quality Mitigation Plans are typically selected by the developer/proponent of the project. Once the plan meets the satisfaction of all parties, it is endorsed by the District through a letter sent to the lead agency and the proponent. The municipality adds the Air Quality Mitigation Plan into the environmental document, project approval conditions, and in the MMRP for the project. According to the modeling conducted for the proposed project, buildout would generate operational emissions that exceed SMAQMD's applicable thresholds (Refer to Impact 6.2-2). Consequently, an Air Quality Mitigation Plan was submitted to SMAQMD, which was approved (Refer to Appendix E of the DEIR for a copy of the Air Quality Mitigation Plan and approval letter from SMAQMD). Also, refer to Response to Comment R7-7. SMAQMD is responsible for ensuring the plan is implemented.

29-91 Please refer to response to comment 29-90 above. With respect to air quality mitigation plans, SMAQMD does not require that a certain portion of those measures selected to achieve the 15% reduction be related to mobile or area sources. All that is required is a plan be approved by SMAQMD that achieves 15%, which was fulfilled. Nonetheless, the proposed project contains several measures that would reduce energy consumption from power plants and non-transportation sources of fossil fuel consumption. For example, housing units are anticipated to exceed Title 24 energy efficiency standards through implementation of some or all of the following: enhanced insulation; tight air duct insulation and testing; use of low E glass windows and vinyl frames; and use of radiant barriers where feasible. Further, the applicants also intend to construct units with high-efficiency plumbing systems and offer solar voltaic panels as an option on all detached homes.

29-92 Please refer to response to comments R7-8, -9, -10, -11, -12, 13-, and 14 The Health Risk Assessment prepared for this project used ARB's most current version of the EMFAC emissions inventory model available at the time of the analysis. The EMFAC model was used to estimate emissions of hydrocarbons, and respirable particulate matter (PM10) from gasoline and diesel vehicles specifically for Sacramento County. The PM10 emission factors for diesel-fueled engines were used in the analysis to determine risk from diesel exhaust.

29-93 The comment relates to climate change and greenhouse gas emissions. Various gases in the earth's atmosphere, classified as atmospheric greenhouse gases (GHGs), play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. The earth emits this radiation, which was initially absorbed, back to space, but the properties of the radiation have changed from high-frequency solar radiation to lower frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate on Earth. Without the Greenhouse Effect, Earth would not be able to support life as we know it.

Prominent GHGs contributing to the Greenhouse Effect are carbon dioxide (CO_2), methane (CH_4), ozone, nitrous oxide, water vapor, hydrofluorocarbons, chlorofluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs (with the exception of water vapor) in excess of natural ambient concentrations are responsible for intensifying the Greenhouse Effect and have led to a trend of warming of the earth's climate, known as global climate change or global warming (Ahrens 2003). Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (California Energy Commission [CEC] 2006a). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (CEC 2006a). Emissions of CO_2 are byproducts of fossil fuel combustion, and are the largest portion of human-caused GHG emissions by mass. Methane, a highly potent GHG, results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) associated with agricultural practices and landfills. CO_2 sinks, or reservoirs, include sequestration by vegetation or dissolution into the ocean, among other processes.

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and TACs, which are pollutants of regional and local concern, respectively. California is the 12th to 16th largest emitter of CO_2 in the world (CEC 2006a).

California produced 492 million gross metric tons of carbon dioxide equivalent in 2004 (CEC 2006a). Carbon dioxide equivalent is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the Greenhouse Effect. This potential, known as the global warming potential of a GHG, is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. Expressing emissions in carbon dioxide equivalent takes the contributions of all GHG emissions to the Greenhouse Effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 40.7% of total GHG emissions in the state (CEC 2006a). This sector was followed by the electric power sector (including both in-state and out-of-state sources) (22.2%) and the industrial sector (20.5%) (CEC 2006a).

According to the Intergovernmental Panel on Climate Change (IPCC), which was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, global average temperature is expected to increase by 3–7°F by the end of the next century, depending on future GHG emission scenarios (IPCC 2007). Resource areas other than air quality and atmospheric temperature could be indirectly affected by the accumulation of GHG emissions. For example, an increase in the global average temperature is expected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the state. According to the CEC (2006b), the snowpack portion of the water supply could potentially decline by 30–90% by the end of the 21st century. A study cited in a report by the California Department of Water Resources (DWR) projects that approximately 50% of the statewide snowpack will be lost by the end of the century (Knowles and Cayan 2002). Although current forecasts are uncertain, it is evident that this phenomenon could lead to significant challenges in securing an adequate water supply for a growing population. An increase in precipitation falling as rain rather than snow could also lead to increased potential for floods because water that would normally be held in the Sierra Nevada snowpack until spring could flow into the Central Valley concurrently with winter storm events. This scenario would place more pressure on California's levee/flood control system (DWR 2006).

Another outcome of global climate change is sea level rise. Sea level rose approximately 7 inches during the last century (CEC 2006b), and it is predicted to rise an additional 7–22 inches by 2100, depending on the future levels of GHG emissions (IPCC 2007). If this occurs, resultant effects could include increased coastal flooding, saltwater intrusion (especially a concern in the low-lying Sacramento–San Joaquin River Delta, where pumps delivering potable water could be threatened), and disruption of wetlands (CEC 2006b). As the existing climate throughout California changes over time, the ranges of various plant and wildlife species could shift or be reduced, depending on the favored temperature and moisture regimes of each species. In the worst cases, some species would become extinct or be extirpated from the state if suitable conditions are no longer available.

Neither the ARB nor any air district in California, including SMAQMD, has identified a significance threshold for analyzing GHG emissions generated by a proposed project or a methodology for analyzing air quality impacts related to global warming. Though, by adoption of Assembly Bill (AB) 32, California has identified GHG reduction goals to 1990 levels, the effect of increased GHG emissions as they relate to global climate change is inherently an adverse environmental impact. To meet this goal, California would need to generate lower levels of GHG emissions than current levels. However, no standards have yet been adopted quantifying 1990 emission targets. It is recognized, however, that for most projects there is no simple metric available to determine if a single project would substantially increase or decrease overall GHG emission levels (e.g., help or hinder meeting the AB 32 emission goals). In addition, at this time AB 32 only applies to stationary source emissions. Consumption of fossil fuels in the transportation sector accounted for over 40% of the total GHG emissions in California in 2004. Current standards for reducing vehicle emissions considered under AB 1493 call for "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles," and do not provide a quantified target for GHG emissions reductions for vehicles.

Emitting CO_2 into the atmosphere is not itself an adverse environmental effect. It is the increased concentration of CO_2 in the atmosphere resulting in global warming and the associated consequences of global climate change that results in adverse environmental effects (e.g., sea level rise, loss of snowpack, severe weather events). Although it is possible to generally estimate a project's incremental contribution of CO_2 into the atmosphere, it is typically not possible to determine whether or how an individual project's relatively small incremental contribution might translate into physical effects on the environment. Given the complex interactions between various global and regional-scale physical, chemical, atmospheric, terrestrial, and aquatic systems that result in the physical expressions of global climate change, it is impossible to discern whether the presence or absence of CO_2 emitted by the project would result in any altered conditions.

The cumulative increase in GHG concentrations in the atmosphere has resulted in and will continue to result in increases in global average temperature and associated shifts in climatic and environmental conditions. Given the significant adverse environmental effects linked to global climate change induced by GHGs, the emission of GHGs is considered a significant cumulative impact. Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (California Energy Commission 2006a). Therefore, the cumulative global emissions of GHGs contributing to global climate change can be attributed to every nation, region, and city, and virtually every individual on Earth. The challenge in assessing the significance of an individual project's contribution to global GHG emissions and associated global climate change impacts is to determine whether a project's GHG emissions—which, it can be argued, are at a micro scale relative to global emissions—result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact.

Because the effects of GHGs are global, a project that merely shifts the location of a GHG-emitting activity (e.g., where people live, where vehicles drive, or where companies conduct business) would result in no net change in global GHG emissions levels. For example, if a substantial portion of California's population migrated from the South Coast Air Basin (managed by the South Coast Air Quality Management District) to the San Joaquin Valley Air Basin (managed by the San Joaquin Valley Air Pollution Control District), this would likely result in decreased emissions in the South Coast Air Basin and increased emissions in the San Joaquin Valley Air Basin, but little change in overall global GHG emissions. However, if a

person moves from one location where the land use pattern requires substantial vehicle use for day-to-day activities (commuting, shopping) to a new development that promotes shorter and fewer vehicle trips, more walking, and overall less energy usage, then it could be argued that the new development would result in a potential net reduction in global GHG emissions.

Every new resident at the project site would be moving from an existing location where their activities are contributing to CO_2 emissions. It is also reasonable to expect that at least a portion of the businesses at the project site would be moving from an existing location to the project site and are not completely new business or commercial facilities. Thus, much of the CO_2 emissions attributed to project residents and businesses would simply be from emissions sources that move from an existing location to the project site, not from new emissions sources relative to global climate change.

Broadly speaking, climate change mitigation and adaptation strategies fall into three categories: (1) transportation sector strategies; (2) electricity sector strategies, including renewable energy and energy efficiency; and (3) all other adaptation strategies. The project incorporates guidelines, strategies and mitigation measures that minimize the human and spatial environmental footprint with respect to transportation and electricity consumption. Implementation of these would help reduce potential GHG emissions resulting from the development of the project.

As indicated, the transportation sector is the state's largest fossil energy consumer (California Energy Commission 2006a). The purpose of the project by its very nature (e.g., promotion of the use of alternative modes of transportation and overall design that creates a compact development pattern that encourages walking, biking, and public transit use which reduces trip number and length) would reduce potential consumption of fossil energy within the area, and thereby reduce potential GHG emissions. For example, 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;
- 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;
- develop and implement the project consistent with the General Plan Update Vision and Guiding Principles adopted by the City of Sacramento.

Please see, also, responses to comment letter R8, among others, to understand how the project is intended to reduce vehicular emissions. Development of the project site in a manner consistent with and supportive of the SACOG's Blueprint plan is of significant importance as the principles of the Blueprint Project are in line with those of air quality improvement. According the modeling conducted, implementation of the preferred blueprint scenario in comparison to the base case would reduce vehicle miles traveled (VMT) per household per day from 47.2 to 34.9, and associated reductions in CO_2 per capita.

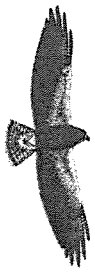
In addition to targeting GHG emissions through the transportation sector, the proposed project contains several measures that would reduce energy consumption from power plants and non-transportation sources of fossil fuel consumption. For example, housing units are anticipated to exceed Title 24 energy efficiency standards through implementation of some or all of the following: enhanced insulation; tight air duct insulation and testing; use of low E glass windows and vinyl frames; and use of radiant barriers where feasible. Further, the applicants also intend to construct units with high-efficiency plumbing systems and offer solar voltaic panels as an option on all detached homes.

It is uncertain how current regulations might affect CO_2 emissions attributable to the project and cumulative CO_2 emissions from other sources in the state. Also, as discussed previously, it cannot be determined how CO_2 emissions associated with the proposed project might or might not influence actual physical effects of global climate change.

Given that Greenbriar is consistent with the SACOG Blueprint, is close to employment centers, includes energy efficiency measures, and is intended to rely on alternative modes of transportation, it is the type of project that could help reduce cumulative greenhouse gases, as populations moving to the site shift from average longer commute patterns and instead travel fewer miles and live in a more efficient community.

29-94 Please refer to the responses to comment letter 20.

30



Swainson's Hawk

Technical Advisory Committee

City of Sacramento
North Permit Center
Department of New Development
2101 Arena Blvd, 2nd Floor
Sacramento, CA 95834

September 2, 2006

Subject: Comments on the Greenbriar Development Project DEIR

Dear City Staff:

The Swainson's Hawk Technical Advisory Committee (TAC) respectfully submits the following comments on the proposed Greenbriar Development Project Draft Environmental Impact Report (DEIR) (EDAW 2006). The TAC is an ad hoc group of research biologists formed in 1989 to facilitate research on the state-threatened Swainson's Hawk and to provide technical assistance to the California Department of Fish and Game and other state, federal, and local agencies regarding land use issues affecting this species. The following comments are specific to issues related to the Swainson's Hawk. 30-1

Page 6.12-10, last paragraph, last sentence.

While it is true that the Natomas Basin Habitat Conservation Plan (NBHCP) does not include specific provisions related to land use on the Greenbrier project site, the NBHCP assumes continued agricultural uses in all areas of the basin not included in the 17,500 acres authorized for development. This was the primary rationale used to support a conclusion that along with the enhancement of the NBHCP reserves, remaining undeveloped areas of the basin would be sufficient to sustain covered species populations. 30-2

The reserve system alone is insufficient to – and was never intended to fully offset impacts from development. The NBHCP includes a habitat compensation ratio of only 0.5: 1 (i.e., for every acre of land removed, one-half acre is acquired and included in the reserve system) and specifies that upland habitat (i.e., habitat suitable for Swainson's Hawk) on reserves will comprise only 25% of the reserve land base. Thus, because nearly all of the land that has been developed to date within the City of Sacramento's permit area was high quality upland habitat, the ultimate compensation ratio for Swainson's Hawk habitat has been approximately 0.125:1 (i.e., for every acre of land 30-3

removed, one-eighth acre is managed as upland habitat on Natomas Basin Conservancy [NBC] reserves). To account for this deficiency and still attempt to meet the goals of the plan, the NBHCP assumes that remaining areas of the basin not authorized for development are considered essential to sustain Swainson's Hawk (and other Covered Species) populations in the basin.

30-3 Cont'd

Page 6.12-19, Swainson's Hawk, second paragraph.

The second sentence notes that Central Valley Swainson's Hawks migrate only as far south as Mexico. While the bulk of the population appears, based on radio-telemetry studies, to winter in Mexico, some segment of the population also winters in Central America and South America.

30-4

Page 6.12-20, first complete paragraph.

The Natomas Basin Conservancy's most recent survey report is for year 2005. Available since April 2006, the DEIR should be updated accordingly. Only 45 sites were active in 2005 (compared with 59 active in 2004), which is similar to unpublished results for 2006. In addition, while it is accurate that the majority of nests in the basin occur along the western side of the basin, it seems relevant to note that development within the City of Sacramento's permit area has resulted in removal of several nest sites and inactivity of others. Thus, the data are beginning to demonstrate the effects of development permitted under the NBHCP.

30-5

Page 6.12-20, third complete paragraph.

Idle agricultural lands can provide high quality foraging habitat for Swainson's Hawks. Estep (1989) ranks fallow fields as a high value cover type. It depends on the vegetation structure and prey availability. The value of fields planted to wheat, while usually ranked lower than several other common agricultural crop types, should be assessed relative to other surrounding crop types. Wheat and other grains may still provide valuable foraging habitat in the context of a foraging habitat matrix, and because they are harvested relatively early in the season (June), may provide an important source of mid-season prey availability. However, the application of these distinctions may provide little current value in the Natomas Basin (see below).

30-6

Page 6.12-31, first paragraph.

This description of Impact 6.12-2 relies on the approach that evaluates the suitability of individual crop types rather than the importance of landscapes to foraging Swainson's Hawks (i.e., value versus area). While perhaps appropriate at a broader landscape level, this is a less effective method of evaluating impacts and assigning compensation in the Natomas Basin where the overall suitable landscape is diminishing rapidly. The concept relies on the rationale that foraging habitat can be increased through application of higher value cover types that support more robust and more accessible prey populations. However, with continued urbanization of the Natomas Basin, this concept for purposes of

30-7

habitat compensation realizes increasingly diminished return as the overall land base is reduced. While it may be possible to maximize the value of individual fields, Swainson's Hawks require large unbroken landscapes and are much less likely to use fragmented landscapes or isolated parcels regardless of their individual 'value'.

30-7 Cont'd

With the extent of upland habitat already lost in the southern portion of the basin due to urbanization and the likelihood of population declines that are expected to occur as a result of this loss, all upland habitats in remaining portions of the basin are considered essential to continued Swainson's Hawk occurrence and use of the basin. Describing impacts on the basis of somewhat subtle distinctions between 'moderate' and 'low' value foraging habitat, while important with respect to maximizing habitat value on reserves, is today less applicable in the Natomas Basin with regard to assessing development-related impacts and assigning appropriate levels of compensation.

30-8

In fact, if further development is allowed at all (which would be inconsistent with the intent of the NBHCP), the continuing reduction of Swainson's Hawk habitat and the inability of the NBHCP to fully compensate for this loss would argue for a significantly higher level of compensation for 'new' projects than currently required under the NBHCP.

30-9

Page 6.12-31. Second paragraph, second sentence.

Focused surveys would not necessarily reveal the importance of the project area to nearby nesting pairs. Intensive multi-year observation studies could determine the extent of use of the project area relative to the surrounding landscape; however, it would not address the effects of fragmentation or overall landscape changes as a result of urbanization. Data collected since 1999 in the Natomas Basin has indicated the effects of habitat fragmentation and urbanization on local Swainson's Hawk nesting. Many traditional nesting territories in the southern portion of the basin have either abandoned or are expected to abandon in the near future, not necessarily as a result of lack of foraging habitat near the nest, but rather as a result of an overall transformation from agricultural uses to urbanization.

30-10

As noted above, evaluating specific crop types is no longer an appropriate method for addressing impacts to Swainson's Hawk in the Natomas Basin. The project site lies on the northern edge of the 'upland' portion of the basin. Along with an approximately 1-mile edge along the Sacramento River, this is also the portion of the basin that has provided most of the available foraging habitat for Swainson's Hawks and is the area that continues to be urbanized. The loss of suitable upland foraging habitat in the basin has been dramatic since the late-1990s because development has focused in upland areas. Continuing loss of upland habitat within the southern portion of the basin, including the project area, contributes to this overall decline. So, characterizing the loss of habitat as a 'cumulative' loss is appropriate; however, the site-specific assessment of crop types has little relevance.

30-11

Page 6.12-31, Mitigation Measure 6.12-2.

The preceding impact section notes that the project will remove 546 acres of upland habitat suitable for Swainson's Hawk foraging. Mitigation Measure 6.12-2 would require implementation of Mitigation Measure 6.12-1, which would provide the following:

- 27.9 acres along Lone Tree Canal
- 100.6 acres at Spangler mitigation site
- 18.5 acres at North Natomas 130 site
- 49 acres to be acquired

30-12

The 27.9 acre buffer along the Lone Tree Canal will provide virtually no value to foraging Swainson's Hawks. Both sides of the canal will be urbanized, which will preclude use of a narrow isolated strip along the canal. If isolated within an otherwise unsuitable landscape, the 18.5 acres at the North Natomas 130 site would also provide little if any value to Swainson's Hawks. However, the 18.5 acres is assumed to be contiguous with a larger reserve, and if so may provide additional value to an existing reserve.

Of the 196 acres proposed as mitigation, 168.1 acres may have value to foraging Swainson's Hawks if managed to maximize foraging value and sufficient land is retained in the Natomas Basin to sustain the Swainson's Hawk population. Thus, the proposed mitigation would provide 168.1 acres of suitable habitat to offset the loss of 546 acres of suitable habitat.

30-13

The mitigation measure suggests that enhancing the foraging value of individual fields on 168.1 acres of mitigation land split into at least 4 separate fragmented parcels can offset the loss of 546 contiguous acres of foraging habitat area.

30-14

As noted above, the primary management issue for Swainson's Hawk in the Natomas Basin is available upland area, not specific crop type value, so to calculate mitigation responsibility on the basis of an evaluation of the foraging value of specific crop types on mitigation lands vs. impacted lands leads to deficient mitigation. Based on the above, the proposed mitigation is 0.3:1, or for every acre lost only 0.3 acres will be preserved. While mitigation lands can be, and should be, managed to maximize foraging habitat value, this does not offset the loss of suitable foraging landscape. As noted above, given the recent and ongoing loss of upland habitat in the basin and the current and anticipated loss of nesting Swainson's Hawks – in order to even conceptually meet the goals of the NBHCP – compensation for future projects (those not included in the City's permit area) should be expected to compensate at a rate significantly higher than the 0.5:1 ratio in the NBHCP.

30-15

Page 6.12-32. Significance after Mitigation

This section states the proposed mitigation would reduce this impact to a less-than-significant level. As noted above, a 0.3:1 ratio even with enhanced value on mitigation

30-16

lands does not fully mitigate the loss of upland habitat in the Natomas Basin for Swainson's Hawk. It assumes that Swainson's Hawk populations can be sustainable on smaller landscapes by increasing site-specific foraging value. There is no evidence to suggest that this is the case. The Swainson's Hawk is a wide-ranging, open plains species that requires large unbroken landscapes for successful foraging, reproduction, and population sustainability. The proposed mitigation is based solely on the foraging value of specific crop types and assumes less area is required if prey availability can be maximized on smaller areas, and does not acknowledge or address the full ecological needs of the species. The end result is that the foraging land base in the Natomas Basin will be further reduced and overall landscape value will decline, likely resulting in further declines of the Natomas Basin Swainson's Hawk population.

30-16 Cont'd

Page 6.12-42. Effect on the Conservation Strategy of the NBHCP, first paragraph.

This suggests that the conservation strategy for Swainson's Hawk in the NBHCP is an 'effective' strategy. While the NBC has masterfully maintained compliance with all aspects of the NBHCP, effectiveness of this strategy has not been demonstrated. The TAC commented similarly during preparation of the NBHCP noting in particular that the 0.5:1 compensation ratio was insufficient to sustain the current Swainson's Hawk population. Given this, using the NBHCP strategy as the baseline for 'effectiveness' is problematic and if effectiveness cannot be demonstrated relative to the goals of the plan, the proposed project would, in fact, further reduce the effectiveness of the NBHCP.

30-17

Page 6.12-42. Effect on the Conservation Strategy of the NBHCP, second paragraph.

This paragraph correctly states that the basis for the 0.5:1 mitigation ratio used in the NBHCP included:

- Much of the land to be developed was considered marginal habitat quality,
- NBC reserves would provide higher habitat quality, and
- The lands outside the permit area but within the basin would not be developed.

30-18

Irrespective of the deficiencies of the NBHCP strategy (i.e., most of the land that has been developed has been high value Swainson's Hawk foraging habitat; NBC reserves can provide only 25% upland habitat replacement – not the full 0.5:1 – and thus NBC reserve management alone cannot successfully mitigate impacts on Swainson's Hawk from urbanization in the basin), the third bullet above was a key assumption regarding the long-term sustainability of Swainson's Hawk in the basin. The concept was not based on specific crop-type habitat value, but rather the maintenance of the landscape as agricultural.

30-19

The second paragraph suggests that because mitigation lands would be enhanced to increase their foraging value, this would not be inconsistent with the third bullet above and thus would not affect the basis of the NBHCP 0.5:1 ratio. It argues that maximizing site-specific foraging habitat value on a smaller number of acres is sufficient to offset the

30-20

loss of larger landscapes, and thus while less land is available, these small islands of 'enhanced foraging habitat' will sustain the Swainson's Hawk population in the basin consistent with the goals of the NBHCP.

As noted above, this assumption has no ecological basis with regard to Swainson's Hawk and thus is an inappropriate method of addressing impacts and mitigation for this species in the Natomas Basin. The proposed mitigation (0.3:1 compensation ratio) is inconsistent with both the existing compensation requirements under the NBHCP (0.5:1 compensation ratio) and the intent and goals of the NBHCP relative to long-term Swainson's population sustainability in the Natomas Basin. 30-20 Cont'd

Page 6.12-43, Second paragraph

This paragraph continues the same argument regarding enhanced foraging value as an appropriate means of offsetting the reduction of available landscape. There is no evidence to support this argument. While Swainson's Hawk foraging ranges differ based on cropping patterns and individual fields can be enhanced on the basis of crop types, long-term sustainability requires maximizing landscapes, not individual fields. As less and less foraging landscape is available in the Natomas Basin, compensation on the basis of the value of individual fields is less relevant (i.e., as the landscape becomes less suitable, Swainson's Hawk use of isolated fields or suitable habitats that occur within a highly fragmented environment will decline regardless of the value of individual fields). Again, maximizing foraging value on reserves using the proposed approach is essential as long as Swainson's Hawks continue to use the Natomas Basin, but compensation for development-related impacts using this approach will result in an unmitigated loss of suitable open foraging landscape that will contribute to further loss of habitat in the Natomas Basin, and in turn may contribute to local population declines. 30-21

This concludes comments by the Swainson's Hawk TAC on the proposed Greenbrier Development Project DEIR. We hope our comments are useful and provide some value in terms addressing the long-term sustainability of Swainson's Hawks in the Natomas Basin. The TAC appreciates the opportunity to comment on this project and welcomes the opportunity to provide further comment or technical support. 30-22

Sincerely,

James A. Estep
Chair

LETTER 30

Swainson's Hawk Technical Advisory Committee
James Estep
Chair
September 5, 2006

30-1 Because the comment does not raise any issues related to the environmental analysis conducted in the DEIR, no further response is necessary.

30-2 Although the NBHCP does assume that some foraging habitat would be available in the Natomas Basin in addition to the reserves established through the NBHCP, it does not assume that all land would remain in agricultural use. This is explicitly stated in the conservation strategy, and is implied by the inclusion in the NBHCP of provisions related to additional development beyond the 17,500 acres authorized by the NBHCP and MAP HCP.

Analyses in the NBHCP make some assumptions regarding the continuation of agricultural land uses. In particular, section "*e. Foraging Habitat*" of the conservation strategy of the NBHCP (which begins on page IV-11 of the NBHCP) states that:

> "Analysis of the effectiveness of the NBHCP is based on the assumption that some portion of the existing foraging habitat would remain outside of the Permit Areas as development occurs under the NBHCP."
>
> City of Sacramento et al. 2003.

This, however, is not an assumption that agricultural use will continue on all land outside of the 17,500 acres authorized for development under the NBHCP and MAP HCP.

The NBHCP also acknowledges that undeveloped lands in the Natomas Basin could be converted to urban uses, and states that its adaptive management program is designed to respond to changes in baseline habitat that could occur if existing undeveloped lands in the Basin (in addition to the authorized 17,500 acres) were converted to urban uses. In section "*e. Foraging Habitat*", the conservation strategy of the NBHCP (which begins on page IV-11 of the NBHCP) states that:

> "Under the provisions of the NBHCP, neither the City or Sutter County may approve any urban development beyond the Authorized Development until the applicable Permittee conducts an evaluation of the effects of the additional development on the NBHCP's Operating Conservation Program, and the City's or the County's permit is amended to include the new areas or a new permit is issued for such additional areas."
>
> City of Sacramento et al. 2003

Consistent with the provisions of the NBHCP (that are referred to in the above quote), an evaluation of the effects of the project on the NBHCP was conducted (Appendix P of the DEIR) and a new HCP has been required as part of the project's mitigation for biological impacts. Please refer to response to comment 1-5.

Because the NBHCP includes provisions regarding the requirements for additional development, and provisions regarding management actions if additional development

reduced foraging resources, there is no basis for concluding that all areas of the basin not included in the 17,500 acres authorized by the NBHCP and MAP HCP would remain in agricultural land uses.

30-3 The "ultimate compensation ratio" for Swainson's hawk foraging habitat under the NBHCP is higher than the 0.125:1 stated in this comment. In addition to uplands land cover types, the upland components of managed marshes and fallow rice, approved as mitigation for the NBHCP, provide suitable foraging habitat for Swainson's hawk. Furthermore, the 0.125:1 ratio inaccurately assumes that all land within the permit area was suitable foraging habitat for Swainson's hawk foraging habitat when the permit was issued. Also, please refer to response to comment 30-2. The comment does not specifically address the analysis provided in the EIR; therefore, no further response can be provided.

30-4 Although the Swainson's hawk may migrate to Central America and South America, this fact would not change the analysis of potential effects to Swainson's hawk habitat conducted in the DEIR.

30-5 Swainson's hawk breeding success varies from year to year. The decline in the number of active nests between 2004 and 2005 could be a result of factors other than, or in addition to, development. The reason for the decline is not known. Further, new reserves take time to establish, and as higher quality habitat is made available and matures, there is an expectation that the food source for Swainson's hawks would increase. This, in turn, could lead to additional high quality habitat, and a potential for increases in the numbers of the species.

30-6 Idle crop land and wheat may provide valuable foraging habitat for Swainson's hawk during certain times of the year as the commenter suggests. The discussion of idle crop land and wheat fields presented in the existing conditions of the DEIR was general and did not discuss seasonality as it relates to habitat value. However, the impact analyses conducted for the DEIR (including the effects analysis in Appendix P) provided detailed information on foraging habitat value. Idle crop land and wheat fields, along with other land cover types, were assigned to four levels of relative value or quality based on the quantity and accessibility of prey, and existing studies of Swainson's hawk foraging. Because of the limited accessibility of prey, wheat was considered low quality habitat relative to other land cover types in the Natomas Basin, except during and following harvest, when prey is more accessible (as referred to in this comment). The value of idle fields as foraging habitat is greater than the value of wheat because of greater prey accessibility. However, in the analyses of foraging habitat conducted for the DEIR, idle fields were not assigned to the highest quality category ("high") because they lack harvest and irrigation activities. The frequency of harvest, flood irrigation and other activities was considered in rating habitats because of the importance of these activities for hawk foraging. For example, in the radio telemetry study conducted by Estep (1989), approximately half of all Swainson's hawk foraging was associated with harvest, flood irrigation, and other agricultural activities. Therefore, idle fields were considered to be in the second highest of the four quality categories defined in the DEIR analyses ("high-moderate").

30-7 As required by CEQA, impacts discussed under Impact 6.12-2 compare potential impacts of the project against baseline conditions. In order to determine project-level impacts on Swainson's hawk foraging habitat, CEQA requires that the existing conditions, in this case existing crop types, are compared with proposed land uses. It is also appropriate under CEQA to compare relative value of foraging habitat on the project site under pre- and post-project conditions. It would be difficult to measure the value of mitigation lands to reduce impacts to Swainson's hawk without assessing the value of the proposed crop types that would be maintained on these lands.

The comment does not acknowledge that some land cover types represent substantial, not subtle, distinctions in habitat quality and foraging resources provided. In crop types such as corn and wheat (i.e., low quality habitat) foraging is restricted to field edges (a small fraction of the land area) except during harvest (a small fraction of the time that Swainson's hawk is present in the Natomas Basin); in contrast, in grasslands and pasture (high-moderate quality habitat), foraging occurs throughout the field and throughout the period that Swainson's hawk is present in the Natomas Basin. Alfalfa and other hay crops (high quality habitat) also provide multiple foraging opportunities during flood irrigation and mowing, during which prey are more accessible and more readily captured (and Swainson's hawks from throughout a region often congregate on a single field where these activities are occurring).

The comment points to the continued urbanization of the Natomas Basin as necessitating a landscape-based approach to assessing impacts of the project. Continuing urbanization does pose a serious threat to Swainson's hawks. However, under CEQA, these effects are considered cumulative impacts. Cumulative impacts of the project, including impacts to Swainson's hawk, are discussed in Chapter 7 (page 7-21) of the DEIR. As noted under cumulative impacts, the NBHCP and other conservation plans in the Natomas Basin, in combination with mitigation recommended for the proposed project, would reduce the severity of cumulative impacts on biological resources. Implementation of the same conservation strategies would result in contiguous parcels of suitable foraging habitat for Swainson's hawk. Nonetheless, the DEIR acknowledges that the project would contribute to a significant cumulative impact on biological resources.

30-8 Please refer to response to comment 30-7.

30-9 The ITP allows for development of a certain amount of acreage within the boundaries of the NBHCP, and describes a process that must be followed if additional acreage is proposed for development, including an analysis of such development on the conservation strategy in the NBHCP. This analysis is included in Appendix P of the DEIR, and the Greenbriar project will prepare its own HCP. It is acknowledged that the amount of acreage required for mitigation of the species affected by the Greenbirar project would be higher than contemplated for development within the NBHCP ITP. The total acreage required will be established through the HCP process. Further, the DEIR (Section 6.12) contains extensive mitigation to reduce impacts to Swainson's hawk to a less-than-significant level. Also, please refer to response to comment 30-7.

30-10 The DEIR does not discuss the value of focused surveys in terms of revealing the importance of the project area to nearby nesting pairs. This discussion represents a brief summary of what is known about Swainson's hawk use of the project site under baseline conditions. The commenter statements regarding prior surveys, and the effects of development on Swainson's hawk, are noted.

30-11 The habitat loss in the southern Natomas Basin since the 1990s that is referred to in this comment is due to development authorized by the NBHCP and has been mitigated elsewhere in the Natomas Basin by the NBHCP. Increasing the foraging resources provided by upland habitats, by converting land to land cover types providing higher quality habitat, has been part of that mitigation.

The distinctions among land cover types represent substantial, not subtle, distinctions in habitat quality and foraging resources provided. Comparison of the attributes of land cover types can be a valuable tool for assessing impacts when measuring change from baseline conditions as mandated by CEQA.

Please also refer to response to comment 30-7.

30-12 The DEIR acknowledges that the buffer along the along the Lone Tree Canal would provide low-quality habitat to foraging Swainson's hawk and that additional off-site mitigation is needed to reduce this impact to a less-than-significant level. As required by mitigation measures 6.12-1 and 6.12-2, the applicant will not only set aside the acreage as described in the measure, it will also be required to set aside any additional acreage to the extent USFWS and DFG concur that equal or greater habitat value to that lost is established.

30-13 This comment states that a portion of the 196 acres of land proposed as mitigation may have value to foraging Swainson hawk's if managed to maximize foraging value. Thus, this comment appears to claim that some of the upland habitat proposed as mitigation does not currently provide foraging habitat, and that without management to enhance habitat value (presumably through changing land cover type) these sites may not provide habitat. This claim conflicts with other comments (e.g., comments 30-7 and 30-8) that all upland within the Natomas Basin is essential foraging habitat and that differences in the foraging habitat provided by different land cover types are only subtle distinctions that do not have a substantial effect on foraging resources. Most upland land cover provides foraging habitat for Swainson's hawk but there is a substantial range in the resources provided by this habitat and its overall value to the Swainson's hawk population using the Natomas Basin (as described in the response to comment 30-7).

The comment also states that mitigation measure 6.12-2 would provide 168.1 acres of suitable habitat to offset the loss of 546 acres of suitable habitat. This statement misrepresents the content of mitigation measure 6.12-2 because it does not mention that measure 6.12-2 identifies the minimum acreage that would be required and also states that the mitigation acreage could range up to 546 acres, and requires that the wildlife agencies (USFWS and DFG) concur that the mitigation results in equal or greater value to the species than would the foraging habitat present at the project site. In addition, it excludes 27.9 acres of mitigation land as not providing habitat (please see the response to Comment 12 above), and fails to acknowledge that the enhancement, preservation, and management of habitat will have beneficial effects (please refer to response to comment 30-7).

30-14 The comment refers to 168.1 acres at four separate sites. The 168.1 acres refers to three of the four mitigation sites: and 49 acres at a site to be acquired. It is inaccurate to characterize these sites as "fragmented," which implies that they are isolated from other Swainson's hawk habitat by urban development or other non-habitat. Two of these sites, in fact, are in closer proximity to and have greater continuity with adjacent Swainson's hawk habitat than does the foraging habitat at the Greenbriar site, and the third site, which will be selected solely to provide Swainson's hawk habitat, presumably would as well have greater continuity with other habitat. The Natomas 130 site is bordered by foraging habitat to the north, an existing

Natomas Basin Conservancy reserve to the south, and nesting habitat along the Sacramento River (and is within a mile of 9 recently documented Swainson's hawk nests). The Spangler site is bordered by agricultural lands on all sides, and is within a mile of the 1-mile wide Swainson's hawk zone along the Sacramento River, is within a half mile of two Natomas Basin Conservancy reserves, and is within 2 miles of 11 recently documented Swainson's hawk nests. In contrast, although it is within a mile of 5 recently documented Swainson's hawk nests, the Greenbriar site is bordered by urban development to the east and southeast, major roads to the north and south, and will be bordered to the west by development authorized by the MAP HCP, and will be bisected by a major new road (Meister Way) that also was authorized by the MAP HCP. These sites should have greater not lesser habitat value and importance to the Swainson's hawk population using the Natomas Basin. However, the greater value of these mitigation sites, based on landscape attributes, was not considered in determining the minimum acreage of habitat required to mitigate for the loss of habitat at the Greenbriar site.

30-15 Please refer to responses to comments 30-7, and 30-12 through 30-14.

30-16 Please refer to responses to comments 30-7, and 30-12 through 30-14.

30-17 The comment contends that the NBHCP effectiveness has not been demonstrated. The NBHCP has been approved by the USFWS and DFG, and has been upheld in both federal and State courts. The comment does not provide facts to support the assertion that the HCP, which is a long-term plan for habitat conservation, is not effective. As to the project's effect on the HCP, please see Appendix P of the DEIR, which extensively analyzes the project's affect on the conservation strategy in the NBHCP.

30-18 Because the comment does not raise any issues related to the environmental analysis conducted in the DEIR, no further response is necessary. However, please refer to response to comment 30-2.

30-19 Because the comment does not raise any issues related to the environmental analysis conducted in the DEIR, no further response is necessary. However, please refer to response to comment 30-2.

30-20 Please refer to response to comment 30-14, as well as responses to comments 30-7, 30-12 and 30-13.

30-21 Please refer to responses to comments 30-7 through 30-14.

30-22 Because the comment does not raise any issues related to the environmental analysis conducted in the DEIR, no further response is necessary.

SOS Cranes
PO Box 22192
Sacramento, CA 95822

31

August 8, 2006

Chairman Christopher Tooker and Members
Sacramento Local Agency Formation Commission
1112 I Street, Suite 100
Sacramento, CA 95814

RE: The Greenbriar Project and other Sacramento County USB Expansion Requests

Dear Chairman Tooker and Members of Sacramento LAFCo:

I represent an organization called Save Our Sandhill Cranes, also known as SOS Cranes, which is concerned with land use changes that primarily affect Sandhill Cranes and other vulnerable species that co-exist on the open grasslands and land used for agricultural field crops in Sacramento County. We at SOS Cranes are deeply disturbed by the pattern of rapid growth and land use conversion taking place in Sacramento County because it further reduces the remaining habitat that supports our region's biodiversity. Consequently, we strongly urge you to reject pending requests to expand the current urban services boundary (USB) to accommodate proposed projects that fall outside the existing USB. 31-1

We realize that the primary drivers for growth are economic. The belief that *more* subdivisions are needed to support *more* industry (jobs) which are needed to support *more* services for the people who are moving to Sacramento County is what drives our current process. In addition, there are pressures from landowners who want to obtain more economic benefit from their land than is currently possible based on its present use and zoning. 31-2

There are two questions we should be asking relative to current and pending land use changes and urban services boundary expansions being considered in General Plan updates throughout the county. 1) If we continue on our present path – and the urban services boundary is continuously extended every 10-15 years for the next 100 years so that most of Sacramento County has been covered with residential subdivision and supporting infrastructure, where will we obtain ***more*** habitat to support the natural biodiversity of our region? 2) Will the other creatures who currently share this region with us be forced to flee or perish as their natural homes are replaced with human habitat? 31-3

If we are concerned with the quality of life experienced by ourselves and those that follow us, as well as the preservation of biodiversity in the county, we need to change the current direction of planning and land use decision making. We must find other ways to support our citizens and fund city and county services. We must consider growth limits, instead of growth projections – and hold the existing urban services boundary line. We must find other ways to promote economic prosperity that will not further degrade the habitat that nurtures us, our children, and the other creatures who share the region with us. We must insist upon compact housing and infill strategies. We must turn down project requests – such as Greenbriar – that fall outside the urban services boundary line and require the conversion of more open space, habitat, and agricultural land to development. We must control the growth vision of Sacramento County, and not let the growth control us. 31-4

Respectfully submitted,

Tara Hansen
Member, Board of Directors
Save Our Sandhill Cranes

LETTER 31

Save Our Sandhill Cranes
Tara Hansen
Member, Board of Directors
August 8, 2006

31-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

31-2 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

31-3 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

31-4 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

SOS Cranes
PO Box 22192
Sacramento, CA 95822
www.soscranes.org

32

September 5, 2006

Chairman Christopher Tooker and Members
Sacramento Local Agency Formation Commission
1112 I Street, Suite 100
Sacramento, CA 95814

RE: Comments on the Greenbriar DEIR

Dear Chairman Tooker and Members of Sacramento LAFCo:

Save Our Sandhill Cranes is a non-profit group (501 c 3) that formed in response to the threats facing the wintering habitat of our local Sandhill Cranes. We are also concerned about the potential loss of other critical habitat in the Central Valley due to the impact on all wildlife, including Sandhill Cranes and other species of concern such as Swainson's Hawk and Giant Garter Snake.

We are very concerned about the current direction of growth within Sacramento County, as well as the possible extension of the Urban Services Boundary further into areas that are currently zoned for agricultural use. A copy of an earlier letter to the Commission expressing our concerns about the Greenbriar project and possible expansion of the County's Urban Services boundary is attached for reference. SOS Cranes is opposed to the expansion of the City's SOI, and we strongly urge that LAFCo deny the City's request to expand the SOI and focus instead on higher density projects within the existing urban core and along existing public transportation routes. Specific comments related to the Draft Environmental Impact Report for the Greenbriar project are included in the body of this letter. 32-1

Comments Specific to the Greenbriar Draft Environmental Impact Report (DEIR):

Section 2.3.2 Dispersed Development Alternative and City of Sacramento's SOI Expansion Request:

The DEIR indicates that the City of Sacramento's holding capacity falls short of expected growth based on current planning estimates included in the City's background report for their General Plan Update that is currently in progress. However, the underlying technical report shows that there are significant variations in the population projection numbers for both the City and the County. The high estimate of 650,000 residents for City of Sacramento by the year 2030 is in fact based on the inclusion and annexation of additional greenfield areas such as the area proposed Greenbriar site. This implies that it may be possible to address real growth needs within the City's current SOI, without extending the City boundary further into the open spaces in the County. The underlying technical report also states that the development of new greenfield areas will occur significantly faster than infill development 32-2 32-3

within the existing SOI boundaries. This premise is in conflict with current LAFCo policies which encourage infill development and discourage suburban sprawl into outlying areas. 32-3 Cont'd

Section 6.12. Summary Response to the Suggestion of Completing an HCP Specific to this Project:

A Habitat Conservation Plan, and compliance in general with the ESA and CESA, does not provide a net benefit to a particular species but rather mitigates for the effects of a given project. Any mitigation lands or replacement habitats are not increases in the overall habitat availability, but rather land use designation changes. To create a preserve on one piece of land, while diminishing or destroying habitat on another piece of land does not increase the total amount of potentially viable habitat for species. In the end there is a net reduction of available land for viable habitat. As this reapportioning continues there is inevitably less and less available land and as such the habitat value for the remaining land increases due to scarcity rather than an increase in inherent ecological factors. Rejecting this proposal for the Greenbriar project would be a wise step in attempting to regain ecological balance in the Natomas Basin. 32-4

Section 2. Summary Response to the Overall Mitigation Plan:

The Memorandum of Understanding for the Natomas Joint Vision, signed in December of 2002 by officials from the City of Sacramento and Sacramento County, specifically calls for one acre of habitat and open space for every acre of land developed. The principles of the MOU were reaffirmed by City and County staff in a workshop in May of 2006. The DEIR for Greenbriar proposes total mitigation lands that fall required by the MOU. In addition, the USFWS requires significantly higher mitigation ratios (3:1) for Giant Garter Snake so the total mitigation lands should exceed the 1:1 ratio of the MOU. Furthermore, while the DEIR states that the overall habitat value of the lands included in the mitigation plan for loss of habitat at the Greenbriar site is of higher quality, it has not been established that smaller intermittent parcels of higher quality habitat to replace one large parcel of uninterrupted open space/habitat is in fact a superior alternative. 32-5

Section2 (also 3.5.1) – Comments on the Project Location and Proposed Lake and Detention Basin:

The project site lies within the existing Sacramento International Airport's (SIA) flight zone and would necessitate that the project applicant grant an avigation easement over the subject site. This easement would include a provision to provide title notification to prospective homeowners alerting them to the fact that airport operations will occur within a mile of the subject site, resulting in significant noise impacts associated with aircraft over-flights. In addition, the project includes a proposal to include a 39-acre lake/detention basin on the project site which may attract migrating waterfowl and other birds into the airport flight zone. 32-6

The DEIR addresses the noise impact by including a title notification to prospective homeowners alerting them to the fact that airport operations will occur within a mile of the subject site, resulting in significant noise impacts associated with aircraft over-flights. While homeowners may be willing to sign such a notification in order to purchase a home in the 32-7

subject site, the ongoing aircraft noise would have a significant impact on potential residents, resale of homes on the site, and conflict with the objectives of the SIA (Section 2, Table 2-1; 6.3-5). 32-7 Cont'd

The DEIR also lays out a management plan to address the potential aircraft safety hazards caused by the proposed 39 acre lake/detention basin – and calls for specific measures, up to and including the use of chemical repellents, to deter migrating waterfowl and other birds from landing on or using the lake as habitat to mitigate airport concerns about bird strikes (Section 2, Table 2-1; 6.8-4). 32-8

First, the Natomas Joint Vision MOU (12/02) item A (4) states that an Airport Protection Plan will include measures to protect the preserved open space around it and keeping noise sensitive development and water fowl attractions in relatively distant areas. The project site lies less than one mile away from SIA's field of operation. Although the DEIR requires a management plan to address bird strike concerns, it will be impractical, if not impossible, to mitigate the airport's concerns about additional bird strike hazards in the flight zone. An additional body of water in the Central Valley Flyway is certain to attract the interest of migrating waterfowl. It is unlikely that any ongoing measures will successfully deter them. Furthermore, because the DEIR calls for specific measures to prevent the use of the lake by waterfowl, the lake should not be included as part of the mitigation acreage. 32-9

Section 2. Comments Specific to Flood Hazards on the Project Site and Within the Natomas Basin:

The DEIR states that "the project site is not located within a designated 100-year floodplain as currently delineated by FEMA" and therefore results in less than significant flooding impacts (Table 2-1 6.10-3). On July 20, 2006, The U.S. Army Corps of Engineers withdrew their previous certification of the levees in the Natomas Basin due to concerns about deep-water seepage. The Federal Emergency Management Agency is expected to follow with a change the flood hazard zoning for the area – designating it to be within the 100-year floodplain - in the very near future. 32-10

The DEIR barely addresses the potential flooding impacts of the subject site because it is using FEMA's current flood hazard designation, which has not yet been updated to address the Corps of Engineer's change in position on the levee certification. In Table 2-1, 6.10-3, the project applicant states that building pads would be raised should FEMA decertify the site for 100-year flood protection, however this falls significantly short of all of the human impact issues involved in addressing the potential of a major flood event. For example, emergency egress in the event of a levee failure is not addressed – and complete evacuation of the area would be a likely scenario in the event of major flood event. 32-11

Section 2. Comments Specific to the Giant Garter Snake Habitat and Mitigation Measures

The DEIR includes a number of mis-statements relative to the impact on Giant Garter Snake habitat and relative mitigation methods (Table 2-1. 6.12-1). First, the DEIR indicates that rice farming fields are an important habitat for the giant garter snake. 32-12

> *"Rice fields and their adjacent irrigation and drainage canals serve an important role as aquatic habitat for giant garter snake. The elements and cycle of the rice field*

ecosystem coincides fairly closely with the biological needs of the giant garter snake. During the summer, giant garter snakes use the flooded rice fields as long as their prey is present in sufficient densities. During the late summer, rice fields provide important nursery areas for newborn giant garter snakes. In late summer/fall, water is drained from the rice fields and giant garter snake prey items become concentrated in the remaining pockets of standing water, which allows the snakes to gorge prior to their period of winter inactivity (USFWS 1999). It appears that the majority of giant garter snakes move back into the canals and ditches as the rice fields are drained, although a few may over-winter in the fallow fields where they hibernate within burrows in the small berms separating the rice checks."

32-12 Cont'd

The claim that rice farming is good for giant garter snakes is in direct contradiction to the historical facts. As rice farming and other agriculture blossomed in the Central Valley, Giant Garter Snake populations plummeted to the point that they are now a Threatened Species under the ESA. Clearly this would not be the case if rice farming was in any way comparable to the traditional habitat of the Giant Garter Snake. Site specific snake population densities also indicate that rice fields are substandard compared to traditional habitat. The fact that the snakes utilize rice fields as a substitute habitat is a testament to the resilience of the species, not the quality of the habitat. It would seem easier to prove that rice fields were leading to the extinction of the snake, not sustaining it.

Secondly, the assertion that some snakes may over-winter "in the small berms separating rice checks" is very unlikely. These berms are likely to be too low to provide protection from seasonal flooding, and they are unlikely to contain a sufficient number of mammal burrows for hibernation due to the scarcity of such mammals in rice production fields. The importance of mammal burrows is a problematic issue in this DEIR, and the recovery plan for the giant garter snake in general. It is clearly stated that the snake relies on these burrows for its lifecycle - both as a hibernaculum's in the winter and as an escape from the summer heat. Yet there is no explicit or implicit arrangement to either ensure the ongoing production of these burrows through management of the mammals that create them, or to determine their density and distribution within upland giant garter snake habitat. There is not even an acknowledgement of which animals are responsible for the production of these burrows. This is not a matter of a lack of knowledge but rather an inherent problem with the ESA and CESA. These two acts are specifically concerned with the listed species. Other associated species are not typically considered unless they are also listed or are exerting excessive predatory pressure on the listed species being considered. This approach leaves out important contributory species that are critical to the recovery of the listed species. In this case, ground squirrels, or gophers, or rabbits among others, are digging these burrows which the giant garter snake can utilize for its own lifecycle. These burrowers are not openly considered in the HCP, and yet they are critical.

32-13

32-14

There is possibly an implicit acknowledgement of the importance of the burrowers in Section 1. Habitat Creation, Preservation, and Management in the Lone Tree Canal Linear Open Space/Buffer Area section c, which states:

"Upland giant garter snake habitat within the Lone Tree Canal linear open space/buffer area shall be created and managed to provide cover, basking areas, and refugia during the winter dormant period. Hibernaculae would be constructed at

32-15

regular intervals by embedding concrete or coarse rock in the bank or in a berm along the Lone Tree Canal corridor to provide additional winter refugia." 32-15 Cont'd

Rather than relying on the ongoing work of burrowing mammals to continue creating these essential burrows, an unproven replacement measure seems to be offered instead. This solution seems problematic at best. 32-16

Embedded concrete and rocks will create substandard digging conditions for burrowing mammals due to the inherent hardness of the added substratum. The resultant hibernaculae would also have very different qualities from abandoned mammal burrows. For starters, porosity would be significantly greater allowing for the possibility of dripping and seeping of winter rains directly onto the snake causing substantial conductive cooling and potential peril. The nature and quality of the air pockets within this concrete and coarse rock substratum could be problematic as well with dirt and clay seeping into these pockets shrinking them over time. Further, many snakes, garter snakes included, will communally den in the winter if circumstances allow. This provides a benefit to the species survival because a ball of snakes has a smaller overall surface area for cooling in the cold of winter than those snakes would have if they denned individually. Shrinking hibernaculae, due to soil seepage, would be an issue for communal dens and since snakes of different species will den together, diminishment of other species of snakes in the area could also have a potential impact on winter survival in any communal sites. 32-17

A further issue with the mammal burrows is that even though they are identified as important habitat requirements, there is no consideration of this when doing a field analysis of potential Giant Garter Snake habitat. This seems to be of particular concern in the designation of the 200 foot wide upland corridor along Lone Tree Creek. A 200 foot upland corridor is really an arbitrary designation when one considers that the giant garter snakes have been documented using burrows 820 feet from the nearest aquatic habitat. Would it not be substantially more prudent to survey the density and distribution of suitable mammal burrows before determining what would be a reasonable corridor for a given site? 32-18

Further, if mammal burrows are being utilized in the heat of the summer by snakes for a respite, knowing the distribution of suitable burrows is critical for the onset of construction. Measure (a) from the "On Site Avoidance and Mitigation Measures" states:

"All grading activity within giant garter snake habitat (aquatic habitat and uplands within 200 feet of aquatic habitat) shall be restricted to a period between May 1 and October 1. Because this is during the snakes' active stage, it would allow snakes to actively move away from danger and thereby reduce chances of snake mortality. Additionally, this restriction is timed to avoid grading during the snakes' breeding, dispersal, fall foraging and over-wintering periods, when they are most vulnerable to disturbance." 32-19

Without a determination based upon density and distribution of suitable mammal burrows, there is a significant risk that if construction begins in the heat of the summer, when snakes could be utilizing a burrow to escape the heat of the day, snakes could be crushed underground. This possibility holds for both the 250 foot corridor as well as potential burrows up to a least 820 feet. As well as identifying suitable burrows for the determination 32-20 32-21

of the sensitive area during construction, work would need to commence before the extreme heat of the summer drives the snakes underground.

Third, the issue of burrows brings up the question: What is the extent of upland habitat for the giant garter snake in the Greenbriar project? Using the 200 foot corridor as a guide means that 52.57 acres of upland habitat will be lost. A more accurate assessment based on suitable burrow sites could dramatically increase the accuracy of the determination of which lands are actually giant garter snake habitats and thus are also impacted. This could reasonably result in a larger affected area which would deem that more mitigation lands are required as reparation for habitat loss. 32-21 Cont'd

The final issue with burrows has to do with winter flooding. It is critical that suitable winter burrows be above that level which could reasonably be determined to flood. Rice berms and checks are clearly below that level. It also seems reasonable to analyze the potential impact of a levee breach on the snake in its newly constrained habitat. .This is a factor of particular importance given that the USCOE has decertified the local levees for 100-year flood protection. 32-22

Measure (e) from Onsite Avoidance and Mitigation Measures concludes with: *"Snakes encountered should be relocated to the nearest suitable habitat off-site by a qualified biologist."* This would be an unwise action given the documented parasite loads in giant garter snakes of the American Basin as well as the likely mortality of any transplanted snakes. Transplantation would surely result in the "take" of the transplanted individual and could potentially lead to the "take" of individuals in the new site if they are exposed to parasites. 32-23

Section 2 (Table 2-1 6-.12-5). Comments Specific to Burrowing Owl Habitat:

Burrowing owls have been observed on this site, however those sightings may not have been adequately documented. The DEIR calls for focused surveys no more than 30 and no less than 14 days prior to site grading by a qualified biologist to determine if there are any occupied burrows on the site. The presence of burrowing owls and the habitat mitigation issues should be properly documented and addressed with appropriate mitigation measures in the final EIR. 32-24

Section 6. Comments Specific to Project and Cumulative Traffic Impact:

By itself, the project will result in significant and unavoidable impacts to 7 intersections, 2 road segments and 3 highway ramps. Cumulative impacts estimated for 2030 include 14 impacted intersections, 3 highway segments, and six freeway ramps. Impacted means Level of service F, which in turn means delays at intersections and stop and go traffic for commuters. There is no proposed mitigation for these impacts. Existing residents in the Natomas Basin, those traveling along the I-80 corridor, and those traveling along I-5 will be heavily impacted with significantly longer travel times. 32-25

The DEIR also finds that the bicycle/pedestrian provisions need to be addressed. However, other than stating that bicycle lanes and facilities need to be identified and incorporated, the DEIR does not specify where, how many, or which types of bicycle lanes are to be 32-26

constructed. Also lacking is the very important connectivity of bicycle lanes on the proposed project with existing bicycle routes. This is critical for bicycle commuter safety, and would be a significant safety issue if not addressed. 32-26 Cont'd

Summary Comments:

In summary, SOS Cranes believes that the DEIR for the project falls short in a number of key areas, but also raises several significant and unavoidable impacts. Of the project alternatives discussed in Section 8, the "Reduced Size" alternative – if reduced to a level of development necessary to mitigate the significant and unavoidable impacts – would not be a satisfactory alternative to the project applicant. The "Dispersed Alternative" would fall more in line with LAFCo's objectives, but would not meet the objectives of the project applicant and may not meet the City's growth objectives. The "No Project" alternative would completely mitigate the environmental concerns (identified as the "Environmentally Superior Alternative",) and the significant and unavoidable impacts of the project as identified in the DEIR. This alternative may not satisfy the overall growth objectives of the City, but could still satisfy the growth *needs* of the City. SOS Cranes supports the "No Project" alternative as the best alternative, and suggests that LAFCo deny the City's SOI expansion request, effectively denying the Greenbriar project in total. 32-27

Sincerely,

for

Tara Hansen
Sean Wirth
For the Board of Directors,
SOS Cranes

Encl. Letter to LAFCo dated August 8, 2006

LETTER 32

Save Our Sandhill Cranes
Tara Hansen and Sean Wirth
Board of Directors
September 5, 2006

32-1 The comment does not raise any issues related to the environmental analysis presented in the DEIR, no further response is necessary.

32-2 The fact that annexation of greenfield sites would be needed to provide for expected City of Sacramento housing demand is noted. The statement that City growth needs could be accommodated within the existing sphere of influence (SOI) is not supported by factual information. As stated on page 2-3 of the DEIR, the City has an estimated holding capacity of 564,000 people, and an expected 2030 population of 650,000. The Sacramento region is becoming an increasingly attractive place to live through its strong employment market, its relatively affordable housing, and other quality of life factors. The discussion in the DEIR demonstrates that, absent additions to developable land through SOI changes, there would not be sufficient land to provide for this population projection. If additional land was not provided to accommodate the population growth, it is likely that two outcomes would occur:

1. If housing was not provided to meet population projections in the City of Sacramento, demand for available housing would be increasingly higher than supply. This would likely drive the price for available housing up substantially. In other areas of California, this has resulted in moderate income families being increasingly priced out of the housing market.

2. In addition to the socioeconomic issues resulting from pricing moderate income families out of the housing market (socioeconomic effects are not environmental impacts and are therefore not considered further herein), the common physical environmental impact that consequently results is to push development to outlying communities where greenfield sites are plentiful. The tendency in higher priced communities (e.g., Los Angeles, Orange County, and Bay Area) is that development is pushed further and further from the job centers, increasing commutes, air quality effects, and traffic congestion. The Blueprint process was developed in large part as a result of the concern that the Sacramento region needs to accommodate a large future demand for housing, and that if the region was not considered as a whole, the pattern found in the above referenced communities would be repeated in the Sacramento region. The Greenbriar proposal is consistent with land use recommendations for the site as shown in the Blueprint.

The desire to accommodate some level or all the growth projected for Sacramento is a policy decision for the City and LAFCo; the EIR evaluates the environmental impacts of allowing the project and the population that would accompany the project. It also considers the environmental impacts of not allowing Greenbriar to move forward, as in the alternative described above. In addition to the discussion in the EIR, the City and LAFCo will consider the socioeconomic implications of not planning for expected growth demands, including upward pressure on housing prices, pressure to develop in more outlying areas of the region, and other implications.

32-3 The comment does not raise any issues related to the environmental analysis presented in the DEIR, no further response is necessary.

32-4 The comment does not raise any issues related to the environmental analysis presented in the DEIR. However, the statements regarding HCPs and compliance with the ESA and CESA could be misleading. The comment does not accurately reflect requirements for Habitat Conservation Plans (HCP) as reflected in the Endangered Species Act. While mitigation for loss of species is an important objective of HCPs, they are also required to aid in the recovery of listed species, which is intended to be a net benefit to the covered species. As stated in the USFWS website:

Section 10(a) of the ESA allows the Service to issue permits authorizing the incidental take of listed species in the course of otherwise lawful activities, provided that those activities were conducted according to an approved HCPs, and the issuance of the HCP permit would not jeopardize the continued existence of the species. Accordingly, these proposed HCPs must satisfy specific issuance criteria enumerated in section 10(a)(2)(B) of the ESA. In deciding whether these criteria have been satisfied and whether the permit should be issued for a given species, the Service considers, among other things, the extent to which the habitat of the affected species or its long-term survivability may be improved or enhanced. (http://www.fws.gov/endangered/hcp/NOSURPR.HTM, 2007)

Although the acreage of "habitat" available to certain species may be diminished if a project, such as Greenbriar, is developed, the quality of replacement habitat would be superior to the habitat lost in order to fully mitigate for the impacts to the affected species, a requirement of both ESA and CESA. As described in detail in Section 6.12 of the DEIR, extensive mitigation is proposed to enhance habitat available to affected species.

32-5 Please refer to response to comment 14-2. Regarding mitigation required by the USFWS for impacts to giant garter snake (GGS)and the 3:1 ratio, the project applicants are preparing a separate habitat conservation plan (HCP) from the project (as required by Mitigation Measure 6.12-1 of the DEIR), which will be subject to review and approval by USFWS and the California Department of Fish and Game (DFG). The preparation of the HCP is proceeding independently of the EIR. Note that the project would affect approximately 59 acres of GGS habitat and includes 235 acres of habitat creation and preservation for the species, which is a 4:1 ratio.

The EIR has fully evaluated the project's potential impacts to open space and sensitive biological resources in Sections 6.6, "Parks and Open Space," and 6.12, "Biological Resources," of the DEIR.

Regarding the value of proposed mitigation lands, the commenter offers no evidence to support the assertion that the mitigation plan proposed in the DEIR would not fully mitigate impacts to sensitive biological resources; therefore, no further response can be provided.

32-6 The comment does not raise any issues related to the environmental analysis presented in the DEIR, no further response is necessary.

32-7 Please refer to response to comment 20-8. The comment does not raise any issues related to the environmental analysis presented in the DEIR, no further response is necessary.

32-8 The comment does not raise any issues related to the environmental analysis presented in the DEIR, no further response is necessary.

32-9 Regarding the feasibility of the proposed lake/detention basin management plan, the project applicants in consultation with staff of the Sacramento County Airport System (SCAS) have developed a management plan for the lake/detention plan (in response to the requirements of Mitigation Measure 6.8-4 of the DEIR) to reduce bird attractants associated with the lake/detention basin. This plan has been prepared in conformance with the recommendations of the Sacramento County Airport Land Use Commission (ALUC) and feedback from SCAS staff. SCAS has commented on the DEIR (see comment letter 21, comment 21-3) indicating that it concurs that the proposed management plan would adequately reduce the potential aviation/bird strike hazards associated with the proposed lake/detention basin, to a less-than-significant level. The commenter offers no evidence that the proposed management plan would be infeasible; therefore, no further response can be provided. Please also refer to comment letter 21.

Regarding the inclusion of the lake/detention basin in the open space mitigation calculations for the project, the City, LAFCo, and County staff have all agreed that the proposed lake/detention basin would meet the definition of "open space" included within the Natomas Joint Vision Memorandum of Understanding (December 2002). Therefore, it is appropriate to count the lake/detention basin acreage as part of the Natomas Joint Vision open space mitigation package proposed by the applicant. The USFWS / DFG have determined that the lake / detention basin would not qualify as HCP open space mitigation.

32-10 Regarding the project's potential flooding impacts please refer to Master Response 1.

32-11 Regarding the project's potential flooding impacts please refer to Master Response 1.

32-12 Regarding the value of rice fields in supporting giant garter snake populations, the commenter offers no evidence to support the linkage between the historical increase in rice farming and a decrease in giant garter snake populations. During the period when rice farming increased, numerous other substantial alterations of giant garter snake habitat also occurred and could have directly resulted in or contributed to the decline in giant garter snake populations. These changes include implementation of major flood control projects and other changes in water management practices, conversion of wetland habitats to non-flooded croplands or urban land uses, dramatic increases in human populations and road density, introduction and spread of non-native species (including predators of giant garter snakes and plant species that have altered the structure of wetland habitats), and changes in water quality. The analysis included in the DEIR regarding use of rice fields by giant garter snakes was based on documentation prepared by the USFWS based on field data and information collected to substantiate such conclusions. Because the commenter does not provide any evidence to support an alternate conclusion, no further response can be provided.

32-13 Regarding the discussion of giant garter snakes and their over-wintering characteristics, the DEIR states the following (see page 6.12-17):

"It appears that the majority of giant garter snakes move back into the canals and ditches as the rice fields are drained, although a few may over-winter in the fallow fields where they hibernate within burrows in the small berms separating the rice checks (Hansen 1998)."

This statement acknowledges the possibility of snake use of drained rice fields, while also indicating that canals and ditches are much more important habitat. The commenter offers no evidence to support the assertion that snakes would not use habitat within drained rice fields during the winter; therefore, no further response can be provided.

32-14 The commenter's concerns with requirements of the ESA and CESA are noted. The comment does not raise any specific issues related to the environmental analysis presented in the DEIR, no further response is necessary.

32-15 The comment does not raise any specific issues related to the environmental analysis presented in the DEIR, no further response is necessary.

32-16 The commenter offers no evidence to support the assertion that mitigation requiring the construction of hibernaculae for giant garter snake would be infeasible; therefore, no further response can be provided.

32-17 The proposed preserve along Lone Tree Canal would include artificial hibernaculae (i.e., hibernation sites), which are intended to supplement, not replace, mammal burrows and other refuges for giant garter snake. The proposed enhancements to Lone Tree Canal would not include any features that would reduce or limit the activity of burrowing mammals. Rather, with the cessation of agricultural activities along Lone Tree Canal and the measures that would be implemented to prevent domestic and feral cats from hunting along Lone Tree Canal, it is anticipated that mammal burrows along this stretch of the canal would increase and provide greater opportunities for dens and refugia.

32-18 Giant garter snakes have been documented using upland sites up to 820 feet from water (Hansen 1988). Hibernaculae at this distance from water, however, are most often found in areas with high winter floods. Giant garter snakes also seek refuge in upland burrows during hot summer weather (Hansen and Brode 1993), and have been documented up to 164 feet from aquatic habitat during this time (Wylie et al. 1997). However, snake use of sites at greater distances from wetlands is associated with landscapes where suitable close sites are not available. This is not generally the case in the agricultural landscape of the Natomas Basin because canal banks often provide refuges and hibernaculae, and the agricultural lands themselves are at slightly lower elevations than canal banks, generally have less cover and fewer refugia than canal banks, and may be flooded or tilled during winter.

The proposed reserve along Lone Tree Canal is intended to conserve connectivity of giant garter snake habitat along Lone Tree Canal, not to include all upland areas on the Greenbriar site that might be used by giant garter snakes. The analysis of potential effects on the NBHCP (Appendix P of the DEIR) evaluated the setback width that is required to maintain connectivity along a canal (see *Assessment of Required Width and Other Setback Attributes*, pages 3-22 to 3-25); it concluded that the total width of setbacks should be at least the width of the canal and its banks, plus an additional 125–200 feet. The proposed setback along Lone Tree Canal is at the wider end of this range. The project applicants are preparing a separate HCP for the project, which will be subject to review and approval by the USFWS and DFG. The preparation of the HCP is proceeding independently of the EIR. However, the EIR has fully evaluated the project's potential impacts to sensitive biological resources as documented in Section 6.12, "Biological Resources," of the DEIR. Please refer to response to comment 1-5.

32-19 Please refer to response to comment 32-18. Although there does remain a possibility of risk to a snake during summer grading, numerous efforts have been incorporated into the Mitigation Measures to significantly reduce this limited seasonal risk. For example, Mitigation Measure 6.12-1, 3.a (which limits grading to the snake's active season so snakes can respond and move away from equipment) would substantially reduce the likelihood of snake mortality during grading activities at the project site, particularly when combined with Mitigation Measures 6.12-1, 3.b-i. These related measures include pre-construction dewatering of on-site canals

and ditches to reduce snake use of the site, preconstruction surveys of the site, avoidance of the 250-foot wide corridor along Lone Tree Canal, presence of a biological monitor to ensure that construction activities do not encroach on unauthorized areas and that construction ceases in the vicinity of any giant garter snakes that are found, and an exclusion fence to prevent snakes from entering the site during construction, among other measures.

32-20 Please refer to response to comments 32-18 and 32-19.

32-21 The distribution of burrows and other potential refugia would not necessarily provide a more accurate measure of the extent of upland habitat for the giant garter snake because the distribution of food resources, perceived predation risk, and the energetic cost of using potential refugia would likely affect the location of refugia used by giant garter snakes. All of these factors, except possibly for the number of potentially suitable burrows and crevasses, become less suitable at greater distances from aquatic habitat. Therefore, the distance from aquatic habitat is more likely to accurately indicate the extent of upland giant garter snake habitat compared to the distribution of potentially suitable burrows and crevasses across uplands.

32-22 Regarding the potential for flooding to occur at the project site, please refer to Master Response 1 and response to comment 29-12. In the event of a levee breach, the entire North Natomas Area would be flooded by multiple feet; however, measures are in place and are currently being constructed to prevent a levee breach during storm events. Therefore, the potential for impacts to occur to giant garter snake habitat would be remote.

32-23 Mitigation Measure 6-12.3.e includes actions related to clearing and grading of the site and specifically refers to the handling of snakes stranded in an exclusion fence. The exclusion fence would be placed between the development area and the Lone Tree Canal linear open space/buffer area prior to and during construction to prevent giant garter snake entry into the construction zone. The fence would be erected prior to the onset of the dormant season preceding construction when giant garter snakes are less likely to occupy upland retreats on the project site. The interior or project side of the fence would be routinely monitored for stranded giant garter snakes. Snakes encountered would be relocated to the nearest suitable habitat off-site by a qualified biologist. In this case, the nearest suitable habitat would be located in the Lone Tree Canal corridor that is adjacent to the development area. Because of the limited aquatic habitat present in the development area, the extensive movements made by giant garter snakes on a daily and seasonal basis and the close proximity and connectivity of the Lone Tree Canal to habitat in the development area, any snakes stranded at the exclusion fence are likely already using habitat in the Lone Tree Canal corridor. Therefore, movement of a stranded giant garter snake from the exclusion fence into the Lone Tree Canal corridor is unlikely to increase exposure of other snakes to parasites.

32-24 The commenter offers no evidence that the biological surveys conducted for the project site were inadequate; therefore, no further response can be provided.

32-25 The commenter summarizes the traffic impacts described in the EIR. The comment does not raise any specific issues related to the environmental analysis presented in the DEIR, no further response is necessary.

32-26 The DEIR acknowledges that specific information related to improvements to on- and off-site bicycle facilities were not available at the time of preparation. However, the DEIR recommends mitigation that requires the project applicant to coordinate with the City to identify necessary on- and off-site bicycle facilities (see Mitigation Measure 6.1-9(a) of the DEIR). Subsequent to the publication of the DEIR, the applicants in coordination with the City have prepared Draft Planned Unit Development (PUD) Guidelines for the Greenbriar Project. As identified in Section 2, "Transit Orientation and Mobility, " and Section 5, "Parks, Open Space, and Habitat Conservation," the project includes a network of both on-and off-street trails and pathways to allow for the safe and convenient movement of non-vehicular traffic (e.g., pedestrians and bicycles). All arterial and collector streets would have striped Class II bike lanes and these lanes would be connected to off-site areas via Meister Way. A copy of the Draft PUD Guidelines is available for review at the City of Sacramento, Planning Department public counter.

32-27 The commenter's opinions regarding the alternatives evaluated in the DEIR are noted. No further response is necessary.

33

September 5, 2006

Mr. Tom Buford, Associate Planner
City of Sacramento Environmental Services Division
North Permit Center
2101 Arena Boulevard, 2nd Floor
Sacramento, CA 95834

RE: Comments Regarding Draft Environmental Impact Report (DEIR) for the Greenbriar Project Annexation Proposal

Dear Mr. Buford,

Please find herein the Natomas Community Association's (NCA) comments on the City of Sacramento's (hereafter referred to as the City) Sphere of Influence and Annexation Proposal for the Greenbriar Project (hereafter referred to as the Proposal) as contained in the Draft Environmental Impact Report (DEIR).

The Proposal is in an effectively decertified flood plain- how will the applicant and the City mitigate the flooding risks necessary to bring the proposal up to 200 year flood protection? If construction and mitigation is proposed, how will it be specifically funded? Please provide thorough details on flooding mitigation measures, be they physically constructed or otherwise. Please provide a construction and financing plan if proposed. 33-1

Loss of agriculture- how will the applicant make up for the loss of agriculture that the Proposal would cause? How would that be mitigated? How will the lost crops be re-sourced from other sources in the region? Is the loss of agriculture consistent with regional planning efforts in these regards? 33-2

Sewer outflow issues - the local and regional sewer systems as currently constructed and planned do not include the ability to handle the outflows that the Proposal would create. What is specifically proposed to address these sewer systems concerns? If construction and mitigation activities are proposed, how will they be specifically funded? What are the details of any construction plans? Please provide a construction and financing plan if proposed. 33-3 Have additional permits been sought from the appropriate water agencies that restrict (treated) sewer outflows into the Sacramento River, and if not, will they be sought? 33-4 Will the additional sewer flows negatively impact habitat conservation and restoration efforts in the San Francisco Bay Delta water region? 33-5

The City of Sacramento is currently out of compliance with the police, fire, and emergency services standards and staffing ratios required by the North Natomas Community Plan (NNCP), the governing document for the development of North Natomas. How will the City be brought into compliance with these various standards before the Proposal can be properly considered? How will the Proposal affect this already out of compliance situation? What do the applicant and the City propose? When 33-6

and how will the two police and fire substations required by the NNCP be funded and built? How will emergency services be provided to the thousands of additional residents contemplated by the Proposal? How will the necessary additional officers, firemen, and associated resources be provided to the residents? How will the city mitigate an already desperately strained, out of compliance service situation in North Natomas that the Proposal will exacerbate? If mitigation, personnel budgeting, and facility construction is proposed, how will it be specifically funded? Please provide a budgeting, construction, and financing plan if proposed. Please provide specific timelines that the applicant and City propose to bring the City into compliance with all of these ratios and requirements. 33-7

The Project's DEIR describes serious, unmitigatable traffic congestion to I-5, 99 and surrounding roads from the Proposal and notes that I-5 and 99 would have to be widened to six lanes. Because the applicant and city do not propose to widen these roads, serious, unmitigatable traffic congestion would result, likely hampering necessary commerce and business to and from our regional airport, and preventing the delivery of a necessary level of transportation services to Greenbriar. How will these transportation impacts be mitigated? How will ground commerce to and from the regional Airport be maintained? How will land be obtained to provide for the necessary road widening? If land acquisition and transportation construction and mitigation is proposed, how will it be specifically funded? Please provide a construction and financing plan if proposed. 33-8

The Proposal's inconsistency with and unrelatedness to the existing Habitat Conservation Plan (HCP) and North Natomas Community Plan (NNCP), the governing documents for the development of North Natomas. How will the applicant and the City ensure that the Proposal is equitable with these existing governing documents? How will the Applicant and the City avoid the creation of an inequitable and unfair situation for other developers who must still comply with the existing HCP and NNCP? How will the applicant and the City avoid the creation of a brand new planning process for the Proposal that might subject the earlier plans to extensive litigation? 33-9

The financing plan contained in the DEIR Proposal is seemingly incomplete and unworkable. Will it be revised? Will additional funding streams be secured? How will a better plan address the many funding discrepancies and shortfalls? How will it ensure that existing residents of North Natomas receive the services they need while simultaneously being able to supply funding for the many new residents in the Proposal? 33-10

Thank you very much for the opportunity for our community association to comment on and address this critical matter.

Sincerely,

Thomas Reavey, for the Natomas Community Association (NCA)
Natomas Community Association (NCA)
3291 Truxel Road, Suite 26 Sacramento, CA 95833
916-991-2177

LETTER 33

Natomas Community Association
Thomas Reavey
September 5, 2006

33-1 Regarding the project's flooding impacts please refer to Master Response 1.

33-2 The DEIR thoroughly evaluates the project's impacts to agricultural resources. As described in Impact 6.11-1 of the DEIR, the project would result in the loss of up to 518 acres of important farmlands. Mitigation measure 6.11-1 recommends the preservation of off-site agricultural lands through purchase of conservation easements. The recommended mitigation complies with the policies outlined in the Natomas Joint Vision MOU for open space preservation. If the project is approved, the project applicants will identify lands that would be permanently conserved for agricultural operations consistent with the requirements of Mitigation Measure 6.11-1. The City, County, and LAFCo would be responsible for ensuring that the proposed mitigation land fulfills the requirements of Natomas Joint Vision MOU policies. Prior to annexation of the site, the City of Sacramento and Sacramento County will develop an open space agreement for the site consistent with the Natomas Join Vision MOU.

33-3 As described in Impact 6.4-3 (see Section 6.4, "Utilities," of the DEIR), staff at SRCSD confirmed the North Natomas interceptor and downstream facilities currently have adequate capacity to the serve the project. Because adequate capacity is available to serve the project, the project would result in a less-than-significant impact to regional sewer facilities.

Regarding the project's financing plan, a Draft copy of the Finance Plan for the Greenbriar Development Project was included in Appendix C of the DEIR. Since publication of the DEIR the finance plan has been reviewed by the City and updated to reflect its comments. A copy of the Revised Draft Greenbriar Finance Plan is included in Appendix E of this document.

33-4 The DEIR thoroughly evaluated the project's impacts to local and regional wastewater collection, conveyance, and treatment facilities (see Section 6.4, "Utilities"). The Sacramento Regional County Sanitation District (SRCSD) is the agency responsible for operating, maintaining, and constructing new regional wastewater collection, conveyance, and treatment infrastructure. SRCSD operates the regional sewer interceptor and collection system and the Sacramento Regional Wastewater Treatment Plant (SRWTP). SRCSD has an existing permit from the Regional Water Quality Control Board (RWQCB) to treat and discharge up to 181 millions gallons per day (mgd) of treated effluent from the SRWTP to the Sacramento River, and currently treats and discharges an average of 165 mgd, 16 mgd below the capacity of the wastewater treatment plant (WWTP). Wastewater generated on the project site would be conveyed to the SRWTP and would be treated and discharged to the Sacramento River in accordance with SRCSD's existing permit requirements. During preparation of the DEIR, SRCSD confirmed that adequate capacity is available to treat wastewater generated from the project.

SRCSD has adopted the SRWTP 2020 Master Plan, which identifies the necessary treatment facilities to meet increased treatment demands over the next 20 years. The master plan identifies the expansion of the SRWTP from 181 million gallons per day (mgd) to 218 mgd. A new permit from the RWQCB would be required to increase discharge from the SRWTP from 181 mgd to 218 mgd. SRCSD would be the agency responsible for securing this permit. As noted, SRCSD has indicated that adequate treatment capacity is available to serve the project and no new permits would be required at this time. See also, response to comment 11-4.

33-5 Please refer to response to comment 33-4. A separate EIR was conducted for the SRWTP 2020 Master Plan project (*Sacramento Regional Wastewater Treatment Plant 2020 Master Plan EIR, 2004).* As described in that document, no significant impacts to biological, fishery, or botanical resources would occur with implementation of that project.

33-6 The DEIR thoroughly evaluated the project's impacts to public services (e.g., police, fire protection, emergency services) in Section 6.5, "Public Services," and utilities (e.g., sewer) in Section 6.4, "Utilities." As described therein, the project with recommended mitigation would not result in any residual significant impacts and adequate police, fire, and emergency services would be provided to the project site. Mitigation Measure 6.5-1 requires the applicant to enter into an agreement with SFD to ensure adequate fire protection services are in place before issuance of the project's first occupancy permit. Moreover, the finance plan prepared for the project shall identify necessary public facility improvements needed to serve the project, 100% of the costs required, and all the project's fair share costs associated with provision of these facilities and services. The applicant shall pay into a fee program, established by the finance plan, which identifies the funding necessary to construct needed public facilities including police, fire, water, wastewater, libraries, and schools. As discussed in Impact 6.5-2, no new police facilities would be required to serve the project, and the finance plan ensures adequate funding is paid into a fee program to ensure basic police services as development occurs. See also response to comment 9-1.

The boundaries of the NNCP area would be amended to include the project site; however, the Greenbriar site would be a Special Planning Area (SPA) within the NNCP and would be subject to its own development policies (see Section 5.2.2, "Land Uses in the North Natomas Area," of the DEIR). While the commenter offers an opinion regarding the City's compliance with policies and standards of the NNCP, no specifics are provided. Further, the City does not have any adopted policies regarding staffing ratios for police and fire personnel. The Greenbriar project is a SPA of the NNCP and would not be subject to the policies and standards of the NNCP. While an evaluation of the City's compliance with the standards and policies of the NNCP is requested, provision of such an evaluation within the Greenbriar EIR is not appropriate and is not required by CEQA.

33-7 Please refer to response to comment 33-6.

33-8 The DEIR provides a comprehensive analysis of the project's transportation and circulation impacts (see Section 6.1, "Transportation and Circulation"). The DEIR concluded that some transportation impacts would remain significant and unavoidable despite implementation of all feasible mitigation measures. Please refer to Section 7.4, "Summary of Significant and Unavoidable Adverse Impacts," of the DEIR for a full listing of the project's significant and unavoidable impacts. For many of the project's transportation impacts, the applicants would contribute their fair share funding towards the City's Traffic Congestion Relief Fund. However, consistent with CEQA's requirements, the DEIR concluded that these impacts would remain significant and unavoidable because the project's contribution to the City's Traffic Congestion Relief Fund would not ensure that impacts to regional transportation facilities would be reduced to a less-than-significant level. With regard to the final mitigation program outlined for the project's transportation improvements, please refer to response to comment 3-3. For the remaining transportation impacts, the DEIR concluded that significant and unavoidable impacts would occur because no feasible mitigation is available to reduce these impacts to a less-than-significant level. No other feasible mitigation is available to reduce the project's transportation impacts. Regarding the project's impacts to travelers to and from the Sacramento International Airport, please refer to response to comment 29-44.

The determination of whether the project should be approved despite its significant and unavoidable impacts is a discretionary action for consideration by the City and LAFCo as the co-lead agencies for the project. If the City and LAFCo decide to approve the project despite its significant impacts, each agency would be required to prepare findings for each significant impact and a statement of overriding considerations that describes the specific economic, legal, social, technical, or other benefits of the project that outweigh the unavoidable adverse impacts (Section 15091 and 15093 of the State CEQA Guidelines).

Regarding the Revised Draft Greenbriar Finance Plan, please see Appendix E of this document.

33-9 Regarding the project's consistency with the NNCP, please refer to response to comment 33-6. Regarding the project's consistency with the NBHCP, the City and LAFCo have overseen the preparation of the *Analysis of Effects on the Natomas Basin Habitat Conservation Plan* report (dated July 19, 2006) (included as Appendix P of the DEIR). The purpose of the effects analysis was to provide an evaluation of the effects on each species covered by the NBHCP, on specific conservation measures, and on the project's ability to attain the NBHCP's goals and objectives as a result of implementing the proposed project. As described in Impact 6.12-9 of the DEIR, the project was determined to be consistent with the goals and policies of the NBHCP with implementation of all mitigation recommended in Section 6.12, "Biological Resources," of the DEIR.

Regarding the planning process for projects within the North Natomas area, the City received an application from the Greenbriar project applicants in May 11, 2005. Consistent with its standard application review procedures, the City has proceeded with processing of the Greenbriar application including initiating the preparation of the EIR and other associated environmental documents. The City has complied with all planning review procedures and the requirements of CEQA and the State CEQA Guidelines. As other new developments are proposed within the City, those projects would also be able to submit applications to the City for review and processing, consistent with City policy and procedure. The review process for other future projects is beyond the scope of this EIR prepared specifically for the Greenbriar project.

33-10 The commenter indicates that the Draft Finance Plan for the Greenbriar project was incomplete; however, no specific deficiencies were identified. A draft copy of the Finance Plan for the Greenbriar Development Project was included in Appendix C of the DEIR. Since publication of the DEIR the finance plan has been reviewed by the City and updated to reflect its comments. A copy of the Revised Draft Greenbriar Finance Plan is included in Appendix E of this document. Because the commenter did not cite specific deficiencies in the finance plan, no further response can be provided.

WILLIAM D. KOPPER

Attorney at Law
417 E Street
Davis, CA 95616
(530) 758-0757
Fax (530) 758-2844

34

Paralegals
Kristin Rauh
SherryAugustine

August 31, 2006

SENT VIA U.S. MAIL & FACSIMILE TO #(916)808-5328

Mr. Tom Buford
City of Sacramento
Development Services Department
Environmental Planning Services
901 I Street
Sacramento, CA 95814

Re: Greenbrier Development Project DEIR

Dear Ms. Buford:

I represent Rudolph L. Bargas, Jacob C. Snyder and Charles T. Link, all residence of the City of Sacramento. These are their comments on the Greenbrier Development Project DEIR. We incorporate the comments of all other individuals and entities into these comments. My clients oppose the project. Our comments at this point in time include the traffic comments of Mr. Neal Liddicoat which are attached. 34-1

Sincerely,

WILLIAM D. KOPPER

WDK/sra
Enc.

ENGINEERS
2202 Plaza Drive
Rocklin, California
95765-4404
PHONE (916) 783-3838
FAX (916) 783-5003
www.mroengineers.com

September 2, 2006

Mr. William D. Kopper
Attorney at Law
417 E Street
Davis, California 95616

Subject: Review of Transportation and Circulation Analysis for the Greenbriar Development Project; Sacramento County, California
(MRO Project No. 20626)

Dear Mr. Kopper:

As requested, MRO Engineers, Inc., has completed a review of the transportation and circulation analysis completed with respect to the proposed Greenbriar Development Project in Sacramento County, California. One of the proposed actions associated with the Greenbriar project is annexation of the project site into the City of Sacramento The proposed project is the subject of a Draft Environmental Impact Report (DEIR), which is currently being processed by the City of Sacramento and the Sacramento Local Agency Formation Commission (LAFCo). (Reference: EDAW, *Greenbriar Development Project - Sacramento, California - Draft Environmental Impact Report,* July 2006.) Our review focused on the technical adequacy of the "Transportation and Circulation" section of that document. 34-2

Background

The proposed Greenbriar Development Project involves a 577-acre site located between the City of Sacramento's North Natomas community and Sacramento International Airport, in unincorporated Sacramento County. If approved, the proposed project site would be annexed into the City of Sacramento. According to the "Transportation and Circulation" section of the DEIR, land uses proposed within the Greenbriar project include:

- Residential: 3,473 dwelling units (DU), including:
  - Low-density residential: 671 DU,
  - Medium-density residential: 2,215 DU, and
  - High-density residential: 587 DU;
- Village and community commercial: 373,700 square feet (SF); and
- Elementary school: 10.2 acres. 34-3

Also included would be neighborhood parks, a lake/detention basin, and an open space buffer.

The DEIR incorporated a transportation and circulation analysis conducted by TJKM. That analysis addressed the impacts of the proposed development at eight existing and fourteen future intersections in the vicinity of the proposed project. The analysis also addressed four roadway segments, five freeway segments, and various freeway ramps. 34-4

The analysis indicated that completion of the proposed Greenbriar Development Project will result in "Significant and Unavoidable" impacts at many of the study intersections and roadway segments, with unmitigated degradation in level of service at those locations.

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Transportation and Circulation Analysis Review

Our review of the "Transportation and Circulation" analysis for the proposed Greenbriar Development Project revealed a number of issues that should be addressed prior to certification of the environmental document by the City of Sacramento and LAFCo. These issues are summarized below. 34-5

1. ***Analysis Methods*** – The intersection level of service analysis procedures are not in strict conformance with currently-accepted methodologies, as described below. 34-6

   Signalized Intersections – City of Sacramento

   According to the "Transportation and Circulation" section of the DEIR (page 6.1-4), "The operating conditions at the City study signalized intersections were evaluated using the Highway Capacity Manual (2000 HCM) Operations Method as incorporated into the standard traffic engineering software package SYNCHRO (version 5)." The HCM is generally accepted as the definitive resource for analysis of all types of roadway facilities. However, certain key aspects of the TJKM traffic analysis do not conform to the HCM methodologies. 34-7

   As noted, the intersection level of service calculations were performed using the *Synchro* software. Although that software generally conforms to the HCM analysis methodologies, it allows the user a choice of two different types of delay values. The first set of delay values is fully consistent with the HCM methodology for signalized intersections (which is based on application of "Webster's Formula"). These values are found by printing the "HCM Signals" report at the conclusion of the *Synchro* analysis. 34-8

   The second type of delay value generated by the *Synchro* software (which is described in the *Synchro User Guide* as the "core calculation" performed by the software) is referred to as "percentile delay." The delay values reported in the Greenbriar DEIR "Transportation and Circulation" section are percentile delay values, which are not consistent with the HCM methodology. In fact, the *Synchro User Guide* provides the following guidance with respect to which set of delay values to use: 34-9

   Use the HCM Signals Report When:

   - *Compatibility with Highway Capacity Manual is desired*

   Use Synchro [i.e., percentile] Delay When:

   - *Evaluating actuated signal parameters*
   - *Optimizing offsets*
   - *Detailed modeling of coordination is needed*
   - *Detailed modeling of actuated signals is needed*

   Review of these criteria suggests that use of the "HCM Signals" report would be more appropriate than the percentile delay values, in order to maintain consistency with the HCM methodology and previous analyses conducted for the City of Sacramento.

Signalized Intersections – Sacramento County

The DEIR states that the level of service calculations for signalized intersections in unincorporated Sacramento County were performed ". . . using volume-to-capacity ratio based on the Intersection Capacity Utilization methodology, which is similar to the Circular 212 methodology." (Reference: DEIR, page 6.1-4)

The Circular 212 methodology referred to here was published in a document entitled, *Interim Materials on Highway Capacity* (Transportation Research Board, Transportation Research Circular Number 212, January 1980). As referenced, the document was published in 1980, over 26 years ago. The purpose of "Circular 212" was to provide a set of procedures to supplement the 1965 version of the *Highway Capacity Manual* until such time as a fully-updated manual could be published. Such an updated manual was distributed to the traffic engineering profession in 1985. Since that time, additional updated manuals have been published in 1994, 1997, and the year 2000. Each of these revised versions of the *Highway Capacity Manual* has advanced the technical procedures associated with the analysis of transportation facilities, including roadway segments and intersections.

34-10

The introduction to the 1980 Circular 212 document addresses the anticipated life span of the procedures documented there, including the following statements:

- *"The choice of a Transportation Research Circular as the publication medium has been quite deliberate. By definition, Circulars contain information of immediate interest but not necessarily of long-lasting value."*
- *". . . the methods presented here can be put to use until such time as a revised Manual becomes available."* [As noted above, that occurred in 1985, followed by subsequent revisions in 1994, 1997, and 2000.]
- *"This report comprises the first set of interim materials which will be distributed prior to the publication of a new "Highway Capacity Manual" in the mid 1980's. These interim materials are intended for application by HCM users in the 1980-1982 period."*

It is clear from these statements that the "interim" procedures documented in Circular 212 have long ago outlived their usefulness and, further, have been superseded. Thus, their use in this analysis is inappropriate.

Unsignalized Intersection Analyses

The analysis results reported for unsignalized intersections also do not conform to the procedures established within the *Highway Capacity Manual*. Specifically, page 17-1 of the HCM states: "Level of service (LOS) for a TWSC [two-way stop-controlled] intersection is determined by the computed or measured control delay and **is defined for each minor movement**. LOS is not defined for the intersection as a whole." [Emphasis added.]

34-11

This is not the approach taken in the TJKM traffic analysis, however. In fact, the traffic analysis report presents delay values for intersection approaches (i.e., combinations of lanes on a particular leg of the intersection), rather than individual movements. This approach delay value represents a volume-weighted average of the individual delay values for all of the movements on the intersection approach. Because, for example, right-turn movements typically have relatively low delay values, the volume-weighted average delay value for the intersection approach is generally substantially lower than the critical movement on the approach (often the left-turn movement). Consequently, the reported delay results fail to

indicate the frustration and inconvenience experienced by many drivers waiting at the STOP sign. In cases where these key left-turn delay values are excessive, safety problems might occur, as frustrated drivers begin to accept less-than-adequate gaps in major street traffic and turn in front of oncoming vehicles. 34-11 Cont'd

In addition to being contrary to the analysis procedure set forth in the *Highway Capacity Manual*, this approach provides an overly optimistic view of intersection operations, masking individual movements that operate at higher levels of delay than have been reported. As such, the traffic analysis provides a misleading indication of intersection operations at these locations and potentially fails to identify significant traffic impacts.

As an example to illustrate this point, consider the intersection of SR 70/99 Northbound Ramps/Elkhorn Boulevard for Baseline conditions in the AM peak hour. According to DEIR Table 6.1-12 (page 6.1-18), this intersection operates at Level of Service B, with 13.2 seconds of delay per vehicle (based on the delay value for the northbound off-ramp approach to the intersection). However, review of the intersection calculation sheet in Appendix B reveals that the critical movement on this approach (i.e., the left turn) has a delay value of 26.3 seconds per vehicle, which represents Level of Service D. 34-12

As illustrated here, substantially different level of service results may be found if the HCM method is strictly followed. Modification of the analysis to accurately reflect the HCM procedures will almost certainly substantially alter the conclusions of the study. (Note that our uncertainty in this regard is primarily the result of not having a complete set of level of service calculation worksheets to review, as described in item 2 below.)

2. ***Level of Service Calculation Worksheets*** – The technical level of service calculation worksheets for the traffic analysis are described as being presented in Appendix B to the DEIR. However, relatively few of the worksheets are actually presented in that appendix. The vast majority of the worksheets are missing and are, therefore, not available for public review. Consequently, it is impossible to determine whether the assumptions employed in performing the calculations are reasonable or whether errors have been made. As such, the DEIR fails in its role as an informational document. 34-13

3. ***Truck Traffic*** – The traffic analysis fails to account for the expected presence of high volumes of truck traffic in the study area. In particular, no adjustments have been incorporated into the analysis to account for the potentially large number of truck trips associated with the industrial uses anticipated in connection with the approved Metro Air park project, immediately to the west of the Greenbriar project. 34-14

The intersection level of service calculation procedures employed in the analysis include provisions for adjustments to reflect the presence of "heavy vehicles." No such adjustments have been made to account for the anticipated substantial volume of truck traffic in the study area, however. Doing so might well have a substantial effect on the results of the intersection level of service calculations. In particular, projected intersection delays might be substantially greater and levels of service might be correspondingly lower once this factor has been considered. 34-15

The effects of large volumes of trucks must also be considered with respect to traffic operations on the freeway facilities.

4. ***Roadway Segment Analysis*** – The DEIR (page 6.1-7) states that, "the arterial level of service analysis was conducted based on the Urban Street LOS methodology described in the 2000 Highway Capacity manual." This is simply incorrect.

   Page 15-2 of the *Highway Capacity Manual* states, "Urban street LOS is based on average through-vehicle speed for the segment or for the entire street under consideration. Travel speed is the basic service measure for urban streets." 34-16

   In contrast, the Greenbriar traffic analysis of roadway segments involves a simple comparison of estimated daily traffic volumes to a set of generic traffic volume thresholds. Application of the HCM procedures, as stated, would almost certainly result in vastly different level of service results, compared to those reported in the DEIR. 34-17

5. ***Freeway Ramp Analysis*** – Much like the roadway segment analysis described above, the DEIR states that the freeway ramps were, ". . . evaluated using the 2000 HCM Operations Method . . ." However, according to the *Highway Capacity Manual*, levels of service for freeway ramps is determined based on density (in terms of passenger cars/mile/lane). In fact, Table 6.1-4 in the DEIR correctly presents the HCM level of service thresholds for this type of roadway facility. The analysis documented in the DEIR, however, ignores density, as it bases the level of service determination on the traffic volume on each ramp. This is inconsistent with the standard HCM procedures, which may lead to understatement of the project's impacts. 34-18

6. ***Freeway Facilities Thresholds of Significance*** – The DEIR (on pages 6.1-14 and 6.1-50) states that Caltrans considers Level of Service D to be the minimum acceptable operating conditions on local freeways. However, an unsubstantiated exception is stated for the portion of Interstate 5 most directly affected by the proposed project. Specifically, the report states that Level of Service E (i.e., operation at capacity) is acceptable on those portions of I-5, but no reference or documentation is presented to corroborate this assumption. 34-19

7. ***Trip Generation Estimate*** – The project trip generation estimate presented in Table 6.1-20 (page 6.1-29) contains several questionable assumptions.

   - *Elementary School Trip Adjustments* – The table indicates that the elementary school adjustment (to account for internal trips associated with that land use) was applied to the AM peak hour volumes only. However, a reduction of 1,868 daily trips is shown in the table. Furthermore, that daily trip reduction (1,868 trips) is greater than the number of daily trips generated by the elementary school (1,774). As such, the project-related daily traffic is under-estimated, so the roadway segment analyses understate the impact of the proposed project. This is must be corrected. 34-20

   - *Retail Trip Generation* – The retail trip generation estimates were developed using the "average" rates in the Institute of Transportation Engineers (ITE) *Trip Generation* manual, rather than on application of the logarithmic formula for "shopping centers" presented in the ITE document. This is contrary to standard practice, and substantially under-estimates the volume of retail traffic in certain time periods. For example, the 263,000 SF retail center would correctly be estimated to generate 12,732 daily trips, which is 1,439 (i.e., 13 percent) more than the project trip generation estimate suggests. In the AM peak hour, the difference is not substantial, but in the PM peak hour about 20 percent more trips will be generated by this retail center than are included in the analysis (i.e., 1,185 trips using the logarithmic formula vs. 986 "average" trips). 34-21

     For the smaller 29,700 SF retail center, similar inaccuracies are found. The correct daily traffic estimate is 3,085 trips, compared to 1,275 as the project trip estimate shows (i.e., 34-22

142 percent more trips than the analysis considers).The AM peak hour volume for this retail center should be 76 trips, not the 31 trips indicated in the table. Finally, the correct PM peak hour trip generation estimate for this center is 281, about 170 more than the DEIR analyzed. 34-22

Correcting the project trip generation estimate to reflect standard practice (which is intended to accurately reflect the specific nature of retail center trip generation) would result in substantial increases in the project-generated trip estimates. This, in turn, could cause higher levels of project-related traffic impacts, requiring additional mitigation beyond that called for in the DEIR. 34-23

- *Light Rail Traffic Reductions* – In addition to the various adjustments presented in Table 6.1-20 to account for non-automobile travel and internal trips, the Cumulative Plus Project conditions analysis includes an additional 11 percent reduction in the number of residential trips. A further reduction of eight percent was assumed for the retail and commercial portions of the project. Those reductions are intended to represent the effects of light rail transit. (Note that page 6.1-40 of the DEIR indicates that a memorandum describing the derivation of this reduction is included in Appendix B. No such memo was found in that appendix, however.) Such reductions in project-generated trips are inappropriate, as the generally-accepted "reservoir area" from which transit trips are typically drawn is one-quarter mile, and many of the residential units and commercial developments in the project will be farther than that from the planned transit station. Moreover, at this time, any assumption regarding light rail transit through the project site is highly speculative. Although regional plans call for such a rail line, reality (largely in the form of funding shortfalls) might intrude. A conservative analysis of the project-related traffic impacts would ignore the potential benefits of the planned rail line. Again, incorporation of such highly speculative assumptions in the analysis raises substantive issues with regard to the accuracy and adequacy of the analysis, as the assumed reduction in project-related trips may lead to underestimation of the project's traffic impacts. 34-24

8. ***Approved Projects*** – The analysis includes the development of "baseline" scenarios, which include previously-approved projects that are not yet complete, for example. Page 6.1-15 of the DEIR lists the seven projects incorporated into the baseline scenarios. Conspicuously absent from the list is the "Promenade at Natomas" project approved by the City of Sacramento in the summer of 2005. This project, which has apparently been renamed "Sacramento Gateway," will have over 1.2 million SF when complete. Included within the overall project is "The Promenade," a 663,000 SF retail center and "Gateway Corporate Center," with 600,000 SF of office space. It is difficult to understand how a project of this magnitude, which will clearly add traffic to the same roadway system evaluated in the Greenbriar DEIR, could be ignored. 34-25

The list of approved projects used to develop the baseline scenarios must be reviewed and updated to include the Sacramento Gateway project, as well as any other such projects that have been ignored. 34-26

9. ***Project Trip Distribution*** – Review of the project trip distribution illustrated on Exhibits 6.1-8 through 6.1-11 raises several questions. The first two figures present the geographic distribution of project-generated trips prior to construction of the Meister Way overpass. Those figures indicate that 10 percent of the project trips will use Elkhorn Boulevard west of the project site in the AM peak hour (i.e., 315 trips). In the PM peak hour, 20 percent of the project trips will be on that roadway (i.e., almost 900 trips). It is simply unclear why any substantial volume of project-generated traffic would use that road. Simply put, it doesn't go anywhere. There is no connection to Interstate 5 via that road, except via a convoluted routing 34-27

using Bayou Way and Power Line Road (and only five percent of the project trips are shown as being oriented to/from that direction on I-5).

Increasing the mystery is the fact that the percentage of the project's traffic expected to use this portion of Elkhorn Boulevard declines in the future (to 5 – 10 percent), even though the Metro Air Park project (which will be directly west of the Greenbriar project and might reasonably be expected to result in some interchange of trips) is assumed to be complete. 34-27 Cont'd

The project trip distribution must be reconsidered. Of particular concern are the 900 trips assumed to use Elkhorn Road west of the project in the PM peak hour in the short-term. Redistribution of that substantial volume of traffic to other, more realistic, routings could have a meaningful impact on the results of the traffic analysis.

10. ***Project Traffic Assignment*** – Comparison of the exhibits presenting the "Baseline" and "Baseline Plus Project" traffic volumes (i.e., Exhibits 6.1-5 and 6.1-12) indicates problems with the project traffic assignment. As a spot check, we considered intersection number 2, Elverta Road/State Route 70/99. According to the project trip distribution presented on Exhibits 6.1-8 and 6.1-9, 15 percent of the project traffic is expected to use the segment of SR 70/99 between Elverta Road and Elkhorn Boulevard in both the AM and PM peak hour. Subtracting the "Baseline" volumes from the "Baseline Plus Project" volumes indicates that a substantial portion of these trips is missing, as follows:

- AM Peak Hour (Northbound): The project trip distribution suggests that 291 northbound project trips should be on this roadway segment (i.e., 15 percent of 1,939 outbound project trips). The actual project traffic (derived as described above) indicates only 137 project trips, less than half of the expected number. 34-28
- AM Peak Hour (Southbound): According to the project trip distribution, 182 project trips should be southbound on this segment (i.e., 15 percent of 1,214 inbound trips). The actual number assigned is 172, slightly fewer than expected.
- PM Peak Hour (Northbound): The project trip distribution indicates that 296 project trips should be found (i.e., 15 percent of 1,973 outbound trips). Only 218 were actually assigned to this road segment, over 25 percent fewer than suggested by the report.
- PM Peak Hour (Southbound): Based on the project trip distribution, 374 southbound trips should be assigned to this segment (i.e., 15 percent of 2,494 inbound trips). The actual project trip assignment is 186 trips, about half of the suggested number.

Specifically with regard to the intersection of Elverta Road/State Route 70/99, it is interesting to note that while none of the project traffic is expected make a southbound right turn in the AM peak hour, 75 vehicles are shown as doing so in the PM peak hour. It is unclear why driver behavior would vary so substantially in those two time periods. Once again it raises the question as to why any project-related vehicle would make such a turn. Apparently, those vehicles will proceed west on Elverta Road, then south on Power Line Road, and eventually approach the project site from the west on Elkhorn Boulevard. However, this route is requires so much out-of-direction travel (i.e., those drivers are traveling over two miles out of their way) as to be unbelievable. 34-29

Although we have cited in detail only a single example of deficiencies in the project traffic assignment, it is reasonable to expect that other problems exist, as well. In fact, quick spot checks at the intersections of Power Line Road/Elkhorn Boulevard and Elkhorn Boulevard/East Commerce Way reveal similar inaccuracies (i.e., the project traffic assignment does not match the assignment derived from applying the tip distribution factors to the project 34-30

trip estimate). The project trip distribution and traffic assignment must be reevaluated to create a more accurate, more reasonable "Baseline Plus Project" analysis scenario. Otherwise, project-related traffic impacts will be understated at locations such as Elverta Road/State Route 70/99, for example. 34-30 Cont'd

11. ***Study Intersections and Roadway Segments*** – The discussion presented above concerning the distribution and assignment of project traffic suggests that the study area should be expanded to include other intersections in the vicinity of the project site. For example, the intersection of Riego Road/State Route 70/99 (i.e., the next signalized intersection north of Elverta Road/State Route 70/99) should also be considered, as the vast majority of the traffic passing through Elverta Road/State Route 70/99 will also occur at the Riego Road location (in part, because there are no other access points along SR 70/99 between the two intersections). Because the Elverta Road/State Route 70/99 intersection has been identified as having significant impacts under Baseline conditions, a high likelihood exists that similar results would be found for the Riego Road/State Route 70/99 intersection. 34-31

The segment of SR 70/99 between Elverta Road and Riego Road should also be evaluated. 34-32

12. ***Project-Related Mitigation*** – Our review of the Greenbriar DEIR raised several questions with regard to the proposed mitigation measures. These are discussed below.

- Several of the mitigation measures (e.g., 6.1-1b, 6.1-1d, 6.1-2b, 6.1-2c, 6.1-5g, and 6.1-13) are described as being required "on or before buildout" of a particular percentage of the project, based on total project trips. How were these percentages determined? How will the defined percentage of buildout be established (i.e., how and when will we know that the project has reached the defined percentage of buildout)? Will "buildout" be defined based on issuance of building permits, certificates of occupancy, or some other measure? How will implementation of these mitigation measures be ensured and enforced? If the mitigation measure is not implemented, what sanctions will be imposed? 34-33

- Mitigation measure 6.1-i (page 6.1-58) calls for restricting the intersection of Elkhorn Boulevard/Project Street 3 (i.e., one of the project access points) to right in/right out access only. However, no analysis has apparently been conducted to establish the impacts of implementing this measure, particularly with regard to the diversion of traffic to other access points and the effects of that diverted traffic on nearby intersections and roadway segments. 34-34

- Mitigation measure 6.1-2c calls for widening of Meister Way west of SR 70/99. However, the limits of the improvement are not clear. In particular, the phrase "from the first street intersection of SR 70/99 west to Lone Tree Road" is questionable. The limits of the proposed improvement must be clarified. 34-35

- Several mitigation measures call for implementation of either triple left-turn lanes or triple right-turn lanes. The appropriateness and acceptability of triple turn lanes must be addressed, particularly with regard to safety issues and the potential for increased lane changes (potentially leading to sideswipe accidents) within the intersection or downstream from such facilities. 34-36

- Mitigation measure 6.1-10 states that, "Once demand for public transit services reaches 50 service requests, the project applicant shall begin to provide transit services . . ." What constitutes a "service request?" How will such service requests be logged and documented? Who will be responsible for ensuring that transit service is actually provided upon receipt of the fiftieth request? Must service be initiated on the day following receipt of that request? If not, how much time will be allowed before the service is implemented? 34-37

What level of transit service is required? What headways will be provided? What will be the hours of service? This mitigation measure is so vaguely defined as to be almost meaningless. Would the applicant satisfy this measure by providing a single van, cruising the streets of the project for a couple of hours daily, one hour in the morning peak period and one more in the evening peak period? 34-37

- The transit service called for under mitigation measure 6.1-10 is described as an "interim" service. The measure suggests (although it does not state specifically) that the service will be terminated upon completion of the Meister Way light rail station (should that ever occur). In reality, the proposed shuttle service will continue to be necessary following implementation of light rail service through the project, due to the distance of portions of the development from the LRT station. Because transit patrons are generally considered unlikely to walk more than one-quarter mile to or from a station, the shuttle service will be needed to encourage many of the project residents and employees (i.e., those located farther than this from the station) to use the public transit service. 34-38

- The transit service measure also includes the vague statement that, "[m]idday service shall also be considered . . ." This statement suggests a substantial lack of commitment to midday service. Who will make the determination as to if and/or when midday service will be implemented? What will be the required extent of that service, in terms of hours of service, service headways, number of vehicles, etc.? 34-39

- Mitigation measure 6.1-10 should be modified to state explicitly that all capital, operating, and maintenance costs associated with the required transit service will be borne by the project applicant. 34-40

- Impact 6.1-11 describes the construction-related impacts associated with the proposed project. Included in that discussion is an estimate of the volume of traffic associated with construction activities. Review of the construction traffic volumes indicates that they are substantially under-estimated. For example, the truck traffic estimate states that 50 one-way trips will occur daily. This is equivalent to only 25 trucks entering, then exiting, the site (i.e., 25 round-trips). Given the magnitude of this project and the amount of material needed in construction of the project infrastructure (e.g., roadway construction material such as aggregate, asphalt or concrete, etc., water and sewer pipe, gas lines, etc.), such a low estimate is highly questionable. 34-41

  The same discussion states that 500 one-way daily trips will be generated by construction workers. This estimate was apparently derived by assuming that each of the estimated 250 workers would make two trips per day – one to work in the morning and one to home at night. This ignores the myriad of other types of trips that are made to and from a construction site on a typical day. Recognizing that construction activities are expected to extend over a 5 – 10 year period, a more realistic estimate of construction-related traffic must be developed, so that the impacts of that traffic can be addressed in a meaningful fashion. 34-42

13. ***Unmitigated Project Impacts*** – Review of DEIR Table 2.1 - Summary of Environmental Impacts and Mitigation Measures reveals the severe deficiencies of the mitigation program proposed for the Greenbriar project. As shown there, 50 mitigation measures have been identified to offset significant impacts to the transportation and circulation system in the vicinity of the proposed project. Unfortunately, almost half of those mitigation measures are insufficient to mitigate the project-related impacts. Specifically, 23 of the 50 measures discussed in the DEIR would result in "significant and unavoidable" impacts. This inordinate number of unmitigated impacts means that approval of this project will create severe levels of congestion that will probably never be overcome. It is safe to assume that governmental jurisdictions will, at best, have extreme difficulty in finding funding to solve 34-43

the transportation system problems created by this proposed project, as documented in the DEIR. Further, the proximity of the project to Sacramento International Airport, and the impacts of the project on the key regional roadways serving the airport, suggest that approval and implementation of this project, along with its deficient program of mitigation measures, will adversely effect the economic vitality of the Sacramento region, in proportions that far exceed any economic value derived from the proposed project. 34-43 Cont'd

Conclusion

Our review of the transportation and circulation analysis incorporated into the Draft Environmental Impact Report for the proposed Greenbriar Development Project revealed several issues potentially affecting the validity of the conclusions and recommendations presented in that document. Further, our review indicates that the proposed project may have additional significant impacts on the environment beyond those identified in the DEIR, particularly with respect to unacceptable levels of traffic congestion and degradation of intersection and roadway level of service. These issues should be addressed prior to approval of the proposed project and its related environmental documentation by the City of Sacramento and the Local Agency Formation Commission. 34-44

We hope this information is useful. If you have questions concerning any of the items presented here or would like to discuss them further, please feel free to contact me at (916) 783-3838.

Sincerely,

MRO ENGINEERS, INC.

Neal K. Liddicoat, P.E.
Traffic Engineering Manager

M R O

ENGINEERS

NEAL K. LIDDICOAT, P.E.

Senior Traffic Engineer

Education:

BSCE/1977
Michigan State University

Graduate Studies/1977-80
University of Tennessee

Registrations:

California

Civil Engineer – C35005

Michigan

Professional Engineer – 6201037605

Length of Service with MRO Engineers:

2 Years

Affiliations:

Institute of Transportation Engineers

American Society of Civil Engineers

Mr. Liddicoat has 27 years experience in the analysis of a broad range of traffic engineering, parking, and transportation planning issues, for both public and private sector clients. He has been responsible for traffic engineering analyses for many new roadway facilities. In addition, he has conducted traffic and parking analyses for a wide variety of development proposals, including office buildings, retail/commercial centers, multiplex cinemas, and residential projects. He has a particular expertise in the analysis of unique development proposals, including stadiums, arenas, convention centers, theme parks, and other facilities where large numbers of vehicles and pedestrians converge in a short period of time.

Mr. Liddicoat has developed and presented seminars on technical procedures and quality control in the conduct of traffic impact analyses, both in-house and as a co-instructor for the UCLA Extension Public Policy Program. He currently serves as instructor for the traffic engineering portion of the Civil Engineering licensing exam review course conducted by the Sacramento chapter of the American Society of Civil Engineers.

Mr. Liddicoat manages the firm's on-call traffic engineering services contracts with the cities of Elk Grove and Folsom. In addition, he is frequently called upon to serve as an expert "peer reviewer" for traffic impact analyses prepared by others. In that role, he has commented on the technical adequacy of traffic studies for a variety of projects, including retail centers, office complexes, and mixed-use master plans. His recent experience includes:

Sacramento City College Transportation Master Plan Analysis, Sacramento, CA – Project Manager for the traffic and parking analysis evaluating a proposed master plan aimed at adding 1,260 parking spaces to the Sacramento City College campus, as well as various other improvements to the campus transportation system. The analysis addressed near-term and long-term impacts at 23 intersections in the vicinity of the campus.

State Route 65/Sunset Boulevard Interchange, Placer County, CA – Project Manager for the traffic operations study evaluating existing and future traffic conditions associated with the proposed SR 65/Sunset Boulevard Interchange. Detailed peak hour traffic operations analyses were conducted, as was an analysis of the SR 65 mainline. Extensive coordination with Caltrans District 3 was required.

Thunder Valley Gaming Facility, Placer County, CA – Project Manager for the traffic impact study for this highly-successful casino in Placer County. The study included the assessment of on-site and off-site impacts, including detailed consideration of driveway access and the configuration of key roadways near the project.

El Dorado Justice Center, El Dorado County, CA – Project Manager for detailed traffic impact analysis addressing a proposed justice center complex to be located in Placerville. The analysis included consideration of traffic impacts in the AM and PM peak hours, as well as during the midday period. Extensive survey and data collection activities were undertaken, including a detailed travel behavior survey of all 1,700 County employees affected by implementation of the project.

Additional Projects Include:

- ***STAPLES Center Traffic & Parking, Los Angeles***
- ***Raley Field Traffic Study, West Sacramento***
- ***Central Roseville Parking Analysis, Roseville***
- ***Convention Center Traffic & Parking Studies, Sacramento, Los Angeles, and Anaheim***
- ***Elk Grove Boulevard Master Plan, Elk Grove***
- ***CSUS Bicycle/Pedestrian Study, Sacramento***
- ***SR 99/Twin Cities Road Traffic Operations, Galt***
- ***Disney's California Adventure Preliminary Traffic Analysis, Anaheim***

LETTER 34

William D. Kopper
September 5, 2006

34-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

34-2 The comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

34-3 The comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

34-4 The comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

34-5 The comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

34-6 This comment is prefatory to subsequent comments. Please refer to response to comment 34-9.

34-7 The comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

34-8 The commenter's agreement with the HCM methodology is noted. No further response is necessary.

34-9 The traffic modeling performed for the project and EIR evaluated the signalized intersections using Highway Capacity Manual (HCM) methodology as applied through the traffic engineering software, Synchro. The Synchro software provides modelers two options to evaluate average vehicle delay (e.g., LOS) at signalized intersections: 1) HCM (Webster's) delay and 2) percentile (Synchro) delay.

The HCM delay methodology converts average vehicle delay to a LOS level based on Webster's formula as a measure of effectiveness of the operation of a signalized intersection. This method requires the analyst to estimate the effects of signal coordination and signal actuation on average delay, which reduces the accuracy of the modeling in estimating signalized intersection delay conditions.

The percentile (Synchro) delay method is based on the HCM methodology and is designed to model (versus manual estimation) traffic signal system coordination and actuated signals and provides greater precision in the estimation because manual estimation is removed from the process. This methodology provides greater precision in the modeling results.

34-10 Regarding the use of a volume-to-capacity ratio methodology similar to the Circular 212 methodology for the study area intersections in Sacramento County, the analysis was prepared consistent with the requirements and guidance outlined in the *County of Sacramento Traffic Impact Analysis Guidelines* dated July 2004. As described on page 4 of that document, "for all signalized intersections, except the intersections with Caltrans facilities, the Circular 212 methodology should be applied with sufficient detail to produce a result measured in

volume-to-capacity ratio and level of service." The modeling analysis prepared for the project and included Appendix B of the Second RDEIR used the most up-to-date Circular 212 methodology available and this methodology is appropriate for this analysis.

34-11 Regarding the methodology to estimate delay at unsignalized intersections, the commenter has misinterpreted the analysis. Table 6.1-12 presents the average delay for the intersection as a whole for all-way stop control and average delay for minor stop controlled intersection. Appendix B of the Second RDEIR contains the detailed analysis for the unsignalized intersections, which includes delay for all individual movements. In addition, to understand the traffic delays that occur at the most critical approach, queue lengths are also provided in Table 6.1-12.

34-12 Please refer to response to comment 34-11.

34-13 In response to comments received on the DEIR, the City and LAFCo decided to recirculate the transportation and circulation section of the EIR to address specific issues raised by some commenters. Please refer to Master Response 2 for a discussion of the reasons for recirculation. While the traffic appendix of the DEIR was missing the level of service worksheets, the Second RDEIR included all level of service worksheets. Please refer to Appendix B of the Second RDEIR.

34-14 The commenter is incorrect. The traffic modeling did assume a percentage of the traffic that would travel along nearby freeways and intersections would be truck traffic. The intersection analysis assumed that 2% of the traffic passing through the intersections would be trucks and the freeway analysis assumed that 15% of the traffic along area freeways would be trucks, which is consistent with the guidance provided in the *Caltrans I-5 Route Concept Report (April 1997)***.** Please refer to Appendix B of the Second RDEIR.

Regarding the assumptions for truck traffic at the adjacent Metro Air Park development, the traffic analysis prepared for the project included traffic projections for the Metro Air Park development based on information presented in the Metro Air Park Environmental Impact Report (1993). The specific tenants and businesses and their corresponding truck traffic demands are not currently known. The analysis presented in the EIR presents the best available information and bases its conclusions on this information consistent with the requirements of CEQA. The commenter offers no evidence that alternate truck traffic assumptions should have been used in the analysis. Therefore, no further response can be provided.

34-15 Please refer to response to comment 34-14.

34-16 This comment is prefatory to comment 34-17; please refer to response to comment 34-17.

34-17 The commenter correctly notes that the arterial level of service analysis was conducted based on the Urban Street LOS methodology described in the 2000 HCM. The 2000 HCM allows the comparison of estimated daily traffic volumes to established volume thresholds. The volume thresholds are based on the access control (e.g., stop signs, signals), number of driveways, and vehicle speeds and are converted to a volume estimate that is representative of a particular service level (e.g., A, B). Regarding use of the HCM methodology, please refer to response to comment 34-9.

34-18 The operating conditions at study area ramps were evaluated using the 2000 HCM Operations Method, which determines the operation level based on service flow rates and vehicle speeds. Table 6.1-5 of the Second RDEIR shows maximum service flow rates for freeway ramps, which was obtained from the Highway Capacity Manual, Transportation Research Board, Washington, D.C, 2000, Chapters 13 and 25. This methodology is used in cases where the freeway ramp configuration governs the operating condition of the ramps, which is the situation for the Greenbriar project. Tables 6.1-14, 6.1-18, 6.1-23, 6.1-34, and 6.1-39 of the Second RDEIR present the peak-hour freeway ramp operating conditions for the Baseline and Cumulative scenarios where volumes, LOS, and queue lengths are reported. Consistent with the HCM methodology, the impacts to the freeway ramps were reported in terms of the expected queues versus the storage capacity. For more details about the ramp analysis please see Appendix B of the Second RDEIR.

34-19 The commenter correctly notes that the LOS threshold for Caltrans facilities is LOS D, with the exception of five freeway segments within the vicinity of the project site where LOS E has been determined to be acceptable. The LOS E threshold for the five freeway segments was based on guidance provided in the *Caltrans Route Concept Report* (dates April 1997) as incorporated into the *Sacramento Area Council of Governments I-5 Corridor in Sacramento and Yolo Counties Existing Conditions Report* (dates May 2001).

34-20 The City and LAFCo have recirculated the Transportation and Circulation section of the DEIR. See Master Response 2. In revising portions of the analysis, the City and LAFCo became aware that there was a calculation error in the trip generation table for schools. As such, this table was revised in the Second RDEIR to correct for previous errors in the trip generation assumptions. Please refer to Section 6.1, Transportation and Circulation," of the Second RDEIR for additional details on the changes to the trip generation table. The corrections to the trip generation table (see Table 6.1-20 of the Second RDEIR) resulted in an overall reduction in the total trips generated by the project.

34-21 Please refer to response to comment 34-20. The trip generation table was also revised to correct the assumptions for retail trip generation.

34-22 Please refer to response to comment 34-20 and 34-21.

34-23 Please refer to response to comment 34-20 and 34-21.

34-24 Regarding the assumptions for light-rail transit ridership in the trip generation assumptions, please refer to Master Response 2. All discounts for light rail ridership have been removed from the trip generation estimates. A revised trip generation table has been prepared and circulated as part of the Second RDEIR (see Table 6.1-20).

34-25 The commenter is incorrect. The traffic modeling assumptions for the Baseline Condition includes all projects listed in Table 6.1-11. Further, the SACMET Regional Transportation model included the Promenade at Natomas Project as part of baseline projects. Therefore, this project was included in the analysis.

34-26 Please refer to response to comment 34-25. Regarding additional projects that have not been included in the Baseline Condition analysis, the commenter does not specify which projects have not been included; therefore, no further response can be provided.

34-27 Regarding the proposed trip distribution assumptions for the project, the analysis is based on information and data contained in the City's SACMET traffic model, which includes information regarding existing driving patterns and future roadway facilities and alignments. Based on the model, approximately 10% and 20% of project-related trips (during the a.m. and p.m. peak hours, respectively) would travel along Elkhorn Boulevard to the west of the project site and would access the Metro Air Park development. The roadways proposed as part of the Metro Air Park development are shown on Exhibit 6.1-14. Drivers would be able to pass through the development as they travel west to I-5. In the interim time between development of the project and buildout of the Metro Air Park development, project-related trips were anticipated to travel to Powerline Road to access either Elverta Road to the north or I-5 and Del Paso Road to the south.

34-28 The commenter questions the traffic assignment under the Baseline and Baseline plus Project Conditions. Specifically, the commenter points to discrepancies between data presented in the EIR and his own calculations for the segment of SR 70/99 between Elverta Road and Elkhorn Boulevard. The City's SACMET traffic model was used to perform the traffic assignment on local roadways and freeways. In performing the traffic assignment, the model assigns the traffic from the project to the existing roadway network and accounts for the "driver behavior" effect that these new trips have on the roadway system. It appears from the commenter's calculations that the commenter assumed that the project-related traffic would not affect baseline traffic pattern and driver behaviors, which is not representative of what would occur on the ground. In an equilibrium transportation system, the introduction of new traffic into the system will affect the route choice behaviors of existing travelers. The SACMET traffic model accounts for this effect in assigning traffic to the roadway system.

For projects with the potential to generate large traffic volumes (e.g., greater than 10,000 trips), in comparing Baseline and Baseline plus Project traffic assignments, the traffic assignments will not show an exact additive effect of project traffic and existing traffic assignments. Rather, the Baseline plus Project condition will account for the re-routing effect associated with changed driver preferences because of the substantial traffic volumes that were added to the roadway network as a result of the project. As such, the traffic assignment results provided in the EIR for Baseline and Baseline plus Project Conditions would not match the commenter's calculations.

34-29 Please refer to response to comment 34-28.

34-30 Please refer to response to comment 34-28.

34-31 The City evaluated whether significant adverse impacts would occur on the segment of SR 70/99 north of Elverta Road to determine whether intersections and freeway facilities to the north of Elverta Road needed to be evaluated in the EIR. As shown in the table below, the segment of SR 70/99 between Elverta Road and Riego Road would operate acceptably during a.m. and p.m. peak hours under Baseline and Baseline plus Project conditions. Because this segment of freeway is operating acceptably, it is reasonable to assume that the traffic trips contributed by the project to the freeway ramps at SR 70/99 and Riego Road would not be substantial enough to adversely affect its operation and would not result in a significant impact. Therefore, no further analysis of freeways or roadway segments north of Elkhorn Boulevard was provided.

SR 70/99 between Elverta Road and Riego Road Mainline Operating Conditions							
Scenario	Direction	A.M. Peak Hour			P.M. Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Baseline	NB	969	8.9	A	1,849	17.0	B
	SB	2,472	22.8	C	1,410	13.0	B
Baseline plus Project (without Meister Way overpass)	NB	1,111	10.2	A	2,039	18.8	C
	SB	2,589	23.8	C	1,410	13.0	B
Baseline Plus Project (with Meister Way overpass)	NB	1,096	10.1	A	2,016	18.6	C
	SB	2,580	23.8	C	1,377	12.7	B
NB = northbound SB = southbound Source: TJKM 2006.							

34-32 Please refer to response to comment 34-31.

34-33 The timing requirements for when a mitigation measure recommended in the EIR would need to be implemented were determined based on a comparison of the project's percentage of trips that would be contributed to the identified traffic facility (e.g., roadway segment, ramp, intersection, freeway segment) and the contribution of trips that would result in the facility degrading from an acceptable LOS to an unacceptable LOS. For example, Mitigation Measure 6.1-2b requires Elkhorn Boulevard to be widened to 4 lanes on or before 60% buildout. Buildout is based on the total number of building permits that are issued for the project. Therefore, only 60% of the building permits could be issued before this improvement would need to be implemented. The 60% threshold was determined by evaluating the existing vehicle volumes on the roadway (2,100 vehicles per day), the capacity of the roadway operating at acceptable conditions (LOS C, 14,400 vehicles per day), and the estimated buildout roadway volumes with implementation of the project (20,000 vehicles per day under Baseline plus Project conditions). For this roadway segment, it was determined that approximately 60% (14,400-2,100/20,000 = 61%) of the project could buildout before triggering the need for this improvement. Similar calculations were made for all traffic mitigations recommended in the EIR. The City will monitor the number of building permits issued at the project site as part of its responsibilities in implementing the Mitigation Monitoring and Reporting Program for the project consistent with the requirements of CEQA.

34-34 Based on turning movement volumes presented in Exhibit 6.1-12 (page 6.1-37 of the Second RDEIR), implementation of Mitigation Measure 6.1-1i, which requires restricting the Elkhorn Boulevard/Project Street 3 intersection to right-in/right-out movements, would result in the diversion of approximately 138 westbound left-turns to the intersection of Elkhorn Boulevard and Project Street 1 and Elkhorn Boulevard and Project Street 2. Mitigation Measures 6.1-1g and 6.1-1h required that these intersections be signalized. With signalization, these two intersections would operate at LOS A and would be able to accommodate an increase of 138 vehicles during the peak hour without resulting in an unacceptable level of service. No significant impacts would occur.

34-35 As a requirement of Mitigation Measure 6.1-2c of the Second DEIR, Meister Way would be widened to 4 lanes west of SR 70/99. The widening will occur along the segment of Meister Way from the intersection of Meister Way and 28 Street/36 Street (identified on the tentative map) west to Lone Tree Canal. All widening will occur within the boundaries of the project site. To clarify the limits of the widening, Mitigation Measure 6.1-2c has been modified as shown below. This change is also presented in Chapter 7, "Revisions to the DEIR, RDEIR, and Second RDEIR," of this document. This change does not alter the conclusions presented in the EIR.

Page 6.1-59, second paragraph, of the Second DEIR is hereby revised as follows:

"Mitigation Measure 6.1-2c: Meister Way west of SR 70/99 (City of Sacramento)

On or before 66% total buildout of the project based on trip generation, the project applicant shall widen Meister Way west of SR 70/99 to provide two travel lanes in each direction from the first street intersection of SR 70/99 (Meister Way and 28 Street/36 Street [identified on the tentative map]) west to Lone Tree Road. Right-of-way for the recommended widening is currently available on-site. Based on "windshield surveys" of the project area, the site proposed for this improvement is substantially similar to the project site. Construction-related impacts would be similar to the project's construction-related impacts and no new significant impacts would occur. Mitigation recommended for the project would also substantially reduce construction-related impacts associated with this measure. With implementation of this mitigation measure, this roadway segment would improve to LOS D under Baseline plus Project conditions, which is acceptable based on City standards. Therefore, impacts to this intersection would be reduced to a ***less-than-significant*** level."

34-36 The commenter offers no evidence to support the opinion that triple left turn lanes would result in adverse safety impacts. The City has previously implemented triple left turn lanes (e.g., at Truxel Road and Gateway Park Boulevard) and triple left turn lanes are common in the design of intersections throughout the Sacramento Region and Bay Area. Triple left turn lanes are proposed at only one freeway ramp studied in the Greenbriar project. Based on the design and siting of these facilities, implementation of triple left turn lanes would not result in adverse safety hazard impacts because they are standards roadway design features that are routinely implemented by transportation agencies.

34-37 The details regarding the proposed interim transit service mitigation (Mitigation Measure 6.1-10 in the Second RDEIR) would be developed through consultation with the City, Sacramento Regional Transit, and other transit service providers to ensure that the project would implement a transit service that would implement the performance standards outlined in the mitigation. The City, through its responsibility as a lead agency, will be responsible for ensuring that transit services are offered to residents at Greenbriar through the monitoring requirements of the Mitigation Monitoring and Reporting Program as required by CEQA. The final details of the transit service plan will depend upon the transit services requested by on-site residents. Please refer to response to comment 29-59.

34-38 Please refer to response to comment 34-37. The Greenbriar project is designed to be a transit-oriented development and has been designed to be consistent with the principles of the SACOG Regional Blueprint. The greatest distance between any land use at the project site and the DNA LRT station is approximately 2/3-mile. The transit service required by Mitigation Measure 6.1-10 is intended to be an interim service and would cease once alternate bus transit becomes available or the DNA light rail line is fully operable. Regarding the commenter's assertion that people located greater than ¼-mile from a transit station would

not walk to the station, the commenter does not take into account that people would be able to drive to and park at the LRT station. The ¼-mile distance is a reference point in designing transit-oriented communities that identifies the probability of people to walk to a destination versus driving to that destination. The commenter offers no evidence to support the claim that residents located greater than ¼-mile from the LRT station would not use the station because shuttle service is not provided. Therefore, no further response can be provided.

34-39 Please refer to response to comments 29-59 and 34-37.

34-40 Mitigation Measure 6.10-1 explicitly states that the project applicant shall "fund and operate an interim shuttle/bus transportation service." No changes to the EIR are necessary.

34-41 As identified in the DEIR, construction of the project is anticipated to last approximately 5-10 years and would occur in phases (see Section 3.5.8, "Project Description," of the DEIR). The specific details regarding the number of construction personnel and truck trips that would occur at the site are not currently known. However, the EIR provides a reasonable estimate of the volume of constriction traffic that would be anticipated to occur in any development phase. As described on page 6.1-84 of the Second RDEIR, the project is estimated to require a maximum of 250 construction workers that would commute to the site on a daily basis and would result in 50 one-way truck trips per day for the hauling of materials to the site. The estimate was prepared in consultation with the City and the project applicant. The EIR concluded that these construction trips would be substantial in relation to existing traffic volumes and roadway capacities and that a potentially significant traffic impact would occur. The commenter offers no evidence to support the assertion that different construction vehicle estimates should have been used. Therefore, no further response can be provided.

34-42 Please refer to response to comment 34-41.

34-43 The comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

34-44 Please refer to response to comments 34-9 through 34-43.

35

September 5, 2006

Peter Brundage
Executive Officer
Sacramento Local Agency Formation Commission
1112 I Street. Suite 100
Sacramento, CA 95814

RE: Comments on Greenbriar Draft Environmental Impact Report (EIR)

The comments below identify significant issues with the analyses in the Draft EIR, options that should be analyzed by LAFCo, and corrections to text and one exhibit.

Build-out of the North Natomas Community Plan

The Draft EIR is based on the assumption that all land in the North Natomas Community Plan (NNCP) will be developed. Build out of the NNCP is important to analyze for base-line, cumulative and alternative scenarios in the EIR. This assumption is also critical to ensure that the proposed project that does not impair build-out of the NNCP. The Preparer writes on Page 7-5 that Greenbriar's development "may make other developments more difficult to process." This impact should not fall on property owners inside the current NNCP. 35-1

The Draft EIR is inconsistent in analyzing the build-out of the NNCP. Despite numerous statements in the document that *"All land in the NNCP area is currently proposed for development,"* the analysis in the Draft EIR appears to have left out the impacts from the probable development of the 121 acres of land (Bayou Way Properties-Exhibit A). 35-2

The Draft EIR should use Alternative #5 of the NNCP EIR (Exhibit B), or something similar, for the build-out assumptions of the NNCP. Alternative #5 of the NNCP EIR provides for urbanization of all land inside the NNCP. This alternative is consistent with the City's Habitat Conservation Plan which permits development of all 9,030 acres in the NNCP. This alternative is also consistent with policies of CSD-1 that assumes, and plans sewer capacity for, development of all land within City Community Plans (including land designated for agricultural uses[1]). 35-3

Providing for the build-out of the Bayou Way Properties in the base-line, cumulative, and alternative scenarios will correct other inconsistencies in the document. For example, Section 5.4.3 indicates that "there are no known properties that are designated for residential development that could replace Greenbriar." The Bayou Way property owners can agree with this statement if the above corrections are made. If the Preparer chooses to leave development of Bayou Way out of the Final EIR, then the property 35-4

owners would object to both the validity of the statement, and analysis that follows in Section 8.1.

35-4 Cont'd

The above inconsistencies need to be corrected to ensure that the project impacts are analyzed correctly, and that the project does not impair the build-out of the NNCP.

35-5

Traffic

Exhibit 6.1-2 indicates roadways that were studied in the Draft EIR. It is not clear if the Preparer used the roadway network approved for the NNCP in their analyses of the traffic south of I-5. Figure 10 in the NNCP (Exhibit C) should be used by the Preparer to provide consistency with the NNCP EIR. The Bayou Way Property owners would like to see the traffic counts projected on the local street that connects Bayou Way and Del Paso Road (along the existing City Limits). This analysis is important to understand the impact of the project on the road network planned for the NNCP.

35-6

LAFCo Action to Amend City SOI

LAFCo will consider whether or not to adopt an SOI Amendment to the City of Sacramento for either the proposed Greenbriar project or one of the alternatives. This action is analyzed as part of the EIR. However, there were no alternative SOI boundary adjustments identified for consideration.

35-7

The Bayou Way Properties have not been added to the City's SOI at this time. The NNCP calls for these properties to be added to the City's SOI. Page 96 of the NNCP includes the following section on Sphere of Influence Consistency:

> *"When the Community Plan is adopted, the Sphere of Influence of the City should be revised to include all of the community plan area. The community plan area north of Del Paso Road or west of Interstate 5 is not included in the Sphere, as of June 1993.*

On July 2, 1996, the City Council adopted Resolution 96-346:

> *Resolution to initiate proceedings with the Sacramento Local Agency Formation Commission to amend the Sphere of Influence of the City of Sacramento to include the unincorporated portion of the North Natomas Community Plan.*

35-8

Despite the language in the NNCP, and the language in City Council Resolution 96-346, LAFCo has not added the Bayou Way Properties to the City's SOI. LAFCo has only added the unincorporated portion of the NNCP known as the "Panhandle" to the City's SOI.

At this time, with the presumed development of the Bayou Way Properties in the subject EIR, LAFCo should amend the City's SOI to be consistent with the NNCP and City Council Resolution 96-346. This action should take place whether or not Greenbriar

proceeds. And even though the NNCP EIR provides the analysis for LAFCo to take this action, the Draft EIR for Greenbriar should also provide LAFCo with the analyses necessary to take this action.

35-8 Cont'd

Corrections to Text

In Section 3.7.1, the NNCP acreage should be corrected to be "9,038" instead of "9,000." See page 10 of the NNCP for verification.

35-9

In Section 3.7.8, it should be noted that the Natomas Basin HCP covers unincorporated portions of the NNCP. The NBHCP covers 1,600 acres of unincorporated area inside the NNCP.

35-10

In Section 5.2.2, the preparer used the North Natomas 2002 Nexus Study to define "developable areas." The Nexus Study indicates acreage "planned for development" that are covered by the NNCP Financing Plan - it does not define areas in the NNCP that can be developed. The acreage that can be developed in the NNCP is based on the Natomas Basin HCP – which is the entire 9,030 acres of the NNCP. The reference to the Nexus Study should be deleted.

35-11

In Section 6.12.2, the Preparer indicates that the NBHCP does not include area in the unincorporated County. This is incorrect. The NBHCP covers 1,600 acres of unincorporated area inside the NNCP.

35-12

Correction to Exhibit 7-1

Exhibit 7-1 does not show the correct boundaries of the NNCP Area and excludes the Bayou Way Properties.

> *Exhibit 3-2 correctly identifies the Bayou Way Properties as part of the NNCP. Table 7-1 correctly identifies the Bayou Way acreage as part of the NNCP.*

35-13

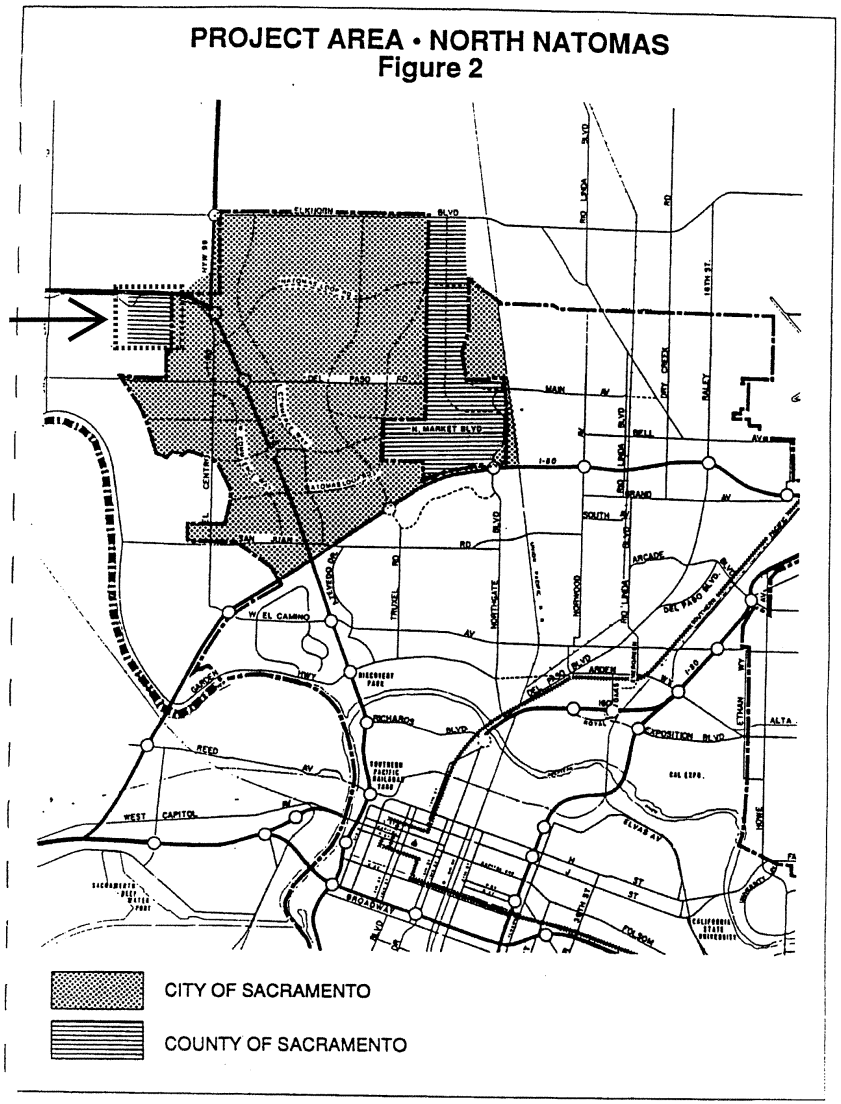
Thank you making these critical changes to the document. We look forward seeing a revised Draft EIR, or a Final EIR that does not impede the build-out of the NNCP. Please contact me if you need supporting documentation for any issues raised in this letter.

Sincerely,

Bill Farley
(916) 479-4432
10115 Brenna Way
Elk Grove, CA 95757

Footnote 1: Page 2-9 CSD-1 Master Plan Update: "for purposes of developing wastewater flow estimates for potential buildout conditions, all areas shown on current land use mapping as agriculture have been assumed to be ultimately developed at a density equivalent to low density residential areas (6 ESD's per acre).

Exhibit A



5

Exhibit B

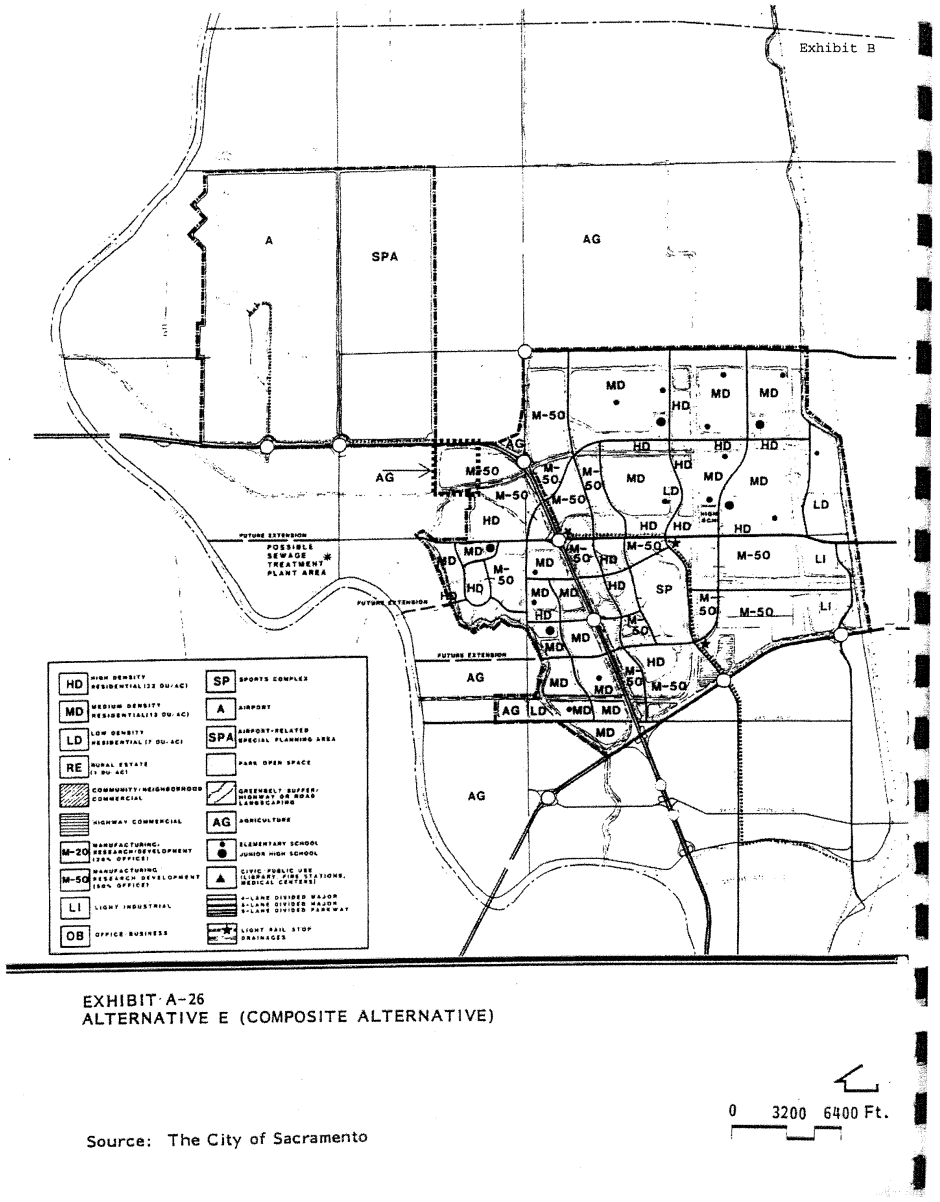


EXHIBIT A-26
ALTERNATIVE E (COMPOSITE ALTERNATIVE)

Source: The City of Sacramento

Exhibit C
VEHICULAR STREET MAP
Figure 10
LEGEND
LOCAL CONNECTION
2+ LANES
4 LANES
6 LANES
8 LANES
RECOMMENDED ROADWAY NETWORK
North Natomas Composite Plan
Transportation Evaluation
September, 1992
2+ = Two through lanes plus left-turn lane
= LIGHT RAIL STATION
= LIGHT RAIL CORRIDOR
HWY. 99
ELKHORN BLVD.
COMMERCE WAY
NORTH LOOP ROAD
TRUXEL RD.
DEL PASO RD.
NORTH MARKET BLVD.
EAST LOOP ROAD
NORTHGATE BLVD.
I-80
I-5
SOUTH LOOP ROAD
EL CENTRO RD.
SAN JUAN RD.
N
E
S
W

40

LETTER 35

Bill Farley
September 5, 2006

35-1 The analysis provided in the DEIR evaluates the project's potential impacts to the environment based on the baseline conditions present at the project site and in the project area at the time of publication of the NOP. The North Natomas Community Plan (NNCP) area is located to the east and south of the project site. This area is anticipated to fully build out by approximately 2016; buildout was therefore assumed for purposes of the cumulative analysis (see page 7-6 of the DEIR). The remaining development plans for the NNCP area were also described and evaluated in the cumulative impact analysis presented in the DEIR (see Section 7.2, "Cumulative Impacts") consistent with the requirements of CEQA and the State CEQA Guidelines.

Regarding the planning process for projects within the North Natomas area, please refer to response to comment 33-9. Further, the comment refers to page 7-5, which discusses development of projects that are located within the Joint Vision area, outside the NNCP. The project would not affect development of lands within the NNCP, which is permitted for development through the Natomas Basin HCP.

For projects, like Greenbriar, that are within the boundaries of the NBHCP but are not permitted for development by the HCP, it is recognized that there is finite habitat within the Basin. Each project that moves forward has the potential to further diminish available habitat. Thus, if Greenbriar is successfully permitted through the endangered species act process, there is the potential that other projects within the Joint Vision area that follow Greenbriar could have a more challenging permit process as resources become more diminished.

35-2 In regards to the Bayou Way Properties, this property is located within the NNCP boundaries, but outside the City's adopted Sphere of Influence (SOI). Further, this site is designated as Agricultural in the NNCP land use map. The cumulative analysis provided in the DEIR evaluates the proposed buildout of the NNCP area consistent with the land use designations identified on the adopted NNCP land use map. Because the Bayou Way Properties site is designated as agricultural, and there are no pending development applications before the City, the analysis assumed that this property would remain in agricultural production with buildout of the NNCP area.

35-3 With regard to buildout assumptions of the NNCP area please refer to response to comments 35-1 and 35-2. As described, buildout of the NNCP is well understood. Also, please see the discussion of cumulative buildout on pages 7-6 through 7-8 of the DEIR.

35-4 The analysis presented in the DEIR accurately characterizes baseline conditions at the time of publication of the NOP. Further, no changes to the baseline have occurred in regards to development patterns within the NNCP area. As described in response to comment 35-2, the Bayou West Properties site is designated as Agricultural in the NNCP land use map. Further, no application for the development of this property with urban development has been received by the City. As such, the DEIR provides an analysis assuming that this property would remain in agricultural production consistent with the requirements of CEQA and the State CEQA Guidelines. It would be speculative to assume any other use of this property. The Bayou West Properties are considered consistently throughout the EIR, including in the Alternatives analysis (in Section 8.1), wherein the Bayou Properties are not considered as a feasible offsite alternative.

35-5 Please refer to response to comments 35-1, 35-2, and 35-4.

35-6 As described in Section 5.2.2, "Land Uses in the North Natomas Area," the NNCP boundaries would be amended to include the project site as a Special Planning Area (SPA) and would be subject to its own land use policies. As such, an evaluation of the project's consistency with relevant policies of the NNCP is not required.

A review of most recent roadway data indicates Bayou Road, Del Paso Road, and Powerline Road are correctly presented in Exhibit 6.1-2 of the DEIR. Regarding the project's traffic impacts, a detailed traffic evaluation was prepared and presented in Section 6.1, "Transportation and Circulation," of the DEIR. As described therein, the project's estimated traffic trips were generated based on trip generation rates for proposed land uses included in the Institute of Transportation Engineers (ITE), Trip Generation, 7th edition and approved by the City. These trip generation rates were then distributed and assigned to local roadways within the project area through the use of the City's SACMET Regional Travel Demand Forecasting Model. Further, the roadway network approved for NNCP was used in the cumulative modeling analysis prepared for the project. The DEIR included an evaluation of traffic impacts to the intersection of Del Paso Road and Powerline Road (see Exhibit 6.1-1). Regarding the need to evaluate impacts along Del Paso Road, please refer to response to comment 29-45. Regarding Bayou Road, there is no direct connection to Bayou Road from the Greenbriar project site; therefore, it is not anticipated that the project would result in a substantial contribution of traffic trips to this roadway.

35-7 The DEIR provides an analysis of Dispersed Development Alternative (see Section 8.2, "Comparative Merits of the Alternatives," of the DEIR) which considers whether existing properties within the City's SOI are available and could support the project's proposed land uses. This alternative is intended to inform decision-makers as to the impacts of an alternative that would result in infill development within the City's existing SOI.

In accordance with CEQA Guidelines section 15126.6 (a), an 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." A separate alternative that would result in different alterations of the City's SOI would not meet the objectives of the project – including the important objective of providing readily accessible light rail transit opportunities on-site. Consideration of such an alternative is not required under CEQA.

35-8 Annexation of the Bayou West Properties site would require a separate application to the City and LAFCo, and it is not part of the Greenbriar proposal. There currently is no application on file for annexation of the Bayou West Properties site. If an application is filed, the annexation proposal would be considered independently and on a separate schedule from the proposed Greenbriar project. Further, because a development application for this property has not been submitted to the City and consistent with the requirements of CEQA, the Bayou West Properties site was not considered in the cumulative impact analysis in the DEIR. It is not the responsibility of the Greenbriar project to provide an analysis of the potential environmental impacts of other proposed development within the area except to the degree that they would be considered cumulative projects.

35-9 Because of the expansive nature of the NNCP, the NNCP was identified as encompassing "approximately" 9,000 acres (see Section 3.7.1, "Project Description," of the DEIR). It is noted that the NNCP more exactly covers 9,038 acres.

35-10 It is acknowledged that the NBHCP permit area included development of lands that are outside the adopted boundaries of the NNCP.

35-11 The commenter is correct. The NNCP area consists of a total of 9,038 acres of which 8,915 acres have been identified by the City as being "developable." The following changes have been made to the DEIR. These changes do not alter the conclusions of the DEIR. These changes are also reflected in Chapter 7, "Correction and Revisions to the DEIR, RDEIR and Second RDEIR."

"The North Natomas Community Plan area is located in the northwest portion of the City of Sacramento and is part of the greater Natomas Basin. The North Natomas community is bound by Elkhorn Boulevard on the north, Interstate 80 (I-80) on the south, the Natomas East Main Drain canal on the east and the West Main Drain canal and SR 70/99 on the west. ~~According to the North Natomas Nexus Study Update (City of Sacramento 2002)~~, The NNCP area consists of approximately 9,038 acres of which ~~4,228~~ 8,915 acres have been identified as "developable" ~~in the NNCP area~~. In 1993, the primary land use in the NNCP area was agriculture. Since that time, the NNCP was adopted in 1994 and land uses have been rapidly converting to urban uses. The project is not within the NNCP but the boundaries will be amended to include the project. The project will not be subject to the NNCP policies but will be designated as a special planning area (SPA)."

35-12 The commenter is correct. Approximately 1,600 acres of unincorporated County areas are included in the NBHCP. The text of the DEIR has been revised to reflect the correct boundaries of the NNCP. Please refer to Chapter 7, "Revisions to the DEIR, RDEIR, Second RDEIR," of this document.

Page 6.12-9, fourth paragraph is revised as follows:

"The project site and Off-site Conservation Lands are within the Plan Area for the NBHCP, a regional conservation plan for minimizing and mitigating impacts to multiple species from urbanization in the Natomas Basin. USFWS has approved the NBHCP and has issued Incidental Take Permits (ITPs) to the City and Sutter County for take of federally listed species to result from urban development in the Natomas Basin. Sacramento County is not a permittee under the NBHCP; however, the NBHCP covers approximately 1,600 acres of, ~~and the NBHCP does not cover urban development for~~ unincorporated portions of Sacramento County, although the NBHCP does provide for land acquisition in these unincorporated areas on a willing-seller basis for conservation purposes. The NBHCP currently authorizes take associated with 17,500 acres of urban development in southern Sutter County (7,500 acres) and within the City (8,050 acres) and Sacramento County (i.e., 1,983 acres of the MAP area)."

35-13 Exhibit 7-1 has been revised to reflect the correct boundaries of the NNCP. Please refer to Chapter 7, "Revisions to the DEIR, RDEIR, Second RDEIR," of this document.

5 COMMENTS AND RESPONSES ON THE RDEIR

The written and oral comments received on the RDEIR and the responses to significant environmental points raised in those comments are provided in this section. Each comment letter and the public hearing transcript are reproduced in their entirety and are followed by responses to comments raised in them. Each individual comment is assigned a number (e.g., 1-1) that corresponds with the response following the comment.

R1

US Fish & Wildlife Service
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, CA 95825
(916) 414-6600
FAX (916) 414-6712

Department of Fish and Game
Sacramento Valley-Central
Sierra Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670
FAX (916) 358-2912

January 17, 2007

Tom Buford, Senior Planner
City of Sacramento Development Services Department
901 I Street
Sacramento, California 95814

Subject: Comments on the City of Sacramento's November 2006, Recirculated Draft Environmental Impact Report for the Proposed Greenbriar Development Project, Sacramento County, California

Dear Mr. Buford:

The U.S. Fish and Wildlife Service (Service) and California Department of Fish and Game (DFG) (hereafter collectively referred to as the Wildlife Agencies) have reviewed the City of Sacramento's (City) November 2006, Greenbriar Development Project Recirculated Draft Environmental Impact Report (DEIR). The DEIR has been prepared as part of the City's consideration of the Greenbriar proposal (proposed project), which would include the construction of 3,473 housing units (consisting of low, medium and high density housing), approximately 28 acres of retail and commercial development, a 10-acre elementary school, an approximately 39-acre common water feature, and eight neighborhood parks totaling approximately 49 acres. The proposed project area totals approximately 577 acres and is north of the existing City limits. The project area is located within the Natomas Basin Habitat Conservation Plan (NBHCP; City of Sacramento *et al.* 2003) Area; however, it is outside the City's Incidental Take Permit (ITP) area in northern unincorporated Sacramento County, approximately one mile east of the Sacramento International Airport. The project site is bounded by Interstate 5 to the south, Highway 99/70 to the east, the Metro Air Park (MAP) development to the west, and Elkhorn Boulevard to the north.

R1-1

The Recirculated DEIR provides additional information and analysis on two items of concern raised during the public comment period for the initial DEIR. These issues, which resulted in the addition of significant new information to the EIR includes information related to the ability of local levees to protect the proposed project site from flooding during 100-year flood events and information related to the exposure of potential residents of the proposed project to diesel particulate emissions from traffic on Interstate 5 and State Route 10/99.

The project would result in impacts to up to 577 acres of giant garter snake (GGS) habitat; direct and indirect impacts could include the loss and displacement of individuals, increased contamination of habitat, predation by domestic and feral animals, effects related to human encroachment, and road mortality. The DEIR discusses a proposed conservation strategy that includes preserving approximately 30.6 acres along the Lone Tree Canal (which would be a 250-foot-wide corridor that includes the canal and 200 feet of adjacent uplands), to be protected and managed in perpetuity as GGS habitat. This proposed conservation strategy includes a proposal to preserve, restore, and manage off-site habitat for GGS and the Swainson's hawk (SWH). The Effects Analysis and proposed conservation strategy in the DEIR were created with little input from the Wildlife Agencies and have not been evaluated by the Wildlife Agencies to determine their consistency with Federal and State Endangered Species Act requirements or their effects on the efficacy of the NBHCP. The Wildlife Agencies previously submitted to the City three letters stating our concerns with the proposed project. The Wildlife Agencies met with the City on June 6, 2006, to further explain our concerns. A summary of these letters and meetings follows. R1-2

Background Summary

The Wildlife Agencies submitted a July 29, 2005, joint comment letter to the City in response to the Notice of Preparation (NOP) of a Draft Environmental Impact Report for the Greenbriar Project. The letter noted that if approved, the proposed project would result in a loss of up to 577 acres of habitat beyond that anticipated, analyzed and covered for take under the City's permit and would constitute a significant departure from the NBHCP's Operating Conservation Program. Additionally, in accordance with the NBHCP's Implementation Agreement, prior to approval of any rezoning or prezoning for the proposed project, the City is required to conduct a reevaluation of the NBHCP and ITPs, prepare a new effects analysis, revise or amend the NBHCP and ITPs, and develop an Environmental Impact Statement, or develop a separate conservation strategy and obtain separate ITPs to address such additional development. We noted that as part of the effects analysis, the full impact of such development on the efficacy of the NBHCP's carefully designed conservation strategy to minimize and mitigate the impacts of take of the Covered Species associated with a maximum of 17,500 acres of development within the Natomas Basin must be thoroughly analyzed and a conservation strategy that adequately addresses the increased impacts to the Covered Species resulting from additional loss of the limited habitat remaining in the basin is also required prior to authorization of any additional take. This effects analysis would need to evaluate if baseline conditions and assumptions used in the original analysis are still accurate. R1-3

On September 7, 2005 Judge Levi issued a decision in the Federal NBHCP litigation, which cautioned in footnote 13 of that decision that "the Service and those seeking an ITP in the future will face an uphill battle if they attempt to argue that additional development in the Basin beyond the 17,500 acres will not result in jeopardy" to GGS and SWH. Judge Levi's opinion considered the effects of the current trend of fallowing rice agriculture lands in the basin to facilitate potential further urban development.

On March 21, 2006, the Wildlife Agencies issued a second joint comment letter to the City in response to the City's December 2005, Analysis of Effects on the Natomas Basin Habitat Conservation Plan Report, which was prepared as part of the City's consideration of the proposed Greenbriar development project. In this letter, the Wildlife Agencies discussed our concerns about the proposed project's effects on the GGS, SWH, and other Covered Species with regards to 1) connectivity among reserve lands and among the three major geographic areas in the Natomas Basin, and 2) the eroding baseline of agricultural lands, and rice farming, in particular, resulting both from current economic conditions and the cumulative effects of other reasonably foreseeable development in the basin. We specifically identified how the City's December 2005 document failed to adequately address the impacts of the proposed project on the NBHCP's Operating Conservation Program and also failed to analyze the proposed project in light of changes in land use since the approval of the NBHCP and reasonably foreseeable land use changes.

R1-3 Cont'd

On June 6, 2006, the Wildlife Agencies met with representatives of the City to discuss the Greenbriar project. In this meeting, the Wildlife Agencies expressed concern and disappointment at the City's decision to release the DEIR without adequate input and review by the Wildlife Agencies. A July 7, 2006, telephone conference call between the representatives of the Wildlife Agencies and the City reviewed many of the topics from the June 6, 2006 meeting.

Finally, on September 5, 2006, the Wildlife Agencies issued a third joint comment letter to the City in response to the City's July 2006, Greenbriar Development Project Draft Environmental Impact Report. In this letter, the Wildlife Agencies reiterated that the Effects Analysis and proposed conservation strategy in the DEIR were created with little input from the Wildlife Agencies and have not been evaluated by the Wildlife Agencies to determine their consistency with Federal and State Endangered Species Act requirements or their effects on the efficacy of the NBHCP.

Conclusion

Based on our review of the DEIR, we reiterate our concerns, expressed previously in our letters and meetings with the City, that DEIR does not adequately address the impacts of the proposed project on the NBHCP's Operating Conservation Program.

Further, the Wildlife Agencies have not evaluated the Effects Analysis in the DEIR to determine its consistency with Federal and State Endangered Species Act requirements or its effects on the efficacy of the NBHCP. Such review will occur during the development of either a new HCP for Greenbriar, an amendment to the existing NBHCP, or a new HCP for the Natomas Basin. The City will be required to obtain a new ITP from the Wildlife Agencies, authorizing incidental take of State- and Federally-listed threatened and endangered species beyond what was permitted in the existing NBHCP. Until our review is completed, we are unable to determine the adequacy of the mitigation and conservation proposal reflected in the Effects Analysis. However, the Wildlife Agencies recognize that the proposal likely represents the minimum of mitigation and conservation measures that may be required for the development of the proposed project.

R1-4

Pursuant to Public Resources Code Sections 21092 and 21092.2, the DFG requests written notification of proposed actions and pending decisions regarding this project. Written notifications should be directed to the DFG Sacramento Valley/Central Sierra Region, 1701 Nimbus Road, Suite A, Rancho Cordova, California 95670. The Service also requests written notification regarding any actions on the proposed project. Notification can be submitted to the Service at the letterhead address.

Thank you for the opportunity to review this project. As the Wildlife Agencies have repeatedly stated in correspondence and in person, we are concerned about the effects of the proposed project on the efficacy of the NBHCP and the City's existing ITPs. The DIER does not adequately address the effects of the proposed project on the GGS, in particular, and more generally, on the NBHCP's Operating Conservation Program. Future development in the basin will require a new conservation strategy that is developed with input and review from the Wildlife Agencies, to address these impacts. We remain committed to working with the City to preserve the benefits of the NBHCP and to ensure that any future development in the basin adequately protects the GGS, SWH and other Covered Species. R1-5

Please contact Holly Herod, the Sacramento Valley Branch Chief, or Kelly Fitzgerald of the Service at (916) 414-6645, and Jenny Marr, Staff Environmental Scientist, at (530) 895-4267, or Kent Smith, Acting Assistant Regional Manager, at (916) 358-2382, of the DFG if you have any questions or concerns regarding this letter.

Sincerely,

Susan K. Moore
Field Supervisor
U.S. Fish and Wildlife Service

for Sandra Morey
Region Manager
California Department of Fish and Game

cc:
Larry Combs, Administrator, County of Sutter, Yuba City, CA
Roger Dickinson, Sacramento County Board of Supervisors, Sacramento, CA
John Roberts, The Natomas Basin Conservancy, Sacramento, CA
Kent Smith, California Department of Fish and Game, Rancho Cordova, CA
Jenny Marr, California Department of Fish and Game, Chico, CA

Literature Cited

City of Sacramento, Sutter County, Natomas Basin Conservancy, Reclamation District No. 1000, and Natomas Mutual Water Company (NBHCP). 2003. Final Natomas Basin Habitat Conservation Plan. Sacramento, California: Prepared for the U. S. Fish and Wildlife Service and CDFG. April.

LETTER R1

US Fish and Wildlife Service
Susan K. Moore, Field Supervisor
California Fish and Game
Sandra Morey, Region Manager
January 17, 2007

R1-1 The comment describes the project and does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

R1-2 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

R1-3 Please refer to response to comments 1-3 through 1-11.

R1-4 Please refer to response to comments 1-3 through 1-11.

R1-5 USFWS will be notified of all future public documents pertaining to the project. Please also refer to response to comment 1-3 through 1-11.

R2

STATE OF CALIFORNIA
GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH
STATE CLEARINGHOUSE AND PLANNING UNIT

ARNOLD SCHWARZENEGGER
GOVERNOR

CYNTHIA BRYANT
DIRECTOR

July 23, 2007

Tom Buford
City of Sacramento, Sacramento LAFCo
North Permit Center
2101 Arena Boulevard, 2nd Floor
Sacramento, CA 95834

Subject: Greenbriar Development Project (P05-069)
SCH#: 2005062144

Dear Tom Buford:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on December 28, 2006, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

R2-1

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

Terry Roberts
Director, State Clearinghouse

Enclosures
cc: Resources Agency

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Appendix C

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P. O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # 2005062144

Project Title: Greenbriar Development Project (P05-069)
Lead Agency: City of Sacramento/Sacramento Local Agency Formation Commission — Contact Person: Tom Buford, Senior Planner
Mailing Address: North Permit Center, 2101 Arena Blvd., Second Floor — Phone: (916) 808-7931
City: Sacramento, CA — Zip: 95834 — County: Sacramento

RECEIVED
NOV 13 2006
2:55
STATE CLEARING HOUSE

Project Location:
County: Sacramento — City/Nearest Community: North Natomas — Zip Code: 95203
Cross Streets: Elkhorn Boulevard and Highway 99
Assessor's Parcel No.: 225-0300002, -003, -004, -015 to -018, -021 to -024 — Section: ____ Twp.: ____ Range: ____ Base: ____
Within 2 Miles: State Hwy #: SR 99, I-5 — Waterways: ____
Airports: Sacramento Int'l — Railways: ____ — Schools: ____

Document Type:
CEQA: ☐ NOP ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ____ ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec ☒ Other Recirculated Draft EIR
NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI
Other: ☐ Joint Document ☐ Final Document ☐ Other ____

Local Action Type:
☐ General Plan Update ☐ Specific Plan ☐ Rezone ☒ Annexation
☒ General Plan Amendment ☐ Master Plan ☒ Prezone ☐ Redevelopment
☐ General Plan Element ☒ Planned Unit Development ☐ Use Permit ☐ Coastal Permit
☒ Community Plan ☐ Site Plan ☐ Land Division (Subdivision, etc.) ☐ Other ____

Development Type:
☒ Residential: Units 3,723 Acres 286
☐ Office: Sq.ft. ____ Acres ____ Employees ____
☒ Commercial: Sq.ft. ____ Acres 29.6 Employees ____
☐ Industrial: Sq.ft. ____ Acres ____ Employees ____
☒ Educational 11.3-acre Elementary
☐ Recreational Approx. 50 acres of parks
Total Acres (approx.) ____
☒ Water Facilities: Type Lake 41 acres MGD ____
☐ Transportation: Type ____
☐ Mining: Mineral ____
☐ Power: Type ____ MW ____
☐ Waste Treatment: Type ____ MGD ____
☐ Hazardous Waste: Type ____
☐ Other: ____

Project Issues Discussed in Document:
☒ Aesthetic/Visual ☐ Fiscal ☒ Recreation/Parks ☒ Vegetation
☒ Agricultural Land ☒ Flood Plain/Flooding ☐ Schools/Universities ☒ Water Quality
☒ Air Quality ☐ Forest Land/Fire Hazard ☐ Septic Systems ☒ Water Supply/Groundwater
☒ Archeological/Historical ☒ Geologic/Seismic ☒ Sewer Capacity ☒ Wetland/Riparian
☒ Biological Resources ☐ Minerals ☒ Soil Erosion/Compaction/Grading ☒ Wildlife
☐ Coastal Zone ☒ Noise ☒ Solid Waste ☒ Growth Inducing
☒ Drainage/Absorption ☒ Population/Housing Balance ☐ Toxic/Hazardous ☒ Land Use
☐ Economic/Jobs ☒ Public Services/Facilities ☒ Traffic/Circulation ☒ Cumulative Effects
☐ Other ____

Present Land Use/Zoning/General Plan Designation:
Agriculture (AG-80)

Project Description: *(please use a separate page if necessary)*
The proposed project would amend the City's sphere of influence to include the 577-acre project site, annex the site to the City and result in detachment from other districts, and would construct a residential and commercial mixed use development on the site.

State Clearinghouse Contact: (916) 445-0613 (AM)
State Review Began: 11-14-2006
SCH COMPLIANCE 12-28-2006

Please note State Clearinghouse Number (SCH#) on all Comments
SCH#: 2005062144
Please forward late comments directly to the Lead Agency

AQMD/APCD 25
(Resources: 11/18)

Project Sent to the following State Agencies

- X Resources
- ____ Boating & Waterways
- ____ Coastal Comm
- ____ Colorado Rvr Bd
- X Conservation
- X Fish & Game # 2
- ____ Delta Protection Comm
- ____ Forestry & Fire Prot
- ____ Historic Preservation
- X Parks & Rec
- X Reclamation Board
- ____ Bay Cons & Dev Comm
- X DWR
- ____ OES (Emergency Svcs)

Bus Transp Hous
- X Aeronautics
- X CHP
- X Caltrans # 3
- ____ Trans Planning
- X Housing & Com Dev
- ____ Food & Agriculture
- X Health Services

State/Consumer Svcs
- ____ General Services

Cal EPA
- ____ ARB – Airport Projects
- ____ ARB – Transportation Projects
- ____ ARB – Major Industrial Projects
- ____ Integrated Waste Mgmt Bd
- ____ SWRCB: Clean Wtr Prog
- ____ SWRCB: Wtr Quality
- ____ SWRCB: Wtr Rights
- X Reg. WQCB # 5S
- X Toxic Sub Ctrl-CTC

Yth/Adlt Corrections
- ____ Corrections

Independent Comm
- ____ Energy Commission
- X NAHC
- ____ Public Utilities Comm
- ____ State Lands Comm
- ____ Tahoe Rgl Plan Agency
- ____ Conservancy

- ____ Other: ____

LETTER R2

State of California
Office of Planning and Research
Terry Roberts
May 29, 2007

R2-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary. The comment letter forwarded by the comment letter is presented as comment letter R3.

R3

Flex your power!
Be energy efficient!

DEPARTMENT OF TRANSPORTATION
DIVISION OF AERONAUTICS – M.S.#40
1120 N STREET
P. O. BOX 942873
SACRAMENTO, CA 94273-0001
PHONE (916) 654-4959
FAX (916) 653-9531
TTY (916) 651-6827

December 7, 2006

Mr. Tom Buford
City of Sacramento
Development Services Department
901 I Street
Sacramento, CA 95814

Mr. Peter Brundage
Sacramento Local Agency Formation Commission
1121 I Street, Suite 100
Sacramento, CA 95814

Dear Messrs. Buford and Brundage:

Re: City of Sacramento and Sacramento Local Agency Formation Commission's Recirculated Draft Environmental Impact Report for the Greenbriar Development Project; SCH# 2005062144

The California Department of Transportation (Caltrans), Division of Aeronautics (Division), reviewed the above-referenced document with respect to airport-related noise and safety impacts and regional aviation land use planning issues pursuant to the California Environmental Quality Act (CEQA). The Division has technical expertise in the areas of airport operations safety, noise and airport land use compatibility. We are a funding agency for airport projects and we have permit authority for public and special use airports and heliports. The following comments are offered for your consideration.

R3-1

The proposal includes construction of approximately 3,473 housing units, approximately 27.5 net acres of retail and commercial space, an elementary school, eight parks and a central lake/detention basin. The project site is located approximately one mile east of the Sacramento International Airport. The project site is also within the Sacramento County Airport System's (SCAS) Airport Planning Policy Area for Sacramento International Airport. It is likely that future homeowners and tenants will be subject to aircraft-related noise and safety impacts in this area.

The western half of the project site is within the Overflight Zone as designated in the Comprehensive Land Use Plan (CLUP) for Sacramento International Airport prepared by the Sacramento Council of Governments (SACOG) in its capacity of Airport Land Use Commission (ALUC). As discussed in the recirculated draft Environmental Impact Report (EIR), portions of the proposal are inconsistent with the CLUP and the proposal will be submitted to SACOG for a consistency determination. The EIR discusses the possibility of the City of Sacramento issuing an override of the ALUC if it issues an inconsistency determination.

R3-2

As stated in the State Law, California Public Utilities Code (PUC) 21676 et seq., Caltrans reviews and comments on the specific findings a local government intends to use when proposing to overrule an ALUC. Caltrans specifically looks at the proposed findings to gauge their relationship to their overrule. Also, pursuant to the PUC 21670 et seq., findings should show evidence that the local agency

is minimizing "...the public's exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses." For more information, please contact the Division's ALUC coordinator for northern California, Ms Joanne McDermott, at (916) 654-5253.

R3-2 Cont'd

As we have stated previously, Education Code, Section 17215 requires a school site investigation by the Division prior to acquisition of land for a proposed school site located within two miles of an airport runway. Our recommendations are submitted to the California Department of Education for use in determining acceptability of the site. The Division's school site evaluation criteria is available on-line at http://www.dot.ca.gov/hq/planning/aeronaut/htmlfile/regulations.php.

R3-3

Future homeowners and tenants must be advised of the proximity of Sacramento International Airport. In accordance with Section 11010 of the Business and Professions Code and Sections 1102.6, 1103.4, and 1353 of the Civil Code (http://www.leginfo.ca.gov/calaw.html) buyer notification is required for lands around airports. Any person who intends to offer land for sale or lease within an *airport influence area* is required to disclose that fact to the person buying the property, as stated below:

> "This property is presently located in the vicinity of an airport, within what is known as an airport influence area. For that reason, the property may be subject to some of the annoyances or inconveniences associated with proximity to airport operations (for example: noise, vibration, or odors). Individual sensitivities to those annoyances can vary from person to person. You may wish to consider what airport annoyances, if any, are associated with the property before you complete your purchase and determine whether they are acceptable to you."

R3-4

Public Utilities Code, Section 21659, "Hazards Near Airports Prohibited" prohibits structural hazards near airports. To ensure compliance with Federal Aviation Regulation, Part 77, "Objects Affecting Navigable Airspace," submission of a Notice of Proposed Construction or Alteration (Form 7460-1) to the Federal Aviation Administration (FAA) may be required. For further technical information, please refer to our website at http://www.dot.ca.gov/hq/planning/aeronaut/htmlfile/oairport.php and click on Obstruction Evaluation/Airport Airspace Analysis.

R3-5

The proposal also includes several water features. We concur with the identified requirement for a "wildlife management plan for the on-site lake/detention basin".

R3-6

Aviation plays a significant role in California's transportation system. This role includes the movement of people and goods within and beyond our State's network of over 250 airports. Aviation contributes nearly nine percent of both total State employment (1.7 million jobs) and total State output ($110.7 billion) annually. These benefits were identified in a recent study, "Aviation in California: Benefits to Our Economy and Way of Life," prepared for the Division of Aeronautics which is available at http://www.dot.ca.gov/hq/planning/aeronaut/. Aviation improves mobility, generates tax revenue, saves lives through emergency response, medical and fire fighting services, annually transports air cargo valued at over $170 billion and generates over $14 billion in tourist dollars, which in turn improves our economy and quality-of-life.

R3-7

"Caltrans improves mobility across California"

The protection of airports from incompatible land use encroachment is vital to California's economic future. Sacramento International Airport is an economic asset that should be protected through effective airport land use compatibility planning and awareness. Although the need for compatible and safe land uses near airports in California is both a local and a state issue, airport staff, airport land use commissions and airport land use compatibility plans are key to protecting an airport and the people residing and working in the vicinity of an airport. Consideration given to the issue of compatible land uses in the vicinity of an airport should help to relieve future conflicts between airports and their neighbors.

R3-7
Cont'd

These comments reflect the areas of concern to the Division of Aeronautics with respect to airport-related noise and safety impacts and regional airport land use planning issues. We advise you to contact our District 3 Office in Marysville at (530) 741-4211 concerning surface transportation issues.

Thank you for the opportunity to review and comment on this proposal. If you have any questions, please call me at (916) 654-5314.

Sincerely,

Sandy Hesnard

SANDY HESNARD
Aviation Environmental Planner

c: State Clearinghouse, SACOG, SCAS

"Caltrans improves mobility across California"

LETTER R3

California Department of Transportation, Division of Aeronautics
Sandy Hesnard
December 7, 2006

R3-1 The comment does not raise any issues related to the environmental analysis provided in the RDEIR; therefore, no further response is necessary.

R3-2 The comment does not raise any issues related to the environmental analysis provided in the RDEIR; therefore, no further response is necessary.

R3-3 The project applicants will be required, pursuant to the Education Code, to coordinate with Caltrans regarding the preparation of a school site investigation prior to construction of the proposed elementary school on the project site. Please also refer to response to comment 3-7.

R3-4 As described in Section 3.5.1, "Land Uses," of the DEIR, the project applicants are proposing to notify future land owners and tenants through title documents and lease agreements that occupants could be subject to increased noise levels associated with aircraft overflights. The project applicants will coordinate with Caltrans regarding the specific notification language to be used. See also response to comment 20-11.

R3-5 The project applicants will submit all necessary forms and documents to the Federal Aviation Administration for the construction of the proposed project. Given the distance of the project from the airport, it is not expected that any structure built on Greenbriar would affect navigable airspace.

R3-6 The comment does not raise any issues related to the environmental analysis provided in the R DEIR; therefore, no further response is necessary.

R3-7 The comment does not raise any issues related to the environmental analysis provided in the RDEIR; therefore, no further response is necessary.

R4

DEPARTMENT OF TRANSPORTATION
DISTRICT 3 – SACRAMENTO AREA OFFICE
VENTURE OAKS – MS 15
P.O. BOX 942874
SACRAMENTO, CA 94274-0001
PHONE (916) 274-0614
FAX (916) 274-0648
TTY (530) 741-4509

Flex your power!
Be energy efficient!

January 2, 2007

06SAC0210
03-SAC-99 PM 33.180
Greenbriar Annexation
Recirculated Draft Environmental Impact Report
SCH#2005062144

Mr. Tom Buford
City of Sacramento
2101 Arena Boulevard, Second Floor
Sacramento, CA 95834

Mr. Don Lockhart
Sacramento Local Agency Formation Commission (LAFCO)
1112 I Street, Suite 100
Sacramento, CA 95814

Dear Mr. Buford and Mr. Lockhart:

Thank you for the opportunity to review and comment on the recirculated Draft Environmental Impact Report (DEIR) for the Greenbriar Annexation project. The air quality, hydrology, drainage, and water quality portions of the DEIR were recirculated. The proposed project includes a request for a Sphere of Influence amendment for the City of Sacramento. Resulting development within the 577 acre project area is anticipated to include 3,473 housing units, approximately 28 net acres of retail and commercial space, one 10-acre elementary school site, eight neighborhood parks, and an overpass over State Route (SR) 99. The project is immediately adjacent to the Interstate 5 (I-5)/SR 99 interchange. Our comments are as follows: R4-1

- Per our October 13, 2006 meeting with City staff, Sacramento LAFCO, and representatives for project proponents, Caltrans is determining the potential footprint of a widened I-5 and SR 99 and reconstructed I-5/SR 99 interchange. We are also estimating the cost of the I-5 and SR 99 widenings. Our goal is to provide this information to the City by Friday, January 19, 2007. Caltrans appreciates the effort to mitigate significant impacts to the mainline freeways and the collaborative working relationship with the City and project proponents. R4-2

If you have any questions about these comments or to schedule the requested meeting please contact Alyssa Begley at (916) 274-0635.

Sincerely,

BRUCE DE TERRA, Chief
Office of Transportation Planning—South

LETTER R4

California Department of Transportation, District 3
Bruce De Terra, Chief
January 2, 2007

R4-1 The comment does not raise any issues related to the environmental analysis provided in the RDEIR; therefore, no further response is necessary.

R4-2 Please refer to response to comments 3-3 and 3-6.

CSD-1
COUNTY SANITATION DISTRICT 1
Wastewater Collection For a Growing Sacramento

10545 Armstrong Avenue
Mather
California
95655
Tele: (916) 876-6000
Fax: (916) 876-6160
www.csd-1.com

R5

December 11, 2006
E225.000

Don Lockhart
Sacramento LAFCo
1112 I Street Suite 100
Sacramento, CA 95814

Subject: **Notice of Availability of the Re-circulated Draft Environmental Impact Report (DEIR) for the Greenbriar Project**
APN: 201-0300-049, 067 through 071, 076, 077, 079, 080, 083, 085
Control No. P05-069

Dear Mr. Lockhart:

County Sanitation District 1 (CSD-1) has reviewed the subject documents and has the following comments.

The subject property is outside the Urban Service Boundary and will not be provided sewer service by CSD-1. Sacramento City Utilities Department approval will be required for sewage service. R5-1

Page 7-2 references the need to amend the CSD-1 Sphere of Influence (SOI) boundaries. This is not necessary, since CSD-1 will not be the local sewer provider. R5-2

We have not reviewed a revised Financing Plan. The Draft Financing Plan from July 2006 specified CSD-1 as servicing and reimbursing the sewer. This information is incorrect and should be revised to reflect Sacramento City Department of Utilities service. R5-3

We also did not see Appendix I (the sewer study) revised in the Re-circulated DEIR. The previous Appendix I was an unapproved sewer study based on CSD-1 criteria. This is not appropriate since CSD-1 will not be maintaining the sewer collection system for Greenbriar. R5-4

If you have any questions regarding these comments, please call me at (916) 876-6094.

Sincerely,

Wendy Haggard

Wendy Haggard, P.E.
Department of Water Quality
Development Services

WH: cc

cc: Melenie Davis
Amber Schalansky
Steve Norris
Bob Hedges
Steve Hong (31-304B)
Tom Buford
City of Sacramento
Planning Division
New City Hall
915 I Street, Third Floor

lockhart121106.ltr

LETTER R5

County Sanitation District 1
Wendy Haggard, P.E.
December 11, 2006

R5-1 Please refer to response to comment 24-1.

R5-2 Please refer to response to comment 24-1.

R5-3 A copy of the Revised Draft Greenbriar Finance Plan is included as Appendix E of this document. Regarding CSD-1 service, please refer to response to comment 24-1.

R5-4 The project applicants are in process of preparing a revised Municipal Services Review (MSR) in coordination with the City and LAFCo. A final MSR will be circulated to CSD-1 for review. It is anticipated to be available by August 2007. Regarding CSD-1 service, please refer to response to comment 24-1.

County of Sacramento
MUNICIPAL SERVICES AGENCY – CHERYL CRESON, ADMINISTRATOR
Department of Transportation
Including service to the Cities of Citrus Heights and Rancho Cordova
Thomas J. Zlotkowski, Director

R6

November 21, 2006

Mr. Tom Buford
City of Sacramento
Development Services Department
2101 Arena Boulevard, Second Floor
Sacramento, CA 95834

SUBJECT: COMMENTS ON RECIRCULATED DEIR FOR GREENBRIAR MASTER PLANNED COMMUNITY

Dear Mr. Buford:

The Sacramento County Department of Transportation has reviewed the Recirculated Draft Environmental Impact Report (DEIR) for the Greenbriar Master Planned Community. We appreciate the opportunity to review this application. Our comments continue to be as identified in our previously sent July 24, 2006 letter. They are as follows:

1. The cumulative traffic volumes shown in the DEIR do not match the cumulative traffic volumes shown in the report for the Metro Air Park traffic study prepared in 2003. In some cases these volumes are significantly different. Please justify this volume difference.

2. Any transportation modeling performed in the study should include buildout of Metro Air Park as part of the cumulative base conditions. The text appears to state that this land use was included in the traffic model. The traffic model should also take into consideration the land use being considered in the Elverta Specific Plan. This project has been forwarded to the County Board of Supervisors by the Planning Commission and is therefore in process. R6-1

3. The DEIR should identify funding for any improvements that the study recommends and those improvements should be consistent with the improvements identified for the recently approved Metro Air Park development. The development of the financing plan for Greenbriar should be closely coordinated with the financing plan for Metro Air Park. It appears that several of the traffic related impacts are identified as significant and unavoidable because they are not in control of the jurisdiction. Where this occurs feasible mitigation measures should be identified and project costs and fair shares should be identified based on the findings of the traffic study.

If you have any questions, please feel free to contact me at 874-7052.

Sincerely,

Matthew G. Darrow
Senior Civil Engineer
Department of Transportation

C: Don Lockhart – Sacramento LAFCO 1112 I Street, Suite 100, Sacramento, CA 95814
Judy Robinson - Planning
Steve Hong -IFS
Dan Shoeman – DOT
Dean Blank – DOT
Bob Davison – IFS
Theresa Mack – IFS

LETTER R6

County of Sacramento, Department of Transportation
Matthew Darrow, Senior Civil Engineer
November 21, 2006

R6-1 This comment letter repeats the information presented in Sacramento County Department of Transportation's comment letter dated July 24, 2006. Please refer to response to comment 22-1 through 22-4 for responses to issues raised in this comment letter.

R7

December 29, 2006

Mr. Tom Buford
Senior Planner
Development Services Department
Environmental Planning Services
City of Sacramento
2101 Arena Blvd, 2nd floor
Sacramento, CA 95834

Mr. Don Lockhart
Assistant Executive Officer
Sacramento Local Agency Formation Commission
1112 I Street, Suite 100
Sacramento, CA 95814

SUBJECT: Recirculated DRAFT EIR, GREENBRIAR PROJECT
FILE # P05-069, SAC 200400304H

Dear Mr. Buford and Mr. Lockhart:

Thank you for sending the Recirculated DEIR for the project listed above to the Sacramento Metropolitan Air Quality Management District (District) for review and comment. District staff comments follow.

Please see our original comments dated August 31, 2006 regarding our concern about the fact that this project is located outside of the County Urban Services Boundary and the City of Sacramento city limits. R7-1

URBEMIS analyses

Upon review of the URBEMIS computer runs found in Appendix D of the Recirculated DEIR (RDEIR), we see that the project was divided into a north and south portion and projected to be built over 6 years. For the most part, SMAQMD guidance about URBEMIS modeling was followed. An exception to that has to do with the amount of building equipment and paving equipment that was foreseen to be used in both the North of Meister and South of Meister portions of the project. It appears the equipment is underestimated in the URBEMIS model runs included in the RDEIR. R7-2

Current SMAQMD guidance[1] states that 3 "other" pieces of equipment should be used as a default value for every 10 acres of "actively graded" land. In the case of the North section, there are 75 acres projected to be "actively graded" at any one time. That would call for 7.5 * 3 or 22.5 pieces of "other" equipment to be input into the URBEMIS model.

[1] Guide to Air Quality assessment in Sacramento County, July 2004, pg 3-4 and amended in CEQA FAQ May 2006, pg 3.

Instead, the URBEMIS output file indicates that 15 pieces of "other" equipment was used. Likewise, there should be 20.4 pieces of "other" equipment used in the building construction phase for the South section as opposed to the 14 used. In a similar fashion, 7.5 pavers and 7.5 rollers should be used in the north section as opposed to the 9 in the URBEMIS model run. There is no explanation given for this deviation from District guidance. If the proponent had specific information about the equipment that was going to be used and could commit to it, then deviations from SMAQMD guidance are understandable. Or, if the analyst could offer some other reason for using non standard equipment assumptions, we could consider the reasonableness of the scenario. Absent that, we suggest the URBEMIS building construction models be rerun according to SMAQMD guidance for both building equipment and paving equipment. We believe the outcome will be more conservative and that the projected emissions will be greater than what is reported in the RDEIR. R7-2 Cont'd

For the reader who may not be familiar with URBEMIS, the idea of fractional equipment such as 22.**5** pieces of "other" equipment may seem bizarre. In reality, there is no such thing as a .5 piece of equipment which is able to operate. However, URBEMIS has the ability to scale emissions according to these fractional factors and the emission outputs are more accurate if fractional equipment is what's appropriate. R7-3

Off-site construction mitigation fee calculation

The fee calculation spreadsheet included in Appendix D appears to contain a few errors. First, it lists emissions from phased construction activities for both the area North of Meister and the area South of Meister. Those activities are modeled to take place from 2007-2012. Some activities on the North and South portions will overlap during 2009 and 2010. The spreadsheet errs in subtracting the District's threshold (85 lbs/day) twice during that period. R7-4

Secondly, some of the "duration" values differ from how we would calculate them. For example, building construction for the North section is projected to start June 07 and last 3 years. That means that in 2007, there will be 154 days of building construction (7 mos *22 days) as opposed to the 198 days reported in the spreadsheet. If those two problems are modified in the spreadsheet, the fee would be **$1,780,822**. The cost per acre would be $**3,086.35**, assuming every acre in the project is "disturbed." By that, we mean there is no (undisturbed) open space in the project. A copy of a District generated spreadsheet is attached. It does not take into account any changes to the NOx values because of the above mentioned underestimation in equipment. If the NOx values go up, then we would expect the fee to go up somewhat also. The project analyst should re-do the spreadsheet calculation if that is the case. R7-5

If the fee does deviate from that listed in the RDEIR, then Mitigation Measure 6.2-1 c would need to be amended to reflect the new amount. Furthermore, we suggest several other changes to that mitigation measure. 1) The language that states "*The determination of the final mitigation fee shall be conducted in coordination with SMAQMD*" be deleted. It is our protocol that off-site mitigation fees be determined at the time of the environmental document. 2. The fee should be based on the then current cost to reduce a ton of NOx in order to be effective. We suggest the mitigation measure be rewritten in this way: R7-6

c. The applicant shall pay $1,780,822 into SMAQMD's off-site construction mitigation fund to further mitigate construction-generated emissions of NOx that exceed SMAQMD's daily emission threshold of 85 lb/day. The calculation of the fee listed here is based on the current cost of $14,300 to reduce a ton of NOx. However, the then current cost of reducing NOx should be used at the time of the payment of the fee. The fee should be paid to SMAQMD prior to the issuance of any grading permit for any portion of the project. The fee can be paid on an acre basis of $3,086.35/acre as development occurs and grading permits are sought. (See Appendix D for calculation worksheet.)

R7-6 Cont'd

(Note: the fee amounts listed will likely be different if URBEMIS analyses are re-done as suggested on pg 1)

Operational mitigation measure MM6.2-2

The District's operational mitigation program has evolved significantly since the Greenbriar Air Quality Mitigation Plan (AQMP) was first submitted to the District in October 2005. Despite the fact that District employee Art Smith, now retired from the District, stated that this Plan "met the expectations of the District" in a 12/21/05 letter, the AQMP needs more detail. For example, the list of the AQMP's measures on page 6.2-22 (under Mitigation Measure 6.2-2) does not match the measures in listed in the "Greenbriar Master AQ/TSM Plan included in Appendix E. Specifically, the list on page 6.2-22 states *"ozone destruction catalyst shall be installed on air conditioning systems in consultation with SMAQMD (residential, commercial, mixed.)"* It also calls for bicycle lockers, racks, personal showers for employees. These measures are not mentioned by the Air Quality Plan in the Appendix. We recommend the City require the proponent further refine and strengthen this Plan. Specifically, we recommend MM6.2-2 read:

R7-7

MM6.2-2 *In order to reduce the significant operational NOX emissions of this project by 15%, the proponent will commit to and implement a SMAQMD-endorsed Air Quality Mitigation Plan (AQMP). It should be separate and distinct from a TSM Plan. The AQMP can be a revision to the October 5, 2005 Greenbriar Master AQ/TSM Plan, but it must be re-endorsed by the SMAQMD prior to the publication of the FEIR.*

(Note- the list of measures on pg 6.2-22 is deleted.)

Toxic Air Contaminants (TACs) from Mobile sources

- **RDEIR sets "standard" for mobile source TACs for project's EIR**

The RDEIR discusses the fact that the District has not adopted a significance threshold pertaining to mobile TAC exposure. It states "*the standard* (equal or greater than 10 in a million incremental cancer risk) *used by SJVAPCD and SCAQMD is a reasonably protective standard for consideration of pubic health, whether it is intended to be applied to stationary or mobile source exposure, and is therefore used in this EIR.*"[2] It, thus, establishes a threshold for TACs for this project. It states this standard is one which is used by the District and others for stationary source TACs. That is correct, but it is currently not a standard for mobile source TACs. Mobile source TACs present various modeling challenges including the sources' linear characteristics, changes in fleet and volume and orientation to the sensitive receptors in question. TAC analysis from mobile

R7-8

[2] RDEIR, pg 6.2-16

sources is an emerging issue across the state. It is acceptable, however, for the lead agency to set a standard or threshold, if desired. R7-8 Cont'd

- **SMAQMD draft Recommended Protocol**

In April 2005, the California Air Resources Board (CARB) published the Air Quality and Land Use Handbook: A Community Health Perspective to provide guidance to local planners and decision-makers about land use compatibility issues. The Handbook provides guidance concerning land use compatibility with TAC sources, in particular mobile (i.e. trucks and cars) sources on high volume freeways and streets. The Handbook suggests that, at a minimum, the siting of residential uses should not occur within 500 feet of a freeway. The Handbook did not provide a threshold of significance for mobile source TACs.

In response to the Handbook, the District published[3] draft Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways (Protocol) in October 2006 to give further guidance to planners as to when a Health Risk Assessment (HRA) would be appropriate. Through the use of screening tables, a planner can reference such factors as compass orientation of the roadway, compass orientation of the project with respect to the roadway, traffic volume and distance from the freeway in order to determine whether the District would recommend a HRA be undertaken for a particular land use project. The Protocol also describes accepted methodology for an HRA if it is found necessary to perform one. The Protocol does not provide an acceptable cancer risk or threshold of significance for TACs from mobile sources. R7-9

The Protocol suggests that the results from the screening methodology as well as the screening matrix[4] itself should be reported by the local agency or consultant. If, as a result of the screening process, a site specific Health Risk Assessment is called for, the local land use agency or consultant should complete the risk assessment for eight receptor distances (10, 24, 50, 100, 200, 300, 400, 500 ft) from the roadway as well as the receptor location that is the site of the nearest potentially affected population.

- **RDEIR TAC analysis and conclusions: Off-site mobile sources**

The RDEIR references the District Protocol and states that "according to this protocol, this risk is below the level requiring a site-specific HRA.[5]" Normally, the District would expect to see 1) the matrix used to screen this cancer risk value and 2) a qualitative discussion of the results. It pursues an approach which deviates from District recommendations in several ways. First, it does not contain the screening table matrix. Secondly, it includes an HRA despite the fact District protocol would indicate there is no need to do so. R7-10

[3] SMAQMD website www.airquality.org. See "CEQA and Programs" page.
[4] SMAQMD Draft Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways, October 2006, page 10
[5] Recirculated Draft Environmental Impact Report, Greenbriar Development Project, page 6.2-27.

The RDEIR states that relative to TACs from mobile sources on the highways near this project (I-5 and SR 70/99), the impact is ***less than significant***. The District believes the conclusion of "less than significant" is not supported by the data presented in the document. R7-11

Despite the fact District protocol would not require a HRA, one is included in the RDEIR in Appendix E[6]. The RDEIR states *that "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 … for the residents closest to freeways, is* ***29 in 1 million***.

The "29 in 1 million" number appears to have been taken from Table 3 of the HRA which arrays various percentages of "2000 Total Average Risk for the Sacramento Valley Air Basin." These percentages allegedly correspond to various "average years" and various distances from the two highways running near the project. The "70 year average" column shows a 5.5% value for the distance which is 61.4 meters from Interstate 5. This means the average risk level over 70 years is 5.5% of the "2000 Total average Risk." When 5.5% is multiplied by 520 (average basin cancer risk), the result is close to 29. The value of 29 corresponds to 29 more cases of cancer per million over the background level.

Table 3 of the HRA could be seen as confusing to the average reader and not very informative. The data is presented in terms of the percentage of a background level. Many readers may have a difficult time comparing those percentages to something as straightforward as a "standard" of one in a million. Another issue is that the HRA, too, appears to use emission factors for vehicle fleets in the future. R7-12

The RDEIR goes on to state that because residents typically stay in their houses for 11 years as opposed to 70 years, that this "*concern* (sic: cancer) *risk for residents would more closely average five in 1 million for single-family residents…and two in 1 million for rental housing.*" It also discusses the fact that emission trends for TACs have been going down. Based on these arguments, the RDEIR states the project is ***less than significant*** even though the HRA shows an increased cancer risk of 29 in one million and the RDEIR's own chosen standard is 10 in one million. The discounting of the risk factor because of these two arguments appears faulty.

The RDEIR discounts the 29 in a million figure through a discussion of the fact that the length of average residency in a given house is 11 years. It multiplies 29 times 11/70 years and gives the result as 4.5 increased cancer cases, or "less than significant." However, OEHHA guidance recommends the 70 year exposure duration be used for determining residential cancer risks. [7] This guidance further states that "exposure durations of 9 years and 30 years may also be evaluated as supplemental information to show the range of cancer risk based on residency periods. There is no discussion of 11

[6] The HRA is erroneously labeled as Appendix E "Greenbriar Master AQ/TSM Plan." In reality, it should be listed as Appendix F "Air Quality Health Risk Assessment" as it is in the July 2006 DEIR. The HRA included in the RDEIR is an earlier version of the HRA included in the DEIR. We understand there was an error in getting the more current HRA in the RDEIR.

[7] Air Toxics Hot Spots Program Risk Assessment Guidelines. The Air Toxics Hot Sopts Program Guidance Manual for Preparatino of Health Risk Assessments, August 2003, Office of Environmental Health Hazard Assessment, CA EPA, pg 8-3.

years. If one wanted to be conservative, using the 30 year period would be more reflective of maximum impact than would the use of 11 years. Furthermore, according to Table 3, the increased risk is calculated to be 12.2% (or 63.44 cases) at 2007 and 4.4% (or 22.88) at 2037. The average risk of years 2007-2037 is probably closer to 43.16 increased cases of cancer. If that's the case, using the RDEIR's logic, eleven years of that average risk would mean an increased cancer risk of 15.82. (43.16 x11/30). This would be above the RDEIR's standard of significance.

R7-12 Cont'd

The HRA does offer up several possible mitigation strategies for the TAC impact. We suggest the City and proponent consider adopting those strategies to possibly mitigate whatever impact there may be. Those strategies include the use of tree planting (vegetation) and sound walls. The subject of effective mitigation for mobile souce TAC is one which is currently being studied by researchers.

R7-13

In summary, we suggest the discussion of mobile source TACs more closely follow the District guidance outlined in the Protocol for any subsequent environmental document. A more extensive use of the District screening tables would be followed, most likely, by a qualitative discussion of TACs. If an HRA is needed, it would follow District protocol.

R7-14

- **RDEIR TAC analysis and conclusions: short term construction activities**

The RDEIR finds that short term construction activities would result in short-term diesel exhaust emissions (pg 6.2-24). The RDEIR states that this impact would be ***less-than significant*** because the impact will be temporary. Again, the District does not have any current guidance on TAC emissions from mobile construction equipment nor does it have a threshold of significance for this equipment. There does not appear to be any modeling of the impact to support the statement of less than significance. The District believes that absent a threshold or modeling, this finding is not based in fact.

R7-15

If you have questions, please contact me at 874-4885 or jborkenhagen@airquality.org.

Sincerely,

Jeane Borkenhagen

Jeane Borkenhagen
Associate Planner

cc Larry Robinson SMAQMD
Scot Mende City of Sacramento

Enc: SMAQMD generated fee calculation spreadsheet for Greenbriar, assuming URBEMIS modeling outputs included in RDEIR

Construction Emissons Mitigation Fee Calculation

PART 1: PROJECT INFORMATION

Project Name:	Greenbriar		
Control/Application #:	SAC200400304 SMAQMD		
Single Family Dwelling Units:	2886	*Note: Enter information only in blue bordered cells*	
Multi Family Dwelling Units:	587000	Total Residential Acreage:	256
Non-residential Square Feet:	410400	Total Non-residential Acreage:	321

PART 2: EMISSIONS INFORMATION

Year	Activity Phase	NOx (lbs/day) unmitigated	NOx (lbs/day) mitigated*	NOx over threshold (lbs/day)	duration (days)	Total significant NOx (lbs)
	Demolition (on road)					
	Demolition (off road)		0.00			
	TOTAL Demolition	0.00	0.00	0		0.00
	Grading	638.70	510.96	425.96	145	61764.20
	Building Construction 2007 North	265.66	212.53	127.53	154	19639.31
	Building Construction 2008 N	253.78	203.02	118.02	264	31158.34
	Building Construction 2009 N	241.54	193.23	108.23	264	28573.25
	Building Construction 2010 N	229.64	183.71	98.71	110	10858.32
	Asphalt 2010 N	128.19	102.55	17.55	40	695.06
	Building Construction 2009 S	210.88		168.70	154	25980.42
	Building Construction 2010 S	200.21		160.17	264	42284.35
	Building Construction 2011 S	200.21	160.17	75.17	264	19844.35
	Building Construction 2012 S	200.21	160.17	75.17	110	8268.48
	Asphalt 2012 S	96.75	77.40	0	40	0.00
	Total project Nox over threshold (lbs)		*249066.08*	lbs		
	Total project Nox over threshold (tons)		*124.53*	tons		

PART 3: MITIGATION FEE RESULTS

TOTAL MITIGATION FEE ($14,300/TON)	***$1,780,822***					
>>>	*Fee is to be paid to the SMAQMD, either in total or on a by acre basis, prior to any ground disturbance.*					
		Mitigation Fee ($/acre)		**$3,086.35**		

* Assumes a construction mitigation plan which achieves a 20% reduction in NOx from on-site, off-road equipment.

** Or the $/ton of NOx cost-effectiveness value in effect at the time the fee is collected.

LETTER R7

Sacramento Metropolitan Air Quality Management District
Jeane Borkenhagen, Associate Planner
December 29, 2006

R7-1 Please refer to response to comments 23-2 and 23-3.

R7-2 The initial preparation of the site would include the grading of approximately 577 acres. This amount is based on the total project site of 577 acres which includes the approximate 31 acres (Refer to Lots V, W, and X in Exhibit 3-4) which would provide a buffer for the protection of giant garter snake habitat. As stated in the project description, this area is proposed to be preserved as natural habitat (Refer to Page 3-6 of the DEIR). Also, refer to Page 6.12-26 under 1.a. for further discussion of this buffer area. Though this area would be preserved as natural habitat, portions of the approximate 31 acres would likely be disturbed due to habitat preparation activities. Thus, grading-related emissions and associated fee for the initial site preparation in the RDEIR were based on the disturbance of 577 acres.

With respect to phase 1 of building construction (area north of Meister Way), the amount of building and paving equipment should be based on an actively disturbed area of 72 acres which would call for 7.2 * 3 or 21.6 pieces of "other" equipment to be input into the URBEMIS model. The actively disturbed area of 72 acres is based on 25% of the total area of the project site north of Meister Way (i.e., approximately 303 acres) minus the approximate 15 acres (refer to Lots V and W) which would be set aside for natural habitat. No building construction or paving would occur on this 15-acre area and thus no associated equipment should be included in the URBEMIS modeling. The previous modeling in the RDEIR indicated 15 pieces of "other" equipment. This was updated to reflect 21.6 pieces of equipment, as shown below in revised text and Table 6.3-3 (refer to Appendix G of this document for revised modeling output files). The previous modeling in the RDEIR also indicated 9 pavers and 9 rollers. Similarly, the modeling was also updated to reflect 7.2 pavers and 7.2 rollers.

With respect to phase 2 of building construction (area south of Meister Way), the amount of building and paving equipment should be based on an actively disturbed area of 65 acres which would call for 6.5 * 3 or 19.5 pieces of "other" equipment to be input into the URBEMIS model. The actively disturbed area of 65 acres is based on 25% of the total area of the project site south of Meister Way (i.e., approximately 274 acres) minus the approximate 16 acres (refer to Lot X) which would be set aside for natural habitat. No building construction or paving would occur on this area and thus no associated equipment should be included in the URBEMIS modeling. The previous modeling in the RDEIR indicated 14 pieces of "other equipment". This was updated to reflect 19.5 pieces of equipment, as shown below in the revised text and Table 6.3-3 (Refer to Appendix G for revised modeling output files). The previous modeling also indicated 7 pavers and 7 rollers. Similarly, the modeling was also updated to reflect 6.5 pavers and 6.5 rollers.

Although the changes result in higher construction emissions, the relative difference compared to the totals reported in the DEIR is minor. The changes would not result in any new significant impacts, or in any substantially more severe environmental effects, as shown below. These changes are presented below and in Chapter 7, "Revisions to the DEIR, RDEIR, and Second RDEIR."

Page 6.2-16, 3rd paragraph, is hereby revised as follows:

" 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~~423.7 lb/day and ~~297.0~~374.1 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 the SMAQMD's significance threshold of 85 lb/day. In addition, because Sacramento County is currently designated as a nonattainment area for ozone and PM_{10}, construction-generated emissions could further contribute to pollutant concentrations that exceed the CAAQS."

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~~61.7	~~330.9~~396.7
Employee Trips	21.2	27.0
Architectural Coating [3]	-	-
Asphalt Off-Gas[4]	6.1	-
Total Unmitigated (Phase 1)	~~79.3~~89.0	~~357.94~~423.7
Total Mitigated (Phase 1)[2]	~~76.7~~85.9	~~291.7~~344.4
Building Construction Phase 2-Soutb of Meister Way (Beginning 2009)		
Diesel Mobile Equipment Exhaust[1]	~~43.8~~55.6	~~279.2~~356.3
Employee Trips	14.5	17.8
Architectural Coating [3]	-	-
Asphalt Off-Gas[4]	4.5	-
Total Unmitigated (Phase 2)	~~62.8~~74.6	~~297.0~~374.1
Total Mitigated (Phase 2)[2]	~~60.6~~71.8	~~241.2~~302.8
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

R7-3 Fractions of construction equipment are identified only as part of the URBEMIS output model in Appendix D of the DEIR. The written analysis provided in DEIR (see Impact 6.2-1) does not identify fractions of construction equipment and, therefore, would not provide the possibility for confusing the reader. No further response is necessary.

R7-4 The fee calculation spreadsheet was updated to reflect the changes to the modeling discussed above in R7-2 and to account for overlap during 2009 and 2010 by only subtracting SMAQMD's threshold once during those periods. In addition, the duration values in the fee calculation spreadsheet were also updated to reflect those suggested by SMAQMD. With the aforementioned changes, the new fee would be $2,587,955 ($4,485.19/acre). Refer to Appendix G of this document for revised fee calculation spreadsheet.

R7-5 Please refer to response to comment R7-4.

R7-6 Mitigation measure 6.2-1 c. (Page 6.2-20 for RDEIR) was revised as shown below to reflect the new fee amount and SMAQMD's suggested changes to the mitigation language.

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

c. The applicant shall pay ~~$1,525,537~~ 2,587,955 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 the fee listed here ~~daily NO_x emissions~~ is based on the current cost of $14,300 to reduce a ton of NO_x. However, the then current cost of reducing NOx should be used at the time of the payment of the fee. ~~The determination of the final mitigation fee shall be conducted in coordination with SMAQMD.~~ The fee shall be paid to SMAQMD prior to the issuance of any grading permit for any portion of the project. The fee can be paid on an acre bases ~~($5,959.13 $2,634.91/acre~~[2] $4,485.19) as development occurs and grading permits sought. (See Appendix D of the DEIR for calculation worksheet)."

R7-7 The District commented on this issue when the DEIR was released (please refer to response to comment 23-6), and the information did not change in the RDEIR. Mitigation measure 6.2-2 (Page 6.2-22 of the RDEIR) was revised as shown below to concur with those measures contained in the SMAQMD-approved Greenbriar Air Quality Mitigation Plan (AQAP). This change is also presented in Chapter 7, "Revisions to the DEIR, RDEIR, and Second RDEIR."

Page 6.2-21, Mitigation Measure 6.2-2, is hereby revised as follows:

"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 (AQAP) ~~(Appendix E)~~ to reduce operational emissions by a minimum of 15% shall be submitted to SMAQMD for approval. The following mitigation is included in the SMAQMD-approved AQAP for this project (Appendix E) ~~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~~a. 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~~b. 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~~c. ~~High density r~~Residential~~, mixed, or retail/commercial~~ uses ~~s~~hall be within 1/4 mile of planned transit. ~~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~~d. Neighborhoods shall serve as focal point~~s with parks, school and civic uses within 1/4 mile (residential, mixed).~~

~~k~~e. Separate, safe, and convenient bicycle and pedestrian paths shall connect residential, commercial, and office uses ~~(residential, commercial, mixed)~~.

~~l~~f. 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~~g. 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~~h. Average residential density shall be seven dwelling units per acre or greater (residential).

~~r~~i. 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)~~.

j. A display case/kiosk displaying transportation information shall be provided.

k. Minimum amount of parking shall be provided.

l. Parking lot shade shall be increased by 10%.

m. The project shall become a permanent member of a Transportation Management Association (TMA).

n. The project shall provide a transportation coordinator.

o. The project shall contract with landscapers complying with ARB standards.

The changes would not result in any new significant impacts, or in any substantially more severe environmental effects.

R7-8 The City acknowledges that modeling of mobile source emissions presents challenges that are different from those associated with stationary source emissions. However, models do exist, even if they require modification to fit the analysis needs, and were used for the DEIR and RDEIR analyses. The primary differences between stationary source and mobile source emissions are:

1. Stationary sources generally produce a stable quantity and quality of emissions over the life of the project. There may be improvements in emissions control technology during the life of the stationary source, but these improvements generally do not need to be installed unless there is a change to the source operations, under certain rules. On the other hand, emissions control technology for mobile sources such as automobiles and trucks--changes relatively frequently, and as these vehicles age and are replaced with new vehicles, emissions improve. This is primary reason why air quality in California has improved dramatically over the past few decades, in spite of a large increase in vehicles and vehicle miles traveled in the State. Thus, an accurate model for stationary sources assumes the source would generally produce the same quantity and quality of emissions over time, while an accurate model for mobile sources would need to consider changes in the quantity and quality of emissions, as the number of vehicles on the road increase while at the same time emissions controls are improved. The URBEMIS and EMFAC models, for mobile sources, for that reason, include improved pollutant reduction in emissions over time, and these assumptions are well accepted by air districts throughout California. This same assumption applies to consideration of controllable toxic air contaminants.

2. Unlike stationary sources, which generally emit from one source point, mobile sources by their very nature emit pollutants along a linear path. This makes modeling of these pollutants more complex.

With respect to stationary source versus mobile source risk levels, because the source of the risk would not be material to the receptor, it is reasonable to apply the risk level associated with significant impacts from stationary sources (incremental cancer risk of 10 or more in a million) to exposure from mobile source emissions.

R7-9 It is acknowledged that the California Air Resources Board handbook provides blanket recommendations that residences should not be located within 500 feet of a freeway, but provides no thresholds of significance. This is reported in the DEIR and the RDEIR (please refer to response to comment 23-7).

Regarding the referenced Protocol, this was used in the RDEIR and its results were reported on page 6.2-27. No assertions are made in the RDEIR correlating the results of the Protocol to acceptable cancer risk. For one, the Protocol is based on general data, and is not site-specific to the conditions at Greenbriar. Second, the Protocol does not make reference to acceptable risk, tied to the Protocol results. Consequently, the EIR did not come to any conclusions relating to the Protocol results and impact significance.

R7-10 The RDEIR used the matrix tables in the Protocol to arrive at the reported relative risk results. As described on page 6.2-27 of the RDEIR, based on the location of residents closest to the freeways and the 2025 projected traffic volumes (Table 6.1-40 of the DEIR), the Protocol shows an incremental cancer risk of 90 to 135 per one million at those residences closest to Interstate 5, and between 24 and 45 per one million at those residences closest to SR70/99.

The specific data used to derive these conclusions for I-5 were the peak hour traffic on I-5 east of Power Line Road, 9,984 trips in 2025 at a distance of 300 feet from the roadway (nearest sensitive receptor). The Protocol matrix (Table 1 of the Protocol, which shows risk for sites north or south of a freeway) shows a cancer risk of 90 per million people at 300 feet and 8,000 peak hour trips, and 135 per million with 12,000 trips for sites located north of a roadway (location of Greenbriar relative to I-5 at this location). Because the 9,984 peak hour trips are between the trip data shown in the table, the range of relative risk was reported in the EIR. For SR70/99, peak hour trips in 2025 would be projected to be 6,369. Comparing this projection to Table 2 in the Protocol (the table used to determine risk east or west of a freeway), the risk for residences within 300 feet of the roadway ranges from 24 (correlated to 4,000 peak hour trips) to 45 (at 8,000 peak hour trips). Again, this range of risk is reported in the RDEIR.

A site-specific health risk assessment (HRA) was included in the DEIR and the RDEIR, in spite of the Protocol not requiring one, because it had been prepared prior to the District's publication of the Protocol. The HRA included in the EIR is based on the site-specific conditions at Greenbriar, and this provides a more accurate assessment of relative risk than the more generic Protocol, which is regional in nature, but not site-specific. Because an HRA had been prepared, it was appropriate to report on its results for Greenbriar.

R7-11 Please refer to response to comment R7-12, which details why the conclusion of less than significant is supported by the data.

R7-12 The commenter is correct in the observation that the data in Table 3 of the HRA could be confusing; this is why the data are summarized in the DEIR and the RDEIR. As required by Section 15140 of the State CEQA Guidelines:

> EIRs shall be written in plain language and may use appropriate graphics so that decision-makers and the public can rapidly understand the documents.

This mandate necessarily requires that complex technical information is translated into discussions that are understandable to the lay public.

Based on the site-specific HRA, the RDEIR reports a total risk of 29 in one million over 70 years of exposure. This is based on exposure to current *and future* emissions levels; please refer to response to comment R7-8. The EIR also reports that, with expected improvements in air pollution controls, background risk (average risk of exposure in the Sacramento area) is expected be reduced from the current 143 in one million to between 21 and 36 in one million. The project exposure, over a 70-year period, would be substantially less than current background levels in the region, and would be slightly more or slightly less than future background levels. However, the project's *increment of risk*, is not 10 more than the most improved background condition of 21 in one million (29-21=8), and is less than current background and the high range of future background cancer risk. This is why the RDEIR concluded that the relative cancer risk was less than significant. CEQA requires that impacts are based on a comparison between current conditions and those conditions in place with the project. In the case of the analysis contained in the EIR, it looked at both existing *and* future background conditions, and compared the project to both.

As to the data about further risk reduction because people do not tend to live in their homes for 70 years, and the average residence time is much lower, this data is presented as further information to consider in evaluation the project. However, this data was not used to derive the impact conclusions. The conclusions were based on a comparison of the risk over a 70-year period of exposure to current background risk, as well as a comparison future (substantially improved as emissions controls are improved) risk. The data were then compared to determine if risk would increase by 10 in one million, which it would not.

In summary, the Protocol was used, as requested by the District, and a site-specific HRA was discussed in the analysis because it had been prepared and reflected a more accurate projection of onsite conditions. The cancer risk to residents closest to the freeway is estimated at 29 in one million people from exposure to TAC, and this is an increment of approximately 8 in one million more than improved future background levels, and less than current background conditions (i.e., less than the cancer rate if background conditions did not improve over time). This impact would be less than significant.

R7-13 The applicant will be planting trees for landscaping, and a noise barrier between the freeway and onsite residences is proposed (Mitigation Measure 6.3-4). These measures would accomplish the suggestions of the commenter. Thus, even if there ultimately is a disagreement between the District and the EIR, please note:

1. The District has no thresholds of significance for exposure to mobile source TACs. Under the District's approach, risk levels are reported, but no significance conclusions are drawn. The EIR reports the level of risk using District protocol, as well as using a more precise, site-specific HRA. The EIR does include thresholds of significance as a basis for determining if the incremental risk of exposure at the site would be a significant impact under CEQA. Consequently, the EIR both provides the information requested by the District, as well as providing CEQA significance conclusions that are based on commonly accepted risk metrics.

2. As Stated in Section 15151 of the State CEQA Guidelines: "Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts." By including the District's protocol and a site-specific analysis, as well as the discussion about why the EIR methodology was selected, the EIR meets the requirements of Section 15151.

3. Most importantly, although the District does not have significance thresholds for TAC exposure, it recommends measures to reduce the risk of exposure to TACs. The proposed project has adopted these measures in the project design and in mitigation of noise impacts, so the same end result would occur, despite there being a potential disagreement among experts regarding the avenue to get to this common result.

Please also refer to Master Response 3.

R7-14 Please refer to responses to comments R7-10 through R7-12.

R7-15 During construction, TAC-producing vehicles move throughout construction areas and operate for a relatively short period of time. Vehicles may, for short periods of time (e.g., a few days to a month at a time), operate next to residences, but these activities would be sporadic and not persistent. Given that the vehicles would not operate in consistent patterns (unlike roadways, construction vehicles would not be confined to a linear corridor wherein they would produce TAC in one location and over a long period), modeling is both difficult and unlikely to be accurate. Further, there are no unusually long construction activities foreseeable at the site that would result in persistent exposure to TAC. Given the short-term nature of construction and the mobility of construction vehicles, exposure to construction TAC would not be substantive. Thus, this impact was concluded to be less than significant. No information has been provided that would suggest a different conclusion.

Sacramento Area Bicycle Advocates
SABA
Making Sacramento a cycling capital

909 12th Street Ste 114 Sacramento, CA 95814 (916) 444-6600 www.sacbike.org

R6

December 27, 2006

Tom Buford, Senior Planner
City of Sacramento, Development Services Dept.
Environmental Planning Services
North Permit Center
2101 Arena Boulevard, Second Floor
Sacramento, CA 95834

Re: Greenbriar Recirculated Draft EIR

Dear Mr. Buford:

The Sacramento Area Bicycle Advocates (SABA) offers the following general comments and comments on the alternatives to the proposed project:

As noted in the DEIR, the SACOG Blueprint Principles include providing transportation choices. The city of Sacramento has adopted smart growth principles and has a goal of being the most livable city in the country as well as the walking capital. While the project description asserts that the project is pedestrian-friendly, there are many ways the project is not well-designed for bicyclists and pedestrians and can be improved. R8-1

Several place in the DEIR, for example on page 3-11, bicycle and pedestrian trails "throughout ... community" are mentioned, yet these paths are not clearly shown on the maps and thus are not possible to evaluate.

The proposed street system has poor internal and external connectivity.

Internal connections

The proposed water features in the project create barriers to direct and convenient pedestrian and bicycle trips. By doing so, they discourage walking and cycling and encourage automobile use. R8-2

The project does not fully employ the traditional grid pattern of streets. The DEIR claims the project has a grid pattern of streets, but it is not a true grid. There very limited connection of the grid to main streets. For example, as the DEIR notes on page 3-12, there are only four access points to Elkhorn Boulevard. The northern portion of the project has 8 access points to Meister Way and the southern portion of the project only three access points to Meister Way. R8-3

The grid need to be fully connected to optimize connections between origins and destinations. A fully connected grid offers cyclists and pedestrians a wide choice of routes and shorter, more direct trips.

Streets should be designed considering the Complete Streets Best Practices document produced by the Sacramento Transportation and Air Quality Collaborative. The document is available on the Sacramento Transportation Authority Web site. Pertinent recommendations in the best practices document include a grid street pattern and having streets with short block lengths. R8-4

External connections

The site is approximately a mile square. The project site is hemmed in by Hwy 99, I-5 and the Lone Tree Canal making external connections difficult. The external connections proposed to overcome these barriers are extremely limited. There is no connection at all to south. There is only the Meister Road overcrossing to the east. The Elkhorn Boulevard interchange with Hwy 99 makes its use by pedestrians and cyclists problematic. There is only the Meister Road connection to the west. There are only four access points to Elkhorn Boulevard. R8-5

Carbon dioxide and other greenhouse gas emissions are not covered in the DEIR. The California legislative record and Assembly Bill 32, signed into law by the governor, indicate that global warming is a significant environmental problem for the world and for California in particular. This environmental impact needs to be addressed. R8-6

Additional mitigations

Even with the proposed mitigations in the DEIR, significant and unavoidable air quality impacts, as well as transportation and circulation impacts, remain. We recommend adopting the following additional bicycle- and pedestrian-related mitigations. These additional recommended mitigations would reduce all criteria emissions plus carbon dioxide emissions. The mitigations also would reduce all motor vehicle trips generated by access and egress from the project site, R8-7

which include trips contributing to the conditions considered environmentally significant and unavoidable.

There needs to be convenient access to the connectors and arterials surrounding the project as well as to the street system within the project. Additional access points should be included in the project. Streets that are bicycle- and pedestrian-friendly need not only to be safe and attractive for cyclists, they need to be convenient—to enable pedestrians and cyclists to get to destinations without out-of-direction travel. R8-7 Cont'd

Mitigation 6.1-9 addresses dedication of a buffer along the west south and east project edges that would include space for a 10 foot off-street bikeway. It should be clear that 10 foot wide bike trail may require additional width for a shoulder and clearance from fixed objects. R8-8

The project applicant should not only dedicate land for trails in the buffer areas, it should construct the trails. Trails should be constructed in consultation with the city of Sacramento and according to Caltrans Highway Design Manual, Chapter 1000 standards. R8-9

Additional crossings of the Long Tree Canal and Hwy 99 should be provided. One or more crossings of I-5 should be provided. The crossing or crossings could be bike/ped only or a non-interchange vehicle crossing with space for cyclists and pedestrians. R8-10

A financial contribution to a separate light rail crossing of Hwy 99 should be made or provisions for light rail in the Meister Way overcrossing should be included in the design and construction. R8-11

A financial contribution should be made to the light rail crossing of the American River. R8-12

The Meister Way and other barrier crossings should be built with the first project phase. R8-13

Construct trails in the open space/buffer areas in the Hwy 99 and I-5 corridors with convenient and frequent access to the project's internal road and trail system. These trails should be connected to any overcrossings of the freeways. While proximity to the freeways could be an health concern related to air quality, the freeways do provide corridors for trails. R8-14

Schools, parks, transit stops and retail should all be easily accessible by bike. If it is possible to add off-street bicycle and pedestrian short R8-15

cuts to and between such sites, such short cuts should be included in plans.

R8-15
Cont'd

Yours truly,

Walt Seifert
Executive Director

Cc: Ed Cox, City of Sacramento Alternate Modes Coordinator

LETTER R8

Sacramento Area Bicycle Advocates
December 27, 2006

R8-1 The Draft Greenbriar PUD Guidelines fully incorporate the "Smart Growth" Principles. Section 1.3 of the Draft PUD Guidelines addresses the SAGOG Blueprint principles in detail. Consistent with Blueprint principles, the Greenbriar PUD would provide a varied network of both on- and off-street pedestrian pathways and trails, allowing for safe and convenient non-vehicular travel throughout and within the PUD. The street and trail system within the PUD would allow for varied opportunities for safe and convenient non-vehicular travel throughout the plan area. All arterial and collector streets would have striped Class II bike lanes. Nearly all sidewalks within the PUD's streets would be detached from the street edge and separated from the street by a landscape planter of varying width depending upon the street facility. These pedestrian-friendly streets would provide a safe, walkable route to everywhere in the PUD area under a dense canopy of shade trees.

The comment states that the bicycle and pedestrian trails are not clearly shown on the DEIR's maps and thus are not possible to evaluate. The bicycle and pedestrian trail system is shown on the face of the tentative map on the Street and Trail cross sections.

R8-2 The comment states that the proposed water features would discourage walking and cycling and encourage automobile use. As described in the DEIR, approximately 3.9 acres of pedestrian trails would be provided around the lake/detention basin. (DEIR page 3-12) While on-street direct access may be interrupted by the lake in some circumstances, the lake feature and its associated Lakewalk promenade would offer off-street trail connections that are a signature feature of the land plan that have both community-wide and regional benefit.

In addition, Mitigation Measure 6.2-2 requires separate, safe, and convenient bicycle and pedestrian paths to connect residential, commercial and office uses. It also requires the project to 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. In addition, that mitigation measure requires the entire project to be located within ½ mile of a Class I or Class II bike land and provide a comparable bikeway connection to that existing facility (residential, commercial, mixed.) For further discussion of bicycle connectivity, please refer to responses to comments 32-21 and R8-3.

In addition, the Draft Greenbriar PUD Schematic Plan provides many varied recreation opportunities in the location of both publicly- and privately-owned active and passive parks and open spaces. One large community park, three neighborhood parks, three private parks, two private recreation centers, numerous pocket parks, pedestrian paseos and marina parks (ranging in size), and an elementary school are located within the PUD. These amenities are linked by residential streets and trails. Additionally, the PUD includes a large lake with a pedestrian-friendly lake-walk or promenade around its perimeter , and a wide freeway buffer/open space corridor (along the south and east project boundaries) enhanced with pedestrian trails and landscaping.

R8-3 The Greenbriar land use plan provides for internal connectivity within the plan area and utilizes a hierarchy of streets to maximize circulation opportunities and link neighborhoods. In the northern half of the project a traditional grid system is used. In the southern half of the project, a modified grid system is employed due to the shape, design, and function of the lake (which is a significant drainage control feature). The plan provides multiple residential street connections to primary residential streets and to arterial streets throughout the plan area. The street plan employs only a few, very short cul-de-sacs for individual residential lot access where limited access opportunities exist.

Connection from Meister Way to the south is limited due to the location of the DNA light rail line corridor and appropriate public safety limits by Sacramento Regional Transit for safe corridor crossings and efficient train operating procedures.

R8-4 The land plan incorporates Sacramento Transportation & Air Quality Collaborative's "Best Practices for Complete Streets" (http://wwwsactaqc.org/Resources/Agreements/CompleteStreets.pdf) by utilizing a 'grid' pattern to the extent feasible (please refer to response to comment R8-3) and employing short block lengths of less than 600 feet throughout the plan area to the extent feasible.

R8-5 The comment points out the geographic constraints associated with a site that is located adjacent to two major freeways and includes extensive biological habitat mitigation, and is acknowledged.

The project would provide three external connections to the north to Elkhorn Boulevard (excluding off-site Lone Tree Boulevard) and would be limited by Sacramento Public Works standards to these connection points due to space constraints between Lone Tree Road and the freeway interchange. The project would provide one connection to the east and would be limited to one connection due to Caltrans requirements. The project would provide two connections to the west through the Wildlife/Habitat Buffer, but would be limited by biological mitigation needs for the preservation of sensitive species (giant garter snakes) and mobility of the species. The project does not provide any connectivity to the south over the Interstate 5 corridor due to constraints with Caltrans and lack of regional funding options.

R8-6 AB 32 was signed into law following preparation of the DEIR, and was consequently not included in the DEIR. Please refer to response to comment 29-93 for an extensive discussion of greenhouse gases, AB 32, and the project's relationship to global climate change effects.

R8-7 The commenter requests additional bicycle and pedestrian connectivity. The adequacy of the project's bicycle and pedestrian path and trail connectivity is addressed in responses to comments R8-2 through R8-5 above. Because the commenter's concern is only general in nature, no further response is required.

R8-8 The space for a trail section included within the buffer along the south, west and east boundaries of the project site would be developed to City of Sacramento standards for bikeways with a 10-foot paved bike trail with 2-foot shoulders on each side totaling 14-feet. The buffer would be dedicated to the City of Sacramento.

R8-9 The buffer trail section would be constructed to City of Sacramento standards. As described in the DEIR, prior to recordation of the first map, the applicant will coordinate with the City of Sacramento Development Engineering and Finance Division to identify the necessary on- and off-site pedestrian and bicycle facilities to serve the proposed development, which shall be incorporated into the project. These facilities include, among other things, sidewalks, stop signs, in-pavement lighted crosswalks, lane striping to provide a bicycle lane, and other such

features associated with bike and pedestrian trails. (DEIR p. 6.1-83.) At the time the City and the applicant determine which specific improvements would be required, the City and the applicant would determine the most appropriate manner in which to fund and construct the improvements.

R8-10 Please refer to response to comment R8-5.

R8-11 Please refer to response to comment R8-5 regarding the adequacy of the project's external connectivity. Inclusion of a light rail crossing in the Meister Way vehicular crossing cannot be accomplished due to different structural loading characteristics of the two types of crossings. Further, there is no current shared funding in North Natomas for the SR 70/99 LRT crossing the commenter proposes. The light rail crossing of SR 70/99 will be funded by Regional Transit. Regional Transit supports the project and the mitigation measures currently incorporated into the project. (Please refer to comment letter 26 and response to comment 8-2) Regional Transit has not requested a financial contribution to the Highway 70/99 crossing and the commenter has not shown that there is any nexus between project-related impacts and a requirement to contribute to funding the Highway 70/99 crossing.

R8-12 The light rail crossing of the American River will be funded by Regional Transit. The North Natomas Community Plan (NNCP) requires the collection of development fees and the finance plan prepared for the NNCP allocates funds toward the development of the DNA facilities. A portion of these funds would be used to fund the American River LRT Crossing. Regional Transit supports the project and the mitigation measures currently incorporated into the project. (Please refer to comment letter 26 and response to comment 8-2.) Regional Transit has not requested a financial contribution to the American River Crossing. Further, there is not a meaningful nexus between project-related impacts and a requirement to contribute to funding the American River Crossing.

R8-13 The Meister Way Crossing and other crossings would be constructed consistent with warrants as established in the traffic study and as determined by the City of Sacramento.

R8-14 Please refer to response to comment R8-5 regarding internal connectivity.

R8-15 The project's neighborhood and street design is carefully planned with convenient and frequent connections to the site's trail features. Additionally, schools, parks and retail uses would be easily and conveniently accessible by walking and biking. Bicycle and pedestrian path and trail connectivity is further addressed in responses to comments R8-2 through R8-5.

James P. Pachl
Attorney at Law
717 K Street, Suite 534
Sacramento, California, 95814
Tel: (916) 446-3978
Fax: (916) 447-8689 jpachl@sbcglobal.net

R9

January 2, 2007

Tom Buford, Senior Planner
City of Sacramento, Development Services Dept
901 I Street
Sacramento, CA 95814

Peter Brundage, Executive Director
Sacramento LAFCo
1112 I Street, Suite 100
Sacramento, CA 95814

Comments of Sierra Club - Mother Lode Chapter, Environmental Council of Sacramento, Sacramento Audubon Society, and Friends of the Swainson's Hawk, on the Draft Recirculated Environmental Impact Report, Greenbriar Project, November 2006

Dear Messrs. Buford and Brundage,

The following comments, including attached Exhibits, are submitted on behalf of Mother Lode Chapter, Environmental Council of Sacramento, Sacramento Audubon Society, and Friends of the Swainson's Hawk regarding the RDEIR for Greenbriar. We also incorporate herein by reference our previous comments on the original Greenbriar DEIR and all of the comments of other individuals and organizations regarding the DEIR and RDEIR, and will rely on these comments as well as our own. Our organizations continue to oppose the proposed SOI expansion, annexation, general plan amendment, rezone, and related land use approvals. R9-1

Included also are comments on the original DEIR's analysis of the project's impacts on agriculture and consistency with LAFCo policies on agriculture.

A. FLOOD HAZARD FROM POTENTIAL LEVEE FAILURE ON SACRAMENTO AND AMERICAN RIVERS, AND NATOMAS CROSS-CANAL

1. The RDEIR Fails to Disclose the Full Extent or Seriousness of the Risk of Catastrophic Deep Flooding of the Project Site R9-2

Please refer to our previous comments on the DEIR.

Lester Snow, Director of the California Department of Water Resources, by letter addressed to Sacramento Mayor Heather Fargo, dated November 21, 2006, **(EXHIBIT ONE)** stated that the Natomas levee system does not meet minimum federal flood insurance program standards for 100-year flood protection, that "the area is at **high risk**" and that DWR was working with FEMA to have the Basin remapped into an AR or A99 Special Flood Hazard Zone. Director Snow further stated: "In the meantime it is imperative that additional measures be taken to reduce the threat to public safety and property" and that "with less than 100-year flood protection, the chance of homes flooding over the next ten years is approximately 10 percent." He recommended a number of measures which City of Sacramento should undertake "to protect the public against this higher risk," which included a "limitation on new construction until minimum flood protection is achieved." (*Id,* p. 2) R9-3

The SAFCA Executive Director's report to the SAFCA Board ,dated February 16, 2006, titled "Information - Natomas Levee Evaluation Study", **(EXHIBIT TWO)** stated that less than 100-year flood protection was "**high risk**", and that greater than 100-year but less than 200 year protection was "moderate risk." (p. 1); that a study by URS in 2002 concluded that most of the levees would need "substantial additional work . . .to reach a high level of flood protection" (p. 2), and that the 2005, URS report for the Corps determined that at some locations, there was potential for subsurface permeability "that could threaten the stability of the affected levees ..." (p. 3)

Do City and LAFCo agree with the statements by the Director of DWR, *supra,* that Natomas is at high risk of flooding from the Sacramento or American Rivers due to having less than 100-year flood protection? (see **EXHIBIT ONE** p. 1.) If not, please explain why not.

Do City and LAFCo agree with the statements by the Executive Director of SAFCA, *supra,* that less than 100-year flood protection is "high risk", and that greater than 100-year but less than 200 year protection was "moderate risk"? (See **EXHIBIT TWO,** p. 1) If not, please explain why not R9-4

What actions is City undertaking to comply with the request of the Director of the California Department of Water Resources (**EXHIBIT ONE** p. 2) to limit new construction in Natomas Basin until the levees are upgraded and re-certified by the Corps as providing adequate protection against the FEMA 100-year flood event?

Does the City intend to comply with the request of the California Department of Water Resources **(EXHIBIT ONE**, p. 2) to limit new construction in the Basin "until minimum flood protection is achieved"? R9-5

If the City does not intend to comply with the Director's request, please explain why.

Do the City or LAFCo contend that the Basin is not at high risk of flooding due to its present lack of 100-year flood protection? If so, please explain why City or LAFCo believe that the Basin is not at high risk of flooding. R9-6

It is increasing apparent that the City and AKT are fast-tracking the Greenbriar project for expedited approval, hoping for land use entitlements and start of construction before FEMA R9-7

issues new a Floodplain Insurance Rate Map ("FIRM") which recognizes that the Natomas Basin, including the Greenbriar project area, is a flood basin with less than 100-year flood protection. Such a designation by FEMA would require City to impose very strong restrictions on new development within the Natomas flood plain, including Greenbriar, as a condition of retaining the community's eligibility for FEMA Flood Insurance.

R9-7 Cont'd

The RDEIR p. 6.10-23, 7-23, mistakenly asserts that SAFCA will construct a new setback levee inland of the existing east levee of the Sacramento River. In fact, SAFCA has rejected that option from further consideration. See SAFCA's DEIR "Local Funding Mechanisms for Comprehensive Flood Control Improvements," November 2006.

R9-8

The RDEIR pp. 6.10-24 incorrectly states that SAFCA "is currently proceeding with necessary improvements to provide a 200-year level of flood protection". In fact, SAFCA has developed a plan for such flood protection, but lacks the funding to implement it.

R9-9

It would be more truthful for the RDEIR to disclose that SAFCA is now seeking funding to implement its plan but that there is presently no assurance that adequate funding will be provided, and no assurance that the estimated budget for achieving 100-year and 200-year levels of protection will be adequate.

R9-10

2. There Is No Substantial Evidence That Flood Protection at the 100-year FEMA Level Would Reduce The Potential For Flooding to Less Than Significant

The RDEIR pp. 7-21, 7-30, states that once levee improvements are made which provide a 100-year level of flood protection, exposure to the potential 100-year level flood event would be less than significant. Please explain why achieving a 100-year level of flood protection would reduce exposure to flooding to "less than significant".

R9-11

A 100-year level of flood protection means that there is a 1 percent chance of a 100-year level flood every year, which amounts to a 26% chance of a 100-year level flood during any 30-year period. Such a flood in Natomas Basin would be deep, with catastrophic damage to property and perhaps with large loss of life. BY COMPARISON, the odds of losing a round of Russian Roulette is one out of six, or 16-2/3%, which is considered unacceptably hazardous yet is substantially less than the 26% chance of deep flooding in the Basin during thirty years.

R9-12

Please explain why the authors of the DEIR believe that a 26% chance of such a flood event occurring during a 30 year period is "less than significant" exposure.

Please explain why the City believes that a 26% chance of such a flood event occurring during a 30 year period is "less than significant" exposure

R9-13

3. Development of the Greenbriar Site Would Violate "Sacramento General Plan Section 8, Health and Safety, Goal A, Policy One" (Flood Hazards)

Permitting development on the Greenbriar site prior to upgrade of the levees to 100-year level of flood protection (current FEMA and Corps standards) would be inconsistent with Sacramento City General Plan Section 8, Goal A, Policy One, Flood Hazards, which states:

R9-14

> "Prohibit development of areas subject to unreasonable risk of flooding unless measures can be implemented to eliminate or reduce the risk of flooding." (RDEIR 6.10-13)

Lester Snow, Director of DWR, in his letter dated November 21, 2006, **EXHIBIT ONE,** p. 2, first paragraph, states that "with less than 100-year flood protection, the chance of homes [in Natomas Basin] flooding over the next 10 years is approximately 10 percent," and that Natomas is at high risk of flooding from the Sacramento or American Rivers due to having less than 100-year flood protection. (**EXHIBIT ONE** p. 1.) The Executive Director of SAFCA, *supra,* has stated that less than 100-year flood protection is "high risk". (**EXHIBIT TWO,** p. 1)

R9-15

Does not the City believe that the expert opinions of the Directors of DWR and SAFCA, *supra,* are conclusive evidence that there is "unreasonable risk of flooding", which requires prohibition of development in the Basin under General Plan Section 8, Goal A, Policy One (Flood Hazards), *supra*?

R9-16

If not, please explain why City believes that there is not unreasonable risk of flooding which triggers the prohibition against development in the Basin pursuant to General Plan Section 8, Goal A, Policy One (Flood Hazards).

Isn't new development on the Greenbriar project site inconsistent with this General Plan policy?

If the authors of this EIR or City or LAFCO contend that urban development on the Greenbriar project site, prior to upgrading of the levees to 100-year level of flood protection as determined by current Corps standards, is consistent with General Plan Policy One, Flood Hazards, please explain why.

R9-17

4. Development of Greenbriar Would Violate the "North Natomas Community Plan Flood Control Policy Guiding Policy A"

Development on the Greenbriar site prior to upgrade of the levees to 100-year level of flood protection (current FEMA and Corps standards) would be inconsistent with the North Natomas Community Plan Flood Control Guiding Policy A, which states:

> "One hundred year flood protection must be obtained prior to any new residential development in the North Natomas Community."

R9-18

The DEIR, p. 4.11-12, states that "this level of flood protection has been previously obtained", which was once believed to be true. Per the documents and reports cited and discussed above and in our comments on the DEIR, it is now known that the Basin does not have 100-year flood protection, which is known to City.

City cannot rely upon the fact that FEMA's Flood Insurance Rate Map (FIRM) still shows the Basin as outside the 100-year flood plain. Per the documents cited above, the Basin clearly does not have 100-year flood protection. R9-18 Cont'd

5. The RDEIR Fails to Disclose That Flood Hazard for the Basin May Have Increased Since 1997 Due to Levee Improvements On the Feather and Yuba Rivers Upstream of Sacramento

The RDEIR correctly states that the Sacramento and American River levees protecting Natomas Basin withstood the high flows of the Sacramento and American Rivers during the storms of 1986 and 1997.

The RDEIR fails to disclose that during the 1986 and 1997 storm events, levee failures on the Feather and Yuba Rivers diverted huge volumes of water into the Middle American Basin east of the Feather River upstream from Sacramento between Yuba City and the Bear River, where the water was detained until the floods receded. Had the Feather and Yuba River levees held, this volume of water would have passed by Sacramento at the peak of the 1986 and 1997 flood. Whether the Sacramento River levee would have held if the Feather and Yuba River levees had not failed in 1986 and 1997 is unknown but a worrisome concern that now must be considered in any assessment of today's potential flood hazard to Natomas Basin. R9-19

During the past two years, those portions of the Feather and Yuba River levees which failed in 1986 and 1997, and other vulnerable portions of the Feather-Yuba-Bear River levees, have been upgraded. The upgraded levees on the Feather-Yuba-Bear River levees are much less likely to fail during future major storm events. The DEIR should re-examine its assessment of the likelihood of flooding in light of the fact that the area east of the Feather River upstream of Sacramento is now much less likely to provide a de facto "detention basin" by flooding, as it did in 1986 and 1997 during future major storm events.

B. ALTERNATIVES ANALYSIS: alleged benefit of the project not supported by evidence

The RDEIR's assessment of alternatives, and selection of preferred alternative, repeatedly states that a key objective of the project is to provide residential development to support a light rail line from downtown to the Airport. However, new information plus earlier information cited in our comments on the original DEIR provide overwhelming evidence that light rail from downtown to the Airport is financially infeasible even if Greenbriar is built. An alternatives analysis cannot rely upon speculation as a reason for selection of the preferred alternative. For that reason, a new analysis of the alternatives must be included in a Recirculated RDEIR which acknowledges that light rail to the Airport is not feasible. R9-20

1. No Evidence That Light Rail To The Airport ("LRT" or "DNA Line") Will Ever Be Built

RDEIR 8-1 asserts that "the basic objectives of the project" include "providing a light rail stop along the proposed [DNA] light rail line with densities that would support the feasibility of a light rail line." The RDEIR p. 8-6 says that "the project's objective" is "providing readily R9-21

accessible light rail opportunities on-site." The RDEIR p. 8-19 asserts that the "disperse development" alternative should be rejected because it "would not meet the key project objective of providing a development along the Downtown-Natomas-Airport light rail line."

As discussed in our previous comments on the original DEIR, there is absolutely no evidence that the Federal or State governments, or the region's taxpayers, will fund the very costly proposed DNA line. The RDEIR provides no evidence to demonstrate that the DNA line would even come close to meeting the Federal cost-benefit criteria even assuming the Greenbriar project. The RDEIR provides no evidence of any Federal interest in funding DNA. R9-21 Cont'd

The proposed DNA line would have 13 station stops between Downtown and the Airport, providing a slow ride to the Airport that would be unattractive to air travelers, particularly those concerned about arriving timely at the Airport. Express bus or super-shuttle service from downtown to the Airport would be much quicker and more reliable, and thus much more attractive to air travelers. R9-22

In December 2006, the General Manager of Regional Transit announced that Regional Transit will no longer qualify for federal transit money for rail expansions until it shows that it has enough of its own money to run all of its trains and routes. It is not known how RT will find the additional money, and leaders of RT are now considering means of expanding transit service that are less costly than light rail. See *Sacramento Bee*, "Finances Put Brakes on Light-Rail Work", December 15, 2006, attached **EXHIBIT THREE.** R9-23

The same Bee article also reported that the estimated cost of the DNA line would be $90,000,000 per mile, which computes to $1,170,000,000 for the entire 13-mile line. This is a dramatic increase above the previously projected cost of $650 million announced at the December 2005 meeting of the Regional Transit Board.

2. Without Light Rail, the Project is Inferior to the Alternatives and Should Be Rejected

The RDEIR repeatedly demonstrates that the alternatives (Off-Site within North Natomas Community Plan area, Dispersed Development, Reduce Size, and No Project) are environmentally superior to the proposed Greenbriar project. (See RDEIR 8-1 through 8-19, summarized at 8-19). There is sufficient vacant land within the NNCP area and elsewhere within the City to accommodate a project similar to Greenbriar.

The RDEIR rejects these alternatives because the landowner, AKT development, does not own sufficient vacant land within the City limits which is suitable for the project. (RDEIR p. 8-19). However, City is under absolutely no obligation to annex unincorporated land zoned agricultural (Greenbriar site) to accommodate a particular landowner. Indeed, City would be guilty of malfeasance if it annexed and authorized development primarily to accommodate the landowner, particularly where, as here, the project would have numerous adverse environmental impacts which could be avoided by instead authorizing a similar amount of similar development, as a single development or dispersed smaller projects, elsewhere within City. R9-24

There are 2000 acres designated for commercial and industrial in nearby MetroAirPark, all of which remains vacant and cannot be re-designated for residential use due to proximity to the Airport. There are large areas of vacant land within the existing NNCP. Much of that (alongside I-5) is presently designated for commercial uses which have not materialized. This land is likely to remain vacant for years unless there is a dramatic upswing in the demand for commercial land in Natomas Basin, which is unlikely, or unless City redesignates it for residential use, which is much more likely. R9-25

It is pointed out that a large population growth is projected for the City in the future. This projection is speculation. The City's population growth will largely be determined by decisions which City Council will make in the future regarding its footprint, infill, and density. R9-26

Why doesn't City exhaust all opportunities for infill development within its existing footprint before considering annexing vacant prime farmland for urban development?

Why does City feel that it should approve this project to accommodate this particular developer (AKT), despite all of the adverse environmental impacts of developing the site, while other suitable land within the City limits, already designated for urban development, remains vacant? Please explain. R9-27

C. IMPACTS ON AGRICULTURE: Analysis, Proposed Mitigation, and Inconsistency with LAFCo policies

The DEIR is inaccurate in characterizing the lands surrounding the project and their current and future agricultural uses.

The DEIR fails to fully describe the Metro Air Park site which is adjacent to the Greenbriar site to the west. It describes Metro Airpark as "these lands are in the process of being developed with commercial land uses consistent with the County's recently approved Metro Airpark Development." In fact, Metro Air Park has no expectations of development in the foreseeable future. It is entitled for development and some infrastructure has been constructed. However there are no development plans are underway due to lack of market. Metro Air Park cannot be redesignated for residential use because of its proximity to the Airport. Meanwhile, the Metro Air Park HCP requires that the land be used in agriculture until developed. The proposed Greenbriar project provides for only a narrow buffer on its west side to reduce any conflicts between urban development and adjacent agricultural activities on the Metro Air Park site, which could continue for decades. R9-28

Similarly, the RDEIR at 5-11 says that agricultural lands to the north will be developed under the Joint Vision Plan. This is inaccurate. The Joint Vision Plan does not designate lands to be developed but instead leaves that decision for future agreement considering that habitat, agriculture and open space must remain in the Sacramento County portion of the North Natomas Basin. The DEIR must assume that lands to the north may stay in agriculture in perpetuity. At least a 250-foot buffer in the northern portion of the project is needed to mitigate the impacts. Moreover, the impacts of conversion of Greenbriar on agricultural land loss might best be mitigated through permanent agricultural easements on lands to the immediate north. R9-29

The DEIR states that lands to the south are either urban land or planned to be urban land. In fact, the land to the south of the project (south of I-5), which is not in the City of Sacramento, is not entitled to develop and is used for agricultural purposes. Development of Greenbriar will put additional growth inducing pressure on these lands. There also can be conflicts between the agricultural uses on the lands south of I-5 and the residential uses at Greenbriar, but the DEIR is silent on these impacts. R9-30

The DEIR correctly assesses cumulative impacts on surrounding agricultural lands. However the concluding statement at DEIR 7-21 that "no additional feasible mitigation measures are available" to mitigate for impacts on nearby agricultural lands is clearly untrue. As discussed below under the heading "Biological Impacts", the project proponent, AKT, or entities controlled by AKT, owns much of this land (several tracts are listed elsewhere in this letter), and a permanent agricultural easement could be placed on the lands to protect them from future development pressures. Moreover, the easement could require organic production, thus eliminating potential conflicts with neighboring residential uses which could otherwise arise due to use of agricultural chemicals. R9-31

The City's NBHCP makes a commitment to permanent protection of the Swainson's Hawk zone. Agricultural lands in that zone and in close proximity are excellent candidates for agricultural easements. It is also appropriate that those landowners benefiting from development outside the NNCP permit area should be required to guarantee the permanent protection of lands not to be developed. R9-32

1. Inconsistency with LAFCo policies regarding preservation of agricultural land and open space

LAFCo is currently in the process of reviewing and updating its policies regarding agricultural and open space land preservation. The project's impact should be evaluated in terms of updated policies. The proposed Greenbriar project would be the first new development outside of the County Urban Services Boundary (USB) since 1993 and represents a significant change in the baseline conditions for which the present LAFCo policies were developed. Greenbriar would be precedent-setting for LAFCo and the cumulative impacts haven't been adequately analyzed for LAFCo. R9-33

The project is also inconsistent with the LAFCo policies as presented in the DEIR and RDEIR. LAFCo policy requires findings that all or a substantial portion of land proposed for annexation will be developed within five years of annexation. (DEIR p. 5-5). The Greenbriar project cannot be started, much less completed, within this 5-year window because of various constraints, chief of which is the flood hazard and imminent revision of FEMA's Flood Insurance Rate Map affecting the area. These constraints are described in this and our previous comment on the DEIR (9/5/06). The DEIR and RDEIR fails to offer any convincing evidence that "development of a substantial portion of the proposed project would occur within 5 years," or that construction of the proposed project can begin in the spring of 2007, as asserted. There is no reason to believe that FEMA will ignore its statutory obligation to revise its Flood Insurance Rate Map to show the Greenbriar site as being within the 100-year floodplain, which will trigger restrictions that would effectively prevent the project from proceeding until levee repairs are completed and the area re-mapped as being outside of the floodplain. Completion of repairs are R9-34

not expected until 2012 at earliest, assuming that there is sufficient and prompt funding and no substantial unforeseen engineering challenges. R9-34 Cont'd

The DEIR fails to identify or incorrectly interprets facts pertaining to consistency with LAFCo policy related to agricultural land conversion. The DEIR at 5-11 concludes that "insufficient vacant nonprime land exists within the City's SOI". . . "there is no known site that could accommodate a development similar to the Greenbriar project (in size) that is not already being pursued for development by other property owners.". . . "because of its logical connection to the North Natomas community, the project site is highly accessible."

In fact, the housing market has changed dramatically in 2006 and demand for the type of housing proposed for the project is no longer growing. No evidence is presented in the DEIR or RDEIR that housing need or demand justifies conversion of important farmland. The City of Sacramento has a 350 acre plus project underway called "Natomas Central" that has yet to be built and marketed. The Panhandle area in the SOI is seeking annexation to build a project of the size and type of the Greenbriar project. In contrast to the Panhandle, there is no direct physical connection between the North Natomas Community Plan and the Greenbriar project. Greenbriar is landlocked by two intersecting freeways and an undeveloped vacant 2000 acre industrial-commercial project to the west. The proposal to convert and urbanize this important farmland (most of which has been classified as prime agricultural land) is exceedingly premature and should not be considered until Metro Airpark is built out and all of the existing NNCP including the Panhandle are completed. In addition, the City of Sacramento has many acres of infill potential, including over 200 acres in the Railyards Project. These infill projects are more consistent with City policies and the Regional Blueprint and should precede new SOI/annexation for Greenbriar. R9-35

2. LAFCo's Authority

The RDEIR, p. 3-17, states that LAFCo will consider the merits of the project as it relates to issues of growth projections, buildout rate, municipal services, open space, and prime agricultural resources.

Does City contend that LAFCo lacks the authority to consider other issues and to base its approval or disapproval of an SOI or annexation on other issues, as flood hazard, unmitigated significant impacts on regional transportation and circulation, violation of the "Joint Vision" MOU, violation of the Natomas Basin HCP by failure to obtain Incidental Take Permits prior to prezoning, or failure of City to utilize opportunities for infill prior to considering this project. All of these are significant issues as to the Greenbriar proposal R9-36

3. Mitigation Measure for Impact of Conversion of Agricultural Land

The proposed Mitigation Measure 6.11-1 is inadequate and fails to meet the requirements of CEQA. For the conversion of 518 acres of important farmlands, the EIR proposes the mitigation measure shall be MM 6.6-2, which is a mitigation measure to offset loss of habitat and open space at .5 to 1. The DEIR p. 7-21 erroneously asserts, without basis, that no additional feasible mitigation measures are available. R9-37

The mitigation measure proposed double counts ("stacks") mitigation of agricultural land on top of land to be preserved for open space and habitat loss mitigation. It fails to achieve any guarantee of permanent agricultural uses and does not require agricultural easements on the preserved lands. R9-38

Other jurisdictions are mitigating farmland loss at a minimum of 1:1. Therefore the Mitigation Measure 6.11-1 should at minimum require 518 acres of important farmlands, including at least 329 acres of prime farmland, in the Sacramento County portion of North Natomas, be placed in permanent agricultural easement.

For example, the City of Lathrop recently entered into an agreement with a developer to mitigate for loss of agricultural land at 3:1 ratio. (`Win-Win Project' Preserves Farmland, Allows City Of Lathrop To Expand" at http://www.consrv.ca.gov/index/news/2006%20News%20Releases/NR2006-26_Lathrop_Easement_Exchange.htm). R9-39

There is no substantial evidence that preservation of habitat mitigation land under the NBHCP will also mitigate for loss of farmland. The farmland and endangered species habitat mitigation requirements have differing goals, which in some instances are incompatible. Mitigation for loss of agricultural land is intended to preserve commercial production agriculture. By contrast the Natomas Basin Conservancy is mandated to manage its land as "high quality habitat" for covered species, notably the threatened Giant Garter Snake and the Swainson's Hawk. Twenty-five percent of NBC land is required to be converted to managed marsh, a non-agricultural use, and another 25% managed for "high quality" upland habitat values, which, due to soil and agricultural market conditions, is nearly impossible to achieve in the Basin on land managed for production agriculture. R9-40

The DEIR does not address the incompatibility of NBHCP and stacking or the risk and consequences of failing to meet multiple mitigation objectives with the same land easement. There is substantial risk that the multiple mitigation objectives cannot be met in perpetuity. Given the legal status of the NBHCP as a state and federal permit, it is likely the objectives of the agricultural land mitigation measure would ultimately not be met if the mitigation requirements were stacked. Therefore stacking is not an adequate CEQA mitigation measure because there is no evidence that it is capable of full implementation.

4. Impacts on Agriculture.

The DEIR identifies three land classification systems used to determine agricultural significance. They do not identify alternative land classification systems that were not included in the analysis and why they were not included. Nor does the DEIR address the issue of the cumulative impacts of using the three land classification systems as used in this DEIR to assess agricultural impacts of continued development in the Natomas Basin and in southern Sacramento County. If the analysis and conclusions used in this EIR is replicated in the future EIR for "Joint Vision", what are the cumulative impacts on agriculture compared with alternative analytic techniques and conclusions. R9-41

The DEIR claims the Storie index of soils shows a specific distribution of soil types and it claims R9-42

to have calculated a LESA model score of 45.49. It interprets these data to show that the site consists of agricultural land that is not considered significant. The analysis and data used to reach this conclusion should be approved by the Department of Conservation, which was not done here. A recirculated RDEIR should include all scientific reports and calculations relied upon to reach the conclusion that the agricultural land is not considered significant, not just the final scores.

R9-42 Cont'd

D. BIOLOGICAL IMPACTS AND ENDANGERED SPECIES

Please refer to our previous comments on the original DEIR.

R9-43

City agreed, as a condition of approval of the 2003 NBHCP, that it would obtain an amendment to the 2003 NBHCP and Incidental Take Permits issued by the Federal and State wildlife agencies covering any new development outside the NBHCP Permit Area prior to City's approval of prezoning for such new development. Specifically, the 2003 NBHCP Implementation Agreement, p. 3, § 3.1.1(a), executed by the City states:

> "Thus, the CITY and SUTTER further agree in the event this future urban development should occur [outside the City's NBHCP Permit Area], **prior to approval of any related** rezoning or **prezoning,** such future urban development shall trigger a reevaluation of the Plan and Permits, a new effects analysis, potential amendments and/or revisions to the Plan and Permits, a separate conservation strategy and **issuance of Incidental Take Permits** to the permittee for that additional development ...."

R9-44

The DEIR acknowledges that a new or amended HCP and Incidental Take Permits, approved by DFG and USFWS, will be required for Greenbriar. However, neither the DEIR nor RDEIR acknowledge that such amended or new HCP and Incidental Take Permits must be approved by DFG or USFWS prior to prezoning. City's attorneys (Morrison and Foerster) have incorrectly asserted at a previous LAFCo meeting that City need not obtain an amended HCP and new Incidental Take Permits covering Greenbriar until approval of the final tract map.

Does the City now contend that it need not obtain approval by FWS and DFG of an Amended or new HCP and Incidental Take Permits covering Greenbriar prior to prezoning by the City? If this is the City's position, please explain why.

R9-45

The RDEIR, p. 7-25, states that the project applicant would "consult with" USFWS and DFG on the mitigation plan. "Consultation" is not compliance with NBHCP Implementation Agreement 3.1.1(a), *supra*.

R9-46

Does the City now contend that it need not obtain approval by FWS and DFG of an HCP and Incidental Take Permits covering Greenbriar? If so, please explain why

LAFCO's schedule of sequence of activities should include LAFCO's verification that California Department of Fish and Game and U.S. Fish and Wildlife Service have approved a new or amended HCP and issuance of Incidental Take Permits to City covering the project area, prior to LAFCO's consideration of annexation. If LAFCo approves an SOI, LAFCO should include, as a

R9-47

condition of approval of the SOI, the requirement that an HCP and Incidental Take Permits for the project be obtained by the City prior to prezoning. R9-47 Cont'd

City proposes a mitigation ratio of one-half acre of habitat preserved for each acre developed in Greenbriar. We are reliably informed that USFWS and DFG rejected this proposal as inadequate, so it puzzling that the DEIR and RDEIR continue to claim that this proposal is adequate. R9-48

The "Joint Vision for Natomas" MOU requires a one-to-one mitigation ratio for loss of open space. However, an attorney representing AKT development asserted, at a City Council meeting, that this is economically infeasible, and the DEIR proposes that parks, bicycle paths, and detention basins within the project be credited towards the applicant's "open space". However, applicant AKT, and entities controlled by AKT already own or contractually control sufficient land to meet the 1 to 1 open space requirement of Joint Vision in Natomas Basin, Sacramento County. These parcels, which would be difficult or infeasible to develop, are shown on the map attached as **EXHIBIT FOUR**, indicated with hand-written crosshatches. All are next to existing habitat preserves of the Natomas Basin Conservancy in Sacramento County and could be readily incorporated as part of the Conservancy's preserve system. These parcels are:

• APN No 201-110-22: 317 acres north of Elverta Road, connects two Natomas Basin Conservancy preserves. The northern half is within the mile-wide open space "community separator" designated by Joint Vision along the County line, and most is within the internal 100-year flood plain, shown on the map attached as **EXHIBIT FIVE**, and thus difficult or perhaps infeasible to develop.

• APN No 225-020-22, -24, -03, -05, -26, -27, -21, -16, -10, totaling 275 acres, south of I-5, between I-5 and the West Drainage canal, adjoins the NBC's Fisherman Lake preserve, and is entirely within the internal 100-year flood plain, per map attached as **EXHIBIT FIVE**. Much of it flooded on January 1, 2006 from stormwater and overflow from the West Drainage Canal. Proximity to the Airport makes residential development infeasible. Commercial development would be very expensive, perhaps infeasible, because it would require at least 18 inches of fill and a new drainage canal to the Sacramento River with pumps. The existing West Drainage Canal cannot accommodate additional stormwater (J. Lamare & J. Pachl pers. observation, January 1, 2006.) Commercial development at that location would compete with efforts to develop Metro Air Park, immediately north, which County hopes will become a revenue-generator. R9-49

• APN No 225-030-11, -46, is 135 acres on the east side of Fisherman Lake north of Del Paso Rd. AKT filed an application for annexation with City that has been "on hold" for several years. Approximately forty percent is in the Swainson's Hawk Zone, which is to remain undeveloped as a mitigation measure of the Natomas Basin HCP. (The SWH Zone is measured one mile from the inland toe of the Sacramento River levee.) Jets flying 3000 feet overhead make it unsuitable for residential development. The western part was flooded from stormwater on January 1, 2006 (J. Lamare & J. Pachl pers. observation). Homeowners along the top of the low bluff to the east (Westlake) paid premium prices for the view because the sales agents of the developers (AKT and Lennar) told them that it would remain undeveloped.

• APN No 225-090-14, 225-010-50, which is 65 acres between Garden Hwy and Fisherman Lake, adjoining a small NBC preserve to the south.

AKT or entities controlled by AKT acquired these parcels when Natomas land prices were much lower than today, and there is no reason why AKT cannot dedicate all of these lands to mitigate for the loss of open space and habitat destroyed by the Greenbriar project.

R9-49 Cont'd

E. AIR QUALITY

The RDEIR p. 6.2-28states that the average residence time in an owner-occupied house will be 11 years, and uses the ratio of this duration to a 70-year lifetime to adjust the peak cancer risk at a residence in the proposed Greenbriar project. The fault with this logic is that it uses the average residence time to characterize expected risk for every member of an exposed population. In this analysis, the peak expected exposure should be used to determine the impacts to the most impacted resident, which is one of the standards in health risk assessment methodology. The California Office of Environmental Health Hazard Assessment (OEHHA), in its health risk assessment guidance published in 2000[1], recommends using a 30-year residency period for peak exposure analyses. This term was determined to represent the 90th-percentile of occupancies from a variety of data sources. Using this exposure period, the 29-in-a-million risk 70-year average cancer risk reported by the Sierra Research health risk assessment would equate to a 30-year exposure risk of 12.4-in-a-million cancer risk. Additionally, the maximum 30-year (2007-2037) average cancer risk interpolated from the Sierra Research report is 43.2-in-a-million. When this impact is adjusted to a 70-year average, the result is 18.7-in-a-million increased cancer risk. Both of these levels exceed the significance threshold reported in the RDEIR of 10-in-a-million cancer risk. On this basis, the impacts from off-site mobile sources should be concluded to be ***significant and unavoidable***.

R9-50

The RDEIR should also be amended to include the analyses of mitigation measures and the adoption of feasible measures. The list of mitigation measures should include, at a minimum, the cultivation of a fully-opaque vegetative screening within the project boundaries and adjacent to I-5 and SR-99, and the installation of HEPA filters in HVAC systems serving residences within the 10-in-a-million risk isopleth

R9-51

Dated: January 2, 2007

Respectfully submitted,

James P. Pachl

[1] Air Toxics Hot Spots Program Risk Assessment Guidelines Part IV: Exposure Assessment and Stochstic Analysis Technical Support Document, OEHHA, July 2000, http://www.oehha.ca.gov/air/hot_spots/pdf/chap11.pdf

TE OF CALIFORNIA -- THE RESOURCES AGENCY
EPARTMENT OF WATER RESOURCES
16 NINTH STREET, P.O. BOX 942836
CRAMENTO, CA 94236-0001
6) 653-5791

ARNOLD SCHWARZENEGGER, Governor

November 21, 2006

Honorable Heather Fargo
Mayor of the City of Sacramento
City Hall
915 I Street, 5th Floor
Sacramento, California 95814-2604

Re: Natomas Basin Risk Reduction

Dear Mayor Fargo:

The need to improve flood protection in the Central Valley is receiving more attention at the federal, State and local levels than it has in decades. There is an unprecedented level of cooperation among these agencies in the expedited repair of critical erosion sites and in developing strategies to increase levels of protection. However, there are still many areas of the valley without adequate flood protection.

The Department of Water Resources (DWR) is charged with managing the State's responsibilities associated with flood management and is keenly interested in reducing the flood risk to life and property. To this end, DWR is in the process of providing communities throughout the Central Valley with the best available information regarding the estimated level of flood protection afforded by levees and other facilities of the flood control system. We hope that local communities will use this information to make improved land use decisions, to better inform their citizens of the level of flood risk in their areas, to encourage the purchase of flood insurance, and to improve emergency response and evacuation planning.

One such area of flood risk in the Sacramento region is the Natomas Basin. Recent letters from the US Army Corps of Engineers and DWR to Sacramento Area Flood Control Agency (SAFCA) indicate that the Natomas levee system does not meet minimum federal flood insurance program standards for 100-year flood protection. While SAFCA is diligently working to improve the Natomas flood management system, and while DWR intends to help expedite these efforts, the area is at high risk and will continue to be at high risk for several years. This is particularly troubling since Natomas is a deep basin and may experience flooding in excess of 15 feet.

DWR has already informed FEMA of this risk and the need for the Natomas Basin to be remapped. We plan to continue to work with FEMA's Region IX Office to have the basin remapped into either an AR or A99 Special Flood Hazard Zone. However, it is currently unclear when FEMA will act on DWR's request.

EXHIBIT ONE

In the meantime, it is imperative that additional measures be taken to reduce the threat to public safety and property. Due to the low level of flood protection for this deep flood plain, we agree with your strategy that "business as usual" is not an acceptable path. With less than 100-year flood protection, the chance of homes flooding over the next 10 years is approximately 10 percent, much greater than the risk of a home fire. Accordingly, we believe that all levels of both the private and public sectors need to take specific steps to reduce flood risk and impacts.

The State of California has already agreed to fund some of the most crucial and immediate repairs in the Natomas Basin, including those at Pritchard Lake, Sacramento River Mile 68.9L, and at Sacramento River Mile 78.0L. The State also plans to fund its share of levee upgrades to the Natomas Basin so that the level of protection extends beyond the federal minimum standard, to at least a 200-year level of protection. The recent passage of Proposition 1E and Proposition 84 improves DWR's ability to assist local, regional, and federal agencies in both the levee evaluation and remapping and the levee repair/upgrade work.

Also needed is an expanded set of local actions to respond to this urgent threat to public safety. We recognize that local governments, together with SAFCA, have done a commendable job of informing the public of flood dangers and developing emergency response plans. It is prudent to consider additional local efforts to protect the public against this higher risk including the following:

- Limitation on new construction until minimum flood protection is achieved.
- Building design requirements on any new construction related to potential depth of flooding and resident survivability.
- Special notifications of the high flood risk to:
  - First-time buyers of new homes
  - Buyers of resale property
  - New renters
- Regular (e.g. annual) notification to existing property owners and renters of the high flood risk.
- Dissemination of information regarding the National Flood Insurance Program and continuing outreach to encourage residents' purchase of flood insurance.
- Requirements that builders provide flood insurance for new residents until the minimum level of flood protection is reached.
- Robust assessment of flood risk in general plan updates, and adoption of policies and plans that are at least as effective as those described in the State General Plan Guidelines for Safety Elements.
- Increased emergency response and evacuation preparation and planning, including practice response drills.

EXHIBIT ONE, P. 2

We know that you have already undertaken some of these actions. We look forward to hearing more details on the efforts that the City of Sacramento will be taking to deal with the high flood risk in the Natomas Basin and would be happy to meet with you to help with these issues and to develop joint efforts as appropriate. If you have any questions or wish to meet to discuss the measures that the City of Sacramento will be taking, please contact me at (916) 653-7007 or Leslie F. Harder, Jr., Deputy Director for Public Safety, at (916) 653-9502.

Sincerely,

Lester A. Snow
Director

EXHIBIT One p. 3

TO: **Sacramento Area Flood Control Agency Board of Directors**

FROM: **Stein Buer, Executive Director (916) 874-7606**

SUBJECT: **INFORMATION – NATOMAS LEVEE EVALUATION STUDY**

SUMMARY

This is an information item to provide your Board with a summary of the preliminary findings and conclusions of the Natomas Levee Evaluation Study (Study), which SAFCA initiated in 2005 to identify the improvements needed to provide the Natomas area with at least a 200-year level of flood protection. No action is requested at this time. Staff intends to return to your Board in March with recommendations as to the next steps which should be taken in responding to the conclusions of the Study.

BACKGROUND

After the record storm of 1986, SAFCA was formed to work with the responsible Federal and State agencies to plan and implement the system-wide improvements needed to provide the Sacramento area with at least a 100-year level of flood protection as quickly as possible while working to provide the area with at least a 200-year level of protection over time. SAFCA has characterized this improvement program as progressing from high risk (less than 100-year) through moderate risk (greater than 100-year but less than 200-year) to low risk (greater than 200-year). The Natomas Basin has been a major focus of this effort. Between 1990 and 1993, about $20.0 million was spent as part of the Sacramento Urban Levee Reconstruction Project to strengthen the east levee of the Sacramento River so as to address through-levee seepage problems experienced during the 1986 flood. Thereafter, another $80.0 million was spent as part of the North Area Local Project (NALP) to raise and strengthen the levees along the eastern and northern flanks of the basin.

As a result of these efforts, the U.S. Army Corps of Engineers (Corps) concluded in 1998 that the Natomas area had adequate protection to safely contain a 100-year flood. In rendering this conclusion, the Corps acknowledged that portions of the east levee of the Sacramento River had less than the normally required three feet of freeboard on the 100-year water surface profile. This was considered acceptable because this levee performed well during the 1997 flood and because the Corps

EXHIBIT Two

anticipated that the levee would be raised in the near future as part of the Federally authorized American River Common Features Project (Common Features). In addition, the Corps assumed that ongoing erosion in the Sacramento River channel would be addressed, either as part of routine local levee maintenance efforts or as part of the Sacramento River Bank Protection Project.

For the 1998 certification process the Corps did not evaluate the risk of underseepage. Although such an evaluation was technically part of their standard operating procedure for evaluating levee performance, underseepage was not considered a significant failure mechanism for levees in the Sacramento Valley, and the effort necessary to accumulate and analyze boring data was not thought to be cost-effective.

However, over time, the Corps' assessment of levee failures during the 1997 flood indicated that underseepage was a potentially significant contributor to levee instability and some of the levee failures during the flood. As a result, in 2000 the Corps retained the engineering firm URS to help evaluate the underseepage risk in Natomas, as well as other levee performance parameters which would need to be addressed to achieve the 200-year flood performance threshold. Boring data was collected along the south levee of the Natomas Cross Canal and the east levee of the Sacramento River, and an initial assessment of the potential for underseepage was completed.

Based on the analysis of the available data, including extensive additional borings, URS, in 2002, concluded that most of the studied levee reaches would need substantial additional work to address underseepage, erosion protection, and freeboard requirements in order to reach a high level of flood protection. Because of the magnitude and anticipated cost of the recommended work, and because underseepage was a newly identified concern in the Sacramento Valley, the Corps and its non-Federal partners determined a panel of experts should be convened to review and refine the Corps' guidelines for evaluating the risk of underseepage and designing remedial measures before proceeding further.

The Corps' Levee Seepage Task Force was convened in early 2003 and completed its work in July 2003. Based on its findings, the Corps developed a new Standard Operating Procedure (SOP) for Geotechnical Levee Practice, recommending guidelines for evaluation, design, and maintenance, which were adopted by the Corps' Sacramento District in August 2004. The most important recommendation embodied in the new SOP was that additional resources should be used in the evaluation, design, and maintenance phases so that less conservative and costly remedial measures could be recommended for construction.

With the new SOP as a guide, the Corps, the State Reclamation Board, and SAFCA staffs collaborated to develop a plan for moving forward with the Natomas levee improvements needed to achieve 200-year flood protection, while at the same time addressing any priority levee deficiencies which might be identified. Given the limited funding available to the Corps through Common Features, it was agreed

EXHIBIT TWO, pg. 2
[pgs 3-6 NOT attached]

This story is taken from Sacbee / News.

Finances put the brakes on light-rail work

By Tony Bizjak - Bee Staff Writer
Published 12:00 am PST Friday, December 15, 2006

Light rail has been on an unprecedented roll in Sacramento.

Four expansions in four years, including a new line last week to the downtown Amtrak depot, have nearly doubled the 20-year-old system's reach and turned its boxy blue and gold trains from curiosities to daily habits for a growing number of Sacramento commuters.

The system appears poised to make its case as a serious player in Sacramento's ever more congested commute picture.

Instead, light rail is about to hit the wall, financially.

Regional Transit officials say they have money for just one more extension, the four miles from Meadowview Road to Cosumnes River College scheduled for completion in 2010.

Then, "we'll be tapped out," RT General Manager Beverly Scott said.

There still is federal transit money available for rail expansions. But, Scott said, her agency will no longer qualify for those crucial funds until it shows it has enough of its own money to run all of its new trains and routes.

That means Regional Transit can't, for now, extend light rail south into Elk Grove, where trains would provide an alternative to the most congested freeway in the Valley, Highway 99, and Interstate 5.

Moreover, RT's long-planned light-rail connection to Sacramento International Airport now isn't expected to happen until 2027, two decades later than it once expected.

The district's looming money crunch comes at a key moment, planners say. The region's blueprint for denser, more urban-style growth is counting on a higher-profile role for transit.

In an effort not to lose momentum -- average weekday rides have jumped nearly 70 percent to 51,000 in four years -- RT officials say they are contemplating a ballot measure, as early as 2008, asking Sacramento voters for more money.

They'll do it with other transportation agencies, they say, or, if circumstances require, they could go it alone with a measure seeking money just for transit.

RT executive Scott said her agency's board won't decide its strategy until RT conducts community meetings next year asking residents what bus and rail service they expect in the

EXHIBIT THREE

coming years from RT.

In Scott's opinion, however, the handwriting is on the wall.

"We need some new and broadened revenues sources to support the transit system that is contemplated" in the region's growth scenarios, she said. "We are talking about transit service times 10 in the region."

Others in Sacramento's transportation arena say they agree that RT faces a tough situation financially, but that a ballot measure for transit alone would be risky.

Just two years ago, Sacramento County voters approved a 30-year extension of the county's half-cent transportation sales tax. That initiative, Measure A, was supported by all of the county's transportation agencies, including Regional Transit.

The money from Measure A is earmarked for an array of projects, including new and expanded roads. It includes enough money for RT to pay for about one-third of the cost of extending light rail to Cosumnes River College, and funds to run the line for 20 years. Using that money as leverage, RT officials expect to win federal funds for the remaining two-thirds of the cost of that project.

The Measure A renewal tax doesn't kick in until 2009, however, and Brian Williams, director of the Sacramento Transportation Authority, the group that administers the Measure A funds, said local transportation planners would be wise to wait until at least several major projects are under way before asking voters for more money.

Williams said he prefers RT join again with transportation executives from around the county in deciding when to seek new funds and determining what kinds of funding sources are appropriate. "You are not going to find anybody who will argue we don't need a subsequent source of funds," Williams said. "But winning a two-thirds vote (the necessary margin for a transportation tax) is daunting, and a lot of people don't ride transit."

Williams said his agency is talking with RT and other officials cooperatively about potential approaches and expects more talks next year.

As a show of RT's willingness to cooperate with other transportation planners, even as it makes its case for a bigger share of the region's transportation pie, RT officials have agreed to improve their fare-box revenues.

The agency raised fares last year and plans to consider increases every three to five years. However, higher ride fares are far from sufficient, RT's Scott said, given the escalating cost of building and running light-rail lines.

The initial south light-rail line, built in 2003 between downtown and Meadowview Road, cost RT $35 million per mile. RT planners estimate the upcoming extension of that line to Cosumnes River College at $58 million per mile.

Early estimates for a light-rail line to the airport are nearly $90 million per mile. Similarly, inflation has hit road projects; an interchange on Highway 99 in Elk Grove will cost $70 million, and a two-mile widening of Hazel Avenue is $60 million, officials say.

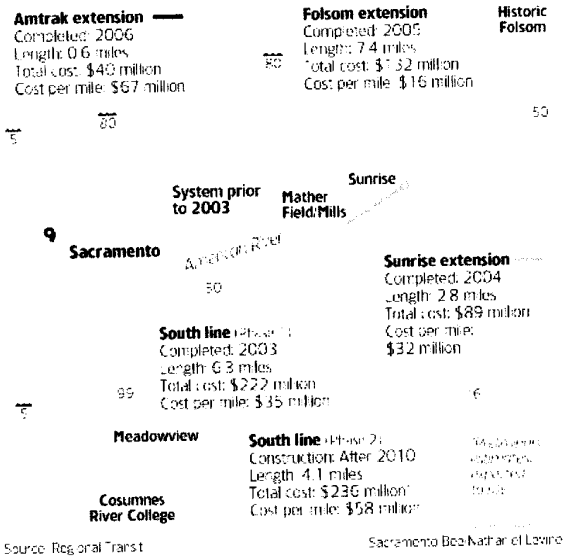
High price tags already have caused RT officials to think in new directions, RT board member Roger Dickinson said. Transit officials recently joined with the cities of West Sacramento and Sacramento in planning a cheaper trolley car system to run on rails between the two cities.

EXHIBIT Three, p. 2

"We have to produce as much (new service) as we can with the money we have" Dickinson said. "What I hear, people want more."

Sacramento's light-rail building boom

Since 2003, Regional Transit has overseen the biggest building boom for light rail since the system opened in 1987, constructing 17 new miles of track, with four more miles planned in 2010. Officials now say hopes for more extensions, including to the airport, may be stalled by lack of funds.



Source: Regional Transit Sacramento Bee/Nathan Levine

Go to: Sacbee / Back to story

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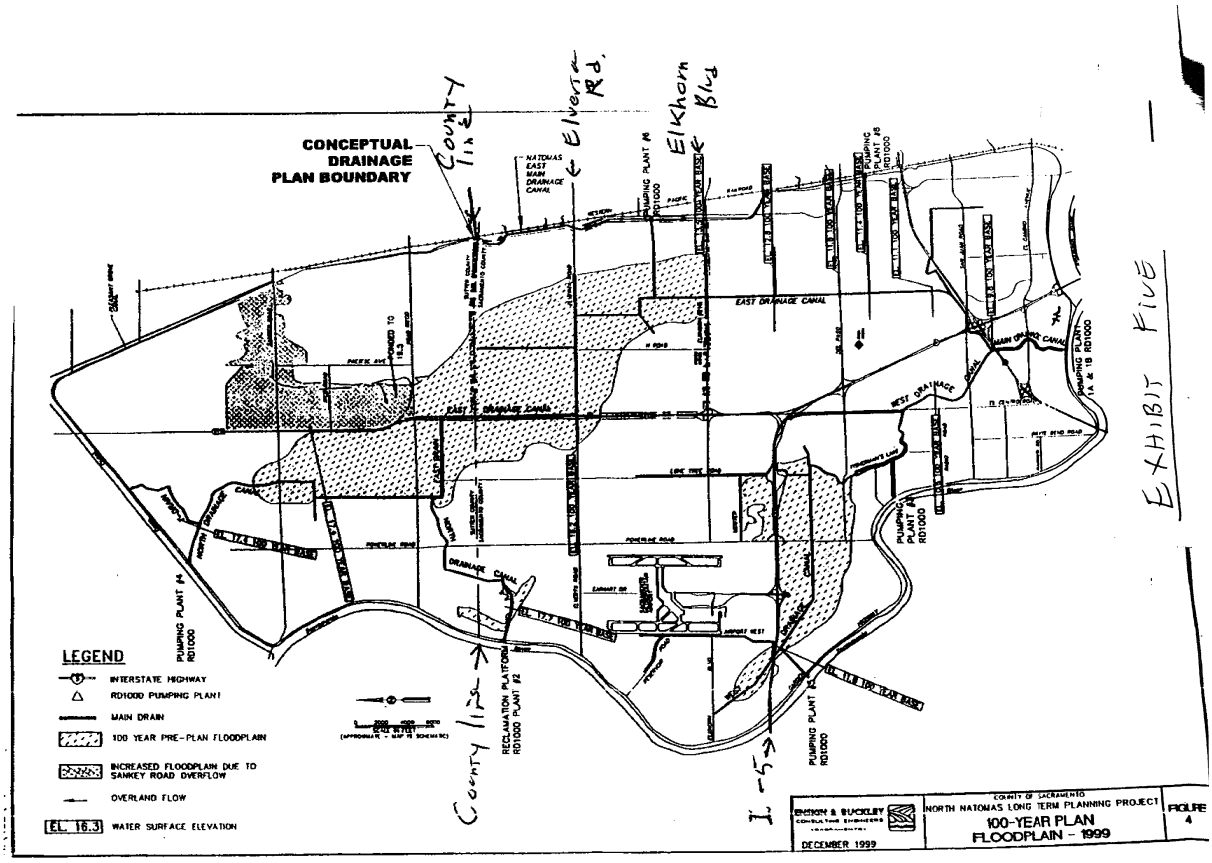

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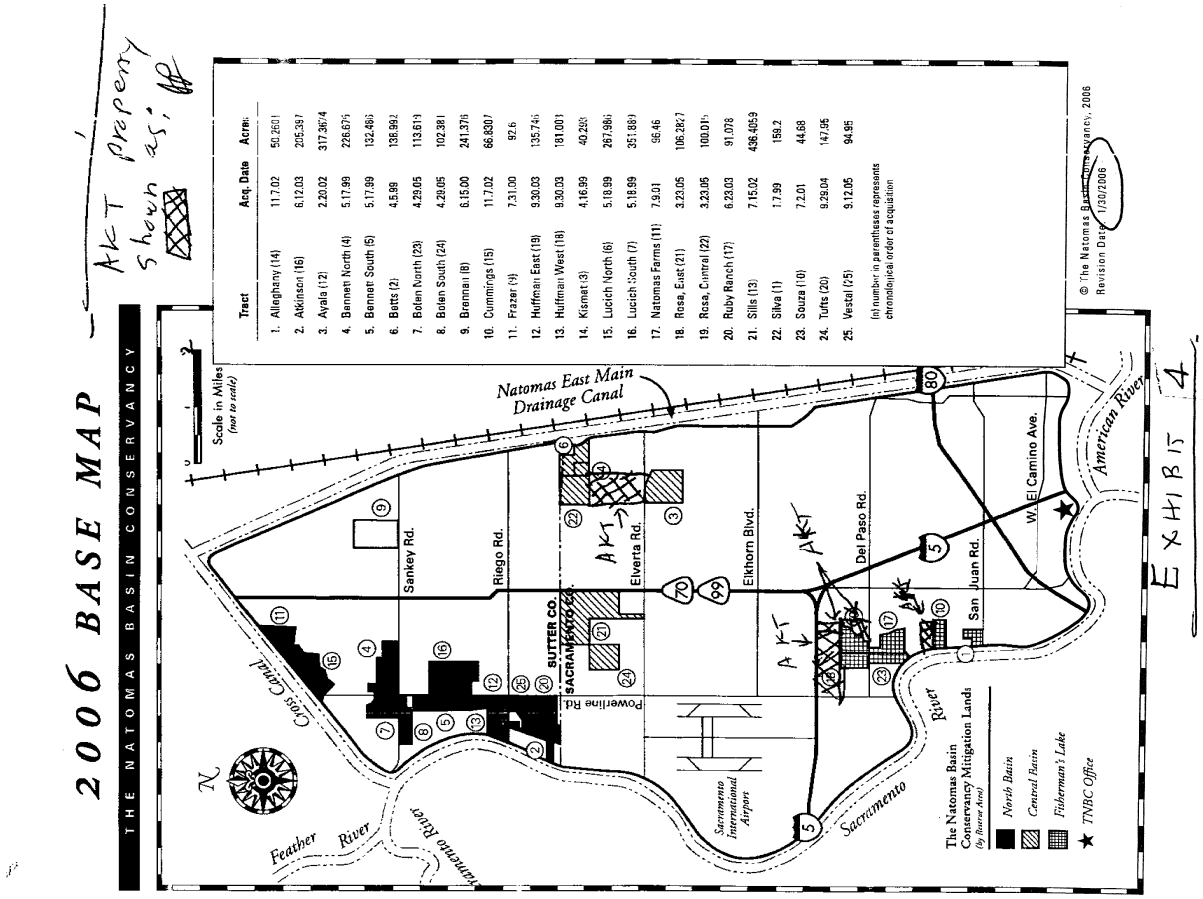

LETTER R9

James P. Pachl
January 2, 2007

R9-1 The comment does not raise any issues related to the environmental analysis provided in the RDEIR; therefore, no further response is necessary.

The commenter indicates that the comment letter, which is submitted in response to the RDEIR, will also include comments on the DEIR. The comment period for the DEIR closed on September 5, 2006. As stated on page 1-2 of the RDEIR, comments to the RDEIR are to be limited to the materials contained in the RDEIR. In accordance with CEQA Guidelines section 15088.5, subdivision (f)(2), when a lead agency recirculates only the revised chapters or portions of the EIR, the lead agency may request that reviewers limit their comments to the revised chapters or portions of the RDEIR. The RDEIR expressly requested that comments be limited to the RDEIR, as is required by CEQA Guidelines section 15088.5(f)(2). Notably, when a lead agency recirculates an EIR, the lead agency need only respond to (i) comments received during the initial circulation period that relate to chapters or portions of the document that were not revised and recirculated, and (ii) comments received during the recirculation period that relate to the chapters or portions of the earlier EIR that were revised and recirculated. Thus, the City need not respond to comments received during the recirculation period that relate to the chapters or portions of the DEIR that were not revised. However, while not required, the City has provided responses to all comments received during the recirculation period.

R9-2 Please refer to Master Response 1 and responses to comment letter 29.

R9-3 Please refer to Master Response 1 and responses to comments 29-2 to 29-24 for a comprehensive discussion of flood risk.

R9-4 Please refer to Master Response 1 and responses to comments 29-2 to 29-24.

R9-5 Please refer to Master Response 1 and responses to comments 29-2 to 29-24.

R9-6 Please refer to Master Response 1 and responses to comments 29-2 to 29-24.

R9-7 The City is proposing to adopt a mitigation measure that would only allow development if allowed by FEMA. The City is working closely with FEMA on the new Flood Insurance Rate Map and fully intends to defer to FEMA's expertise in this matter. Please refer to Master Response 1.

R9-8 The RDEIR did not assert that SAFCA will construct a new setback levee inland of the existing east levee of the Sacramento River. Rather, the RDEIR discussed SAFCA's Natomas Levee Evaluation Study 2005, which proposed a variety of remedies, one of which was a setback levee along the upper 5 miles of the east levee of the Sacramento River. The RDEIR accurately represents the 2005 study.

R9-9 Please refer to Master Response 1.

R9-10 Please refer to Master Response 1.

R9-11 Please refer to response to comments 29-3 and 29-9, and Master Response 1 regarding the City's determination that the long term flood hazard impacts are less than significant because 100 year flood protection would be provided for the project site. Regarding the selection of the significance threshold, CEQA provides agencies with the general authority to adopt criteria, referred to as "thresholds of significance," for determining whether a given impact is "significant." Appendix G of the CEQA Guidelines sets forth an environmental checklist with questions from which thresholds of significance are commonly gleaned. The City relied on Appendix G in establishing its threshold of significance for flooding. Specifically, the City determined that a significant impact from flooding would occur as a result of the Project only if the Project would "place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map." This is consistent with Appendix G. In addition, the 100-year flood is the standard used by most Federal and state agencies, and is used by the National Flood Insurance Program (NFIP), as the standard for floodplain management and to determine the need for flood insurance. An agency's determination regarding the proper thresholds of significance is governed by the "substantial evidence" standard of review. (National Parks and Conservation Association v. County of Riverside (1999) 71 Cal.App.4th 1341, 1358 (National Parks) (court applied the substantial evidence test when upholding an agency's decision to adopt different thresholds of noise significance for different areas of a project); (Mira Mar Mobile Community v. City of Oceanside (2004) 119 Cal.App.4th 477, 493 (court found that a lead agency has the discretion to determine whether to classify impacts as significant, depending on the nature of the area affected).) Under the substantial evidence standard, the court must defer to the City's decision regarding the proper thresholds of significance when it is supported by substantial evidence. (Laurel Heights Improvement Association v. Regents of the University of California (1988) 47 Cal.3d 376, 409; Defend the Bay v. City of Irvine (2004) 119 Cal.App.4th 1261, 1265-1266; Del Mar Terrace Conservancy Inc. v. City Council (1992) 10 Cal.App.4th 712, 725.) In this case, since levee improvements will be made which will provide a 100-year level of flood protection for the Project area, the City determined the Project would not "place housing within a 100-year hazard area" and, thus, exposure to flooding was "less than significant."

The City is aware of the current discussion at a State level regarding 200-year flood protection. While no new legislation has been passed, the City will comply with any future changes in the law.

Please refer also to Master Response 1 and responses to comments 29-3 and 29-9.

R9-12 The relative risks associated with flooding, as expressed in the comment, are part of the record that the City of Sacramento and LAFCo will consider when determining whether to approve the project. Please refer to response to comment R9-11.

R9-13 Please refer to Master Response 1 and response to comments 29-3, 29-9, and R9-11.

R9-14 The commenter is incorrect in claiming that permitting development on the Greenbriar site prior to the upgrade of the levees to 100-year level of flood protection would be inconsistent with the Sacramento City General Plan. Consistency with Sacramento City General Plan Section 8, Goal A, Policy One, Flood Hazard, requires that the City find that measures can be implemented to eliminate or reduce the risk of flooding in the Project area. As discussed in Master Response 1, the City is proposing to adopt a mitigation measure that ensures at least 100-year flood protection will be provided at the project site. The mitigation measure would only allow development if allowed by FEMA, following FEMA's revision of the Flood Insurance Rate Map for the Natomas area. The City is implementing measures to eliminate or reduce flood risk, consistent with the General Plan.

Moreover, the City's determination of consistency with its own general plan is accorded great deference because, as the body that adopted the general plan policies in its legislative capacity, it has unique competence to interpret those policies when applying them in an adjudicatory capacity. (Save Our Peninsula Comm. v. County of Monterey (2001) 87 Cal.App.4th 99, 142.) The City determined that the Project is consistent with the General Plan because such measures, namely the upgrade of the levees to 100-year level of flood protection, can and will be implemented.

R9-15 Please refer to Master Response 1.

R9-16 Please refer to Master Response 1 and responses to comment 29-28 and R9-14.

R9-17 Please refer to Master Response 1 and responses to comment 29-28 and R9-14.

R9-18 Please refer to Master Response 1 and responses to comment 29-28 and R9-14.

Consistency with a City's land use plan or policies is evaluated under the "substantial evidence" standard (See *Sequoyah Hills Homeowners Assn. v. City of Oakland* (1993) 23 Cal.App.4th 704, 717.) Where substantial evidence supports the City's determination of consistency, the court must defer to the agency's determination. (*River Valley Preservation Project v. Metropolitan Transit Development Board* (1995) 37 Cal.App.4th 154, 168; *City of Fremont v. San Francisco Bay Area Rapid Transit Dist.* (1995) 34 Cal.App.4th 1780, 1786.) The City's determination of consistency with its own community plan is accorded great deference because, as the body that adopted the community plan policies in its legislative capacity, it has unique competence to interpret those policies when applying them in an adjudicatory capacity. (See *Save Our Peninsula Comm. v. County of Monterey* (2001) 87 Cal.App.4th 99, 142.) In this case, the project includes mitigation for implementing flood protection which conforms to the current FEMA and Army Corps standards, this will be considered in the City determination of whether the project is consistent with the North Natomas Community Plan Flood Control Guiding Policy A.

R9-19 The commenter states that the RDEIR fails to specifically disclose any increase in flood hazards due to levee improvements on the Feather and Yuba Rivers since the 1997 storm event. However, the City's evaluation of flood protection for the project in the RDEIR is based on two levee evaluation studies which were conducted in 1998 and in 2006, and incorporates the latest information available regarding the status of flood protection within the Natomas Basin, including any recent flood events or levee upgrades. As stated in Master Response 1, the flooding impacts analysis includes information that was publicly available at the time the EIR was circulated, new information available subsequent to publication, revisions made to the flood hazard evaluation as part of the recirculation of the EIR, the status of ongoing flood control projects in the Natomas area and the City's process for approving

projects in the Natomas area. The City initially evaluated the potential impacts of flooding based on the levee evaluation conducted by the USACE in 1998 which found that the levees protecting the Natomas area, including the Sacramento River levee, met FEMA criteria for 100-year flood protection. Although in its 2006 Natomas Levee Evaluation Program report, Sacramento Area Flood Control Agency found that some portions of the levee system would be subject to underseepage and erosion hazards during a 100-year storm event, SAFCA is implementing the necessary levee improvements to correct these deficiencies. The City considered these studies along with possible contingencies and scenarios and determined that, with the implementation of SAFCA flood improvements and project mitigation measures (including the new mitigation discussed in Master Response 1), flood protection would be provided at the site. Further evaluation of the levees in light of the upgraded portions of the Feather-Yuba-Bear River levees will not alter the determinations in the DEIR or RDEIR.

Refer also to Master Response 1.

R9-20 Regarding the feasibility of the DNA line, please refer to responses to 8-2, 29-47, 29-48, 29-61 and S2-13; see also response to comment letter 26 and Appendix B. Moreover, as part of the required mitigation for project impacts, the project applicant will provide a fair share contribution to help fund freeway congestion relief projects, which could include the DNA project. Please refer to response to comments 3-3 and 8-2. Development of the DNA line is considered feasible, and remains a key project objective as well as a priority for the City.

The EIR does not advocate that the City accept or reject one or more alternatives. Rather, the EIR presents a discussion and comparison of impacts of the alternatives to the proposed project in order to provide adequate information to the decision-makers when they consider whether to approve the project. (CEQA Guidelines section 15126.6 (c).) As part of this discussion, the EIR includes an assessment of whether one or more of the alternatives would achieve certain project objectives, including the key project objective of providing development and associated density along the proposed DNA rail line. Ultimately, the determination whether an alternative is feasible will hinge in part upon whether the alternative meets most of the basic project objectives. (CEQA Guidelines section 15126.6 (c).) Although project alternatives ultimately need not satisfy *all* project objectives, they must meet the fundamental goals of the project. This issue was squarely decided in *AIR*, where the court held that a county properly rejected an environmentally superior project alternative because it failed to meet "the fundamental objective of the project." (*Association of Irritated Residents v. County of Madera* (2003) 107 Cal.App.4th 1383, 1400; see also *Sequoyah Hills Homeowners v. City of Oakland* (1993) 23 Cal.App.4th 704, 715.)

The alternatives analysis in the DEIR, and as summarized in the RDEIR, is legally adequate under CEQA.

R9-21 Please refer to responses to comments 8-2, 29-47, 29-48, 29-61 and S2-13 and RD-20.

R9-22 The comment reflects the commenter's opinion that the proposed DNA line would be unattractive to air travelers, particularly those concerned about arriving timely to the Airport and that shuttle service would be quicker and more reliable. There is no evidence to support this opinion. Because the comment does not address the analyses of the DEIR, RDEIR, or Second RDEIR, no further response is necessary.

R9-23 Regarding funding available to construct and operate the DNA light rail transit line, please refer to responses to comments 8-2, 29-47, 29-48, 29-61 S2-13, and RD-20. Since the date of the cited Bee article, the project applicant has agreed to provide a fair share contribution to the City's Traffic Congestion Relief fund, which could be used to help fund the local share of the DNA Project costs. Please refer to response to comment 3-3. Regarding RT's intentions to continue pursuing implementation of the DNA line, LAFCo has received a letter from Dr. Beverly Scott, General Manager/CEO of RT dated November 1, 2005 indicating support for the Greenbriar Project and that the implementation of the Greenbriar Project would increase RT's competitiveness for federal funding to extend the light rail line to the Sacramento International Airport. Further, more recently a letter was received from Dr. Beverly Scott, dated November 1, 2005, indicating that RT has every intention of continuing to pursue and implement the DNA light rail extension. Copies of these letters are included in Appendix B of this document.

In addition, the Sacramento Area Council of Government's Metropolitan Transportation Plan includes the DNA line and a financial plan to insure the implementation of the project as required under the Chapter 30 of Code of Federal Regulations Section 450.322(b)(ii). This financial plan includes strategies to implement identified facilities in the event of funding shortfalls.

R9-24 The commenter asserts that the EIR improperly rejects the off-site and dispersed development alternatives because the applicant does not own sufficient land within the City which is suitable for the project. First, commenter ignores the other reasons that an off-site alternative may not be feasible. As explained by the RDEIR, there is no suitable site within the NNCP that is owned by the project applicant. Moreover, most of the land within the NNCP area is currently proposed for development, as is most of the land within the City. Finally, an off-site alternative does not meet the basic project objectives. (RDEIR pp. 8-1, 8-19.)

Second, the commenter incorrectly asserts that rejecting an off-site alternative because the applicant does not own the land is improper. Pursuant to CEQA, an EIR must describe a reasonable range of alternatives to the project, or to the location of the project, that could feasibly attain most of the basic objectives of the project while avoiding or substantially lessening any of the significant effects of the project. (CEQA Guidelines section 15126.6, subd. (a),(f).) Notably, "among the factors that may be taken into account when addressing the feasibility of alternatives is whether the proponent *can reasonably acquire, control or otherwise have access to the alternative site*. (CEQA Guidelines section 15126.6, subd. (f)(1), emphasis added.)

In *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 574, the court rejected petitioner's claim that the county should not have rejected alternative sites simply because the applicant did not own them: "A project alternative which cannot be feasibly accomplished need not be exhaustively considered. A feasible alternative is one which can be 'accomplished in a successful manner within a reasonable period of time, taking into account economic, legal social and technological factors.' Whether a property is owned or can reasonably be acquired by the project proponent has a strong bearing on the likelihood of a project's ultimate costs and the changes for an expeditious and 'successful accomplishment'." In this instance, the property required for the off-site alternative cannot be reasonably required by the project applicant.

If a lead agency concludes that no feasible alternative locations exist, it must disclose the reasons for this conclusion in the EIR. (CEQA Guidelines Section 15126.6, at subd. (f)(2).) The DEIR and RDEIR considered an off-site alternative, provided a comparative analysis of impacts to the proposed project, and disclosed the multiple reasons why the off-site alternative

was not likely feasible. The analysis is adequate under CEQA. Importantly, there is no other land available along the proposed DNA line. This objective is critical to both Regional Transit and SACOG support of the proposed project. (See Appendix B).

R9-25 This comment is noted. It is difficult to determine what point the comment is intended to make. It does not appear that the comment addresses the analyses contained in DEIR or the RDEIRs, and as such no further response is necessary. To the extent that the comment is intended to demonstrate that the off-site and/or dispersed development alternatives are feasible, please refer to response to comment R9-24.

R9-26 Because the comment does not raise issues related to the analyses or conclusions of the DEIR or RDEIRs, no further response is necessary. To the extent that the comment is intended to demonstrate that the off-site and/or dispersed development alternatives are feasible, please refer to response to comment R9-24.

R9-27 Because the comment does not raise issues related to the analyses or conclusions of the DEIR or RDEIRs, no further response is necessary. To the extent that the comment is intended to demonstrate that the off-site and/or dispersed development alternatives are feasible, please refer to response to comment R9-24.

R9-28 The comment addresses the agriculture section of the DEIR. The agriculture section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1.

The description of the Metro Air Park project contained in the Greenbriar DEIR is based on the Metro Air Park EIR and related project approvals. As stated by the comment, Metro Air Park is entitled for development and construction of infrastructure has begun. The Greenbriar DEIR therefore correctly assumes future development of the Metro Air Park project in its analysis of agricultural impacts. The comment offers no evidence to support its contention that there are no expectations to develop Metro Air Park.

Further, the Greenbriar project includes a 250-foot buffer on the west side of the project site, compared to a 25 foot buffer on the MAP side of the canal. This tenfold increase in buffer width is intended to recognize the importance of the aquatic connection between Fisherman's Lake, the site and points north including the NBC preserve. Moreover, the 250 foot buffer provides an aquatic connection not previously contemplated by the NBHCP.

R9-29 The comment addresses the agriculture section of the DEIR. The agriculture section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1.

The DEIR accurately describes the Joint Vision Plan and Joint Vision MOU. (See DEIR, pp. 5-11.) Furthermore, the City and County have acknowledged that the City is the appropriate agent for planning new growth in the North Natomas area. While the Joint Vision Plan does not designate lands to be developed, the City has made known its intention to develop the lands north of the project site under the Joint Vision Plan. As the lands north of the project are planned for development and not agricultural use, the Project is not inconsistent with the Joint Vision Plan. Moreover, both the City and County are in the process of updating their General Plans. Both the City and County General Plan updates propose the development of the North Natomas Joint Vision.

Further, the 250-foot agricultural buffer the comment claims is necessary to mitigate agricultural impacts (conflicts between agricultural and urban uses) on the northern portion of the project site is a requirement of the North Natomas Community Plan (NNCP). Because the project site is not located within the boundaries of the NNCP, this requirement is not necessary.

Impacts to agricultural lands were adequately analyzed in the DEIR and appropriate mitigation measures have been required. (DEIR, pp. 6.11-1 to 6.11-9.) The City believes it is inappropriate to require agricultural easements on lands that are designated for urban development.

R9-30 The comment addresses the agriculture section of the DEIR. The agriculture section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1.

The comment states that the land south of the project (south of I-5) is not entitled to develop, is used for agricultural purposes and is not in the City of Sacramento. The commenter mistakenly suggests that all of the land immediately south of the project and I-5 is agricultural in character and lies outside the City of Sacramento. The land immediately south of the project's southeast quadrant and I-5 is well within the City of Sacramento city limits and is also urbanized. Known as the Westlake community, this residential neighborhood was anticipated for development as part of the City's NNCP adopted in 1994. The Westlake community also includes a small amount of acreage zoned for commercial development along El Centro Road/Bayou Way near the intersection with Del Paso Road, and at the far northwestern corner of the current city limits. The land immediately east of Westlake and southeast of the project is also within the NNCP. The owners of this parcel are currently seeking entitlements to develop the property for intensive commercial retail use. The Westlake community is nearly built out and the last remaining development of the area is expected to be complete by the winter of 2007.

The area due south of the project's southwesterly quadrant is currently zoned for agricultural use within unincorporated Sacramento County. The same area is also identified for agricultural use within the City of Sacramento's NNCP; however, the land is not currently within the city limits. Together with the land southwesterly of the Greenbriar property across I-5, and the parcel of land known as West Lakeside immediately north of Del Paso Road, these unincorporated parcels have been identified by the City of Sacramento as a "Sphere of Influence Amendment Alternative" for the purpose of analyzing future urban growth and open space preservation as part of the Natomas Joint Vision effort. Furthermore, the City of Sacramento acknowledges that one of a number of current annexation actions within the North Natomas area includes the West Lakeside parcel south of I-5.

The comment also states that development of Greenbriar will put additional growth-inducing pressure on the lands south of the project. The DEIR adequately analyzes growth-inducing impacts of the project. (DEIR, pp. 7-2 to 7-5.) Section 7.1 of the DEIR discusses in great detail the project's potential growth inducing effects, especially as it relates to the area between the NNCP area and the Metro Air Park development. The discussion of potential growth inducement affecting nearby agricultural activities is limited to the lands north of the project. A similar discussion about potential effects on agricultural lands south of the project is not presented due to the fact an interstate highway with its own growth-inducing effects separates the project and the agricultural lands to the south. Additionally, these same agricultural lands for which the commenter expresses concern, abut or are incorporated within the NNCP. Because it is widely recognized that the NNCP significantly influences growth inducement within the Natomas Basin, the Greenbriar DEIR does not need to dedicate extensive discussion to the project's "additional" and relatively insignificant potential growth inducing pressure. The project DEIR does acknowledge that the 1986 NNCP EIR and 1993 NNCP EIR Supplement documented growth-inducing impacts generally associated with urbanization near the agricultural lands (p. 7-2).

The comment also questions the DEIR analysis of potential conflicts between the agricultural uses on the lands south of I-5 and the residential uses at Greenbriar. The DEIR adequately analyzes impacts associated with conflicts between adjacent agricultural and urban uses and requires appropriate mitigation measures. (DEIR, pp. 6.11-8 to 6.11-9.) The project DEIR does not address potential conflicts between agricultural uses on the lands south of I-5 and proposed residential uses because of the relative separation between the two. The project's southern-most residential neighborhood is separated by: 1) a planned on-site freeway buffer; 2) the entirety of the Caltrans I-5 right-of-way; and 3) the entirety of the County of Sacramento Bayou Way right-of-way. The approximate distance of the closest planned residential unit to the agricultural lands south of I-5 is 500+ feet, and because of this separation – including an interstate freeway – potential conflicts do not require exhaustive analysis.

R9-31 The comment addresses the agriculture section of the DEIR. The agriculture section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1. Please see also response to comment R9-49 below.

Impacts to agricultural lands were adequately analyzed in the DEIR and appropriate mitigation measures have been required. (DEIR, pp. 6.11-1 to 6.11-9.) As discussed in response to comment R9-37, implementation of Mitigation Measure 6.11-1 would substantially lessen significant impacts associated with the conversion of farmland on the project site because LAFCo would only approve the conversion of agricultural land where it is consistent with conservation policies. Further, the project would conserve open space and habitat land some of which would be used for agricultural practices at a ratio consistent with the mitigation ratio identified in the City/County Joint Vision Plan MOU. (DEIR, p. 6.11-7.)

Mitigation Measure 6.12-1 requires the project applicant to dedicate land to the Natomas Basin Conservancy (NBC). The NBC serves as plan operator for the Natomas Basin Habitat Conservation Plan (NBHCP) and acquires and manages habitat land for the benefit of the 22 special-status species covered under the NBHCP, including Swainson's Hawk and giant garter snake. Habitat for these species includes agricultural land in rice production.

The project applicant will dedicate the Spangler property, which is located in northern Sacramento County along the Sutter County line, northeast of the Sacramento Airport and west of SR 70/99. The site is currently in irrigated rice and is surrounded by agriculture (primarily rice) on all sides. The North Natomas 130 site, which is adjacent to the NBC's Cummings preserve to the south, Fisherman's Lake to the east, rice land to the north, and the Sacramento River to the west, will also be dedicated to the NBC.

One of the NBC's key conservation strategies is to maintain at least 50% of its mitigation lands in rice production. Typically, the NBC puts up to 75% of the mitigation land in rice production and 25% as managed marsh. A majority of the lands that the project applicant is dedicating to the NBC for habitat management will therefore remain in agricultural use. The project applicant is not required dedicate any additional lands for agricultural use.

R9-32 The comment addresses the agriculture section of the DEIR. The agriculture section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1.

The DEIR adequately analyzed impacts to Swainson's Hawk and requires appropriate mitigation measures to reduce impacts to a less than significant level. (DEIR, pp. 6.12-30 to 6.12-32.) Mitigation measure 6.12-2 requires that 27.9 acres of low-quality, 59.5 acres of moderate-quality, 108.6 acres of high-quality foraging habitat, and 1.9 acres of potential nesting habitat be provided as mitigation for the loss of approximately 546 acres of low- and moderate-quality foraging habitat. (DEIR, p. 6.12-31.) The specific locations of the mitigation

lands will be identified prior to the City Council's consideration of the project. This mitigation land was carefully selected as appropriate habitat for Swainson's Hawk and it is not necessary to put additional lands under agricultural easements to address impacts to Swainson's Hawk.

R9-33 The comment addresses the agriculture section of the DEIR. The agriculture section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1.

The comment asserts that LAFCo is currently updating its policies regarding agricultural and open space land preservation and that the project should be evaluated in terms of the updated policies.. The commenter is incorrect. CEQA does not require evaluation of a proposed project's consistency with draft or proposed policies. Rather, CEQA requires a discussion of any inconsistencies between the proposed project and applicable general and/or regional plans. (CEQA Guidelines Section 15125 subds. (d)-(e).) "[T]here is no express legislative or regulatory requirement under CEQA that a public agency speculate as to or rely on proposed or draft regional plans in evaluating a project." (*Chaparral Greens v. City of Chula Vista* (1996) 50 Cal.App.4th 1134, 1145.) A "plan that is in draft form" is not "applicable" within the meaning of the mandate in section 15125 that EIRs discuss project inconsistencies with "applicable general plans and regional plans." (*Id*. at p. 1145, fn. 7.) Further, LAFCo in December of 2006 decided not to proceed with a "policy update," determining that existing policies were adequate.

Section 5.4.3 of the DEIR provides a thorough discussion of the project's consistency with LAFCo's policies, standards, and procedures as they currently exist. LAFCO will determine the project's consistency with its own policies and any associated impacts.

R9-34 The comment addresses the agriculture section of the DEIR. The agriculture section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1.

The comment states that the project is inconsistent with LAFCo policies related to the planned, orderly, and efficient development of an area. Specifically, the comment cites the LAFCo policy related to the time in which an area should be developed following a change in organization. The commenter mischaracterizes LAFCo's policy to imply that such development must be completed within 5 years. The policy actually states that LAFCo will approve a change of organization or reorganization that will result in the conversion of prime agricultural land in open space use to other uses if it finds, among other things, that "[d]evelopment of all or a substantial portion of the subject land is likely to occur within 5 years. *In the case of very large developments, annexation should be phased wherever feasible. If the Commission finds phasing infeasible for specific reasons, it may approve annexation if all or a substantial portion of the subject land is likely to develop within a reasonable period of time.*" (DEIR p. 5-5, emphasis added.) Thus, contrary to the comment's assertion, LAFCo policy does not require all land proposed to be fully developed within 5-years of project approval. Indeed, such a draconian requirement would make development of large projects, such as Greenbriar, nearly impossible to approve. Moreover, the applicants expect to commence construction in 2010, or once SAFCA has commenced construction of the 100 year flood protection plan.

As stated in the DEIR, the project is expected to be built out within 6 years of the beginning of construction. (DEIR, p. 5-11.) Such a schedule is a reasonable amount of time for a large scale development such as Greenbriar.

Regarding FEMA's Flood Insurance Rate Map, please refer to Master Response 1.

R9-35 The comment addresses the agriculture section of the DEIR. The agriculture section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1.

The comment questions the DEIR's discussion of project consistency with LAFCo's policies related to agricultural land conversion. LAFCo policies require the determination of whether the project would have a significant adverse effect on the physical and economic integrity of agricultural lands. (DEIR, p. 5-11.) LAFCo and the City will make this determination and decide whether the project is consistent with the LAFCo policies related to agricultural land conversion. The EIR is a tool used by LAFCo as lead or responsible agency to determine the effects on the environment when balancing requests for SOI amendments and changes of organization.

The project site is surrounded by development on three sides. 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. Moreover, the commenter's suggestion that the project area remain in agriculture is inconsistent with RT's objective of completing the DNA line between downtown and the airport, and passing through the Greenbriar site.

The comment cites several projects currently seeking entitlements from the City and states that additional housing is not needed at this time. The City is aware of all of the current and pending projects that are being considered and still believes that there is a need for the project. The City's determination is based upon the projections in its General Plan and General Plan update, as well as the County's General Plan update and the SACOG Blueprint. The City's General Plan update anticipates a need for 35,394 (base) or 144,893 (draft preferred blueprint scenario) additional units by year 2050; the County's General Plan update anticipates a need for 406,696 (base) or 498,698 (draft preferred blueprint scenario) additional units by year 2050; the SACOG Blueprint assumes growth in the region that would demand an additional 3,817,000 units by 2050.

The comment offers no evidence in support of the opinion that no additional housing is needed at this time.

R9-36 The comment addresses the agriculture section of the DEIR. The agriculture section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1.

LAFCos were created to oversee local agency changes of organization and are authorized by the Act to consider preservation of open space and agricultural land, as well as the efficient provision of services in making their determinations regarding changes of organization. While LAFCo has the power to impose conditions on changes of organization, they may only act within the parameters of the powers granted by statute. (*Timberidge Enterprises, Inc. v. City of Santa Rosa* (1978)86 Cal. App. 3d 873, 884; *City of Ceres v. City of Modesto* (1969) 274 Cal.App.2d 545, 550.) Further, CEQA does not expand the powers granted by the Act to allow imposition of mitigation measures that are beyond the scope of LAFCo's authority. (See *Sierra Club v. California Coastal Commission* (2005) 35 Cal.4th 839, 859 (CEQA confers no independent authority).) In order to fulfill CEQA's requirement that feasible mitigating actions be taken, a public agency is required to select from the various powers which have been conferred upon it by other law, those which it determines may be

appropriately and legally exercised. LAFCo policies require the determination of whether the project would have a significant adverse effect in the physical and economic integrity of agricultural lands (see DEIR p. 5-11).

R9-37 The comment addresses the agriculture section of the DEIR. The agriculture section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1.

As described in the DEIR, implementation of Mitigation Measure 6.11-1 would substantially lessen significant impacts associated with the conversion of farmland on the project site because LAFCo would only approve the conversion of agricultural land where it is consistent with conservation policies. Further, the project would conserve open space and habitat land some of which would be used for agricultural practices at a ratio consistent with the mitigation ratio identified in the City/Count Joint Vision Plan MOU. (DEIR, p. 6.11-7.) The DEIR adequately analyzes impacts associated with loss of agricultural lands. Please also refer to response to comment R9-31.

R9-38 The comment addresses the agriculture section of the DEIR. The agriculture section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1.

As described above, implementation of Mitigation Measure 6.11-1 would mitigate for the conversion of agricultural lands through conservation of open space and habitat land, some of which would be used for agricultural practices at a ratio consistent with the mitigation ratio identified in the City/Count Joint Vision Plan MOU. (DEIR, p. 6.11-7, 6.6-12.) Please also refer to response to comment R9-31, which discusses Mitigation Measure 6.12-1 and the project applicant's dedication of lands in agricultural production to the Natomas Basin Conservancy for management as habitat preserves.

The comment questions whether impacts to agricultural land can be adequately mitigated with conservation of lands that will also serve as mitigation for impacts associated with loss of open space and habitat. This so-called "stacking" of mitigation is appropriate where substantial evidence shows that the mitigation will reduce impacts for each of its intended purposes. (*San Bernardino Audubon Society v. Metropolitan Water Dist.* (1999) 71 Cal.App.4th 382.)

Here, the project applicant will coordinate with the City to identify appropriate lands to be set aside in permanent conservation easements at a ratio of one open space acre converted to urban land use to one-half open space acre and at a ratio of one habitat acre converted to urban land use to one-half open habitat acre preserved consistent with the Joint Vision MOU. The total acres of land conserved will be based on final site maps indicating the total on-site open space and habitat converted. (DEIR, p. 6.6-12.) In any event, the mitigation ratio will be consistent with the mitigation ratios identified in the City/Count Joint Vision Plan MOU, which will be provided prior to annexation. (DEIR, p. 6.11-7.)

These lands will serve to mitigate for the loss of agricultural land where appropriate. The DEIR recognizes that because the conservation easements described above will be purchased for land exhibiting benefits to wildlife, including a combination of habitat, open space, and agricultural lands, the mitigation would not be applied exclusively to agricultural lands and that therefore, this mitigation would only partially offset conversions of agricultural lands associated with the project impacts. (DEIR, p. 6.11-8.) The DEIR adequately analyzes impacts associated with the conversion of agricultural lands for purposes of CEQA.

R9-39 The comment does not raise any issues related to the environmental analysis provided in the RDEIR; therefore, no further response is necessary.

R9-40 The comment addresses the agriculture section of the DEIR. The agriculture section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1. Please also refer to response to comment R9-38.

R9-41 The comment does not raise any issues related to the environmental analysis provided in the RDEIR; therefore, no further response is necessary. Regarding the land classification systems used in the analysis of agricultural impacts, the EIR identifies the methodology used to evaluate the impacts and the thresholds against which the impacts will be measured consistent with the requirements of CEQA. CEQA does not require an agency to cite all other alternative methodologies that could be used to evaluate agricultural resources impacts.

R9-42 Regarding approval of the agricultural evaluation presented in the DEIR, the Department of Conservation was distributed a copy of the DEIR for the project by the State of California, Office of Planning and Research, State Clearinghouse. To date, no comments have bee received from the Department of Conservation. Please refer to response to comment R9-41.

R9-43 The comment addresses the biological resources section of the DEIR. The biological resources section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1. Please also refer to responses to comment letter 29.

R9-44 The comment addresses the biological resources section of the DEIR. The biological resources section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1. Please also refer to response to comment 1-5.

R9-45 The comment addresses the biological resources section of the DEIR. The biological resources section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1. Please also refer to response to comment 1-5.

R9-46 The comment addresses the biological resources section of the DEIR. The biological resources section was not recirculated and is not included in the RDEIR. Please refer to response to comments R9-1 and 1-5.

R9-47 The comment addresses the biological resources section of the DEIR. The biological resources section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1. Please refer to response to comment 1-5.

R9-48 The comment addresses the biological resources section of the DEIR. The biological resources section was not recirculated and is not included in the RDEIR. Please refer to response to comments R9-1 and 1-5.

R9-49 The comment addresses the biological resources section of the DEIR. The biological resources section was not recirculated and is not included in the RDEIR. Please refer to response to comment R9-1.

The Natomas Joint Vision MOU policy requires the provision of permanent open space in the Natomas area through conservation easements at a 1:1 mitigation ration (comprised of half-to-one ration for habitat and half-to-one for open space). Mitigation Measure 6.6-2 require the project applicant to coordinate with the City of Sacramento to identify appropriate lands to set aside in permanent conservation easements for open space in accordance with the Natomas Joint Vision open space policy.

The comment questions the consideration of parks, bicycle paths, and detention basins within the project as open space for purposes of meeting the required open space mitigation. The Sacramento City Council and the Sacramento County Board of Supervisors have agreed to this interpretation of open space and believe that it is appropriate to include on-site open space areas in the calculation of mitigation credit.

See also response to comment R9-31 for a discussion of the project applicant's dedication of lands to the Natomas Basin Conservancy for management as habitat preserve.

R9-50 The comment refers to text on Page 6.2-28 which discusses average residence time in California. This is just a statement and no adjustments (i.e., ratio of this duration to a 70-year lifetime) were taken in the preparation of the health risk assessment and thus were in no way reflected in the results.

R9-51 Please refer to response to comment R7-13.

R10

SUTTER COUNTY
COMMUNITY SERVICES DEPARTMENT

Animal Control
Building Inspection
Emergency Services
Environmental Health
Fire Services
Planning

Rich Hall, Director
Larry Bagley, Assistant Director,
Permitting Services
Chuck Vanevenhoven,
Fire Services
John DeBeaux,
Emergency Services

January 2, 2007

Don Lockhart, Assistant Executive Officer
Sacramento LAFCO
1112 I Street
Sacramento CA 95814

Tom Buford, Senior Planner
North Permit Center
2101 Arena Boulevard, Second Floor
Sacramento CA 95834

Re: Recirculated Draft Environmental Impact Report for the Greenbriar Project (P05-069)

Dear Mr. Lockhart and Mr. Buford:

The County of Sutter thanks you for the opportunity to review and comment on the Greenbriar project. After reviewing the document, Sutter County offers the following comments: R10-1

As a signatory to the Natomas Basin Habitat Conservation Plan (NBHCP), Sutter County has serious concerns regarding this project and its potential to jeopardize the validity of the NBHCP. Under the NBHCP, Sutter County and the City of Sacramento are allowed a designated amount of development within specific areas in exchange for the preservation of habitat lands for threatened and endangered species. The Severability section of the NBHCP states that if one of the plan's participants has its permits revoked for failure to comply with the NBHCP, the essential effect to the implementation of the NBHCP is that less Authorized Development is covered by the plan. R10-2

Chapter 5 of the DEIR fails to include a separate and distinct section analyzing the project's consistency with the NBHCP policies, although other adopted plans are addressed. R10-3

On page 6.12-9 the DEIR correctly states that approval of the project would constitute a significant departure from the NBHCP's Operating Conservation Plan, and could trigger a reevaluation of the NBHCP. As a signatory to the NBHCP, this is unacceptable to R10-4

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Sutter County, since approval of this project places the integrity of the NBHCP in jeopardy, and could impact Sutter County's ability to develop within its own permitted development area. R10-4 Cont'd

In summary, the topics discussed above are of paramount concern to the County of Sutter. This project lies outside of the boundaries designated in the NBHCP for development. The spheres of influence for the City of Sacramento and Sacramento County Regional Sanitation District should not be modified to accommodate growth which is neither contemplated nor permitted by the NBHCP. Sutter County cannot support a proposal that may undermine the adopted NBHCP, or potentially could threaten Sutter County's ability to develop within its permitted development area. Accordingly, Sutter County strongly encourages Sacramento LAFCO to weigh this matter carefully as it contemplates this proposal. R10-5

Please provide this office with all future notices regarding this project.

Sincerely,

Doug Libby, AICP
Senior Planner

DL:dh

P:\Planning\Projects - Misc\Greenbriar Project in Sacramento County

LETTER R10

Sutter County Community Services Department
Doug Libby, AICP
January 2, 2007

R10-1 The comment does not raise any issues related to the environmental analysis provided in the RDEIR; therefore, no further response is necessary.

R10-2 Please refer to response to comments 1-4 and 1-5 for a discussion of the project's compliance with the requirements of the Natomas Basin Habitat Conservation Plan (NBHCP). Because the comment does not raise any issues related to the environmental analysis provided in the RDEIR, no further response is necessary.

R10-3 The DEIR provides a comprehensive analysis of the project's consistency with the NBHCP in Impact 4-12-9 of the DEIR (page 6.12-38).

R10-4 Please refer to response to comment 1-4 and 1-5 for a discussion of the project's compliance with the requirements of the Natomas Basin Habitat Conservation Plan (NBHCP). Because the comment does not raise any issues related to the environmental analysis provided in the RDEIR, no further response is necessary.

R10-5 Please refer to response to comments 1-4 and 1-5 for a discussion of the project's compliance with the requirements of the Natomas Basin Habitat Conservation Plan (NBHCP). Because the comment does not raise any issues related to the environmental analysis provided in the RDEIR, no further response is necessary.

6 COMMENTS AND RESPONSES ON THE SECOND RDEIR

The written and oral comments received on the Second RDEIR and the responses to significant environmental points raised in those comments are provided in this section. Each comment letter and the public hearing transcript is reproduced in its entirety and is followed by responses to comments raised in them. Each individual comment is assigned a number (e.g., 1-1) that corresponds with the response following the comment.

S1

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

:HWARZENEGGER
'ERNOR

CYNTHIA BRYANT
DIRECTOR

May 29, 2007

Tom Buford
City of Sacramento, Sacramento LAFCo
North Permit Center
2101 Arena Boulevard, 2nd Floor
Sacramento, CA 95834

Subject: Greenbriar Development Project (P05-069)
SCH#: 2005062144

Dear Tom Buford:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. The review period closed on May 25, 2007, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

S1-1

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

Document Details Report
State Clearinghouse Data Base

SCH# 2005062144
Project Title Greenbriar Development Project (P05-069)
Lead Agency Sacramento, City of

Type EIR Draft EIR

Description The proposed project would amend the City's sphere of influence to include the 577-acre project site, annex the site to the City and result in detachment from other districts, and would construct a residential and commercial mixed use development on the site.

Lead Agency Contact

Name Tom Buford
Agency City of Sacramento, Sacramento LAFCo
Phone (916) 808-7931 **Fax**
email
Address North Permit Center
2101 Arena Boulevard, 2nd Floor
City Sacramento **State** CA **Zip** 95834

Project Location

County Sacramento
City
Region
Cross Streets Elkhorn Boulevard and Highway 99
Parcel No. 225-0800-002, 003, 004, 015 to-018, 021 to 038
Township **Range** **Section** **Base**

Proximity to:

Highways SR 99, I-5
Airports Sacramento International
Railways
Waterways
Schools
Land Use Agriculture (AG-80)

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Flood Plain/Flooding; Geologic/Seismic; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife; Growth Inducing; Landuse; Cumulative Effects

Reviewing Agencies Resources Agency; Department of Conservation; Department of Fish and Game, Region 2; Office of Historic Preservation; Department of Parks and Recreation; Reclamation Board; Office of Emergency Services; Caltrans, Division of Aeronautics; California Highway Patrol; Caltrans, District 3; Department of Housing and Community Development; State Water Resources Control Board, Clean Water Program; Regional Water Quality Control Bd., Region 5 (Sacramento); Department of Toxic Substances Control; Native American Heritage Commission

Date Received 04/10/2007 **Start of Review** 04/10/2007 **End of Review** 05/25/2007

LETTER S1

State of California
Office of Planning and Research
Terry Roberts
May 29, 2007

S1-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR; therefore, no further response is necessary.

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 3 – SACRAMENTO AREA OFFICE
VENTURE OAKS – MS 15
P.O. BOX 942874
SACRAMENTO, CA 94274-0001
PHONE (916) 274-0614
FAX (916) 274-0648
TTY (530) 741-4509

S2

Flex your power!
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May 25, 2007

07SAC0054
03-SAC-99 PM 33.180
Greenbriar
Second Recirculated Draft Environmental Impact Report
SCH#2005062144

Mr. Tom Buford
City of Sacramento
2101 Arena Boulevard, Second Floor
Sacramento, CA 95834

Mr. Don Lockhart
Sacramento Local Agency Formation Commission (LAFCO)
1112 I Street, Suite 100
Sacramento, CA 95814

Dear Mr. Buford and Mr. Lockhart:

Thank you for the opportunity to review and comment on the Second Recirculated Draft Environmental Impact Report (DEIR) for the Greenbriar Annexation project. The proposed project includes a request for a Sphere of Influence amendment for the City of Sacramento. Resulting development within the 577 acre project area is anticipated to include 3,473 housing units, approximately 28 net acres of retail and commercial space, one 10-acre elementary school site, eight neighborhood parks, and an overpass over State Route (SR) 99. The project is immediately adjacent to the Interstate 5 (I-5)/SR 99 interchange. Our comments are as follows: S2-1

- Mitigation Measure 6.1-1a: Develop a Financial Plan, is inadequate to address the funding needed to mitigate mainline impacts to Interstate 5 (I-5) and State Route 99 (SR99). The DEIR identifies significant impacts to freeway mainline segments, identifies mitigations that would reduce impacts to a less than significant level, but then finds the impacts to be significant and unavoidable because "no feasible mitigation is available to reduce the project's impacts" on the respective mainline segment. Caltrans disagrees with these findings. The identified mitigations on the mainline freeway segments are feasible and the Financial Plan should be modified to incorporate the mitigation funding. S2-2

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- In the Draft Greenbriar Finance Plan dated July 19, 2006, the funding amount in Table B identified for the Meister Way Overcrossing is approximately $6,500,000. This is an inadequate funding amount to design and construct a vehicle bridge crossing of SR99. Unless the City has substantial additional funding sources for this project, the Finance Plan should be redone. S2-3

- Mitigation Measure 6.1-1b: Meister Way Overcrossing, will require close coordination with Caltrans for the siting, design and construction of the facility. The overcrossing should be designed to span 8 freeway lanes, standard shoulders, and auxiliary or merge lanes. Early consultation between the City and Caltrans will be important to assure that the Meister Way Overcrossing, SR99 widening, and redesign of the I-5/SR99 Interchange are compatible. Both of these highway projects are needed to address increased travel demand created by development within the region. S2-4

- Mitigation Measure 6.1-1c: Elverta Road and SR70/99, will require an encroachment permit. The DEIR's reference to "windshield surveys" of the project area is not an adequate environmental analysis for projects implemented in the State Highway right of way. However, Caltrans, in cooperation with Sacramento County and others is planning to convert this at-grade intersection to a grade separated interchange. The project has been identified for SR99 State Bond funding and mitigation funding from other nearby development projects. Rather than the Greenbriar project implementing a short term restripe at this location, it may be more appropriate for Greenbriar to make a proportional share contribution to the interchange project. Caltrans would be pleased to discuss this with the City and would invite the County to participate in the discussion. S2-5

- Mitigation Measure 6.1-1e: SR70/99 Northbound Ramps and Elkhorn Boulevard, as with other mitigations that involve Caltrans right of way, this mitigation will require an encroachment permit. Early consultation with Caltrans will help ensure the timely implementation of this mitigation. S2-6

- Mitigation Measure 6.1-3c:I-5 Northbound to SR70/99 Northbound off-ramp, is identified as being infeasible and thus the impact significant and unavoidable. Caltrans disagrees. Caltrans considers the identified mitigation to be feasible. There is sufficient right of way and the identified mitigation is consistent with Caltrans planning documents. We do not concur with the highlighted statement that the SR70/99 southbound to I-5 southbound on-ramp operates acceptably based on Caltrans standards. This ramp operates at unacceptable levels during S2-7

peak hours and the Greenbriar project will contribute additional peak hour traffic. Widening of this ramp should be reinstated in the DEIR and proportional mitigation funding provided. Caltrans further disagrees with statements that mitigation is beyond the control of the project applicant, outside the jurisdiction of the City, and the lack of established funding mechanisms as being valid justification for a finding of significant and unavoidable. The City and Caltrans regularly cooperate on projects involving the highway system where funding is accumulated through impacts fees. There are standard means of addressing mitigation implementation that are utilized throughout the State and are currently being used between the City and Caltrans: encroachment permits and cooperative agreements. S2-7 Cont'd

- Mitigation Measure 6.1-4b: I-5 North of Del Paso Road, Caltrans concurs that I-5 in this segment needs to be widened. Such widening is within our planning documents and is considered a necessary and feasible project. Further, there is sufficient right of way to implement such widening. Caltrans disagrees that the impact is significant and unavoidable. S2-8

- Mitigation Measure 6.1-4e:SR70/99 between Elkhorn Boulevard and I-5SR70/99 Interchange, Caltrans disagrees with the statement that we have no plans to expand this segment of SR70/99 beyond its current capacity. Such expansion is consistent with Caltrans planning for this highway segment and is feasible. The Greenbriar Finance Plan should be modified to include proportional share funding for this expansion and other highway mainline mitigations identified in the DEIR. We disagree that these mitigations are infeasible. S2-9

- Impact 6.1-8 Cumulative Freeway Mainline Segment Impacts, Caltrans disagrees with the finding that no feasible mitigation is available to reduce the project's impacts to the mainline segments as identified in the DEIR. The Greenbriar project should contribute proportional share funding to projects to widen SR99 and I-5. Other neighboring projects such as Metro Air Park and the Elverta Plan are providing such mainline mitigation. Greenbriar should also do so. S2-10

- Mitigation Measure 6.1-9 Bicycle and Pedestrian Facilities, Caltrans notes that Item c includes a 10-foot off-street bikeway and landscape buffer that would border the project on the east and south sides. Both of these sides are immediately bordered by highway facilities. In designing these facilities, care should be taken to be sure that the entirety of the new bikeway is clearly visible from the development and not blocked from view of neighboring housing by soundwalls or other features. Failure to provide adequate visibility of the bikepath from dwelling S2-11

units and businesses could help to create an area subject to vandalism, graffiti and other crime. Also, Caltrans is planning to widen both SR99 and I-5 and the SR99/I-5 Interchange will be substantially modified to accommodate additional lanes. Bicyclists and pedestrians generally find it unpleasant to travel immediately adjacent to such facilities. The project may want to reconsider the location of the bikepath and place it internal to the project where it can be used for internal circulation rather than placing the path on the outside border adjacent to the freeway.

S2-11 Cont'd

S2-12

- We commend the Greenbriar project for providing right of way for the proposed DNA Light Rail Line and funding the construction of a station within the development. This will help provide project residents with enhanced access to downtown Sacramento job centers and other regional locations. The DNA line will also provide enhanced access to Greenbriar's proposed retail and commercial space. Caltrans suggests that the project expand its funding commitment to the DNA line so that it can be constructed at an earlier date. If the project were to make a substantial additional contribution to the DNA line in order to partially mitigate impacts to the freeway mainline, Caltrans would like to have the opportunity to review and comment on the methodology used to calculate the funding contribution and the expected reduction in impacts to the freeways.

S2-13

- Caltrans reiterates its observation that the proposed elementary school location is too close to the I-5/SR99 Interchange and the mainlines of those freeways. Based on the Project Site Plan, it appears that the site does not conform to California Department of Education School Site Selection Criteria. We suggest that swapping positions of the school site with the adjacent park site to the immediate north may alleviate part of this problem and minor modifications to the alignment of the school site on its eastern edge away from SR99 will further reduce the problem.

S2-14

If you have any questions about these comments, please contact me at (916) 274-0614 or email bruce_de_terra@dot.ca.gov.

Sincerely,

BRUCE DE TERRA, Chief
Office of Transportation Planning—South

"Caltrans improves mobility across California"

LETTER S2

California Department of Transportation
Office of Transportation Planning - South
Bruce De Terra
Chief
May 25, 2007

S2-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

S2-2 Please refer to response to comment 3-3.

S2-3 As described in the approved Project Study Report (PSR), *Elkhorn Boulevard Interchange Modification, Elverta Road Interchange, and Meister Way Overcrossing,"* dated June 1999, the costs associated with construction of the Meister Way overpass were estimated to be approximately $3,612,000. Because time has passed since the preparation of that document and construction costs of risen, the applicants have prepared a revised estimate dated July 4, 2007. The cost for the Meister Way overpass is estimated to be $8,273,936 in 2007 dollars (based on a cost index of 1.414 and a 35% contingency of $2,145,095). The project applicant is committed to paying its fair share of the proposed overpass based on the financial cost projections outlined below and in the Revised Draft Greenbriar Finance Plan (included as Appendix E of this document).

S2-4 The City and the project applicant will coordinate with Caltrans in the final design and siting of the proposed Meister Way overpass to ensure its compatibility with the future improvements to SR 70/99 and the I-5/SR70/99 interchange.

S2-5 The City and project applicant will coordinate with Caltrans to understand the timing of implementing Caltrans' proposed improvements to the Elverta Road and SR 70/99 interchange. If it is determined that the proposed improvement would be in place prior to the issuance of the first occupancy permit for the project site, then the applicant will contribute funds that are dedicated toward the lane restriping as identified in Mitigation Measure 6.1-1c. If the interchange improvement project would not be implemented prior to issuance of the first occupancy permit, then Mitigation Measure 6.1-1c would be implemented to improve the LOS of this intersection to an acceptable level.

Regarding reference to windshield surveys, the DEIR and Second DEIR identifies several mitigation measures that would require the construction of off-site improvements. Consistent with the requirements of Section 15126.4 (1) (D) of the CEQA Guidelines, the DEIR describes the potential environmental effects that are likely to occur. However, the CEQA Guidelines specifically state that "the effects of the mitigation shall be discussed, but in less detail than the significant effects of the project as proposed." The City and LAFCo acknowledge that once specific details regarding the proposed off-site improvements become known, additional environmental review focusing on the specific elements of those projects would need to be conducted by the appropriate lead agency. In the case of Mitigation Measure 6.1-1c, Caltrans would be the agency responsible for overseeing the preparation of such analysis. The DEIR and Second DEIR have been prepared consistent with the requirements of CEQA and the CEQA Guidelines.

S2-6 The City and the project applicant will coordinate with Caltrans in the final design and siting of the proposed traffic signal at the SR70/99 Northbound Ramps and Elkhorn Boulevard. All necessary encroachment permits will be secured from Caltrans prior to implementation of this improvement.

S2-7 Regarding proposed mitigation for the SR 70/99 Southbound to I-5 Southbound on-ramp, please refer to the enhanced mitigation program discussed in response to comment 3-3. The City and LAFCo acknowledge that there are procedures and mechanisms in place to allow the agencies to coordinate with Caltrans to implement improvements within Caltrans' jurisdiction. The City and LAFCo intend to coordinate with Caltrans in the implementation of all mitigation measures that fall within their jurisdiction.

As described in response to comment 3-3, an enhanced mitigation program would be implemented to address specific improvements along SR 70/99 and I-5. Please refer to response to comment 3-3. These improvements are intended to reduce congestion along the segments of freeway near the project site. However, even with implementation of these improvements, the LOS of these freeway segments would continue to remain unacceptable. As such, while traffic impacts would be improved with implementation of the identified mitigation, this mitigation would not reduce the project's impact to a less-than-significant level. Without the full implementation of mitigation measure 6.1-3c, impacts to the SR 70/99 Southbound to I-5 Southbound on-ramp would remain significant and unavoidable.

Regarding the commenter's disagreement with the conclusions of the EIR, please refer to Master Response 3.

S2-8 Regarding the proposed mitigation for the segment of I-5 north of Del Paso Road, please refer to response to comment 3-3. The City has reviewed and enhanced the applicant's fair-share contribution requirements that would provide for improvements along the I-5 corridor to help alleviate regional congestion that occurs in this area including the segment of I-5 north of Del Paso Road. While these enhanced funding requirements would help to implement the improvements that would reduce the project's traffic-related impacts, these improvements would not fully mitigate the impacts of the project to this freeway segment to a less-than-significant level nor would they be implemented prior to issuance of the first occupancy permit at the Greenbriar site. Therefore, the conclusion that impacts to the segment of I-5 north of Del Paso Road are significant and unavoidable is correct.

S2-9 Regarding the proposed mitigation for the segment of SR 70/99 between Elkhorn Boulevard and I-5/SR 70/99, please refer to response to comment 3-3. The City has reviewed and enhanced the applicant's fair-share contribution requirements that would provide for improvements along the SR 70/99 corridor to help alleviate regional congestion that occurs in this area including the segment of SR 70/99 between Elkhorn Boulevard and I-5/SR 70/99. While these enhanced funding requirements would help to implement the improvements that would reduce the project's traffic-related impacts, these improvements would not fully mitigate the impacts of the project to this freeway segment to a less-than-significant level nor would they be implemented prior to issuance of the first occupancy permit at the Greenbriar site. Therefore, the conclusion that impacts to the segment of SR 70/99 between Elkhorn Boulevard and I-5/SR 70/99 are significant and unavoidable is correct.

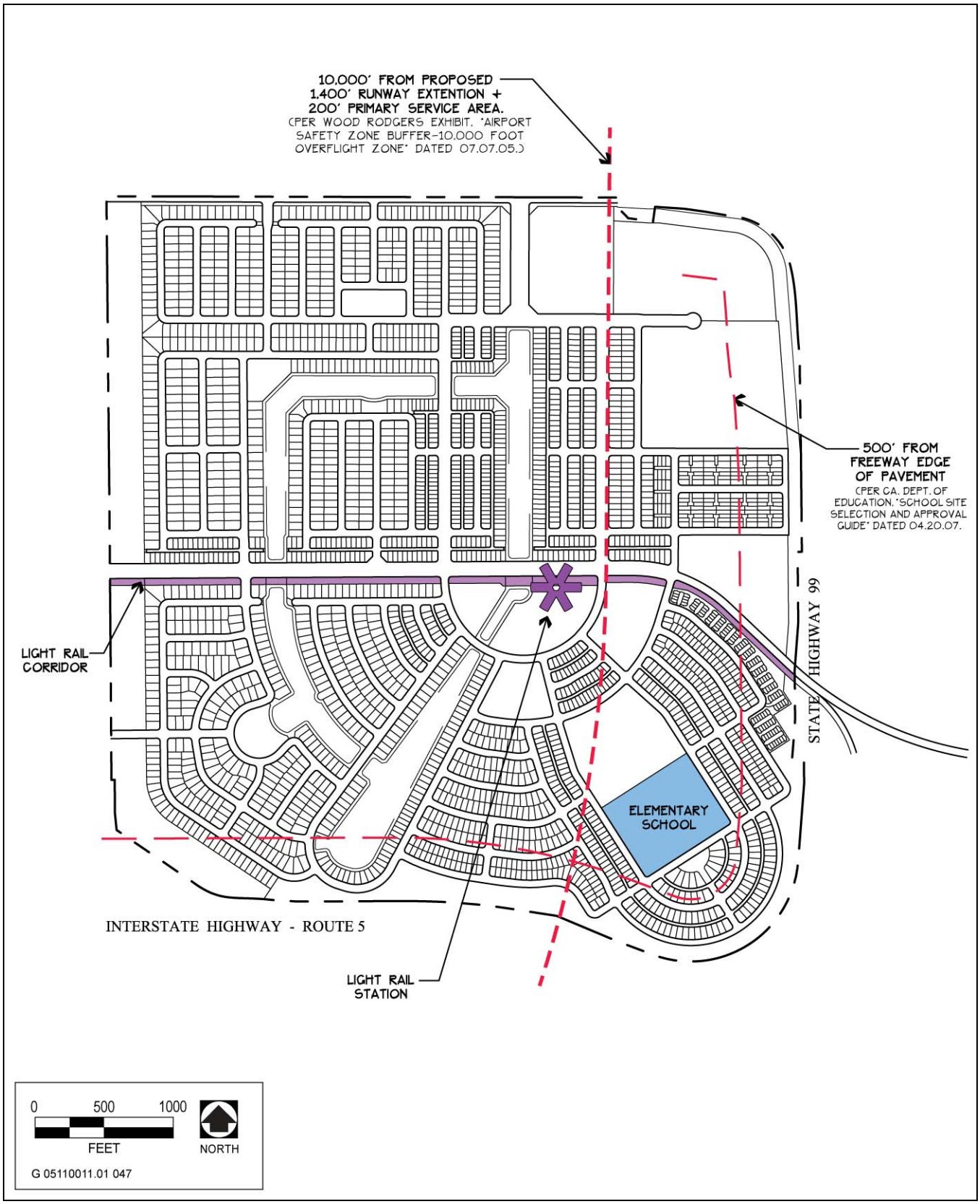
S2-10 Regarding the proposed mitigation for the segments of SR 70/99 and I-5 near the project area, please refer to response to comment 3-3. The City has reviewed and enhanced the applicant's fair-share contribution requirements that would provide for improvements along the SR 70/99 and I-5 corridor to help alleviate regional congestion that occurs in the project area. The Revised Draft Greenbriar Finance Plan (included as Appendix E of this document) has been amended to include then enhanced fair-share contributions.

S2-11 The project applicants will submit their final design plans for proposed bike and trail facilities to the City for review and approval. The proposed bike and trail facilities will comply with all City design standards including requirements for providing adequate sighting and setback from adjacent land uses.

S2-12 The commenter's suggestion for the proposed location of on-site bike paths is noted and will be considered by the City during its review of the merits of the project.

S2-13 Regarding additional funding commitments to the DNA light rail line please refer to response to comment 3-3.

S2-14 Regarding the location of the proposed elementary school, please refer to response to comment 3-7. Alternatives to the location of the school site on the Greenbriar site are not feasible because of other constraining factors at the project site including: requirements of the Sacramento International Airport Comprehensive Land Use Plan and setback requirements associated with diesel emissions from freeway facilities. Exhibit S2-1 presents the constraints associated with siting the school facility at Greenbriar.



Source: Wood Rodgers 2007

School Location Constraints Exhibit **Exhibit S2-1**

S3

WILLIAM D. KOPPER
Attorney at Law
417 E Street
Davis, California 95616
(530) 758-0757
Fax (530) 758-2844

Paralegal
Kristin Rauh

FACSIMILE COVER SHEET

We are sending __12___ pages (including this cover sheet).

This information is for:	Mr. Tom Buford City of Sacramento
Address:	Development Services Department Environmental Planning Services
Telephone:	Fax: (916) 808-3968
Regarding:	Greenbriar Development Project Second Recirculated DEIR
From:	Kristin Rauh Paralegal
Date:	May 24, 2007

MESSAGE:

See attached comments.

IF YOU DO NOT RECEIVE ALL OF THE PAGES OR IF THEY ARE ILLEGIBLE, PLEASE CALL US AT THE ABOVE TELEPHONE NUMBER.

UPON RECEIPT, PLEASE CALL TO VERIFY TRANSMISSION: Yes __ No __

ORIGINAL WILL _x_ WILL NOT ____ FOLLOW BY MAIL.

WILLIAM D. KOPPER

Attorney at Law
417 E Street
Davis, CA 95616
(530) 758-0757
Fax (530) 758-2844

Paralegal
Kristin Rauh

May 23, 2007

VIA FACSIMILE (916) 808-3968
AND FIRST CLASS MAIL

Mr. Tom Buford
City of Sacramento
Development Services Department
Environmental Planning Services
2101 Arena Blvd., 2nd Floor
Sacramento, CA 95834

RE: Greenbriar Development Project Second Recirculated DEIR

Dear Mr. Buford:

I represent Rudolph L. Bargas, Jacob C. Snyder and Charles T. Link, all residents of the City of Sacramento. These are their comments on the Greenbriar Development Project Second Recirculated Draft Environmental Impact Report. We incorporate the comments of all other individuals and entities into these comments. My clients oppose the project. Our comments at this point in time include the traffic comments of Mr. Neal Liddicoat which are attached.

S3-1

Sincerely,

WILLIAM D. KOPPER

WDK:kgr
enclosure

MRO
ENGINEERS
2202 Plaza Drive
Rocklin, California
95765-4403
Phone (916) 783-3838
Fax (916) 783-5003
www.mroengineers.com

May 23, 2007

Mr. William D. Kopper
Attorney at Law
417 E Street
Davis, California 95616

Subject: Transportation and Circulation Analysis for the Greenbriar Development Project; *Second Recirculated Draft Environmental Impact Report*; Sacramento County, California

Dear Mr. Kopper:

In a letter dated September 2, 2006, MRO Engineers, Inc., documented the results of our review of the transportation and circulation analysis presented in the Draft Environmental Impact Report (DEIR) for the proposed Greenbriar Development Project in Sacramento County, California. Since that time, the City of Sacramento and the Sacramento Local Agency Formation Commission (LAFCO) have, on two occasions, recognized shortcomings in the environmental documentation, based on comments submitted in the course of the public review and comment period. In each case, the deficiencies were sufficient to require recirculation of the DEIR. The "Second RDEIR," which is currently available for public review, focuses on issues associated with the project's transportation and circulation analysis. (Reference: EDAW, *Greenbriar Development Project - Sacramento, California – Second Recirculated Draft Environmental Impact Report*. April 2007.) This letter report presents the results of our review of that document. S3-2

Background

The various versions of the Greenbriar DEIR incorporated transportation and circulation analyses conducted by TJKM. Those analyses addressed the impacts of the proposed development at existing and future intersections, roadway segments, freeway segments, and freeway ramps in the vicinity of the proposed project. Moreover, the analyses indicated that completion of the proposed Greenbriar Development Project will result in "Significant and Unavoidable" impacts at many of the study intersections and roadway segments, with unmitigated degradation in level of service at those locations. S3-3

As described below, our review of the current document (i.e., the Second RDEIR) revealed that the traffic analysis fails to fully evaluate the impacts of the proposed project on the study area roadway system. The specific issues that we identified are summarized in the following sections. S3-4

In addition, we noted that many of the issues that we had previously identified are unresolved by the additional work that has been performed since the original DEIR was issued for public review. Those issues are briefly summarized later in this letter.

Review of Second RDEIR

Although the land use plan for the proposed Greenbriar Development Project is unchanged, the Second RDEIR incorporates a revised "Transportation and Circulation" analysis. The revised analysis purports to have addressed errors in the trip generation estimate for the proposed project. However, as described below, the current trip estimate remains flawed. In addition, the document presents modified analysis results for cumulative conditions, reflecting the incorporation of several S3-5

Project Funding
Roadway Design
Site Development
Traffic Engineering
Transportation Planning
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additional background development projects. The revised cumulative conditions analyses address traffic operations on the study roadway segments, freeway mainline segments, and freeway ramps, but no revised intersection analyses were conducted. As described below, this represents a substantial flaw in the environmental document. Table 1 summarizes the modifications to the traffic analysis incorporated into the Second RDEIR.

Table 1
Second RDEIR Traffic Analysis Modifications

	Analysis Scenario			
Analysis Component	Baseline	Baseline + Project	Cumulative Conditions	Cumulative + Project
Intersections	Unchanged	Unchanged	Unchanged	Unchanged
Roadway Segments	Unchanged	Unchanged	Modified	Modified
Freeway Ramps	Unchanged	Unchanged	Modified	Modified
Freeway Mainline	Unchanged	Unchanged	Modified	Modified

Reference: EDAW, *Greenbriar Development Project - Sacramento, California - Second Recirculated Draft Environmental Impact Report*, April 2007.

S3-5 Cont'd

The decision not to perform additional intersection analyses (for either baseline or cumulative conditions) is a particular concern, as it was based on the mistaken conclusion that the proposed project (although unchanged) would generate almost 1,200 fewer daily trips than had previously been determined. The Second RDEIR suggests that this is true, ". . . even with removal of the 11% LRT discount." However, the comparison that results in a difference of 1,200 daily trips is incorrect, as it does not include consideration of the unrealistic LRT discount. Moreover, the revised trip generation estimate cited in the Second RDEIR (and documented in Table 6.1-20, page 6.1-29) is, once again, in error. These issues are addressed in detail below.

Project Trip Generation Estimate

The Second RDEIR states (on page 6.1-28) that, ". . . the trip generation calculation was revised to use the ITE equations instead of the trip rates used in the DEIR because the ITE Trip Generation Handbook recommends the use of regression equations when available." This statement is only partially true, as the *Trip Generation Handbook*, in reality, provides several criteria to be considered in determining whether to use the weighted average rates or the regression equations; the availability of a regression equation is just one consideration. In addition to that, consideration must be given to sample size, the range of the available data (and whether the proposed project falls within that range), and various statistical measures. Attachment A presents the relevant page from the ITE *Trip Generation Handbook*, summarizing the recommended criteria for selection of the appropriate trip generation estimation procedure.

S3-6

Of particular importance is the statistical R^2 value, which provides an indication of the degree of correlation between the number of trips generated and the particular value measured by the independent variable. Specifically, the *Trip Generation Handbook* recommends that a regression equation only be used when the R^2 value for the equation is equal to or greater than 0.75. Detailed review of the trip generation estimate presented in the Second RDEIR reveals that equations with R^2 values as low as 0.50 - 0.52 (for the "Elementary School" and the "Retail/Major Grocery" land use) were employed in deriving the estimate.

Beyond the statistical nuances of the trip generation estimation procedure, there is the matter of providing a conservative analysis of project-related impacts. The traffic analysis presented in the Second RDEIR fails in this regard. It appears that, rather than develop a conservative trip

S3-7

generation estimate, an attempt has been made to minimize the estimated volume of traffic associated with the proposed project. This is contrary to the standard approach to traffic impact analysis employed by most traffic engineers.

As an example to illustrate this point, Table 2 summarizes our estimate of daily traffic associated with the proposed Greenbriar project. Generally, it follows the approach used in the various environmental analyses, including most of the adjustments for non-auto travel and internal trips. Only the adjustment for light rail transit usage has been excluded, as it has been determined that such an adjustment is unrealistic and inappropriate. Also shown in Table 2 are the daily trip generation estimates presented in the Second RDEIR.

Table 2
Daily Trip Generation Estimate Comparison

Land Use	Size	Daily Trip Estimate	
		MRO Engineers[1]	Second RDEIR[2]
Single-family Residential (Low Density)	671 DU[3]	6,421	5,991
Single-family Residential (Medium Density)	2,215 DU	12,980	8,933
Single-family Residential (High Density)	587 DU	3,945	3,678
Residential Subtotal		*23,346*	*18,603*
Elementary School	800 Students	1,032	1,032
Retail	263 KSF[4]	12,732	12,732
Retail/Major Grocery	67 KSF	6,850	5,877
Meister Retail	29.7 KSF	3,085	3,085
Meister Retail/Restaurant	14 KSF	1,780	1,780
Non-Residential Subtotal		*24,479*	*24,506*
TOTAL		**48,825**	**43,109**
RESIDENTIAL TRAVEL DISCOUNTS			
Transit (1%)		(233)	(186)
Walk (2%)		(467)	(372)
Bike (1%)		(233)	(186)
OTHER TRAVEL MODE DISCOUNTS			
Retail Transit (0.3%)		(59)	(56)
Meister Retail Transit (0.3%)		(15)	(15)
Subtotal		*(1,007)*	*(815)*
RESIDENTIAL LINKED TRIPS DISCOUNTS			
Elementary School (8% - AM Only)		(145)	(0)
Retail (10%)		(2,335)	(2,347)
Subtotal		*(2,480)*	*(2,347)*
TOTAL AUTO TRIPS		**45,338**	**39,947**

Notes:
1 Reference: Institute of Transportation Engineers, *Trip Generation*, Seventh Edition, 2003.
2 Reference: EDAW, *Greenbriar Development Project - Sacramento, California – Second Recirculated Draft Environmental Impact Report*, April 2007.
3 Dwelling units.
4 Square feet, in thousands.

S3-7
Cont'd

As shown in Table 2, the proposed project would generate over 45,000 daily auto trips. This corrected estimate is almost 5,400 more trips than were considered in the Second RDEIR, with most of that difference accounted for by the residential land uses. In fact, our estimate indicates slightly lower trip generation for the non-residential land uses. (It is interesting to note that the residential trip generation estimate presented in the DEIR matched our current estimate of 23,346 daily trips. The reason for changing to an approach that substantially reduced the estimated volume of residential traffic (to only 18,603 daily trips in the Second RDEIR) is unclear.)

S3-7 Cont'd

Based, in part, on the faulty trip generation analysis presented in the environmental documents, the Second RDEIR concluded that no re-analysis of intersection, roadway segment, or freeway operations was required under baseline conditions. Use of the corrected (and higher) trip generation estimate documented above would almost certainly indicate greater traffic impacts on the roadways, freeways, and freeway ramps serving the site.

S3-8

The analysis must be revised to reflect the greater number of project-generated trips described here. (As noted above, the DEIR employed a residential trip estimate that matched our figure. Incorporating the original residential trip estimate into the next iteration of the analysis would result in an overall trip generation estimate that is much closer to the value that we found. This would, in turn, provide a more accurate, more conservative indication of project-related traffic impacts.)

S3-9

Cumulative Conditions Analysis

As shown in Table 1, no re-analysis of intersection operations was conducted for cumulative conditions. This is addressed in detail below.

In addition to the trip generation deficiencies delineated above, another factor comes into play when considering the cumulative conditions traffic analysis. Specifically, the revised analysis includes the traffic associated with three additional local development projects and seven more regional development projects. Despite the large number of vehicle-trips associated with these ten projects, the Second RDEIR includes no additional analysis of intersection operations under cumulative conditions (although revised analyses of freeway mainline, freeway ramp, and roadway segment operations were provided). In fact, page 6.1-1 of the Second RDEIR states the following:

> *Because the regional cumulative projects are not located within the City and are distant from the Greenbriar project site, traffic trips contributed by these projects would affect the regional freeway facilities (e.g., mainline segments and off ramps), but impacts to roadways and intersections would not be expected to be substantially different from that described in the DEIR. Therefore, the DEIR analysis of the project's cumulative impacts to roadways and intersections is sufficient and does not require re-modeling.*

S3-10

To test this conclusion, we compared selected "Cumulative Conditions" traffic volumes in the Second RDEIR to equivalent values in the DEIR. Table 3 summarizes that comparison, which clearly demonstrates that key study roadway segments have substantially higher traffic volumes with the addition of the ten local and regional projects. Particularly noteworthy are the segments of Elkhorn Boulevard west of SR 70/99 and Metro Air Parkway north of I-5. Increases in the range of 6,000 – 10,000 vehicles per day on those road segments indicate conclusively that substantial additional traffic will pass through several study intersections, including (at a minimum):

- Elkhorn Boulevard/Lone Tree Road,
- SR 99 Southbound Ramps/Elkhorn Boulevard,
- SR 99 Northbound Ramps/Elkhorn Boulevard,
- I-5 Northbound Ramps/Metro Air Parkway,
- I-5 Southbound Ramps/Metro Air Parkway,
- Meister Way/Lone Tree Road,
- Meister Way/East Commerce Way,
- Meister Way/Metro Air Parkway,
- Elkhorn Boulevard/Project Street 1,
- Elkhorn Boulevard/Project Street 2, and
- Elkhorn Boulevard/Project Street 3.

S3-10 Cont'd

Table 3
Traffic Volume Comparison – Roadway Segments
Cumulative (2025) Plus Project

Roadway Segment	Daily Traffic Volume		
	DEIR[1]	Second RDEIR[2]	Difference
Elkhorn Blvd. west of SR 70/99 Interchange	59,995	66,272	+6,277
Lone Tree Rd. south of Elkhorn Blvd.	20,802	22,320	+1,518
Metro Air Parkway north of I-5 Interchange	81,081	90,391	+9,310
Meister Way west of SR 70/99	17,198	18,460	+1,262

Notes:
1 Reference: EDAW, *Greenbriar Development Project - Sacramento, California - Draft Environmental Impact Report*, July 2006.
2 Reference: EDAW, *Greenbriar Development Project - Sacramento, California – Second Recirculated Draft Environmental Impact Report*, April 2007.

Table 4 provides similar information for key freeway ramps near the project site, in the AM and PM peak hours. The increase in traffic evident in the Second RDEIR analysis once again suggests that additional impacts will be found at study intersections along Elverta Road, Elkhorn Boulevard, and Metro Air Parkway.

Note that this conclusion regarding the need for additional intersection analyses is based on the trip generation estimate presented in the Second RDEIR. As noted above, the Second RDEIR underestimated the volume of traffic associated with the proposed Greenbriar project. If more realistic trip generation figures were employed, the impacts of the project would be even greater in magnitude and, perhaps, more widespread.

S3-11

Given this information, it is clear that there is simply no valid justification for the failure to provide a revised analysis of traffic operations at the study intersections under cumulative conditions.

Table 4
Traffic Volume Comparison – Freeway Ramps
Cumulative (2025) Plus Project

Ramp	Peak-Hour Traffic Volume		
	DEIR[1]	Second RDEIR[2]	Difference
AM Peak Hour			
Elkhorn Blvd. to Southbound SR 70/99	404	824	+420
Southbound SR 70/99 to Elverta Blvd.	785	1,292	+507
Elverta Blvd. to Southbound SR 70/99	40	437	+397
Metro Air Parkway to I-5 Southbound	521	970	+449
PM Peak Hour			
Northbound SR 70/99 to Elkhorn Blvd.	1,024	1,276	+252
Northbound SR 70/99 to Elverta Blvd.	437	1,017	+580
Southbound SR 70/99 to Elverta Blvd.	256	519	+263
Northbound I-5 to Metro Air Parkway	888	1,223	+335
Metro Air Parkway to Southbound I-5	3,690	4,566	+876

Notes:
1 Reference: EDAW, *Greenbriar Development Project - Sacramento, California - Draft Environmental Impact Report*, July 2006.
2 Reference: EDAW, *Greenbriar Development Project - Sacramento, California - Second Recirculated Draft Environmental Impact Report*, April 2007.

S3-11 Cont'd

Outstanding Traffic Analysis Issues

In our September 2, 2006, letter, we provided thirteen comments, which are briefly summarized below. In general, the deficiencies presented here remain unresolved in the Second RDEIR.

S3-12

1. ***Analysis Methods*** – The level of service analysis procedures for signalized and unsignalized intersections were not in strict conformance with currently-accepted methodologies, as documented in the *Highway Capacity Manual* (Transportation Research Board, 2000).

S3-13

2. ***Level of Service Calculation Worksheets*** – Most of the technical level of service calculation worksheets for the traffic analysis were missing and, therefore, were not available for public review. Consequently, the DEIR failed in its role as an informational document.

S3-14

3. ***Truck Traffic*** – The traffic analysis failed to account for the expected presence of high volumes of truck traffic in the study area, particularly with regard to the industrial land uses included in the approved Metro Air Park project, immediately to the west of the Greenbriar project.

4. ***Roadway Segment Analysis*** – The DEIR inaccurately described the methodology for analysis of roadway segments. Further, the methodology employed is inconsistent with procedures documented in the current edition of the *Highway Capacity Manual*. S3-15

5. ***Freeway Ramp Analysis*** – The DEIR analysis of freeway ramps was inconsistent with the standard *Highway Capacity Manual* procedures, which may lead to understatement of the project's impacts. S3-16

6. ***Freeway Facilities Thresholds of Significance*** – The DEIR stated that Level of Service E (i.e., operation at capacity) is acceptable on key portions of Interstate 5 in the study area, but no reference or documentation was presented to corroborate this assumption. S3-17

7. ***Trip Generation Estimate*** – The project trip generation estimate presented in the DEIR contained several questionable assumptions, as well as a number of errors. The Second RDEIR claims to have remedied these deficiencies but, as described above, this is not the case. S3-18

8. ***Approved Projects*** – The analysis includes the development of "baseline" scenarios, which include previously-approved projects that are not yet complete. However, the list of approved projects used to develop the baseline scenarios was incomplete, failing to include the Promenade at Natomas and Metro Air Park projects, both of which have been approved and, therefore, fit within the definition of "baseline" development. S3-19

9. ***Project Trip Distribution*** – The geographic distribution of project-generated trips illustrated in the DEIR was illogical and unrealistic, potentially leading to understatement of traffic impacts on key roadways and intersections in the study area. S3-20

10. ***Project Traffic Assignment*** – Comparison of the exhibits presenting the "Baseline" and "Baseline Plus Project" traffic volumes indicated problems with the project traffic assignment. In particular, the project traffic assignment did not match the assignment derived from manually applying the trip distribution factors to the project trip estimate. As a result, the project-related traffic impacts will be understated at certain study locations. S3-21

11. ***Study Intersections and Roadway Segments*** – To ensure that all traffic impacts are identified, the study area should be expanded to include other intersections in the vicinity of the project site as well as the segment of SR 70/99 between Elverta Road and Riego Road. For example, because the Elverta Road/State Route 70/99 intersection has been identified as having significant impacts under Baseline conditions, a high likelihood exists that similar results would be found for the Riego Road/State Route 70/99 intersection. S3-22

12. ***Project-Related Mitigation*** – Our review of the Greenbriar DEIR raised several questions with regard to the proposed mitigation measures. Particular issues concerned the lack of specificity of the mitigation measures, uncertainty with regard to the beneficial effects of the measures, and a number of additional deficiencies. S3-23

13. ***Unmitigated Project Impacts*** – According to DEIR Table 2.1 - Summary of Environmental Impacts and Mitigation Measures, 23 of the project's 50 mitigation measures would result in "significant and unavoidable" impacts. Consequently, approval of this project will create severe levels of congestion on key regional roadways that will probably never be overcome, which will adversely affect the economic vitality of the Sacramento region, in proportions that far exceed any economic value derived from the proposed project. S3-24

Conclusion

Our review of the transportation and circulation analysis incorporated into the Second Recirculated Draft Environmental Impact Report for the proposed Greenbriar Development Project revealed the continued presence of deficiencies in the analysis. Those shortcomings potentially affect the validity of the conclusions and recommendations presented in that document, creating a substantial possibility that the proposed project may have additional significant impacts on the environment beyond those identified in the environmental documentation, particularly with respect to unacceptable levels of traffic congestion and degradation of intersection and roadway level of service. As we have previously stated, these issues should be addressed prior to approval of the proposed project and its related environmental documentation by the City of Sacramento and the Local Agency Formation Commission.

S3-25

We hope this information is useful. If you have questions concerning any of the items presented here or would like to discuss them further, please feel free to contact me at (916) 783-3838.

Sincerely,

MRO ENGINEERS, INC.

Neal K. Liddicoat, P.E.
Traffic Engineering Manager

ATTACHMENT A

Excerpt from *Trip Generation Handbook*
(Institute of Transportation Engineers, Second Edition, 2004)

3.3 Guiding Principles

The recommended approach for estimating trip generation for a proposed development is based on the following principles.

When the *Trip Generation* data plot contains more than 20 data points and a regression curve and equation are provided, use of the regression equation is recommended.

A regression equation with an R^2 of at least 0.75 is preferred because it indicates the desired level of correlation between the trips generated by a site and the value measured for an independent variable.

For the same reason, a weighted average rate is preferred when the standard deviation is less than or equal to 110 percent of the weighted average rate.

The value of the independent variable for the study site must fall within the range of data included to use either the rate or equation. Otherwise local data are needed.

Supplemental local data are suggested when the data plot has less than six data points.

The number of trips determined by either the rate or the equation should fall within the cluster of data points (i.e., the range of trip values) found at the study site's independent variable value. Otherwise, additional local data are needed.

Use Regression Equation When:

- Regression equation is provided
- Independent variable is within range of data

and

- Either the data plot has at least 20 points or $R^2 \geq 0.75$, equation falls within data cluster in plot, and standard deviation > 110 percent of weighted average rate

Use Weighted Average Rate When:

- At least three data points
- Independent variable is within range of data
- Standard deviation ≤ 110 percent of weighted average rate
- $R^2 < 0.75$ or no equation is provided
- Weighted average rate falls within data cluster in plot

Collect Local Data When:

- Study site is not compatible with ITE land use code definition
- Only 1 or 2 data points; preferably when five or fewer data points
- Independent variable does not fall within range of data
- Neither weighted average rate line or fitted curve fall within data cluster at size of development

In order to put these principles into practice, two alternative approaches are available to the analyst. The highlighted box in this section presents a checklist for choosing between using the weighted average rate, using the regression equation and collecting local data. A detailed step-by-step approach for estimating trip generation is presented in the next section.

3.4 Recommended Procedure for Estimating Trip Generation

A step-by-step procedure for determining how best to estimate trip generation using data contained in *Trip Generation* is shown below. The procedure is also outlined with simplified text in the flow chart in Figure 3.1.

Step 1: Is the development under analysis consistent with the description of the land use code in *Trip Generation* and with the described or presumed characteristics of development sites for which data points are provided?

> If yes, proceed to Step 2.
> If no, collect local data for the land use being analyzed and establish a local rate. Refer to Chapter 4 for guidelines.

Caution: The analyst should exercise caution before trying to quantify the trip generation effects of isolated and minor changes in characteristics of a particular land use. *Trip Generation* data are compiled from a wide range of sources with a potentially high variability in site characteristics within the bounds of the land use code definition. *Trip Generation* does not provide information on the secondary characteristics of the surveyed sites and therefore any analysis of the

LETTER S3

William D. Kopper
May 23, 2007

S3-1 The comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

S3-2 The comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

S3-3 The comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

S3-4 The comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

S3-5 The commenter expresses concern that the Baseline and Cumulative Conditions intersection analysis was not re-modeled with the revised trip generation estimates presented in the Second RDEIR. As described in the Second RDEIR (page 6.1-1) the trip generation estimates were revised to remove the 11% trip discount for light rail ridership. In revising the trip estimates, other errors in the formula calculations were realized and corrected as well. The removal of the light rail discount in combination with other corrections to the trip estimates resulted in a total trip generation estimate that is 1,200 trips fewer than the estimate presented in the DEIR. The Second RDEIR further explained that the intersection analysis was not remodeled because the inclusion of regional projects to the model would change regional traffic patterns at substantial distance from the study area intersections such that substantial changes to local intersections would not be expected to occur. The commenter offers no evidence that impacts to local intersections would be substantially different from that presented in the Second DEIR. Further, the intersection analysis provides an overestimate of the project's impacts to local intersections because the trip generation estimates that the analysis was based on included 1,200 additional trips distributed throughout the roadway network. Please refer to Master Responses 2 and 3.

S3-6 In response to comments received on the DEIR, the project's trip generation estimates were revised using *Institute of Transportation Engineers* (ITE) regression (fitted curve) equations for all land use components. Please refer to Master Response 2, response to comment S3-5, and the Second DEIR for additional details regarding the revised trip generation estimates.

The commenter asserts that use of the ITE regression equations was not appropriate because the statistical R2 values were too low. The ITE *Trip Generation Handbook (Second Edition)* provides guidance on the application of ITE trip generation rates. As stated on page 9 of the handbook, ITE recommends using regression equations when: 1) a regression equation is provided; 2) the independent variable is within range of data and either the data plot has at least 20 points or the R2 value is 0.75 or greater and standard deviation is greater than 100% of weighted average rate.

The trip generation rates for the elementary school and retail/major grocery land uses were reviewed. Both of these land uses meet the first criterion for use of regression equations. For the elementary school uses, the R2 values (based on ITE Land Use Code 520 [ITE 520]) were 0.50 for the a.m. peak hour and 0.52 for the p.m. peak hour; however, use of the regression equation was appropriate because the a.m. peak hour regression was based on 38 studies of peer sites (meeting criterion 2) and the independent variable value of 800 students is within the range of the studies (0 to 1,100 students). For the p.m. peak hour, the regression equation is based on 37 studies of peer sites (meeting criterion 2) and the independent variable value of 800 students is within the range of the studies (0 to 1,100 students).

For the retail/major grocery land uses, the daily regression equation (based on the ITE 850 equation) had an R2 value of 0.52; however, the daily equation was not used in the generation of a.m. and p.m. peak hour trips or the a.m. and p.m. peak hour level of service (LOS) analysis. Instead, for the retail/ major grocery land use an R2 value of 0.75 for the p.m. peak hour, which is the critical peak hour for retail land uses**.**

S3-7 While the commenter provides their estimate of project-related trips, no supporting calculations are provided. The Second DEIR and Master Response 2 and response to comment S3-5 explain the changes that were made to the trip generation estimates for the project. The City and LAFCo have presented a conservative traffic analysis based on established traffic modeling assumptions. The commenter offers no new factual evidence that would support changes to the EIR or traffic analysis. Regarding disagreement with the conclusions presented in the EIR, please refer to Master Response 3.

S3-8 Please refer to response to comments S3-5 through S3-7.

S3-9 Please refer to response to comments S3-5 through S3-7.

S3-10 Please refer to response to comment S3-5. The commenter suggests that with the addition of 7 regional projects to the traffic model, traffic volumes at local intersections would be substantially increased and would result in new significant impacts. A significant impact at study area intersections would be significant if the operation (i.e., LOS) of the intersection exceeded the thresholds identified on pages 6.1-48 through 6.1-50 of the Second RDEIR. The commenter provides a comparison of the traffic volumes that would occur along 4 roadway segments based on the information contained in the DEIR and Second DEIR. While traffic volume increases are presented, no evidence is presented by the commenter to indicate that the operation (i.e., LOS) of study area intersections would substantially degrade. This is supported by the analysis of the LOS for the intersections located near the roadway segments presented in Table 3 of the comment. As described above, the operation of these intersections would not result in any new or substantially more sever significant impacts.

S3-11 Regarding trip generation estimates, please refer to response to comment S3-5 through S3-7. The commenter provides a comparison of the traffic volume increases that would occur at 4 freeway ramps for the a.m. peak hour and 5 freeway ramps for the p.m. peak hour based on the contained in the DEIR and Second DEIR. While traffic volume increases are presented, no evidence is presented by the commenter to indicate that the operation (i.e., LOS) of study area intersection would substantially degrade. This is supported by the analysis of the LOS for the intersections located near the roadway segments presented in Table 4 of the comment.

Table 1 Peak Hour Intersection Levels of Service – Cumulative (2025) Plus Project Conditions				
ID	Signalized Intersection	Peak Hour	Second DEIR (TJKM)	Second DEIR Plus Seven Regional Projects
			LOS	LOS
2a	SR 70/99 SB Ramps / Elverta Road	P.M.	A	B
5	SR 70/99 SB Ramps / Elkhorn Boulevard	P.M.	B	B
6	SR 70/99 NB Ramps / Elkhorn Boulevard	P.M.	B	C
10	I-5 SB Ramps / Metro Air Parkway	A.M.	C	C
10	I-5 SB Ramps / Metro Air Parkway	P.M.	A	A
Note: Delay = Average control delay in seconds per vehicle, LOS = Level of Service				

As described above, the operation of these intersections would not result in any new or substantially more sever significant impacts.

S3-12 Please refer to response to comments 34-7 through 34-12.

S3-13 Please refer to response to comment 34-13.

S3-14 Please refer to response to comments 34-14 and 34-15.

S3-15 Please refer to response to comments 34-16 and 34-17.

S3-16 Please refer to response to comment 34-18.

S3-17 Please refer to response to comment 34-19.

S3-18 Please refer to response to comments 34-20 through 34-24.

S3-19 Please refer to response to comments 34-25 and 34-26.

S3-20 Please refer to response to comment 34-27.

S3-21 Please refer to response to comments 34-28 through 34-30.

S3-22 Please refer to response to comments 34-31 and 34-32.

S3-23 Please refer to response to comments 34-33 through 34-42.

S3-24 Please refer to response to comment 34-43.

S3-25 The comment does not raise any issues related to the environmental analysis provided in the DEIR, no further response is necessary.

County of Sacramento
MUNICIPAL SERVICES AGENCY – CHERYL CRESON, ADMINISTRATOR
Department of Transportation
Including service to the Cities of Citrus Heights and Rancho Cordova
Thomas J. Zlotkowski, Director

S4

July 11, 2007

Mr. Tom Buford
City of Sacramento
Development Services Department
2101 Arena Boulevard, Second Floor
Sacramento, CA 95834

SUBJECT: COMMENTS ON RECIRCULATED SECOND DEIR FOR GREENBRIAR MASTER PLANNED COMMUNITY

Dear Mr. Buford:

The Sacramento County Department of Transportation has reviewed the Recirculated 2nd Draft Environmental Impact Report (DEIR) for the Greenbriar Master Planned Community. We appreciate the opportunity to review this application. Our additional comments are as follows:

1. **General.** The report did not evaluate the following facilities which were requested in the letter dated September 22, 2005. These intersections are as follows (highlighted facilities were not analyzed):

   Intersections/Interchanges/Ramp Junctions/Weaving Sections

   - SR 99/Elverta Road I/S (I/C in Future);
   - SR 99/Elkhorn Boulevard I/C;
   - I-5/SR 99 I/C;
   - I-5/Metro Air Parkway I/C (Future I/C); and
   - I-5/Airport Boulevard I/C.

   S4-1

   Roadway Segments

   - SR 99 between Elverta Road and I-5; and
   - I-5 between Airport Parkway and SR-99.

   Intersections

   - Elkhorn Boulevard/Lone Tree Road;
   - Elkhorn Boulevard/Power Line Road;
   - Elkhorn Boulevard/Dry Creek Road;
   - Elkhorn Boulevard/16th Street;

- Elkhorn Boulevard/Watt Avenue;
- Elverta Road/Lone Tree Road; and
- Elverta Road/Watt Avenue.

Roadway Segments

- Elverta Road between Lone Tree Road and Watt Avenue; and
- Elkhorn Boulevard between Power Line Road and Watt Avenue.

S4-1 Cont'd

2. **Page 6.1-2. Section 6.1.2.** Environmental Setting: report states that I-5 is an eight lane facility in the vicinity of the project. But, it is currently a four-lane south of the project site. S4-2

3. **Page 6.1-4.** Traffic counts were done in the June 2005, which is during the school off session. Typically, this would result in the lower AM peak hour counts at various locations. I would suggest applying a factor to the AM peak hour counts to reflect the school traffic conditions. S4-3

4. **General.** According to Sacramento County TIS guidelines, PHF = 1.0 shall be used to compute LOS for all Sacramento County facilities. S4-4

5. **General.** Synchro software was used to compute level of service for the County signalized intersections and ICU numbers were reported in the LOS tables. TIS guidelines for Sacramento County states that modified circular 212 methodology should be used. Please use these modified thresholds to compute LOS for Sacramento County signalized facilities. For additional information see attached Sacramento County TIS Guidelines, dated July 2004. S4-5

6. **Page 6.1-15 Section 6.1.4. - Impacts and Mitigation Measures.** Please add an exhibit showing the baseline lane configuration and traffic controls. Also, please add a paragraph describing the 7-year transportation improvement plans (TIP) for the study facilities. Information about the TIP is found at http://www.sacdot.com/documents/ under the project master list. S4-6

7. **Page 6.1-29.** Please site the source for the "Residential Linked Trip by Purpose Discount" for "Elementary School." S4-7

8. **General.** Please add a forecasting methodology for Cumulative (2025) traffic volumes i.e, NCHRP 255 Furness difference method or ratio method. As a proof and tracking purposes, I would recommend adding 2025 SACMET model plots in the appendix showing the peak period volumes for both study periods which should cover the study facilities. In addition to Exhibit 6.1-7, add a paragraph describing assumed cumulative roadway network improvements and funding sources for cumulative no project conditions. I would recommend that the traffic consultant directly coordinate the cumulative 2025 MTP assumptions with SACDOT staff prior to finalizing the report. This information is available on the SACOG's website at http://www.sacog.org/mtp/ S4-8

9. **General.** Please explain the cumulative volume discrepancies between "Greenbriar Development Project 2nd Draft EIR" and recently approved "FINAL Sacramento S4-9

International Airport Master Plan (SMF-MP) EIR" and "Final I-5/Metro Air Parkway Interchange – Project Report." See attached (PLATE TC-7) excerpt from the SMF-MP EIR. This document is also available online at http://www.dera.saccounty.net/portals/0/docs/EnvDocs_Notices/20040018620070703103254.pdf See attached Figure 7 excerpt from the Metro Air Parkway Interchage. S4-9 Cont'd

10. **General.** See attached Exhibit B-1 excerpt from Metro Air Park Public Facilities Master Plan – final Report showing the termination of Meister Way. Meister Way terminate at Road B as shown in the Exhibit B-1. Please update the forecast and re-run the LOS calculations. S4-10

11. **General.** The DEIR should identify funding for any improvements that the study recommends and those improvements should be consistent with the improvements identified for the recently approved Metro Air Park development. The development of the financing plan for Greenbriar should be closely coordinated with the financing plan for Metro Air Park. It appears that several of the traffic related impacts are identified as significant and unavoidable because they are not in control of the jurisdiction. Where this occurs feasible mitigation measures should be identified and project costs and fair shares should be identified based on the findings of the traffic study. S4-11

Please incorporate these comments into the revised DEIR. If you have any questions, please feel free to contact me at 875-2844.

Sincerely,

Jaskamal Singh
Associate Transportation Engineer
Department of Transportation

Attachments:
Traffic Impact Analysis Guidelines – County of Sacramento, July 2004.
Plate TC-5 excerpt from Sacramento International Airport EIR.
Figure 7 excerpt from Metro Parkway Interchange.
Exhibit B-1 excerpt from Metro Air Park.

C: Don Lockhart – Sacramento LAFCO 1112 I Street, Suite 100, Sacramento, CA 95814
Judy Robinson - Planning
Steve Hong -IFS
Dan Shoeman – DOT
Dean Blank – DOT
Matthew Darrow – DOT
Bob Davison – IFS
Theresa Mack – IFS

LETTER S4

State of California
Office of Planning and Research
Terry Roberts
May 29, 2007

S4-1 The commenter states that the EIR did not evaluate the project's impacts to the interchange of I-5 and Airport Boulevard, the intersections of Elkhorn Boulevard and Dry Creek Road, Elkhorn Boulevard and 16th Street, Elkhorn Boulevard and Watt Avenue, and Elverta Road and Watt Avenue, and the segment of Elverta Road between Lone Tree Road and Watt Avenue and Elkhorn Boulevard between Powerline Road and Watt Avenue. The facilities identified by the commenter were not selected for analysis because these facilities are all located at a substantial distance (i.e., greater than 2.5 miles from the project site) and these facilities currently operate acceptably. In general, project-related traffic typically diminishes with distance from the project site. The roadways and facilities selected for analysis in the Second RDEIR were generally representative of the outermost points (1 to 1.5 miles from the project site) where traffic trips from the project are expected to be detected by the City's traffic model and that would cause a measurable change in traffic volumes. Further, as shown on Exhibit 6.1-10 of the Second RDEIR, only 15 percent of the project's total traffic trips would be expected to travel east on Elkhorn Boulevard, with only 10 percent of the trips traveling to the north along SR 70/99 and 5 percent of the trips traveling west on I-5. Only some smaller percentage of these trips would be expected to travel along the facilities identified by the commenter because many of the trips would be diverted prior to reaching distant locations. The commenter offers no evidence to support that the identified facilities would operate unacceptably with the project. Further, the facilities selected by the City and LAFCo, in consultation with other transportation agencies, are located at reasonable distances from the project site such that project-related trips would be able to be detected through modeling techniques.

S4-2 The commenter points out a typo in the Second RDEIR. The following changes have been made to the Second RDEIR. These changes are presented in Chapter 7.0, "Revisions to the DEIR, RDEIR, and Second RDEIR." These changes do not alter the conclusions presented in the Second RDEIR.

Page 6.1-2, 5th paragraph, of the Second RDEIR is hereby changed as follows:

> "I-5 is ~~a~~an <u>four- to</u> eight-lane freeway that runs in an east/west direction within the study area. Access to I-5 is currently via State Route 99. I-5 serves as a commute corridor between downtown Sacramento and the northern and southern portions of the City and County. It also provides access to the Sacramento International Airport west of the site and other Central Valley communities (e.g., cities of Woodland and Davis). A future interchange (I-5 / Metro Air Parkway Interchange) is planned approximately one-half mile west of the project site. This interchange would provide direct access to I-5 from the project site through the approved Metro Air Park development (adjacent and west of the project site)."

S4-3 Regarding the commenter's request that the traffic counts should have been performed during the school season, there are no existing schools near the project site. The nearest school is located greater than 2 miles from the project site. While traffic counts were not performed during the school season, it is not expected that traffic counts conducted during the school season would be substantially different, if at all, than the traffic counts included in the Second RDEIR because local roadways near the project site would not be affected by traffic traveling to schools that are distant from the project site.

S4-4 Regarding the methodology to compute LOS for all Sacramento County facilities, the Circular 212 methodology was used to model the project's impacts to Sacramento County facilities and this methodology is recommended in the Sacramento Transportation Impact Study Guidelines. This methodology includes the use of the peak-hour factor = 1.0. See Appendix B of the Second RDEIR.

S4-5 Please refer to response to comment S4-4.

S4-6 The baseline lane configurations are the same as the existing lane configurations depicted in Exhibit 6.1-3 of the Second RDEIR.

Regarding providing a description of the 7-year transportation improvement plans for study facilities, it is unclear what the commenter would like described in the document. The existing configuration for study facilities and proposed improvement to those facilities are described throughout Section 6.1, "Transportation and Circulation," of the Second RDEIR.

S4-7 The source for the "Residential Linked Trip by Purpose Discount" is the Institute for Transportation Engineers (Trip Generation Handbook).

S4-8 The forecasting methodology for the Cumulative (2025) traffic volumes is contained within the City's SACMET Regional Travel Demand Forecasting model. This model includes all traffic improvements identified in the Sacramento Area Council of Government's 2025 Metropolitan Transportation Plan. This traffic model is available for review at the City of Sacramento, Public Works Department during normal business hours. All traffic modeling data used in preparation of the Second RDEIR is included in Appendix B of the Second RDEIR.

S4-9 Regarding differences in cumulative traffic volumes described in the Second RDEIR and other regional transportation projects, the Second RDEIR added several regional cumulative projects into the City's 2025 SACMET traffic model. These projects include Placer Vineyards, Placer Ranch Specific Plan, Regional University and Community Specific Plan, West Roseville Specific Plan, Sutter County Measure M, Elverta Specific Plan, and Plumas Lake project. In reviewing the project listed by the commenter, several of these regional projects included in the Greenbriar SRDEIR were not included in the cumulative traffic volumes for those projects cited by the commenter. For example, page 7-10 of the Sacramento International Airport Master Plan EIR did not include any of these projects. Therefore, the cumulative traffic volumes of the project would not be the same as those presented in these other EIR documents.

S4-10 The roadway network used in the Second RDEIR to perform existing, baseline, and cumulative traffic modeling was based upon the most recent information available regarding the proposed roadway network for the Metro Air Park development. While the modeling performed for the project does not show Meister Way terminating at Road B in the Metro Air Park development (it instead terminates at Powerline Road, which is west of Road B), this change in the roadway network would not result in a substantial change in the Second RDEIR analysis because only 7-10 peak-hour project trips are anticipated to travel west on Meister Way past Road B (see intersection #3, Exhibit 6.1-6 and 6.1-14).

S4-11 The Second RDEIR does identify the funding mechanisms for the traffic improvements recommended as mitigation. Where the project applicants will fully fund or make a fair-share contribution toward recommended traffic improvements, this funding has been identified in the Revised Draft Greenbriar Finance Plan (see Appendix E of this document). Please refer to response to comment 3-3.

7 REVISIONS TO THE DEIR, RDEIR, AND SECOND RDEIR

7.1 INTRODUCTION

This chapter includes revisions to the text in the DEIR and Recirculated DEIR subsequent to their publication and public review. The changes are presented in the order in which they appear in the original DEIR and are identified by the page number. Revisions are shown as excerpts from the DEIR or Recirculated DEIR text, with strikethrough (~~strikethrough~~) text for deletions and underlined (underlined) text for additions.

7.2 REVISIONS TO THE DEIR, RDEIR, AND SECOND RDEIR

CHAPTER 5, PROJECT CONSISTENCY WITH PLANS AND POLICIES

Page 5-1, paragraph 4 is hereby revised as follows:

The North Natomas Community Plan area is located in the northwest portion of the City of Sacramento and is part of the greater Natomas Basin. The North Natomas community is bound by Elkhorn Boulevard on the north, Interstate 80 (I-80) on the south, the Natomas East Main Drain canal on the east and the West Main Drain canal and SR 70/99 on the west. ~~According to the North Natomas Nexus Study Update (City of Sacramento 2002)~~, The NNCP area consists of approximately 9,038 acres of which ~~4,228~~ 8,915 acres have been identified as "developable" ~~in the NNCP area~~. In 1993, the primary land use in the NNCP area was agriculture. Since that time, the NNCP was adopted in 1994 and land uses have been rapidly converting to urban uses. The project is not within the NNCP but the boundaries will be amended to include the project. The project will not be subject to the NNCP policies but will be designated as a special planning area (SPA)."

CHAPTER 6, ENVIRONMENTAL ANALYSIS

6.1, TRANSPORTATION AND CIRCULATION

Page 6.1-2, 5th paragraph, of the Second RDEIR is hereby changed as follows:

"I-5 is a~~n~~ four- to eight-lane freeway that runs in an east/west direction within the study area. Access to I-5 is currently via State Route 99. I-5 serves as a commute corridor between downtown Sacramento and the northern and southern portions of the City and County. It also provides access to the Sacramento International Airport west of the site and other Central Valley communities (e.g., cities of Woodland and Davis). A future interchange (I-5 / Metro Air Parkway Interchange) is planned approximately one-half mile west of the project site. This interchange would provide direct access to I-5 from the project site through the approved Metro Air Park development (adjacent and west of the project site)."

Page 6.1-59, second paragraph, of the Second DEIR is hereby revised as follows:

"Mitigation Measure 6.1-2c: Meister Way west of SR 70/99 (City of Sacramento)

On or before 66% total buildout of the project based on trip generation, the project applicant shall widen Meister Way west of SR 70/99 to provide two travel lanes in each direction from the first street intersection of SR 70/99 (Meister Way and 28 Street/36 Street [identified on the tentative map]) west to Lone Tree Road. Right-of-way for the recommended widening is currently available on-site. Based on "windshield surveys" of the project area, the site proposed for this improvement is substantially similar to the project site. Construction-related impacts would be similar to the project's construction-related impacts and no new significant impacts would occur. Mitigation recommended for the project would also substantially reduce construction-related impacts associated with this measure. With implementation of this mitigation measure, this roadway segment would improve to LOS D under

Baseline plus Project conditions, which is acceptable based on City standards. Therefore, impacts to this intersection would be reduced to a ***less-than-significant*** level."

Page 6.1-65 of the Second DEIR has been modified as follows:

Mitigation Measure 6.1-3c: I-5 Northbound to SR 70/99 Northbound off-ramp: Fair-Share Contribution to the City's Traffic Congestion Relief Fund (City of Sacramento and Caltrans)

a. Prior to issuance of any building permits, the City will establish a Traffic Congestion Relief Fund to fund over all congestion relief projects.

b. Upon the City's issuance of any building permit for the project, the project applicant shall pay its fair-share contribution to the City's Traffic Congestion Relief Fund. Monies collected within the City's fund will be used by the City in the time and manner as required by the City of Sacramento, in coordination with Caltrans and other transportation agencies including Regional Transit, to fund improvements that would relieve freeway congestion. As determined in consultation with Caltrans and RT, the project's fair-share contribution for all feasible (project and cumulative) mainline freeway improvements would be $1,135,904.

The project applicant shall contribute its fair share amount in the City's Traffic Congestion Relief Fund. The City's Traffic Congestion Relief Fund will be used to implement projects that would reduce mainline freeway congestion. However, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and funding for such improvements has not been identified. Therefore, for purposes of CEQA, this impact would remain ***significant and unavoidable***.

~~Widening I-5 Northbound to SR 70/99 Northbound off-ramp to provide an additional lane is required to mitigate this impact. With implementation of this mitigation measure, this freeway ramp would operate at LOS D. Caltrans District 3 Draft DSMP does not include adding a lane to the existing two-lane on-ramp for SR 70/99 southbound to I-5 southbound by the year 2010. To implement this mitigation measure, additional right-of-way would be required and is not currently available. Additionally, this improvement is not included in any of Caltrans' funding mechanisms. Because this mitigation measure is beyond the control of the project applicant, outside the jurisdiction of the City, and there is no established funding mechanism available for contribution, this mitigation measure is considered infeasible and the impact is considered ***significant and unavoidable***.~~

Page 6.1-65 of the Second RDEIR has been modified as follows:

Significance After Mitigation

With implementation of the above mitigation measures, 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 Caltrans jurisdiction).~~ While the project would contribute funds to implement measures that would fully mitigate impact to this ramp to a less-than-significant level, it is unknown whether these measures would be implemented prior to buildout of the project because they are not subject to the exclusive control of the City. As a result, for purposes of CEQA impact to SR 70/99 Northbound to Elkhorn Boulevard off-ramp (Impact 6.1-3b) would remain ***significant and unavoidable.***

For the I-5 Northbound to the SR 70/99 Northbound off-ramp, the project applicant would contribute to the City's Traffic Congestion Relief Fund. While mitigation is recommended that would require the project applicant to contribute to the City's Traffic Congestion Relief Fund, this mitigation (the Fund) does not provide quantifiable actual reduction in the number of project-related trips on the I-5 Northbound to the SR 70/99 Northbound off-

ramp. Therefore, impacts to the I-5 Northbound to SR 70/99 Northbound off-ramp would remain ***significant and unavoidable.***

~~Further, no feasible mitigation is available to reduce the project's impacts to 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 to these ramps are considered ***significant and unavoidable***.~~

Page 6.1-65 of the Second RDEIR has been modified as follows:

Mitigation Measure 6.1-4b: I-5 North of Del Paso Road (City of Sacramento and Caltrans)

a. The project applicant shall implement Mitigation Measure 6.1-3c.

b. Upon the City's issuance of any building permit for the project, the project applicant shall pay its fair-share contribution to the City's Traffic Congestion Relief Fund. This contribution has been previously identified within the fair-share funds calculated for Mitigation Measure 6.1-3c. Monies collected within the City's fund will be used by the City in the time and manner as required by the City of Sacramento, in coordination with Caltrans and other transportation agencies including Regional Transit. The City's Traffic Congestion Relief Fund will be used to implement projects that would reduce mainline freeway congestion. However, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and funding for such improvements has not been identified. Therefore, for purposes of CEQA, this impact would remain ***significant and unavoidable***.

~~Because this mainline segment of I-5 currently operates unacceptably, the only mitigation that could improve the operating conditions of this segment during peak conditions would be the widening of this segment of I-5 mainline to eight lanes (currently six lanes). While widening of I-5 would improve the operating conditions of this mainline segment to acceptable conditions, Caltrans currently has no plans to expand this segment of I-5 beyond its current capacity nor are any funding mechanisms established to collect monies to fund improvements such as this. Further, because of the developing nature of properties to the east and west of I-5, additional right-of-way is not available for the expansion of this freeway segment. Because no feasible mitigation is available to reduce the project's impacts to this mainline segment, this impact would remain ***significant and unavoidable***.~~

Mitigation Measure 6.1-4c: I-5 north of I-5/I-80 Interchange between I-80 and Arena Boulevard Exit (City of Sacramento and Caltrans)

a. The project applicant shall implement Mitigation Measure 6.1-3c.

b. Upon the City's issuance of any building permit for the project, the project applicant shall pay its fair-share contribution to the City's Traffic Congestion Relief Fund. This contribution has been previously identified within the fair-share funds calculated for Mitigation Measure 6.1-3c. Monies will be deposited within the City's fund in the time and manner as required by the City of Sacramento, in coordination with Caltrans and other transportation agencies including Regional Transit. The City's Traffic Congestion Relief Fund will be used to implement projects that would reduce mainline freeway congestion. However, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and funding for such improvements has not been identified. Therefore, for purposes of CEQA, this impact would remain ***significant and unavoidable***.

~~Because this mainline segment of I-5 currently operates unacceptably, the only mitigation that could improve the operating conditions of this segment during peak conditions would be the widening of this segment of I-5~~

~~mainline to eight lanes (currently six lanes). While widening of I-5 would improve the operating conditions of this mainline segment to acceptable conditions, Caltrans currently has no plans to expand this segment of I-5 beyond its current capacity nor are any funding mechanisms established to collect monies to fund improvements such as this. Further, because of the developing nature of properties to the east and west of I-5, additional right-of-way is not available for the expansion of this freeway segment. Because no feasible mitigation is available to reduce the project's impacts to this mainline segment, this impact would remain ***significant and unavoidable***.~~

Page 6.1-67 of the Second RDEIR has been modified as follows:

Mitigation Measure 6.1-4e: SR 70/99 between Elkhorn Boulevard and I-5/SR 70/99 Interchange (City of Sacramento)

a. The project applicant shall implement Mitigation Measure 6.1-3c.

b. Upon the City's issuance of any building permit for the project, the project applicant shall pay its fair-share contribution to the City's Traffic Congestion Relief Fund. This contribution has been previously identified within the fair-share funds calculated for Mitigation Measure 6.1-3c. Monies will be deposited within the City's fund in the time and manner as required by the City of Sacramento, in coordination with Caltrans and other transportation agencies including Regional Transit. The City's Traffic Congestion Relief Fund will be used to implement projects that would reduce mainline freeway congestion. However, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and funding for such improvements have not been identified. Therefore, for purposes of CEQA, this impact would remain ***significant and unavoidable***.

~~Because this mainline segment of SR 70/99 currently operates unacceptably, the only mitigation that could improve the operating conditions of this segment during peak conditions would be the widening of this segment of SR 70/99 mainline to six lanes (currently 4 lanes) between Elkhorn Boulevard and Elverta Road. While widening of SR 70/99 would improve the operating conditions of this mainline segment to acceptable conditions, Caltrans currently has no plans to expand this segment of SR 70/99 beyond its current capacity nor are any funding mechanisms established to collect monies to fund improvements such as this. Because no feasible mitigation is available to reduce the project's impacts to this mainline segment, this impact would remain ***significant and unavoidable***.~~

Significance After Mitigation

While mitigation may become available in the future to reduce the project's impacts to freeway mainline segments, this project would not have sole responsibility for implementing these improvements. The project applicant shall contribute its fair share amount in the City's Traffic Congestion Relief Fund. Monies will be deposited within the City's fund in the time and manner as required by the City of Sacramento. This contribution has been previously identified within the fair-share funds calculated for Mitigation Measure 6.1-3c. The City's Traffic Congestion Relief Fund will be used to implement projects that would reduce mainline freeway congestion. However, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and funding for such improvements has not been identified. Therefore, impacts to the freeway mainline segments (I-5 north of Del Paso Road, I-5 north of I-5/I-80 Interchange between I-80 and Arena Boulevard Exit and SR 70/99 between Elkhorn Boulevard and I-5/SR 70/99 Interchange) would remain ***significant and unavoidable***.

~~Because no feasible mitigation is available to reduce the project's impacts to study area freeway segments, impacts to I-5 north of Del Paso Road, I-5 north of I-5/I-80 Interchange between I-80 and Arena Boulevard Exit and SR 70/99 between Elkhorn Boulevard and I-5/SR 70/99 Interchange freeway segments would remain ***significant and unavoidable***.~~

Page 6.1-78 of the Second RDEIR has been modified as follows:

Mitigation Measure 6.1-7b: I-5 Northbound to SR 70/99 Northbound off-ramp (City of Sacramento and Caltrans)

a. The project applicant shall implement Mitigation Measure 6.1-3c.

b. Upon the City's issuance of any building permit for the project, the project applicant shall pay its fair-share contribution to the City's Traffic Congestion Relief Fund. This contribution has been previously identified within the fair-share funds calculated for Mitigation Measure 6.1-3c. Monies will be deposited within the City's fund in the time and manner as required by the City of Sacramento, in coordination with Caltrans and other transportation agencies including Regional Transit. The City's Traffic Congestion Relief Fund will be used to implement projects that would reduce mainline freeway congestion. However, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and funding for such improvements has not been identified. Therefore, for purposes of CEQA, this impact would remain ***significant and unavoidable***.

~~The project applicant shall coordinate with Caltrans to pay its fair share toward widening the off-ramp to provide an additional lane. This measure would be subject to Caltrans' requirements and Caltrans determining through a feasibility evaluation that this measure could be implemented. It is unknown at this time whether sufficient right-of-way is available to accommodate this improvement. Further, widening of the off ramp is not included in Caltrans' District 3 Draft District System Management Plan (DSMP) and Caltrans does not have any funding mechanisms in place to implement this improvement. Furthermore, widening the off ramp would require additional right-of-way that is not is not subject to the control of the City or the project applicant. It is unknown at this time whether this mitigation would be feasible and, if feasible, whether Caltrans would be able to secure sufficient right-of-way and funding to implement this improvement. Therefore, for purposes of CEQA, this impact would remain ***significant and unavoidable.***~~

Page 6.1-78 of the Second RDEIR has been modified as follows:

Significance After Mitigation

While mitigation recommended would require the project applicant to contribute its fair share amount toward the City's Traffic Congestion Relief Fund, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and full funding for such improvements have not been identified. As a result, for purposes of CEQA, cumulative impacts to these ramps would be considered ***significant and unavoidable***.

~~With implementation of the above mitigation measures, SR 70/99 Northbound to Elkhorn Boulevard off-ramp and the I-5 Northbound to SR 70/99 Northbound off- 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 to 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 to these ramps would be considered ***significant and unavoidable***.~~

While mitigation may be feasible for the I-5 Northbound to Metro Air Parkway off-ramp and the Metro Air Parkway to I-5 Southbound loop on-ramp, this mitigation would not be able to reduce the impact of the project to a less-than-significant level. These ramps would continue to operate at LOS F and no other feasible mitigation is available. Therefore, cumulative impacts to this ramp would remain ***significant and unavoidable.***

Cumulative Traffic Impacts, Pages 6.1-81 and 6.1-82 of the Second RDEIR have been modified as follows:

Mitigation Measure 6.1-8a: I-5 east of Power Line Road to the MAP Interchange (City of Sacramento and Caltrans)

a. The project applicant shall implement Mitigation Measure 6.1-3c.

b. Upon the City's issuance of any building permit for the project, the project applicant shall contribute its fair share toward ~~Because this mainline segment of I-5 would operate unacceptably under Cumulative No Project conditions,~~ widening this segment to six ~~eight~~ lanes (currently four lanes). This mitigation would improve the operating conditions of this segment during peak conditions to an acceptable LOS. The Caltrans' District 3 DSMP includes adding an HOV lane to I-5 by the year 2020 and according to the Metro Air Park Finance Plan, this segment of I-5 would be upgraded to six lanes with buildout of the Metro Air Park project. Therefore, before recordation of the first map, the project applicant shall, in coordination with the City, prepare a City Council-approved Finance Plan. This funding mechanism shall be in conformance with the Draft Greenbriar Finance Plan presented in Appendix C of the DEIR. This funding mechanism shall ensure that the project applicant will pay their fair-share costs, determined in consultation with the City and in coordination with the Metro Air Park Finance Plan, toward the widening of I-5 to six lanes. ~~No other right-of-way is available to widen this segment to eight lanes. The Draft Greenbriar Finance Plan identifies 100% of the funding needed to construct this improvement. Additional right-of-way to accommodate the expansion of this freeway segment beyond six lanes is not available because of the developing nature of properties to the east and west of I-5.~~ While expansion of this freeway segment would reduce the project's cumulative traffic impacts to this freeway segment, it would not reduce the project's cumulative impact to a less-than-significant level because ~~widening to eight lanes is not feasible~~ 100% funding has not been identified. ~~No other feasible mitigation is available to reduce this impact.~~ Therefore, while reduced, this impact would remain ***significant and unavoidable***.

Mitigation Measure 6.1-8b: I-5 north of Del Paso Road (City of Sacramento and Caltrans)

a. The project applicant shall implement Mitigation Measure 6.1-3c.

b. Upon the City's issuance of any building permit for the project, the project applicant shall contribute its fair share amount in the City's Traffic Congestion Relief Fund. This contribution has been previously identified within the fair-share funds calculated for Mitigation Measure 6.1-3c. Monies will be deposited within the City's fund in the time and manner as required by the City of Sacramento, in coordination with Caltrans and other transportation agencies including Regional Transit. The City's Traffic Congestion Relief Fund will be used to implement projects that would reduce mainline freeway congestion. However, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and funding for such improvements have not been identified. Therefore, for purposes of CEQA, this impact would remain ***significant and unavoidable***.

~~Widening this segment of I-5 mainline to twelve lanes (currently six lanes) would improve the operating conditions of this segment during peak conditions to an acceptable LOS. The Caltrans District 3 DSMP includes adding an HOV lane to I-5 by the year 2020 but no funding mechanism for this project is defined. No other freeway expansion projects are planned for this segment of I-5. Further, because of the developing nature of properties to the east and west of I-5, additional right-of-way is not available for the expansion of this freeway segment. Because no feasible mitigation is available to reduce the project's impacts to this mainline segment, this impact would remain ***significant and unavoidable***.~~

Mitigation Measure 6.1-8c*:* I-5 north of I-5/I-80 Interchange between I-80 and Arena Boulevard Exit (City of Sacramento and Caltrans)

a. The project applicant shall implement Mitigation Measure 6.1-3c.

b. Upon the City's issuance of any building permit for the project, the project applicant shall contribute its fair share amount in the City's Traffic Congestion Relief Fund. This contribution has been previously identified within the fair-share funds calculated for Mitigation Measure 6.1-3c. Monies will be deposited within the City's fund in the time and manner as required by the City of Sacramento, in coordination with Caltrans and other transportation agencies including Regional Transit. The City's Traffic Congestion Relief Fund will be used to implement projects that would reduce mainline freeway congestion. However, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and funding for such improvements have not been identified. Therefore, for purposes of CEQA, this impact would remain ***significant and unavoidable***.

~~Because this mainline segment of I-5 would operate unacceptably under Cumulative No Project conditions, widening this segment of I-5 mainline to twelve lanes (currently six lanes) would improve the operating conditions of this segment during peak conditions to an acceptable LOS. The Caltrans District 3 DSMP includes adding an HOV lane to I-5 by the year 2020 but no funding mechanism for this project is available. No other freeway expansion projects are planned for this segment of I-5. Further, because of the developing nature of properties to the east and west of I-5, additional right-of-way is not available for the expansion of this freeway segment. Because no feasible mitigation is available to reduce the project's impacts to this mainline segment, this impact would remain ***significant and unavoidable***.~~

Significance After Mitigation

While mitigation recommended would require the project applicant to contribute its fair share amount in the City's Traffic Congestion Relief Fund, it can not be guaranteed that the congestion relief projects would be constructed or would be constructed prior to buildout of the project because the types of improvements, costs, and full funding for such improvements have not been identified. Therefore, cumulative impacts to the freeway mainline segments (I-5 east of Power Line Road to the MAP Interchange, I-5 north of Del Paso Road, I-5 north of I-5/I-80 Interchange between I-80 and Arena Boulevard Exit) would remain ***significant and unavoidable***.

~~No feasible mitigation is available to reduce the project's cumulative mainline freeway segment impacts to a less-than-significant level. Therefore, the project's cumulative impacts to these mainline freeway segments are considered ***significant and unavoidable***.~~

6.2, AIR QUALITY

Page 6.2-16, 3rd paragraph, is hereby revised as follows:

" 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~~423.7 lb/day and ~~297.0~~374.1 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 the SMAQMD's significance threshold of 85 lb/day. In

addition, because Sacramento County is currently designated as a nonattainment area for ozone and PM_{10}, construction-generated emissions could further contribute to pollutant concentrations that exceed the CAAQS."

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~~61.7	~~330.9~~396.7
Employee Trips	21.2	27.0
Architectural Coating [3]	-	-
Asphalt Off-Gas[4]	6.1	-
Total Unmitigated (Phase 1)	~~79.3~~89.0	~~357.94~~423.7
Total Mitigated (Phase 1)[2]	~~76.7~~85.9	~~291.7~~344.4
Building Construction Phase 2-Soutb of Meister Way (Beginning 2009)		
Diesel Mobile Equipment Exhaust[1]	~~43.8~~55.6	~~279.2~~356.3
Employee Trips	14.5	17.8
Architectural Coating [3]	-	-
Asphalt Off-Gas[4]	4.5	-
Total Unmitigated (Phase 2)	~~62.8~~74.6	~~297.0~~374.1
Total Mitigated (Phase 2)[2]	~~60.6~~71.8	~~241.2~~302.8
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 and 2007

Page 6.2-20 of the RDEIR, Mitigation Measure 6.2-1 is hereby revised as follows:

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

c. The applicant shall pay ~~$1,525,537~~ 2,587,955 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 the fee listed here ~~daily NO_x emissions~~ is based on the current cost of $14,300 to reduce a ton of NO_x. However, the then current cost of reducing NOx should be used at the time of the payment of the fee. ~~The determination of the final mitigation fee shall be conducted in coordination with SMAQMD.~~ The fee shall be paid to SMAQMD prior to the issuance of any grading permit for any portion of the project. The fee can be paid on an acre bases ~~($5,959.13 $2,634.91/acre~~[2] $4,485.19) as development occurs and grading permits sought. (See Appendix D of the DEIR for calculation worksheet)."

Page 6.2-21 of the RDEIR, Mitigation Measure 6.2-2, is hereby revised as follows:

"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 (AQAP) ~~(Appendix E)~~ to reduce operational emissions by a minimum of 15% shall be submitted to SMAQMD for approval. The following mitigation is included in the SMAQMD-approved AQAP for this project (Appendix E) ~~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~~a. 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~~b. 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~~c. ~~High density~~ ~~r~~Residential~~, mixed, or retail/commercial~~ uses ~~s~~hall be within 1/4 mile of planned transit. ~~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~~d. Neighborhoods shall serve as focal point~~s with parks, school and civic uses within 1/4 mile (residential, mixed).~~

~~k~~e. Separate, safe, and convenient bicycle and pedestrian paths shall connect residential, commercial, and office uses ~~(residential, commercial, mixed)~~.

~~l~~f. 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~~g. 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~~h. Average residential density shall be seven dwelling units per acre or greater (residential).

~~r~~i. 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)~~.

j. A display case/kiosk displaying transportation information shall be provided.

k. Minimum amount of parking shall be provided.

l. Parking lot shade shall be increased by 10%.

m. The project shall become a permanent member of a Transportation Management Association (TMA).

n. The project shall provide a transportation coordinator.

o. The project shall contract with landscapers complying with ARB standards.

The changes would not result in any new significant impacts, nor in any substantially more severe environmental effects.

6.3, NOISE

Page 6.3-16 of the DEIR, Table 6.3-8 is hereby revised as follows:

Table 6.3-8
City of Sacramento Maximum Acceptable Interior and Exterior Noise Level Standards for New Development without Mitigation

Noise Source	Land Use	Applicable Area		State Requirements [a]	Noise Element Requirements
		Interior	Exterior		
Traffic or fixed source (industrial, plants, etc.)	Single-family	X		None	$L_{dn} \leq 45$ dB [b]
	Single-family		X	None	$L_{dn} \leq 60$ dB in backyards
	Multi-family [c]	X		$L_{dn} \leq 45$ dB	$L_{dn} \leq 45$ dB
	Multi-family		X	None	$L_{dn} \leq 60$ dB in common outdoor use areas
	Schools	X		None	Noisiest hourly Leq ≤ 40 dB during school day
	Schools		X	None	$L_{dn} \leq 60$ dB

Table 6.3-8 (continued)
City of Sacramento Maximum Acceptable Interior and Exterior Noise Level Standards for New Development without Mitigation

Noise Source	Land Use	Applicable Area		State Requirements [a]	Noise Element Requirements
		Interior	Exterior		
Aircraft	Single-family	X		None	$L_{dn} \leq 45$ dB and maximum instantaneous levels of ≤ 50 dB in bedrooms and ≤ 55 in other habitable rooms [b]
	Single-family		X	CNEL ≤ 65 dB (State Aeronautics Noise Standards) requirement does not apply to Mather and McClellan AFB	CNEL ≤ 60 dB for Sacramento International Airport CNEL ≤ 65 dB for all other areas
	Multi-family	X		$L_{dn} \leq 45$ dB	$L_{dn} \leq 45$ dB and maximum instantaneous levels of ≤ 50 dB in bedrooms and ≤ 55 in other habitable rooms [b]
	Multi-family		X	CNEL ≤ 65 dB (State Aeronautics Noise Standards) requirement does not apply to Mather and McClellan AFB	CNEL ≤ 60 dB for Sacramento International Airport CNEL ≤ 65 dB for all other areas
	Schools	X		None	Noisiest hourly $L_{eq} \leq 40$ dB during school day
	Schools		X	CNEL ≤ 65 dB (State. Aeronautics Noise Standards) requirement does not apply to Mather and McClellan AFB	CNEL ≤ 60 dB for ~~Metro~~ Sacramento International Airport CNEL ≤ 65 dB for all other areas

[a] Projects for which U.S. Department of Housing and Urban Development (HUD) financing is requested are subject to HUD noise requirements. The noise element requirements listed in this table are at least as stringent as the HUD requirements.
[b] The requirement for interior noise exposure is triggered when the exterior L_{dn} exceeds 60 dB.
[c] Multi-family includes hotels, motels, apartment houses, and dwellings other than detached single-family dwellings as defined by Title 24, Part 2, California Administrative Code.
Source: City of Sacramento General Plan 1988

Page 6.3-42, Mitigation Measure 6.3-5 is hereby revised as follows:

Mitigation Measure 6.3-5: (City of Sacramento and LAFCo)

a. Prior to issuance of any building permits, site-specific acoustical analyses shall be conducted once construction plans are available for the proposed school to ensure satisfaction with the City of Sacramento interior noise level standards. This site-specific acoustical analyses shall include site-specific design requirements to reduce noise exposure of proposed on-site receptors and all feasible design requirements shall be implemented into the final site design. Noise reduction measures and design features may include, but are not limited to the use of increased noise-attenuation measures in building construction (e.g., dual-pane, sound-rated windows; mechanical air systems; and exterior wall insulation). Implementation of these design measures would ensure interior noise levels meet the City's noise

standards and ANSI standard, including the ANSI standard that the interior of schools shall not exceed 40 dBA L_{eq} and measured during the peak hour of noise during school operations.

This would result in mitigation of this impact to a less-than-significant level because the interior of school classrooms would be insulated from noise to the degree that speech disruption would not occur."

SECTION 6.4, UTILITIES

Page 6.4-14, paragraph 1 is hereby revised as follows:

Environmental Impacts Associated with SRWTP Expansion. *The SRWTP would provide wastewater treatment services for the project. The SRCSD approved an ~~SRWTP is currently undergoing expansion~~ to accommodate wastewater treatment demands for future growth and development. As a result, the project would contribute to the need to expand the SRWTP. According to the EIR prepared for the SRWTP 2020 Master Plan Expansion, construction and operation of facility improvements could contribute to significant and unavoidable impacts related to construction-related air quality. Because the project would contribute to the need for expanding the SRWTP, and would contribute to the impacts assessed in the EIR for the SRWTP 2020 Master Plan Expansion would be a* ***significant*** *impact to wastewater facilities.*

SECTION 6.10, HYDROLOGY, DRAINAGE, AND WATER QUALITY

Page 6.10-24, Mitigation Measure 6.10-3 has been replaced with the following:

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

The following mitigation shall apply in the event that FEMA revises the FIRM and issues a new SFHA designation that indicates the Natomas levees can no longer provide 100-year flood protection (decertification). The City anticipates that after decertification, but before recertification, FEMA will likely remap the Natomas area (including the Greenbriar project site) as one of three potential SFHA designations: AE, AR, or A99 zone. Each designation prescribes specific building and design requirements for new, above-ground development.

If the Greenbriar project site is remapped by FEMA into an AE, AR, or A99 zone, then:

(1) the City will require development within the project site to comply with all applicable building and design regulations identified by FEMA and by the City of Sacramento's Floodplain Management Ordinance in existence at the date of issuance of building permits pertaining to the applicable remapped zone;

(2) the project applicant shall participate in a funding mechanism such as an assessment district established by SAFCA and/or the City for the purpose of implementing measures that would provide no less than 100-year flood protection for the Greenbriar project site, or for that portion of the Natomas Basin requiring recertification for 100-year flood protection including the Greenbriar project site provided that such funding mechanism is

   i. based on a nexus study;
   ii. is regional in nature;
   iii. is proportionate, fair, and equitable; and
   iv. complies with all applicable laws and ordinances.

(3) the requirements of the applicable FEMA zone and corresponding requirements under the City of Sacramento's Floodplain Management Ordinance shall be met prior to the issuance of building permits for the project. Homeowners within the floodzone shall maintain federal flood insurance, as required under the applicable FEMA and City of Sacramento Floodplain Management Ordinance regulations.

Mitigation measures(1) and (3) shall terminate upon the first recertification of the levees by the U.S. Army Corp of Engineers. Under any of the three SFHA designations (AE, AR, or A99), homebuilders within the floodzone area shall disclose to all prospective buyers, lenders, bondholders and insurers of property through written disclosure, prior to the sale of units, that the U.S. Army Corps of Engineers has determined that the levees protecting the Natomas Basin may not provide flood protection from a 100-year or greater storm event until the levees are recertified as providing 100-year flood protection.

SIGNIFICANCE AFTER MITIGATION

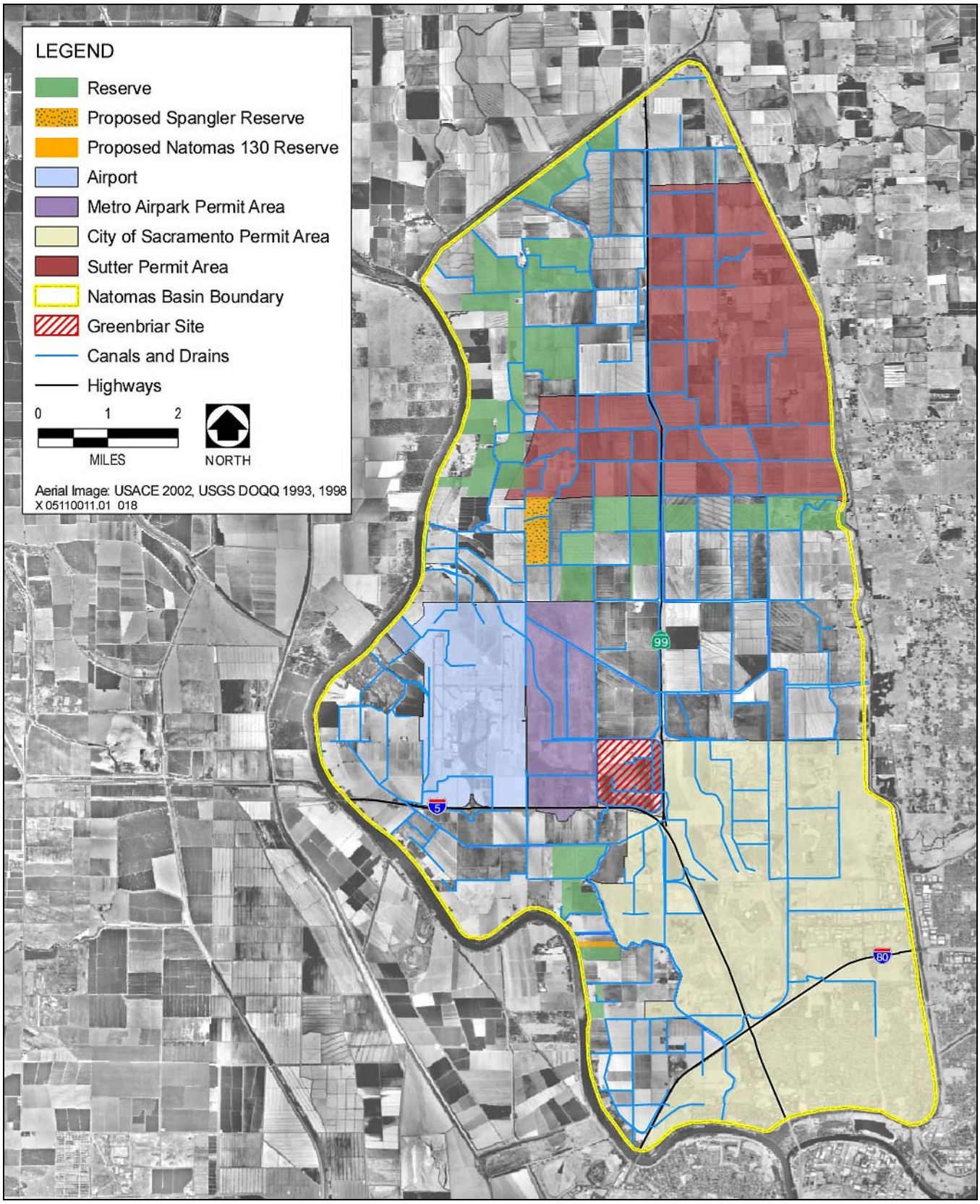
Implementation of the above mitigation would ensure that all development that occurs at the project site prior to recertification of the Natomas levee system would comply with the development restrictions established for flood hazard areas and would result in a ***less-than-significant*** long-term flooding impact because 100-year flood protection would be provided at the project site. Although there is reasonable certainty that the levee improvements would be in place to provide 100-year flood protection by 2010, depending on the SFHA designation selected for the site, it is possible that some damageable structures and/or homes could be in place prior to implementation of all levee improvements that would provide 100-year flood protection. Should this occur, ***significant and unavoidable*** flood hazard impacts would occur for a short-term period of time. Because the construction of structures and homes would be allowable within FEMA's regulations, no other feasible mitigation would be available.

SECTION 6.12, BIOLOGICAL RESOURCES

Page 6.12-9, fourth paragraph is revised as follows:

The project site and Off-site Conservation Lands are within the Plan Area for the Natomas Basin Habitat Conservation Plan (NBHCP), a regional conservation plan for minimizing and mitigating impacts to multiple species from urbanization in the Natomas Basin. USFWS has approved the NBHCP and has issued Incidental Take Permits (ITPs) to the City and Sutter County for take of federally listed species to result from urban development in the Natomas Basin. Sacramento County is not a permittee under the NBHCP; however, the NBHCP covers approximately 1,600 acres of, ~~and the NBHCP does not cover urban development for~~ unincorporated portions of Sacramento County, although the NBHCP does provide for land acquisition in these unincorporated areas on a willing-seller basis for conservation purposes. The NBHCP currently authorizes take associated with 17,500 acres of urban development in southern Sutter County (7,500 acres) and within the City (8,050 acres) and Sacramento County (i.e., 1,983 acres of the MAP area).

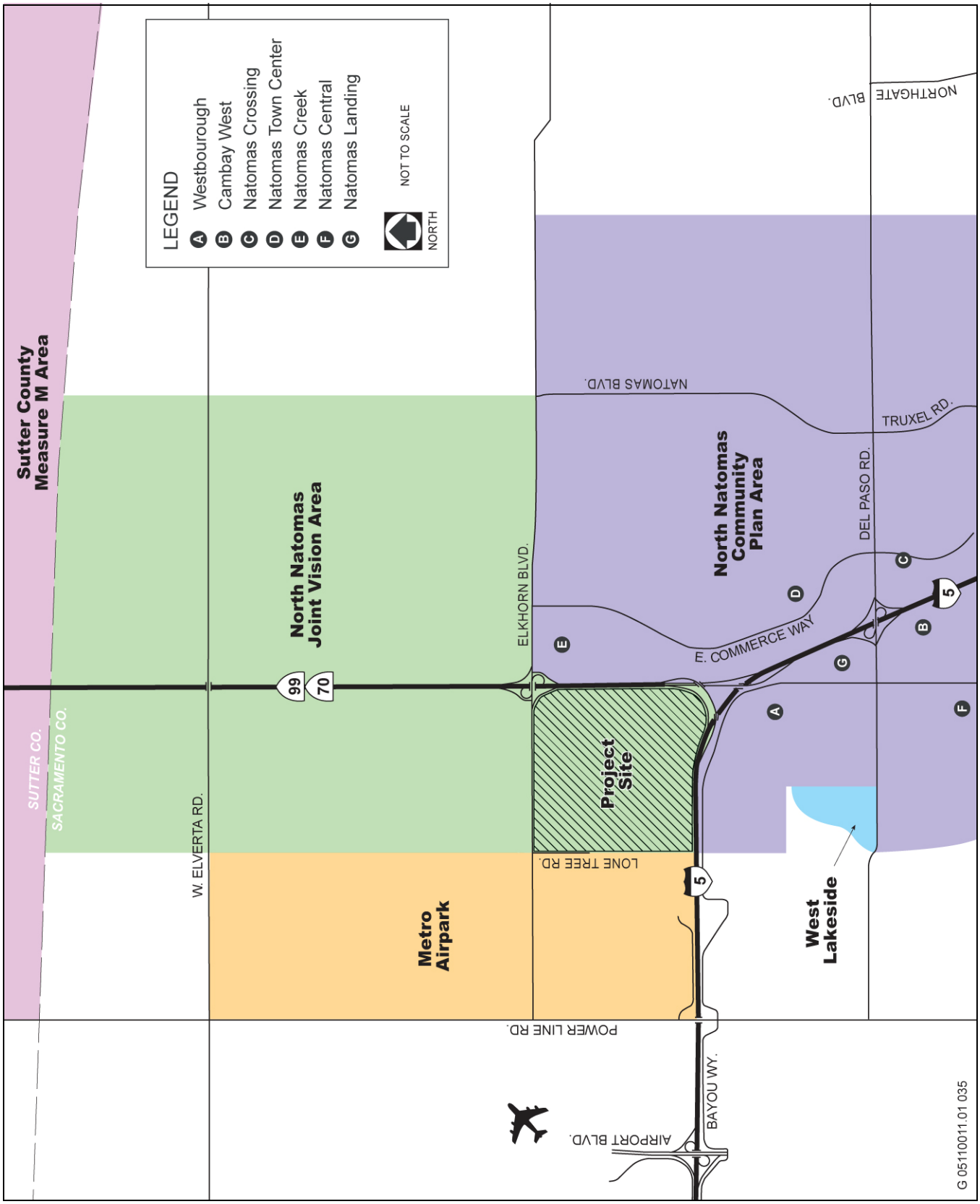
Exhibit 6.12-4 is hereby revised as follows (see comment 21-19):



Location of Greenbriar Project in Natomas Basin **Exhibit 6.12-4**

CHAPTER 7, OTHER CEQA-REQUIRED ANALYSES

Exhibit 7-1 is hereby revised as follows:



Source: TJKM 2005

Project's Contribution to Potential Cumulative Impacts **Exhibit 7-1**

8 REFERENCES

Wood Rodgers. 2005. Greenbriar Master Drainage Study. July 2005.

9 REPORT PREPARATION

9.1 CO-LEAD AGENCIES

CITY OF SACRAMENTO

DEVELOPMENT SERVICES DEPARTMENT

Lezley Buford ..... Environmental Planning Services Manager
Tom Buford ..... Senior Planner
David Kwong ..... Planning Manager
Samar Hajeer ..... Supervising Civil Engineer
Scott Tobey ..... Associate Civil Engineer
Sabina Gilbert ..... Legal Counsel
Joe Cerullo ..... Legal Counsel

PLANNING DEPARTMENT

Carol Shearly ..... Director of Planning
Scott Mende ..... New Growth Manager
Mark Griffin ..... Public Improvements Financing Manager
Arwen Wacht ..... Associate Planner

SACRAMENTO COUNTY LOCAL AGENCY FORMATION COMMISSION

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

9.2 EIR CONSULTANT

EDAW, INC.

Gary Jakobs, AICP ..... Principal-in-Charge
Amanda Olekszulin ..... 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
John Hunter ..... Senior Restoration Ecologist
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

9.3 TRAFFIC CONSULTANT

TJKM TRANSPORTATION CONSULTANTS

Chris D. Kinzel, P.E. ..... Principal in Charge
Gordon Lum, P.E. ..... Project Manager
Jia Hao Wu, Ph.D. ..... Senior Associate
Arun Gajendran, EIT ..... Project Engineer
Stephen Au, P.E. ..... Senior Transportation Engineer
Allen Nie, Ph.D. ..... Senior Modeler
Andrew Kluter, EIT ..... Transportation Engineer
Geri Foley ..... Graphics Designer
Evi PaghP ..... Word Processing