U.S. Army Corps of Engineers

WESTBROOK PROJECT
Draft Environmental Impact Statement
USACE Action ID: SPK-2005-00938

Volume II – Appendices

Prepared For:

U.S. Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, California 95814

Prepared by:

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555 12th Street, Suite 1650
Oakland, California 94607

May 2013

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Westbrook Project

USACE Action ID: SPK-2005-00938

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Volume II

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Air Quality Emissions Calculations Comparison of Alternatives
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3.4 Biological Resources Documentation
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Waters of the U.S. Impact and Mitigation Data for the Study Area (1990 through 2011) extracted from DA permit files (Prepared by the USACE, January 2012)

3.12 Traffic Noise Modeling

3.14 Westbrook EIS Transportation Analysis

APPENDIX 1.0

Scoping Letter

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

RECEIVED
DEC 27 2011
Regulatory Division
USACE-Sacramento

December 21, 2011

James T. Robb
U.S. Army Corps of Engineers
650 Capital Mall Suite 5-200
Sacramento, CA 95814-4708

Subject: Notice of Intent to Prepare an Environmental Impact Statement (DEIS) for the Proposed Westbrook Project, Placer County, California. (SPK-2005-00938).

Dear Mr. Robb:

The U.S. Environmental Protection Agency (EPA) has reviewed the Notice of Intent to Prepare an Environmental Impact Statement (DEIS) for the Proposed Westbrook Project (Project) pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act. These comments were also prepared under the authority of, and in accordance with, the provisions of the Federal Guidelines (Guidelines) promulgated at 40 CFR 230 under Section 404(b)(1) of the Clean Water Act (CWA). Our detailed comments are enclosed.

We question the viability of the project as proposed, due to the lack of suitable area for vernal pool mitigation, including limited opportunities for vernal pool preservation. According to the notice the project proposes to fill 9.6 of the sites approximate 13 acres of waters of the United States. This project and several others nearby would contribute to the loss of already considerably reduced acreage of vernal pools in the Placer County Area, which are designated as critical habitat for a variety of threatened and endangered species by the U.S. Fish and Wildlife Service[1]. In the attached detailed comments, EPA identifies other serious concerns regarding waters of the U.S., cumulative impacts and also provides recommendations on air quality, traffic emissions, smart growth, and green building.

We appreciate the opportunity to review this NOI. When the DEIS is released for public review, please send one hard copy and three CD ROMs to the address above (mail code: CED-2). For further coordination and assistance with issues pertaining to waters of the U.S., please contact Paul Jones, EPA Wetlands Office at (415) 9723470, or by email at jones.paul@epa.gov. For further coordination and assistance with issues pertaining to NEPA, please contact me at (415) 972-3800, or munson.james@epa.gov.

Sincerely,

James Munson

James Munson, Lead Reviewer
Environmental Review Office
Communities and Ecosystems Divisio

[1] See the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon,* 2005, U.S. Fish and Wildlife Service

EPA'S DETAILED COMMENTS ON THE NOTICE OF INTENT TO PREPARE AN ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED WESTBROOK PROJECT, (SPK-2005-00938). DECEMBER 21, 2011

Project Purpose and Need

The purpose and need statement in the Environmental Impact Statement (DEIS) should be clearly stated and briefly describe the underlying purpose and need to which the U.S. Army Corps of Engineers (Corps) is responding in proposing alternatives, including the proposed action (40 C.F.R. 1502.13). The statement of purpose and need should explain why the Corps is undertaking the proposed Westbrook Project (project) and the objectives that the action is intended to achieve. A clear purpose and need statement is important under the National Environmental Policy Act (NEPA) and to EPA's review. It should be directly linked to the proposed alternative designs and clarify the potential impacts of a range of reasonable alternatives for the project.

Alternatives

The DEIS should clearly describe and assess a reasonable range of alternatives, including the no action alternative. Because of the large footprint of the project and the potential for significant impacts to several environmental resources, the Corps and project applicant should consider a range of alternatives that avoid impacts to resources to the maximum extent practicable. EPA strongly encourages the Corps to conduct an assessment of the environmental resources at the project site and preserve areas with higher functions and values in perpetuity. The results of this analysis should be described in the DEIS, including how the alternatives have been developed to avoid and protect environmental resources at the site.

Waters of the United States

The DEIS should demonstrate compliance with Clean Water Act Section 404(b)(1) Guidelines (Guidelines) and their requirements for avoidance and minimization (40 CFR 230.10). Generally, the Guidelines limit issuing 404 permits to only those projects that avoid waters of the United States (WOUS) to the maximum extent practicable.

The DEIS should also demonstrate compliance with the Corps and EPA approved *Compensatory Mitigation for Losses of Aquatic Resources; Final Rule* (Mitigation Rule) 33 CFR Parts 325 and 332, and 40 CFR Part 230. Where impacts to WOUS are determined to be unavoidable, the applicant will need to identify appropriate compensatory mitigation consistent with the Mitigation Rule, which can be found at: http://www.epa.gov/wetlandsmitigation/ and http://www.usace.army.mil/cw/cecwo/reg/citizen.htm.

The amount of impacts to WOUS from this project is large, over 9 acres. This includes impacts to vernal pools. In light of the cumulative impacts to that resource and the amount of mitigation necessary to offset these losses, EPA is concerned about how the applicant will comply with the Mitigation Rule. Assuming acres of vernal pools will be impacted, EPA has concerns regarding where mitigation might occur.

EPA is concerned that opportunities for mitigation are shrinking as numerous development projects compete for the same insufficient finite resources to meet their mitigation requirements. For example, the Placer Vineyards, Sierra Vista, Riolo Vineyards, and the Curry Creek Community Plan projects are all vying for these mitigation resources.

Water Availability

The DEIS should describe existing and/or proposed sources of water supply for the project and direct, indirect and cumulative impacts to water resources that may occur. The project could result in multiple new residents and industrial use in the area, resulting in significant increases in water demands for an indefinite period of time. EPA strongly encourages the Corps to include in the DEIS a description of all water conservation measures that will be implemented to reduce water demands for the project, both during and after construction. Project design should maximize conservation measures such as appropriate use or recycled water for landscaping and industry, xeric landscaping, a water pricing structure that accurately reflects the economic and environmental costs of water use, and water conservation education. An estimate of the water resource benefits that result from each mitigation and conservation measure proposed should be included in the DEIS. Water saving strategies can be found in the EPA's publications *Protecting Water Resources with Smart Growth* at www.epa.gov/piedpage/pdf/waterresources_with_sg.pdf, and *USEPA Water Conservation Guidelines* at www.epa.gov/watersense/docs/app_a508.pdf.

In addition, the DEIS should describe water reliability for the project area and clarify how existing and/or proposed sources will be affected by climate change. At a minimum, EPA request a qualitative discussion of impacts to water snpply and adaptability of the project to these changes, as part of the DEIS impacts analysis.

Biological Resources

EPA is very concerned with the level of significant impact from the project to biological resources. The project area potentially supports habitat for state and federally listed species, including vernal pool fairy shrimp, vernal pool tadpole shrimp, northwestern pond turtle, Swainson's hawk, burrowing owl, prairie falcon, golden eagle, and tri-colored blackbird. The DEIS should provide a description of baseline biological conditions, including habitats and species and a description of direct, indirect and cumulative impacts to these habitats and species. The DEIS should provide information on species and habitats protected under the Federal Endangered Species Act and the California Endangered Species Act, and describe how impacts will be avoided, minimized and mitigated. Include all neighborhood design measures proposed to reduce impacts and highlight how each measure will be effective in avoiding and minimizing impacts. The DEIS should also describe coordination with the U.S. Fish and Wildlife Service and California Department of Fish and Game to reduce and mitigate impacts to all listed species and their habitats in the project area.

Cumulative Effects

The proposed project is one of several developments in the area that have occurred in the recent past or are proposed and under various stages of development. As a result, it is critical that the cumulative effects analysis be comprehensive and rigorous, and that it consider an appropriate scope of activities, and spatial and temporal scales when assessing project effects. EPA suggests referring to the Council on Environmental Quality 1997, guidance *Considering Cumulative Effects Under the National Environmental Policy Act* found at http://www.nepa.gov/nepa/ccenepa/ccenepa.htm, and 1999 EPA guidance, *Consideration of Cumulative Impacts in EPA Review of NEPA Documents* found at http://www.epa.gov/compliance/resources/policies/nepa/cumulative.pdf. In addition, we recommend referring to the EPA, California Department of Transportation, and Federal Highway Administration Guidance for Preparers of Cumulative Impact Analysis found at: http://www.dot.ca.gov/ser/cumulative_guidance/purpose.htm. While this guidance was developed for transportation projects, the principles and the 8-step process in this guidance can be applied to other types

of projects, both within and outside of California. We recommend the principles and steps in this guidance to other agencies as a systematic way to analyze cumulative impacts for their projects.

Air Quality and Traffic

The DEIS must adequately assess air quality impacts of the project and minimize these impacts through adequate mitigation measures. The proposed project area falls within the Sacramento Metropolitan air basin, which is designated nonattainment for some of the National Ambient Air Quality Standards.

The DEIS should provide a discussion of the baseline air quality conditions in the project area and a description of federal and state air quality regulations, and a rigorous assessment of direct, indirect, and cumulative effects of the project on air quality. The analysis of air quality impacts should include direct, indirect and cumulative impacts from construction and post construction conditions, including increased traffic. The Corps should describe in the DEIS specific commitments to mitigate emissions that will prevent further degradation of air quality in the basin. In short, the cumulative impacts analysis should consider all new sources of emissions that are likely to result from the federal action of permitting the proposed project. An estimate of the air quality benefits that result from each mitigation measure proposed should be included in the DEIS. The DEIS should also describe coordination with EPA, California Air Resources Board, and the Placer County Air Pollution Control District to reduce air quality impacts in the air basin.

The DEIS should describe whether the project will or will not meet general conformity requirements with the associated state implementation plans for the air basin. For conformity-related questions, the Corps is encouraged to contact Ms. Dawn Richmond at (415) 947-4151or by email at richmond.dawn@epa.gov.

While the proposed project area is not designated nonattainment for particulate matter (PM), Sacramento County immediately to the south is currently designated moderate nonattainment for PM less than 10 microns (PM10) and may be designated for PM2.5 later this year. To prevent degradation of air quality from construction-caused PM10 in Placer County and any cumulative impacts to Sacramento County, EPA suggest the following fugitive dust control measures be adopted to reduce impacts to existing air quality conditions:

Fugitive Dust Source Controls:

- Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative where appropriate. This applies to both inactive and active sites, during workdays, weekends, holidays, and windy conditions.
- Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions.
- When hauling material and operating non-earthmoving equipment, prevent spillage and limit speeds to 15 miles per hour (mph). Limit speed of earth-moving equipment to 10 mph.

Mobile and Stationary Source Controls:

- Reduce use, trips, and unnecessary idling from heavy equipment.
- Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels and to perform at verified standards applicable to retrofit technologies. Employ periodic, unscheduled inspections to limit unnecessary idling and to ensure that construction equipment is properly maintained, tuned, and modified consistent with established specifications.

- Prohibit any tampering with engines and require continuing adherence to manufacturers recommendations.
- If practicable, lease newer and cleaner equipment meeting the most stringent of applicable Federal or State Standards.
- Utilize EPA-registered particulate traps and other appropriate controls where suitable to reduce emissions of diesel particulate matter and other pollutants at the construction site.

Administrative controls:

- Identify where implementation of mitigation measures is rejected based on economic infeasibility.
- Prepare an inventory of all equipment prior to construction and identify the suitability of add-on emission controls for each piece of equipment before groundbreaking. (Suitability of control devices is based on: whether there is reduced normal availability of the construction equipment due to increased downtime and/or power output, whether there may be significant damage caused to the construction equipment engine, or whether there may be a significant risk to nearby workers or the public.)
- Utilize cleanest available fuel engines in construction equipment and identify opportunities for electrification. Use low sulfur fuel (diesel with 15 parts per million or less) in engines where alternative fuels such as biodiesel and natural gas are not possible.
- Develop construction, traffic and parking management plans that minimizes traffic interference and maintain traffic flow.

The DEIS should identify sensitive receptors in the project area, such as schools, daycare centers, nursing homes, and hospitals and specify the means by which impacts to these receptors will be minimized due to both construction and long term land use associated with the new development . For example, locate construction equipment and staging zones away from sensitive receptors away from fresh air intakes and buildings and design neighborhoods such that activity centers and sensitive receptors are not proximate to emissions sources, such as highways.

Due to the scale of the proposed project and the amount of new residents and jobs in the area, it is reasonable to anticipate increased traffic and congestion in the local surface streets, freeways and highways. The DEIS should include a traffic analysis to determine how the proposed project will affect traffic in the region and contribute to cumulative air quality impacts. Mitigation measures to minimize idling near sensitive receptors should be identified.

We recommend the DEIS include an analysis of the impacts associated with green house gas emissions and hazardous air emissions.

Induced Growth

The DEIS should describe how the proposed project could result in environmental impacts due to induced-growth. Construction of a new development, the size and anticipated population of the project could result in increased pressure for more development, increased transportation infrastructure and other essential services in the area. Taken into account with the other proposed projects in the project area, induced growth impacts could be significant. EPA's recommendation is to make both the methodology and the assumptions in the growth inducing analysis as transparent as possible to the public and decision makers. To do this, EPA recommends that Corps and project:

APPENDIX 2.0

Technical Memorandum: Alternatives Development and Screening

U.S. Army Corps of Engineers—Westbrook Project EIS

TECHNICAL MEMORANDUM: ALTERNATIVES DEVELOPMENT AND SCREENING

JUNE 28, 2012

This memorandum summarizes National Environmental Policy Act (NEPA) alternatives development and screening for the U.S. Army Corps of Engineers (USACE) Westbrook Project EIS.

1.0 PURPOSE AND NEED OF THE PROPOSED ACTION

1.1 Background

In June 2011, Westpark Associates (the Applicant) submitted their draft purpose and need statement to the USACE for the Westbrook project. The stated purpose was "to implement a moderate-scale mixed-use, mixed-density master planned community within or contiguous to the City of Roseville, Placer County, California." According to the Applicant, the project is needed "to help satisfy the City of Roseville's share of the foreseeable regional housing demand and to accommodate commercial and office development in the Roseville area based on the Sacramento Area Council of Government's projections that the region will add approximately 871,000 people by 2035."

1.2 Project Purpose

According to the USACE,

> *[t]he project purpose is to implement a moderate-scale, mixed-use, mixed-density master planned community within or contiguous to the City of Roseville.*

1.3 Project Need

The applicant's stated need for the project is as follows.

> *To help meet the City's foreseeable regional housing demand and to accommodate commercial and office development in the Roseville area based on Sacramento Area Council of Government's projections that the region will add approximately 871,000 million people by 2035.*

2.0 DEVELOPMENT OF EIS ALTERNATIVES

An EIS must consider a reasonable range of feasible alternatives to accomplish the purpose of the agency's action. Once a range of alternatives has been identified, a set of screening criteria may be used to "screen" the alternatives and narrow the range of alternatives to be carried forward for EIS analysis.

To establish the range of alternatives for this EIS analysis, the USACE first developed the project's purpose and need statement. Next, the USACE identified a broad range of potential alternatives that would achieve the project purpose. Finally, the USACE evaluated the potential alternatives against screening criteria based on the aspects of feasibility identified under NEPA—technical, economic, and environmental—to focus consideration on alternatives that meet NEPA stipulations for feasibility. In order to integrate this analysis with the Section 404(b)(1) alternatives analysis, screening criteria that were used in the analysis were also based on the practicability criteria under Section 404(b)(1) – technology, logistics, and cost. This approach ensures a site is screened out only if it is both infeasible under NEPA and impracticable under Section 404(b)(1), and a potential least environmentally damaging practicable alternative (LEDPA) is not eliminated from further analysis for reasons exclusive to NEPA.

The USACE action currently under analysis is the decision whether or not to issue a Section 404 permit to fill approximately 10 acres of jurisdictional waters of the United States in conjunction with the development of the proposed master planned community at the project site. Potential alternatives include a range of alternate development options using all or part of the same site. In addition, based on the project purpose, alternatives development also identifies other sites in or contiguous to the City of Roseville where such a project could reasonably be developed. For purposes of locating alternative sites, the USACE defined "contiguous" as meaning "within 1 mile of the City of Roseville's Sphere of Influence."

The following sections present a summary overview of the No Action Alternative, followed by the Proposed Action (Applicant's project as proposed), a discussion of on- and off-site alternatives development and screening steps, and a list of the alternatives proposed to be carried forward for analysis in the EIS.

2.1 Proposed Action (Applicant's Proposed Project)

The Westbrook project is a proposal to develop a moderate-scale, mixed-use, mixed-density master planned community on an approximately 400-acre site located in the northwestern portion of the City of Roseville (City). The project site is flanked to the east and the north by the West Roseville

Specific Plan area, where development is currently under construction to the east of the project, and to the south by the Sierra Vista Specific Plan site, where development has been approved by the City but the federal permit process is not yet complete. To the west of the site is undeveloped land, some of which lies within the Regional University and Community Specific Plan area and some of which lies within the Curry Creek Community Plan area.

The project site, formerly known as the Richland property, was previously part of the Sierra Vista Specific Plan. In August 2008, the previous owner withdrew from the Sierra Vista Specific Plan, which was subsequently approved by the City of Roseville in May 2010 with the Richland property treated as Urban Reserve. USACE has proceeded with processing an EIS for the Sierra Vista Specific Plan without the Richland property included as part of the Proposed Action. The Richland property was subsequently acquired by Westpark Associates and they are proceeding with the specific plan preparation and approval process for the property, now known as the Westbrook project.

The Proposed Action would entail development of about 361 acres of the 397-acre project site with a mix of land uses, including approximately 257 acres of residential uses, for a total of 2,029 residential units at buildout; approximately 43 acres of commercial uses; approximately 11 acres of school and other public uses; 36 acres of open space; 16 acres of parks; and 46 acres of roads. **Figure 1** presents the proposed land use plan. Development of the master planned community envisioned under the Westbrook project would be a long-term undertaking; construction is expected to begin in 2013 and, depending on market conditions, would be completed by about 2035.

2.2 On-Site Alternatives

2.2.1 Overview of On-Site Alternatives Development

The following paragraphs describe the range of on-site alternatives identified to date. These include four on-site action or "build" alternatives and one alternative entailing no action by the USACE.

No Action Alternative

Under the No Action Alternative, the project site would be developed in a manner that avoids activities in jurisdictional waters of the United States, including wetlands, thereby avoiding the need for USACE approvals under Section 404 of the Clean Water Act. Local approvals may still be required. The No Action Alternative may require authorization from the U.S. Fish and Wildlife Service (USFWS) under the federal Endangered Species Act because of the potential for take of federally listed species.

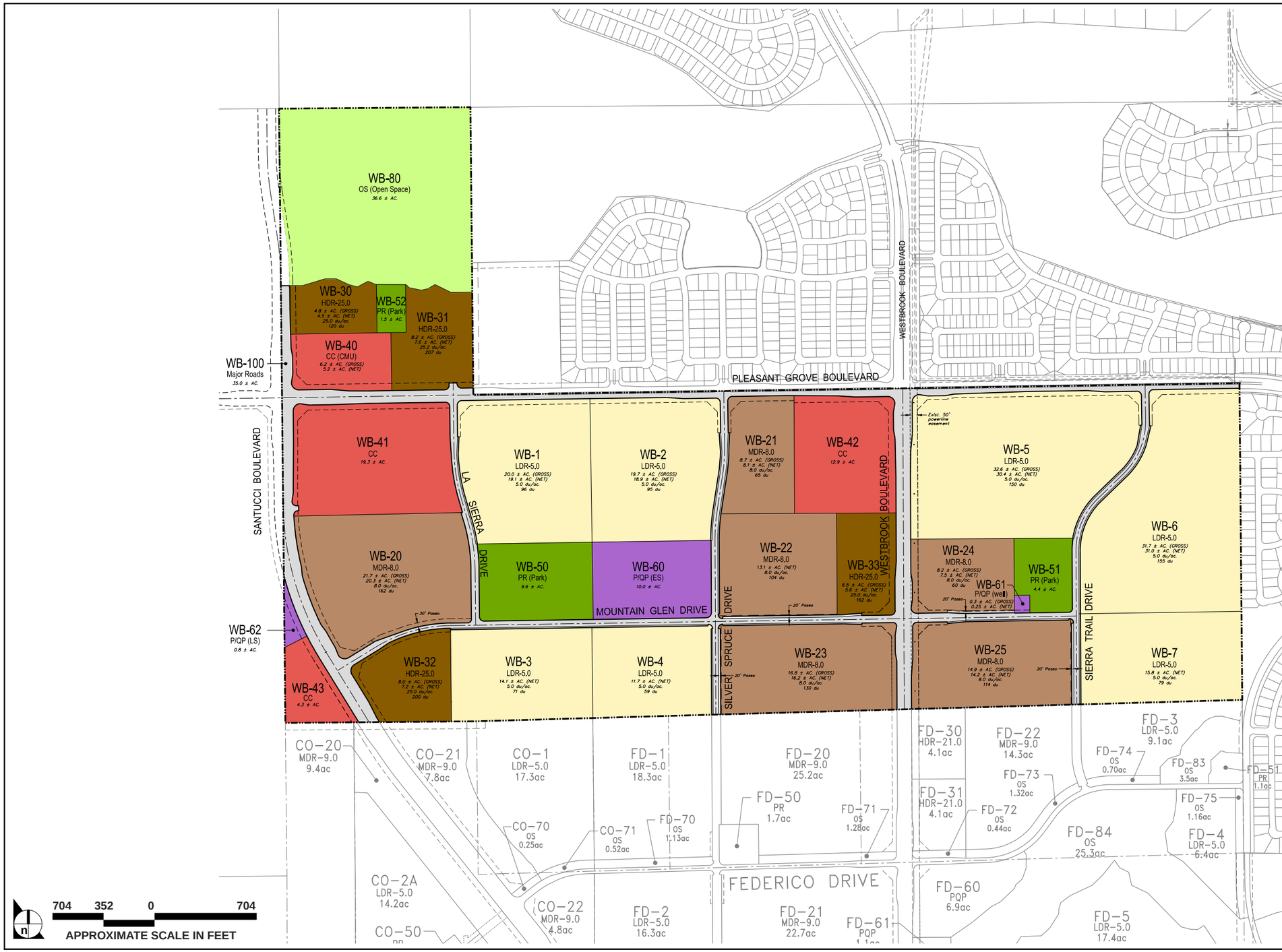
The No Action Alternative would involve development of portions of the approximately 397-acre site, resulting in a reduced extent of residential and commercial uses. Avoidance of Section 404 triggers would reduce the total development footprint to 275 acres, comprising 177 acres of residential uses (1,505 residential units at buildout), 30 acres of commercial and office uses, a 12 acres of school and other public uses, 14 acres of parks, and 44 acres of roads. About 122 acres would be preserved as open space. With the exception of Mountain Glen Drive, which would be curved to minimize open space crossings, roadway layout would be substantially similar to the Proposed Action. **Figure 2** presents the proposed land use plan for the No Action Alternative.

Reduced Footprint/Increased Density Alternative

This alternative would also develop the 397-acre project site but would reduce the footprint of development within the site by increasing the acreage designated as open space, with the additional open space focused in areas that contain the greatest concentrations of sensitive habitat (vernal pools and/or drainages). The additional open space would be concentrated in the central portion of the site, east of La Sierra Drive and west of Westbrook Boulevard, and the eastern portion of the site, north of Mountain Glen Drive and west of Sierra Trail Drive. Under this alternative, total acreage to be developed would be reduced to 267 acres, compared to 361 acres under the Proposed Action, and open space would increase to 130 acres, compared to 36 acres under the Proposed Action. The residential development footprint would decrease to 153 acres, versus 245 acres under the Proposed Action. However, residential densities would increase to accommodate a similar number of residential units (1,890 residential units under this alternative, compared to 2,029 units under the Proposed Action). Acreage designated for commercial uses would be reduced slightly under this alternative and the acreage for public uses would remain the same. The location of roadways and commercial land uses would be largely similar to the Proposed Action, with Mountain Glen Drive and Sierra Trail Drive somewhat more curved to avoid open space areas. **Figure 3** presents the proposed land use plan for this alternative.

Reduced Footprint/Same Density Alternative

The Reduced Footprint/Same Density Alternative would have the same reduced development footprint as the Reduced Footprint/Increased Density Alternative described above, but would develop residential areas at the same densities as the Proposed Action. As a result, this alternative would provide 1,405 residential units, compared to 2,029 units under the Proposed Action. Acreage designated for commercial uses would be reduced slightly under this alternative by comparison with the Proposed Action and the acreage for public uses would remain the same. The location of roadways and commercial land uses would be largely similar to the Proposed Action, with Mountain Glen Drive and Sierra Trail Drive somewhat more curved to avoid open space areas. **Figure 4** presents the proposed land use plan for this alternative.



SOURCE: MacKay & Somps, August 2011

PRELIMINARY STREET GEOMETRY, ACREAGE, and DWELLING UNIT COUNTS

WESTBROOK

Land Use	Acres (gr.)	Acres (net)	D.U.
LDR	145.6	141.0	705 (1)
MDR	83.4	79.4	635 (2)
HDR	27.5	24.9	689 (3)
CC	36.5		
CC(CMU)	6.2		
P/QP (School)	10.0		
P/QP (well site)	0.3		
P/QP (lift station)	0.8		
PARK	15.5		
OPEN SPACE	36.6		
MAJOR ROADS	35.0		
SITE TOTALS	397.4		2029

NOTES:
(1) LDR Dwelling Units based on net acres.
(2) MDR Dwelling Units based on net acres.
(3) HDR Dwelling Units based on gross acres.

SIERRA VISTA LOT NUMBER KEY

LOT NUMBERS	LAND USE
1 - 19	Low Density Residential (LDR)
20 - 29	Medium Density Residential (MDR)
30 - 39	High Density Residential (HDR)
40 - 49	CC/CMU/BP
50 - 59	Park (PR)
60 - 69	Public / Quasi-Public (PQP)
70 - 79	Open Space (OS) - Paseos
80 - 89	Open Space (OS)
90 - 99	Urban Reserve (UR)
100	Major Roads

FIGURE 1

Proposed Action

1122-001•05/13

LAND USE SUMMARY TABLE

LAND USE		ACRES	DENSITY (du/ac.)	DU
Residential				
LDR	Low Density Residential	92.6	5.0	460
MDR	Medium Density Residential	61.7	8.0	490
HDR	High Density Residential	22.3	25.0	555
sub-total		176.6		
Commercial				
CC	Community Commercial	29.8		
sub-total		29.8		
Public Quasi Public - PQP				
	Elementary School	10.0		
	Well Site	0.8		
	Lift Station Site	0.8		
sub-total		11.6		
PR	Park (4)	13.5		
OS	Open Space	121.6		
	Landscape Corridor/Paseo	8.5		
	Major Roads	35.8		
sub-total		179.4		
Total Project Area		397.4±		1505 du

Ⓐ Denotes Affordable Housing Site

Denotes Span or Causeway

NORTH

0 300 600 600

SOURCE: MacKay & Somps – November 2011

FIGURE **2**

No Action Alternative

1122-001•08/12

AREA & FOOTPRINT TABLE

	ACRES
Project area	397.4 ± ac
Existing Open Space	-36.2 ± ac
Project Footprint	361.2 ± ac
25% Project Footprint (additional Open Space)	90.3 ± ac
"Reduced Footprint"	270.9 ± ac

LAND USE SUMMARY TABLE

LAND USE		ACRES	DENSITY (du/ac.)	DU
Residential				
LDR	Low Density Residential	47.5	5.0	235
MDR	Medium Density Residential	58.1	8.0	460
HDR	High Density Residential	47.8	25.0	1195
sub-total		153.4		
Commercial				
CC	Community Commercial	39.9		
sub-total		39.9		
Public Quasi Public - PQP				
	Elementary School	10.0		
	Well Site	1.0		
	Lift Station	0.9		
sub-total		11.9		
PR	Park (4)	15.7		
OS	Open Space	129.8		
	Landscape Corridor/Paseo	12.1		
	Major Roads	34.6		
sub-total		192.2		
Total Project Area		397.4±		1890 du

Ⓐ Denotes Affordable Housing Site

NORTH

0 300 600 1200

SOURCE: MacKay & Somps – June 2012

FIGURE 3

Reduced Footprint / Increased Density Alternative

1122-001•08/12

AREA & FOOTPRINT TABLE

	ACRES
Project area	397.4 ± ac
Existing Open Space	-36.2 ± ac
Project Footprint	361.2 ± ac
25% Project Footprint (additional Open Space)	90.3 ± ac
"Reduced Footprint"	270.9 ± ac

LAND USE SUMMARY TABLE

LAND USE		ACRES	DENSITY (du/ac.)	DU
Residential				
LDR	Low Density Residential	87.9	5.0	440
MDR	Medium Density Residential	46.3	8.0	370
HDR	High Density Residential	23.7	25.0	595
sub-total		157.9		
Commercial				
CC	Community Commercial	39.9		
sub-total		39.9		
Public Quasi Public - PQP				
	Elementary School	10.0		
	Well Site	1.0		
	Lift Station	0.9		
sub-total		11.9		
PR	Park (3)	11.2		
OS	Open Space	129.8		
	Landscape Corridor/Paseo	12.1		
	Major Roads	34.6		
sub-total		187.7		
Total Project Area		397.4±		1405 du

Ⓐ Denotes Affordable Housing Site

NORTH

0 300 600 600

SOURCE: MacKay & Somps – November 2011

FIGURE 4

Reduced Footprint/Same Density Alternative

1122-001•08/12

Central Preserve Alternative

This alternative would reduce the footprint of development within the site by concentrating additional open space in a contiguous area that runs roughly north-south through the center of the site. Under this alternative, total acreage to be developed would be reduced 25 percent to 271 acres, compared to 361 acres under the Proposed Action, and open space would increase to 126 acres, compared to 36 acres under the Proposed Action. The residential development footprint would decrease to 162 acres, versus 245 acres under the Proposed Action. As residential densities would remain similar to the Proposed Action, the total number of residential units under this alternative would be about 1,415. Acreage designated for commercial and school uses would be similar to the Proposed Action under this alternative. The location of roadways and commercial land uses would be largely similar to the Proposed Action, with Mountain Glen Drive and Sierra Trail Drive somewhat more curved to avoid open space areas. **Figure 5** presents the proposed land use plan for this alternative.

One Acre Fill Alternative

Under the One Acre Fill Alternative, areas on the project site containing wetland resources would be preserved as open space such that no more than 1 acre of jurisdictional wetlands would be filled to build the land development under this alternative. This would reduce the development footprint to about 236 acres, compared to 361 acres under the Proposed Action. The proposed residential densities under this alternative are greater than the densities included in the Proposed Action. However, due to the reduced footprint of development, the total residential development would be reduced to 1,340 dwelling units, compared to 2,029 units under the Proposed Action. Land designated for commercial uses would be about 23 acres compared to 43 acres under the Proposed Action. Institutional land uses would be largely the same as under the Proposed Action. School acreage would remain the same as under the Proposed Action. Open space acreage would increase from about 36 acres under the Proposed Action to about 161 acres under this alternative. The alignments of Mountain Glen Drive, Silver Spruce Drive, and Sierra Trail Drive would be substantially different from the locations of these roadways under the Proposed Action. This alternative would also include a bridge along a portion of Silver Spruce Drive. **Figure 6** presents the proposed land use plan for this alternative.

Half Acre Fill Alternative

Under the Half Acre Fill Alternative, areas on the project site containing wetland resources would be preserved as open space such that no more than 0.5 acre of jurisdictional wetlands would be filled to build the land development under this alternative. This would reduce the development footprint to about 223 acres, compared to 361 acres under the Proposed Action. As with the One Acre Fill Alternative above, the proposed residential densities under this alternative are greater than the densities included in the Proposed Action. However, due to the reduced footprint of development, the total number of residential units would be reduced to 1,256 dwelling units, compared to 2,029 units under the Proposed Action. Land designated for commercial uses would be about 19 acres compared to 43 acres under the Proposed Action. Acreage for school uses would be largely the same as under the Proposed Action. Open space acreage would increase from about 36 acres under the Proposed Action to about 174 acres under this alternative. The alignments of Mountain Glen Drive, Silver Spruce Drive, and Sierra Trail Drive would be substantially different from the locations of these roadways under the Proposed Action. This alternative would also include a bridge along a portion of Silver Spruce Drive. **Figure 7** presents the proposed land use plan for this alternative.

2.3 Off-Site Alternatives

2.3.1 Definition of Study Area for Off-Site Alternatives

As noted above, the project purpose is to implement a moderate-scale, mixed-use, mixed-density master planned community within or contiguous to the City of Roseville. Based on the project purpose, the USACE defined the geographic area for alternate sites to include all lands that are within the City of Roseville or within 1 mile of the City's Sphere of Influence (SOI) boundary (the City's SOI is coterminous with the City limits except in the areas around the Creekview Specific Plan area and Amoruso Ranch).

2.3.2 Identification of Potential Alternative Sites

Within this area, as a first step, all areas that are not yet developed but have an active DA permit application with the USACE were excluded from consideration. Therefore, three areas (the Creekview Specific Plan, Sierra Vista Specific Plan, and the Placer Vineyards Specific Plan areas) were excluded.

AREA & FOOTPRINT TABLE

	ACRES
Project area	397.4 ± ac
Existing Open Space	-36.2 ± ac
Project Footprint	361.2 ± ac
25% Project Footprint (additional Open Space)	90.1 ± ac
"Reduced Footprint"	271.1 ± ac

LAND USE SUMMARY TABLE

LAND USE		ACRES	DENSITY (du/ac.)	DU
Residential				
LDR	Low Density Residential	97.5	5.0	485
MDR	Medium Density Residential	40.2	8.0	320
HDR	High Density Residential	24.4	25.0	610
sub-total		162.1		
Commercial				
CC	Community Commercial	39.9		
sub-total		39.9		
Public Quasi Public - PQP				
	Elementary School	10.0		
	Well Site	0.5		
	Lift Station	0.9		
sub-total		11.4		
PR	Park (3)	11.5		
OS	Open Space	126.3		
	Landscape Corridor/Paseo	11.6		
	Major Roads	34.6		
sub-total		184.0		
Total Project Area		397.4±		1415 du

Ⓐ Denotes Affordable Housing Site

NORTH

0 300 600 1200

SOURCE: MacKay & Somps – September 2012

FIGURE 5

Central Preserve Alternative

1122-001•10/12

LAND USE SUMMARY TABLE

LAND USE		ACRES	DENSITY (du/ac.)	DU
Residential				
LDR	Low Density Residential	79.5	5.0	397
MDR	Medium Density Residential	33.9	8.0	270
HDR	High Density Residential	26.9	25.0	673
sub-total		140.3		
Commercial				
CC	Community Commercial	22.8		
sub-total		22.8		
Public Quasi Public - PQP				
	Elementary School	10.0		
	Well Site	1.0		
	Pump Station	1.0		
sub-total		12.0		
PR	Park (4)	12.8		
OS	Open Space	161.0		
	Landscape Corridor/Paseo	16.8		
	Major Roads	31.8		
sub-total		222.4		
Total Project Area		397.4±		1340 du

Ⓐ Denotes Affordable Housing Site

Denotes Span or Causeway

SOURCE: MacKay & Somps – June 2012

FIGURE **6**

One Acre Fill Alternative

1122-001•08/12

LAND USE SUMMARY TABLE

LAND USE		ACRES	DENSITY (du/ac.)	DU
Residential				
LDR	Low Density Residential	74.1	5.0	395
MDR	Medium Density Residential	30.5	8.0	244
HDR	High Density Residential	24.7	25.0	617
sub-total		129.3		
Commercial				
CC	Community Commercial	18.7		
sub-total		18.7		
Public Quasi Public - PQP				
	Elementary School	10.0		
	Well Site	1.0		
	Pump Station	2.4		
sub-total		12.4		
PR	Park (4)	12.5		
OS	Open Space	174.3		
	Landscape Corridor/Paseo	18.3		
	Major Roads	31.8		
sub-total		236.9		
Total Project Area		397.4±		1256 du

Ⓐ Denotes Affordable Housing Site

Denotes Span or Causeway

NORTH

0 300 600 1200

SOURCE: MacKay & Somps – June 2012

FIGURE 7

Half Acre Fill Alternative

1122-001•08/12

The next task was to identify areas offering an amount of contiguous undeveloped land, appropriate to support development of a moderate-scale, mixed-use community. The City has a General Plan policy (Policy LH-6) that requires large development projects to be developed pursuant to a Specific Plan. While there is no minimum size for Specific Plan areas considered by the City, the City generally treats infill sites less than 100 acres and greenfield sites less than 300 acres to be individual development projects rather than Specific Plan projects.[1] Because the Proposed Action would be developed pursuant to a Specific Plan, the USACE had determined that the minimum size of an alternative greenfield or infill site to develop the Proposed Action is 220 acres. This minimum size is also consistent with the Half Acre Fill Alternative, which is the On-Site Alternative with the smallest development footprint (223 acres).

Based on review of the current General Plan for the City of Roseville, together with information on existing development proposals in western Placer County, seven sites within 1 mile of the City's SOI were identified for further screening. The sites are shown on **Figure 8, Potential Off-Site Alternatives,** and are briefly described below.

Placer Ranch Site

The Placer Ranch Specific Plan (SP) area comprises a 2,250-acre site in unincorporated Placer County, north of Roseville. The 2,250-acre site has previously been proposed for development of residential, business park, light industrial uses, office, and commercial uses and a 300-acre branch campus for the California State University, Sacramento. The Placer Ranch SP project was originally proposed in the County. In 2007, a development application was submitted to the City of Roseville, but the project has been on hold since early 2008. The project is not approved at this time.

The central portion of the SP area is within the County-defined Western Regional Landfill buffer area, within which development is restricted to non-residential uses. There is a 329-acre contiguous area in the southeast corner of the Placer Ranch SP area that is outside of the 1-mile landfill buffer and within 1 mile of the City's SOI. This is potentially a suitable alternative site for the Proposed Action (see **Figure 8**).

Amoruso Ranch Site

The 674-acre Amoruso Ranch SP area is located on the south side of West Sunset Boulevard approximately 1.5 miles west of Fiddyment Road. The Creekview SP area is located to the south

1 Pease, personal communication, October 5, 2011.

and Reason Farms is located to the west of the Amoruso Ranch SP area. The site is located in unincorporated Placer County, but is within the City's SOI (see **Figure 8**).

A development application for the Amoruso Ranch SP was submitted to the City in May 2011. The proposed land use plan includes 2,785 residential units, 56 acres of commercial uses, a 7-acre elementary school site, six neighborhood parks, and a 6.9-acre fire station/public facilities site. Approximately 140 acres of the site would be set aside as open space preserve. The project is not approved at this time.

Reason Farms Panhandle Site

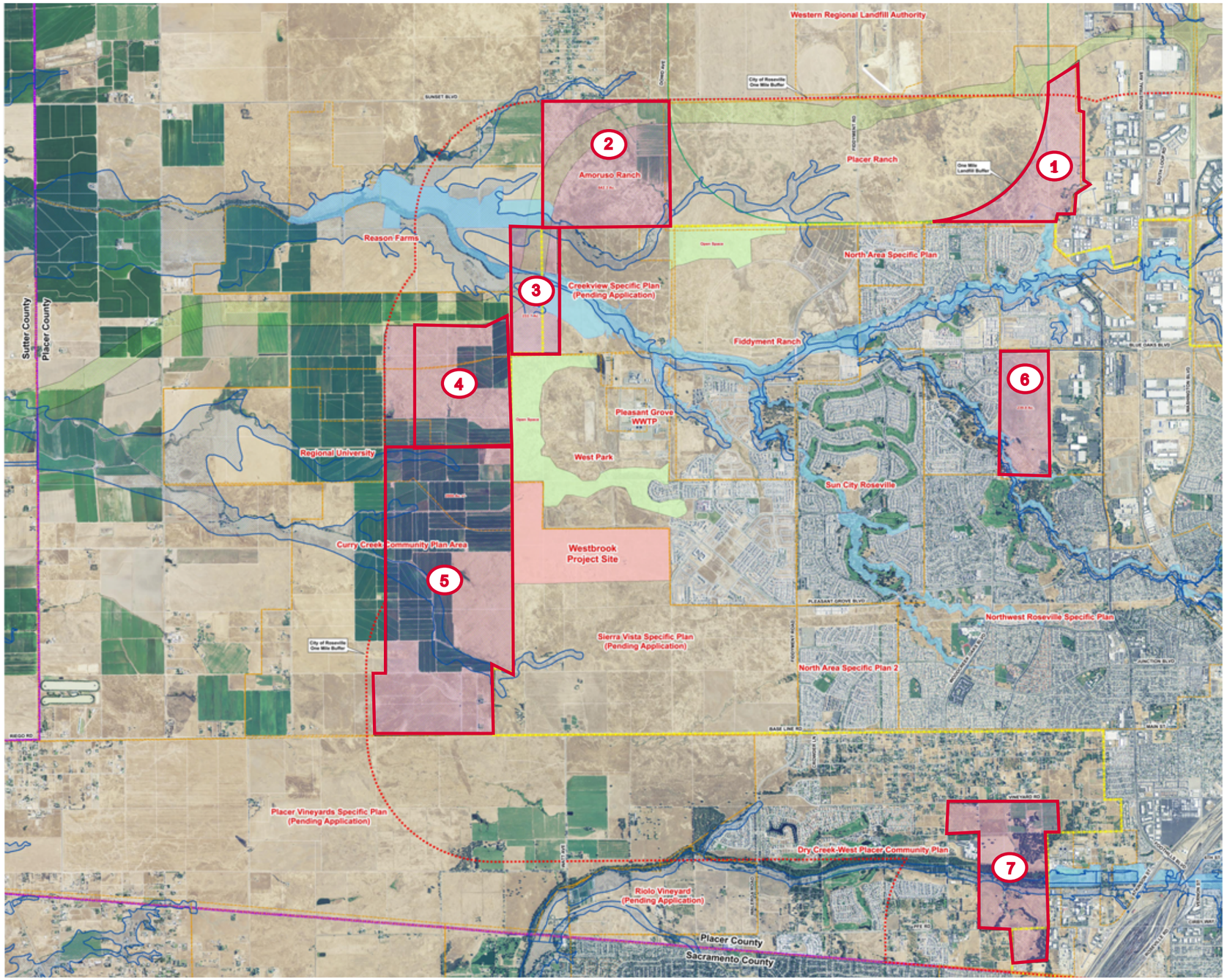
In May 2003, the City of Roseville approved the acquisition of two parcels of land, the Reason Farms and Warnick properties, totaling approximately 1,700 acres along Pleasant Grove Creek. This property was acquired for the purpose of constructing storm water retention basins, but would also provide open space and recreation opportunities for the City of Roseville. Development of the retention basins is currently in the design process.

The "panhandle" is a 234-acre area at the southeastern corner of the Reason Farms property located northwest of the West Roseville Specific Plan area (see **Figure 8**). This area is potentially a suitable alternative site for the Proposed Action because the City does not plan to use this area for storm water detention facilities.

Regional University Site

The Placer County Board of Supervisors considered the proposed Regional University SP in 2008. The Regional University SP comprises approximately 1,158 acres and is located south of Pleasant Grove Creek between Brewer Road and the western boundary of the City of Roseville, approximately 1.6 miles north of Baseline Road.

The eastern portion of the Regional University SP area is within 1 mile of the City's SOI. Although an alternative site could be located anywhere within the 1 mile zone, for purposes of analysis, a 400-acre site immediately adjacent to the West Roseville SP area was selected as a potentially suitable alternative site for the Proposed Action (see **Figure 8**) as this site would be close to the westerly edge of development within the West Roseville SP area and easily accessible via a short extension of Blue Oaks Boulevard.



Legend:

- County Boundary
- Roseville City Limits
- Plan Areas
- Open Space
- Westbrook Project
- FEMA 100 Year Flood Zone
- City of Roseville Flood Zone
- City of Roseville 1 Mile Buffer
- One Mile Landfill Buffer
- Possible Alternate Site
- 1 Placer Ranch
- 2 Amoruso Ranch
- 3 Reason Farms Panhandle
- 4 Regional University
- 5 Curry Creek Community Plan Area
- 6 Industrial Infill
- 7 Dry Creek - West Placer Community Plan Area

8,000 4,000 0 8,000

APPROXIMATE SCALE IN FEET

SOURCE: Impact Sciences, Inc. – 2011

FIGURE **8**

Potential Off-Site Alternatives

1122-001•04/13

Curry Creek Site

The Curry Creek CP Area comprises approximately 2,113 acres bounded by the proposed Regional University and Community SP Area to the north, Baseline Road to the south, the proposed Westbrook area to the east, and undeveloped land to the west. The County Board of Supervisors directed staff to proceed with studying the area for future development in 2003, but at this time there is no specific plan or formal development application for the site.

The eastern half of the Curry Creek CP area is within 1 mile of the City's SOI. As an alternative site could be located anywhere within the 1-mile zone, for purposes of analysis the entire eastern half of the Curry Creek CP area (approximately 1,000 acres as shown on **Figure 8**) was evaluated to determine if any portion of the area could be selected as a potentially suitable alternative site for the Proposed Action.

Industrial Infill Site

The 240-acre Industrial Infill site is located on the south side of Blue Oaks Boulevard to the west of the Hewlett Packard campus (see **Figure 8**). The City processed a specific plan for the site in 2005-2006, but the applicant withdrew the application prior to approval in 2007. At this time there is no specific plan or formal development application for the site.

Dry Creek – West Placer Site

The Dry Creek – West Placer CP area is located to the southeast of the proposed Westbrook project site, south of Baseline Road and east of the Riolo Vineyard SP area. The County approved the CP in 1990, and the plan was subsequently revised in 2007 as part of the Placer Vineyards project approvals. The CP area contains areas of suburban development as well as numerous rural residences.

An approximately 450-acre site within the CP area south of Vineyard Road is currently undeveloped and is potentially a suitable alternative site for the Proposed Action (see **Figure 8**).

2.3.3 Off-Site Alternatives Screening

Screening of off-site alternatives was completed in two phases. In the first phase, the seven potential sites identified above were evaluated under the following two criteria. For each criterion, sites were evaluated as **Feasible**, **Conditionally Feasible**, or **Not Feasible**. Sites that received a Not Feasible rating for any criterion were eliminated from further consideration.

- Criterion 1 – Biological Resources Sensitivity
- Criterion 2 – Preliminary Assessment of Availability for Development

Sites that remained in consideration following the first screening phase were then evaluated in a second phase using a third criterion, which was rated on a binary basis (**Feasible** or **Not Feasible**):

- Criterion 3 – Feasibility of Acquiring Sufficient Acreage

The following sections describe the two screening phases and the criteria in detail, and the results of the analysis.

Phase 1 Screening Criteria and Results

The Phase 1 screening criteria for off-site alternatives were defined as follows.

- **Criterion 1 – Biological Resources Sensitivity** evaluated the nature, extent, and quality of biological resources on the sites, with a particular focus on aquatic resources and special-status species. Sites with extensive, high-quality aquatic resources were rated as Not Feasible for this criterion unless those resources are already protected by conservation easements or other land use management mechanisms. Sites with substantial resources were rated as Conditionally Feasible. Sites with less extensive or more highly fragmented resources, and/or resources of lower quality, were rated as Feasible. Because detailed information (e.g., specific acreage of various sensitive habitat types) was not equally available for all of the potential alternate sites, evaluation under Criterion 1 was conducted in a generalized, qualitative manner, based on site reconnaissance and a reconnaissance-based evaluation of relative sensitivity (expressed as a rank, with the most sensitive site ranked "1" and the least sensitive site ranked "7").

- **Criterion 2 – Preliminary Assessment of Availability for Development** evaluated the status of other potentially competing development proposals for the site, since a site could be physically suitable to support an off-site alternative but not available in practice due to prior or pending approval of another project. Sites without prior development proposals, and sites with a prior proposal that has been formally withdrawn, were rated as Feasible under this criterion. To ensure that the outcomes of this criterion were not unreasonably exclusive, sites with prior development proposals that are currently on hold but have not been withdrawn were rated as Conditionally Feasible, and only sites with active development proposals were rated as Not Feasible.

Table 1 shows the evaluation of the seven potential sites under Criteria 1 and 2.

Table 1
Phase 1 Screening of Alternate Sites

Site Name and Size	Screening Criteria	
	Criterion 1 *Biological Resources Sensitivity*	**Criterion 2** *Preliminary Assessment of Availability*
Placer Ranch Site 329 acres	The site is primarily annual grassland. It is mostly in a fallow state and contains a major drainageway in the eastern portion. Vernal pools/seasonal wetlands are sparsely scattered throughout the site and are of moderate quality. Listed crustaceans are possible. The site is considered conditionally feasible because the resources on this site are generally similar to the Proposed Action. **Conclusion: Conditionally Feasible, Rank: 4**	A development application for this site was submitted to the City of Roseville in 2007, but the project has not been approved, and the application is currently on hold. **Conclusion: Conditionally Feasible**
Amoruso Ranch Site 674 acres	This site is primarily fallow grassland with a large area of irrigated pasture along the eastern boundary. Two large wetland areas are present: a swale/vernal pool system in the northwest quadrant, and a seasonal wetland/vernal pool complex along the southern boundary. The vernal pool component is of relatively high quality because the property has not been highly modified in the past. The entire site is within the fairy shrimp Core Recovery Area. **Conclusion: Conditionally Feasible, Rank: 1**	A development application for this site was submitted to the City of Roseville in May 2011. The applicant is also in early consultation with USACE but has not yet applied for a 404 permit. **Conclusion: Not Feasible**
Reason Farms Panhandle Site 234 acres	The property was formerly contour rice but in recent years has been farmed in a dryland crop. The property is bisected by Pleasant Grove Creek, a major regional creek. Pleasant Grove Creek is a deeply incised channel that flows year round and supports a narrow riparian corridor primarily contained within the channel. Live oak and valley oak define the top of bank. There are very few wetlands outside of the creek channel and the site contains no vernal pools. **Conclusion: Conditionally Feasible, Rank: 6**	The proposed retention basins are not planned for development within the "panhandle" portion of the property, making it potentially available for development. **Conclusion: Feasible**
Regional University Site 400 acres	The site is about half active rice and half annual grassland. The grassland areas support relatively few wetlands. Some of the seasonal wetlands in the grassland are adjacent to the rice fields which leak into them during the dry months. The site has low potential to support listed crustaceans. **Conclusion: Conditionally Feasible, Rank: 5**	The County approved the specific plan for this area in 2008. There have been no development proposals to date for this site. **Conclusion: Feasible**
Curry Creek Site About 1,000 acres	The site is primarily a fallow field, the majority of which was formerly in contour rice. A portion of the site is actively farmed in rice and the northeast section is a non-contour rice fallow field. The contour rice area contains numerous seasonal wetlands and vernal pools. It appears that greater than 5 percent of the fallow contour rice is wetland of relatively high quality. The fallow northern area is sparse with wetlands. Listed crustaceans are probable. This alternative is highly constrained by wetlands over the majority of the site. **Conclusion: Conditionally Feasible, Rank: 2**	Although the County Board of Supervisors has previously directed staff to study this area for development, there is no specific plan and there have been no development proposals for this site to date. **Conclusion: Feasible**

Site Name and Size	Screening Criteria	
	Criterion 1 *Biological Resources Sensitivity*	**Criterion 2** *Preliminary Assessment of Availability*
Industrial Infill Site 240 acres	This site is primarily an open field except for the southwestern area, which supports an oak and vernal pool preserve. The site is regularly disked and supports very few vernal pools outside of the preserve. The wetland that are present are small, highly disturbed and of low quality. **Conclusion: Feasible, Rank: 7**	The development application submitted for this site was withdrawn in 2007. There are no specific plans or other development proposals for this site at this time. **Conclusion: Feasible**
Dry Creek–West Placer Site 450 acres	This site is located in a mostly developed area. It contains several tracts of pastureland that support a sparse vernal pool/seasonal wetland component. Listed crustaceans are possible. Trees and variable land uses are abundant. Dry Creek bisects the middle of the site. The site would be feasible because aquatic resources at this site are sparser than at the Proposed Action site. **Conclusion: Feasible, Rank: 3**	The County approved the community plan in 1990, and the plan was revised in 2007 as part of the Placer Vineyards project approvals. There have been no development proposals to date for this site. **Conclusion: Feasible**

Table 2, below, summarizes the results of the evaluation in **Table 1**. In **Table 2**, **F** represents a rating of Feasible, **C** represents a rating of Conditionally Feasible, and **N** represents a rating of Not Feasible.

Table 2
Summary of Phase 1 Screening Evaluation of Alternate Sites

Site	Screening Criteria		Outcome
	1	2	
Placer Ranch	C	C	Retained
Amoruso Ranch	C	**N**	*Eliminated*
Reason Farms Panhandle	C	F	Retained
Regional University	C	F	Retained
Curry Creek	C	F	Retained
Industrial Infill	F	F	Retained
Dry Creek–West Placer	F	C	Retained

Phase 2 Screening Criteria and Results

The following six sites were carried forward for Phase 2 screening.

- Placer Ranch Site
- Reason Farms Panhandle Site
- Regional University Site
- Curry Creek Site
- Industrial Infill Site
- Dry Creek-West Placer Site

These sites were screened further using Criterion 3 which was defined as follows.

- **Criterion 3 – Feasibility of Acquiring Sufficient Acreage** evaluated the feasibility of acquiring title to the property through purchase, land exchange, or another mechanism. This was explored by the applicant through direct landowner inquiries and independently verified by the USACE. Sites where sufficient contiguous acreage (≥220 acres, the minimum size to accommodate a project like Westbrook) could not be acquired by the applicant were eliminated from further consideration.

Feasibility of Acquiring Sufficient Acreage

Relative to Criterion 3, primary landowners of the Reason Farms Panhandle, Regional University, Curry Creek, and Industrial Infill sites indicated that the properties are not available for sale at this time.

Two owners of parcels totaling 261 acres within the Dry Creek-West Placer site indicated that they have no interest in selling their land at this time; as a result there is not enough available acreage for this to be a viable alternative site.

As a response was not received after several attempts to contact the primary landowner of the Placer Ranch site, it is being assumed for the purposes of this analysis that the site is potentially available for purchase.[2] This site was carried forward for analysis as the Off-Site Alternative as shown in **Figure 9**.

Table 3 summarizes the results of screening based on Criterion 3.

---

2 Jeff Jones, Westpark Associates. E-mails to James Robb, USACE, and Shabnam Barati, Impact Sciences, February 14 and April 13, 2012.

Table 3
Summary of Phase 2 Screening Evaluation of Alternate Sites

Site	Criterion 5 – *Available for purchase*	Outcome
Placer Ranch	Yes	Retained
Reason Farms Panhandle	No	*Eliminated*
Regional University	No	*Eliminated*
Curry Creek	No	*Eliminated*
Industrial Infill	No	*Eliminated*
Dry Creek-West Placer	No	*Eliminated*

3.0 CONCLUSION

Based on the screening process presented in this document, in addition to the Proposed Action, the following alternatives are planned to be carried forward for EIS analysis.

- No Action
- Reduced Footprint/Increased Density
- Reduced Footprint/Same Density
- Central Preserve
- One Acre Fill
- Half Acre Fill
- Off-Site: Placer Ranch Site

LAND USE SUMMARY TABLE

LAND USE		ACRES	DENSITY (du/ac.)	DU
Residential				
LDR	Low Density Residential	106.3	5.0	530
MDR	Medium Density Residential	45.4	8.0	360
HDR	High Density Residential	26.9	25.0	670
sub-total		178.6		
Commercial				
CC	Community Commercial	35.4		
IND	Industrial	44.5		
sub-total		79.9		
Public Quasi Public - PQP				
	School	10.0		
	PQP	2.1		
sub-total		12.1		
PR	Park (4)	14.2		
OS	Open Space	59.5		
	Landscape Corridor/Paseo	18.2		
	Major Roads	43.2		
sub-total		135.1		
Total Project Area		405.7±		1560 du

SOURCE: MacKay & Somps – August 2012

FIGURE **9**

Placer Ranch Off-Site Alternative

1122-001•10/12

APPENDIX 3.3

Air Quality Documentation

Westbrook Amendment to the Sierra Vista Specific Plan Air Quality and Climate Change Analysis

Westbrook Amendment to the Sierra Vista Specific Plan

Air Quality and Climate Change Analysis

PREPARED FOR:
City of Roseville Planning & Redevelopment
311 Vernon Street
Roseville, CA 95678

Westbrook Amendment to the Sierra Vista Specific Plan

Air Quality and Climate Change Analysis

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November 14, 2011

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Appendix

A Emissions Calculations and Modeling

1 AIR QUALITY

This section includes a discussion of existing air quality conditions, a summary of applicable regulations, and an analysis of potential short and long-term air quality impacts caused by the proposed Sierra Vista Specific Plan (SVSP) Westbrook Amendment (project). The method of analysis is consistent with the recommendations of the Placer County Air Pollution Control District (PCAPCD) and guidance from the California Air Resources Board (ARB). In addition, mitigation measures are recommended as necessary to reduce significant air quality impacts.

1.1 ENVIRONMENTAL SETTING

Air quality in this area is determined by such natural factors as topography, climate, and meteorology, in addition to the presence of existing air pollution sources. These factors are discussed below.

TOPOGRAPHY, METEOROLOGY, AND CLIMATE

The project site is located in the Sacramento Valley Air Basin (SVAB), which is a relatively flat area bordered by the north Coast Ranges to the west and the northern Sierra Nevada to the east. Air flows into the SVAB through the Carquinez Strait, the only breach in the western mountain barrier, and moves across the Sacramento–San Joaquin Delta (Delta) from the San Francisco Bay Area.

The Mediterranean climate of the SVAB is characterized by hot, dry summers and cool, rainy winters. During the summer, daily temperatures range from 50 degrees Fahrenheit (°F) to more than 100°F. The inland location and surrounding mountains shelter the area from much of the ocean breezes that keep the coastal regions moderate in temperature. Most precipitation in the area results from air masses that move in from the Pacific Ocean, usually from the west or northwest, during the winter months. More than half the total annual precipitation falls during the winter rainy season (November through February); the average winter temperature is a moderate 49°F. Also characteristic of SVAB winters are periods of dense and persistent low-level fog, which are most prevalent between storms. The prevailing winds are moderate in speed and vary from moisture-laden breezes from the south to dry land flows from the north.

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

May through October is ozone season in the SVAB. This period is characterized by poor air movement in the mornings with the arrival of the Delta sea breeze from the southwest in the afternoons. In addition, longer daylight hours provide a plentiful amount of sunlight to fuel photochemical reactions between reactive organic gases (ROG) and oxides of nitrogen (NO_X), which result in ozone formation. Typically, the Delta breeze transports air pollutants northward out of the SVAB; however, a phenomenon known as the Schultz Eddy prevents this from occurring during approximately half of the time from July to September. The Schultz Eddy phenomenon causes the wind to shift southward and blow air pollutants back into the SVAB. This phenomenon exacerbates

the concentration of air pollutant emissions in the area and contributes to the area violating the ambient-air quality standards.

The local meteorology of the project site and surrounding area is represented by measurements recorded at the weather station nearest to the project site, which is the Sacramento International Airport station. The normal annual precipitation is approximately 17 inches. January temperatures range from a normal minimum of 38°F to a normal maximum of 53°F. July temperatures range from a normal minimum of 58°F to a normal maximum of 93°F (WRCC 2011a). The predominant wind direction and speed is from the south at 8 miles per hour (WRCC 2011a, 2011b).

EXISTING AIR QUALITY

CRITERIA AIR POLLUTANTS

Concentrations of emissions of "criteria air pollutants" are used to indicate the quality of the ambient air because these are the most prevalent air pollutants known to be deleterious to human health. A brief description of criteria air pollutants is provided below. Emission source types and health effects are summarized in Table 1-1. Monitoring data applicable to the project site is provided in Table 1-2.

Ozone

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

Emissions of the ozone precursors ROG and NO_X have decreased over the past several years because of more stringent motor vehicle standards and cleaner burning fuels. During the last 20 years the maximum amount of ROG and NO_X over an 8-hour period decreased by 17%. However, the ozone problem in the SVAB still ranks among the most severe in the state (ARB 2009a).

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2. The combined emissions of NO and NO_2 are referred to as NO_X and are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local sources of NO_X emissions (EPA 2011).

Particulate Matter

Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. PM_{10} consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and exhaust from mobile and stationary sources, construction operations, smoke from fires, natural windblown dust, and particulate matter formed in the atmosphere by reaction of gaseous precursors (ARB 2009a). Fine particulate matter ($PM_{2.5}$) includes a subgroup of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less. PM_{10} emissions in the SVAB are dominated by emissions from area sources, primarily fugitive dust from

vehicle travel on unpaved and paved roads, farming operations, construction and demolition, and particles from residential fuel combustion. Direct emissions of PM_{10} have increased slightly over the last 20 years, and are projected to continue. $PM_{2.5}$ emissions have remained relatively steady over the last 20 years and are projected to increase slightly through 2020. Emissions of $PM_{2.5}$ in the SVAB are dominated by the same sources as emissions of PM_{10} (ARB 2009a).

Table 1-1 Sources and Health Effects of Criteria Air Pollutants

Pollutant	Sources	Acute[1] Health Effects	Chronic[2] Health Effects
Ozone	Secondary pollutant resulting from reaction of ROG and NO_X in presence of sunlight. ROG emissions result from incomplete combustion and evaporation of chemical solvents and fuels; NO_X results from the combustion of fuels	increased respiration and pulmonary resistance; cough, pain, shortness of breath, lung inflammation	permeability of respiratory epithelia, possibility of permanent lung impairment
Carbon monoxide (CO)	Incomplete combustion of fuels; motor vehicle exhaust	headache, dizziness, fatigue, nausea, vomiting, death	permanent heart and brain damage
Nitrogen dioxide (NO_2)	combustion devices; e.g., boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines	coughing, difficulty breathing, vomiting, headache, eye irritation, chemical pneumonitis or pulmonary edema; breathing abnormalities, cough, cyanosis, chest pain, rapid heartbeat, death	chronic bronchitis, decreased lung function
Sulfur dioxide (SO_2)	coal and oil combustion, steel mills, refineries, and pulp and paper mills	Irritation of upper respiratory tract, increased asthma symptoms	Insufficient evidence linking SO_2 exposure to chronic health impacts
Respirable particulate matter (PM_{10}), Fine particulate matter ($PM_{2.5}$)	fugitive dust, soot, smoke, mobile and stationary sources, construction, fires and natural windblown dust, and formation in the atmosphere by condensation and/or transformation of SO_2 and ROG	breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, premature death	alterations to the immune system, carcinogenesis
Lead	metal processing	reproductive/ developmental effects (fetuses and children)	numerous effects including neurological, endocrine, and cardiovascular effects

Notes: NO_X = oxides of nitrogen; ROG = reactive organic gases.
[1] "Acute" refers to effects of short-term exposures to criteria air pollutants, usually at relatively high concentrations.
[2] "Chronic" refers to effects of long-term exposures to criteria air pollutants, usually at relatively low, ambient concentrations.
Source: EPA 2011.

MONITORING STATION DATA AND ATTAINMENT AREA DESIGNATIONS

Criteria air pollutant concentrations are measured at several monitoring stations in the SVAB. The Auburn-Dewitt-C Avenue and the Roseville-N Sunrise Blvd. stations are the closest stations to the project site with recent data for ozone, PM_{10}, and $PM_{2.5}$. In general, the ambient air quality measurements from these stations are representative of the ambient air quality near the project site. Table 1-2 summarizes the air quality data from the last 3 years.

Table 1-2 Summary of Annual Data on Ambient Air Quality (2008-2010)[1]

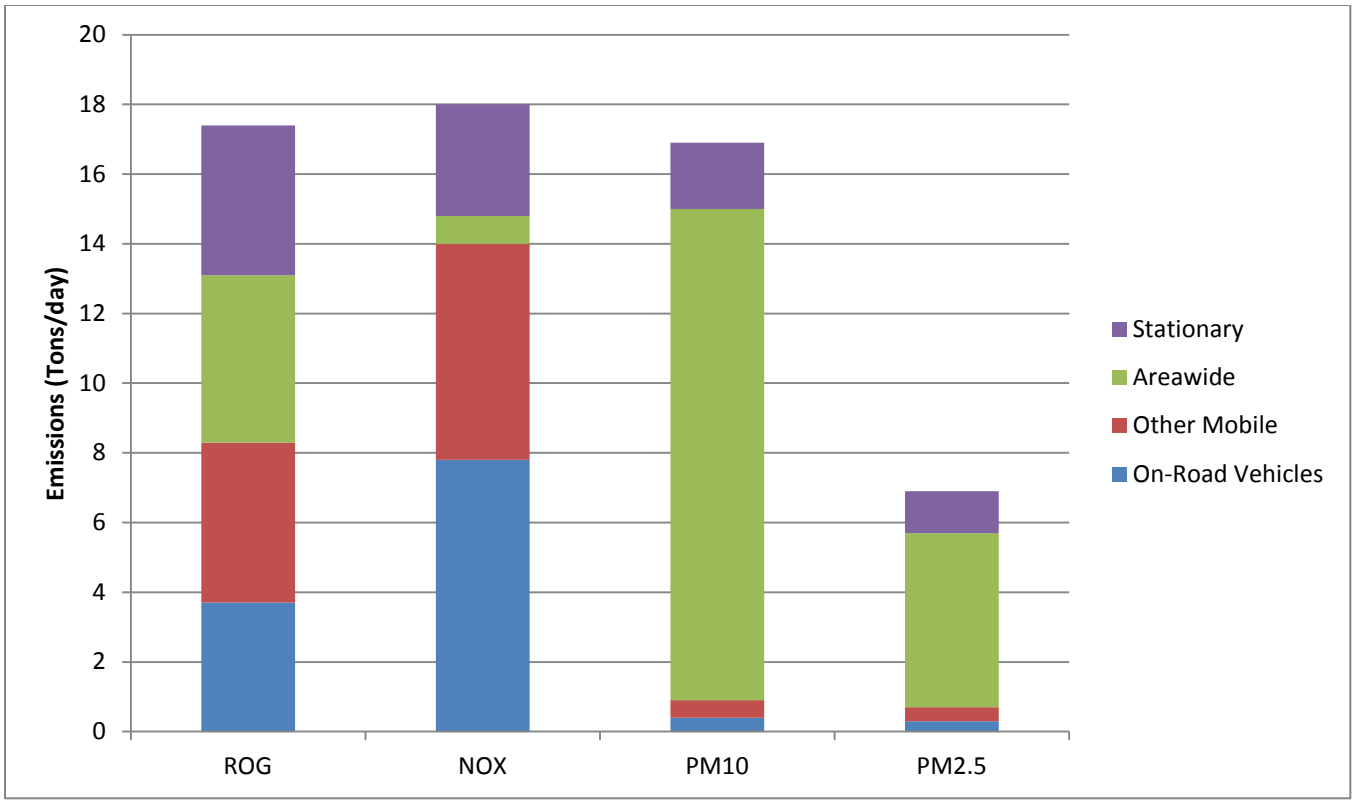
	2008	2009	2010
OZONE			
Maximum concentration (1-hr/8-hr avg, ppm)	0.124/0.112	0.108/0.099	0.107/0.090
Number of days state standard exceeded (1-hr/8-hr)	14/36	5/27	5/19
Number of days national standard exceeded (8-hr)	21	14	10
FINE PARTICULATE MATTER ($PM_{2.5}$)			
Maximum concentration ($\mu g/m^3$)	60.0	22.6	27.3
Number of days national standard exceeded (measured[2])	6.5	0	0
RESPIRABLE PARTICULATE MATTER (PM_{10})			
Maximum concentration ($\mu g/m^3$)	73.9	33.6	35.1
Number of days state standard exceeded (measured/calculated[2])	1/6.0	0/0	0/0
Number of days national standard exceeded (measured/calculated[2])	0/0	0/0	0/0

Notes: $\mu g/m^3$ = micrograms per cubic meter; ppm = parts per million
1 Measurements from the Auburn-Dewitt-C Avenue and Roseville-N Sunrise Blvd stations.
2 Measured days are those days that an actual measurement was greater than the level of the State daily standard or the national daily standard. Measurements are typically collected every 6 days. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.
Source: ARB 2011a.

Both ARB and the U.S. Environmental Protection Agency (EPA) use this type of monitoring data to designate areas according to their attainment to the California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS), respectively. CAAQS and NAAQS are discussed in greater detail in the regulatory setting below and in Table 1-3. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are “nonattainment,” “attainment,” and “unclassified.” An area is designated “unclassified” if it cannot be classified as meeting or not meeting the standards on the basis of available information. In addition, the California designations include a subcategory of the nonattainment designation, called “nonattainment-transitional.” The nonattainment-transitional designation is given to nonattainment areas that are progressing and nearing attainment. Attainment designations for the year 2010 for the project area are shown in Table 1-3 in the regulatory setting below.

EMISSIONS INVENTORY

Exhibit 1 summarizes emissions of criteria air pollutants for the western portion of Placer County for various source categories. Western Placer County is the portion of the county that extends from just east of the City of Auburn to the western boundary of Placer County, encompassing the entire City of Roseville including the project site. Based on this data, on-road mobile sources are the largest contributor of NO_X emissions (43% of the total NO_X inventory) and also a major contributor of ROG emissions (21% of the total ROG inventory). Areawide sources account for approximately 83% and 72% of the western Placer County's PM_{10} and $PM_{2.5}$ emissions respectively (ARB 2009b).



Source: ARB 2009b.

Exhibit 1-1 Western Placer County 2010 Emissions Inventory of Select Criteria Air Pollutants and Precursors

TOXIC AIR CONTAMINANTS

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

According to the *California Almanac of Emissions and Air Quality* (ARB 2009a), the majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being particulate diesel exhaust (diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a

complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emissions control system is being used. Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses the ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene.

Diesel PM poses the greatest health risk among these 10 TACs mentioned. Based on receptor modeling techniques, ARB estimated its health risk to be 360 excess cancer cases per million people in the SVAB in the year 2000. Since 1990, the health risk associated with diesel PM has been reduced by 52%. Overall, levels of most TACs, except para-dichlorobenzene and formaldehyde, have decreased since 1990 (ARB 2009a).

Sources of TACs in the vicinity of the project site include the City of Roseville Dry Creek Waste Water Treatment Plant located at 1800 Booth Boulevard, which is approximately 2.5 miles southeast of the project site (ARB 2011b). Major highways and roadways are also considered sources of TAC emissions, associated with the presence of diesel PM emissions from vehicle exhaust. The closest main arterials to the project site include Pleasant Grove Boulevard, Fiddyment Road, and Baseline Road. Existing Average Daily Traffic on these roads are 10,900 on Pleasant Grove where it intersects with Fiddyment Road, 9,700 on Baseline Road where it intersects with Watt Avenue, and 20,500 on Fiddyment Road where it intersects with Pleasant Grove Boulevard (City of Roseville 2010).

ODORS

Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell very minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; an odor that is offensive to one person may be perfectly acceptable to another (e.g., fast food restaurant). It is important to also note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word strong to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant

concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Existing potential sources of odor in the vicinity of the proposed project include industrial land uses such as the Western Regional Landfill located approximately 4 miles to the northeast and the City of Roseville Dry Creek Waste Water Treatment Plant located at which is approximately 2.5 miles to the southeast. Odors may also be emitted from activities associated with agriculture production on the surrounding land to the west of the City of Roseville.

SENSITIVE LAND USES

Sensitive land uses are generally considered to include those uses where exposure to pollutants could result in health-related risks to individuals. Residential dwellings and places where people recreate or conjugate for extended periods of time such as parks or schools are of primary concern because of the potential for increased and prolonged exposure of individuals to pollutants.

The project site is located in western Placer County, adjacent and to the west of the City of Roseville. Existing land uses in the project vicinity consist of agriculture production and open space. The nearest residences are located on the east side of Fiddyment Road, the eastern boundary of the project site. Coyote Ridge Elementary School, Wishing Well Preschool, and Woodcreek High School are located approximately 0.2, 1, and 1.5 miles, from the eastern boundary of the project site, respectively.

The proposed project would include sensitive land uses such as parks and open space, residential neighborhoods, and an elementary school. The proposed sensitive land uses include approximately 85 acres of park and open space, one elementary school, and 2,029 residential units.

1.2 REGULATORY SETTING

As stated previously, the project site is located in the SVAB. Air quality within the SVAB is regulated by multiple agencies, including the EPA, ARB, and PCAPCD. Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although EPA regulations may not be superseded, both state and local regulations may be more stringent.

Concentrations of several air pollutants—ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead—indicate the quality of ambient air and are therefore are the premise of air quality regulations. Acceptable levels of exposure to criteria air pollutants have been determined and ambient standards have been established for them (Table 1-3).

Air quality regulations also focus on TACs. In general, for those TACs that are carcinogenic, it is assumed that all concentrations present some level of increased cancer risk. In other words, there is no threshold level below which adverse health impacts would not be expected to occur. EPA and ARB regulate HAPs and TACs, respectively, that are generated by stationary sources through statutes and regulations that generally require the use of the maximum or best available control technology for toxics (MACT and BACT). These statutes and regulations, in conjunction with additional rules set forth by PCAPCD, establish the regulatory framework for TACs.

Applicable regulations associated with criteria air pollutants, TACs, and odors are described below.

1.2.1 FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

CRITERIA AIR POLLUTANTS

At the federal level, EPA implements national air quality programs. EPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA), enacted in 1970. The most recent major amendments were passed by Congress in 1990.

Pursuant to the CAA, EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead (ARB 2010a). The NAAQS are summarized in Table 1-3. The primary standards protect public health and the secondary standards protect public welfare. The CAA also requires each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states to revise their SIPs to incorporate additional control measures to reduce air pollution in those areas designated as nonattainment with the NAAQS. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA reviews all state SIPs to determine whether they conform to the mandates of the CAA and its amendments and whether implementing them will achieve air quality goals. If EPA determines a SIP to be inadequate, a Federal Implementation Plan that imposes additional control measures may be prepared for the nonattainment area. If the state fails to submit an approvable SIP or to implement the plan within the mandated time frame, sanctions may be applied to transportation funding and stationary air pollution sources in the nonattainment area.

Table 1-3 Ambient Air Quality Standards and Designations for Placer County

Pollutant	Averaging Time	California		National Standards [1]	
		Standards [2,3]	Attainment Status [4]	Primary [3]	Attainment Status [6]
Ozone	1-hour	0.09 ppm (180 µg/m^3)	N	–	N
	8-hour	0.070 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)	
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	U	35 ppm (40 mg/m^3)	U/A
	8-hour	9 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	A	0.053 ppm (100 µg/m^3)	U/A
	1-hour	0.18 ppm (339 µg/m^3)		–	
Sulfur Dioxide (SO_2)	24-hour	0.04 ppm (105 µg/m^3)	A	–	U
	3-hour	–		0.5 ppm (1300 µg/m^3)[5]	
	1-hour	0.25 ppm (655 µg/m^3)		–	

Table 1-3 Ambient Air Quality Standards and Designations for Placer County

Pollutant	Averaging Time	California		National Standards [1]	
		Standards [2,3]	Attainment Status [4]	Primary[3]	Attainment Status [6]
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	N	–	U
	24-hour	50 µg/m^3		150 µg/m^3	
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	U	15.0 µg/m^3	U/A
	24-hour	–		35 µg/m^3	
Lead [7]	30-day Average	1.5 µg/m^3	A	–	–
	Calendar Quarter	–	-	1.5 µg/m^3	A
	Rolling 3-Month Avg	–		0.15 µg/m^3	
Sulfates	24-hour	25 µg/m^3	A	No National Standards	
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	U		
Vinyl Chloride [7]	24-hour	0.01 ppm (26 µg/m^3)	-		
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer—visibility of 10 mi or more	U		

Notes: µg/m^3 = micrograms per cubic meter; ppm = parts per million

[1] National standards (other than ozone, PM, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The $PM_{2.5}$ 24-hour standard is attained when 98 % of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.

[2] California standards for ozone, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

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

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

[5] Secondary Standard

[6] Nonattainment (N): any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.
Attainment (A): any area that meets the national primary or secondary ambient air quality standard for the pollutant.
Unclassifiable (U): any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.
Maintenance (M): any area previously designated nonattainment pursuant to the CAAA of 1990 and subsequently redesignated to attainment subject to the requirement to develop a maintenance plan under Section 175A of the CAA, as amended.

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

Sources: ARB 2010a; ARB 2010b.

HAZARDOUS AIR POLLUTANTS

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

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

1.2.2 STATE PLANS, POLICIES, REGULATIONS, AND LAWS

CRITERIA AIR POLLUTANTS

ARB coordinates and oversees the state and local programs for controlling air pollution in California and implements the California Clean Air Act (CCAA), adopted in 1988. The CCAA requires ARB to establish California ambient air quality standards (CAAQS) (Table 1-3) (ARB 2010a). ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

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

ARB also oversees local air district compliance with federal and state laws, approving local air quality plans, submitting SIPs to EPA, monitoring air quality, determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

TOXIC AIR CONTAMINANTS

TACs in California are regulated primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807 [Statutes of 1983]) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588 [Statutes of 1987]). AB 1807 sets forth a formal procedure for ARB to designate substances as TACs. This process includes research, public participation, and scientific peer review before ARB can designate a substance as a TAC. ARB has

identified more than 21 TACs to date and has adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to the ARB list of TACs.

Once a TAC is identified, ARB then adopts an airborne toxics control measure for sources that emit that particular TAC. If a safe threshold exists for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If no safe threshold exists, the measure must incorporate BACT to minimize emissions; for example, the ATCM limits truck idling to 5 minutes (Title 13, Section 2485 of the California Code of Regulations).

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

ARB has adopted diesel exhaust control measures and more stringent emissions standards for various transportation-related mobile sources of emissions, including transit buses, and off-road diesel equipment (e.g., tractors, generators). In February 2000, ARB adopted a new rule for public-transit bus fleets and emissions standards for new urban buses. These new rules and standards include all of the following elements:

- more stringent emission standards for some new urban bus engines, beginning with 2002 model year engines;
- zero-emission bus demonstration and purchase requirements applicable to transit agencies; and
- reporting requirements, under which transit agencies must demonstrate compliance with the public-transit bus fleet rule.

Recent and upcoming milestones for transportation-related mobile sources include a low-sulfur diesel fuel requirement and tighter emissions standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide. Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, diesel PM) have been reduced significantly over the last decade and will be reduced further in California through a progression of regulatory measures (e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of ARB's Risk Reduction Plan, it is expected that diesel PM concentrations will be 75% less than the estimated year-2000 level in 2010 and 85% less in 2020 (ARB 2000). Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

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

1.2.3 REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

PLACER COUNTY AIR POLLUTION CONTROL DISTRICT

PCAPCD attains and maintains air quality conditions in Placer County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean-air strategy of PCAPCD includes preparing plans for the attainment of ambient air quality standards, adopting and enforcing rules and regulations concerning sources of air pollution, and issuing permits for stationary sources of air pollution. PCAPCD also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the CAA, CAAA, and CCAA.

Rules

All projects are subject to adopted PCACPD rules and regulations in effect at the time of construction. Specific rules applicable to the construction of the proposed project may include but are not limited to the following:

- **Rule 202—Visible Emissions.** A person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than 3 minutes in any one hour which is as dark or darker in shade as that designated as number 1 on the Ringelmann Chart, as published by the United States Bureau of Mines.
- **Rule 205-Nuisance**. A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause to have a natural tendency to cause injury or damage to business or property. The provisions of Rule 205 do not apply to odors emanating from agriculture operations necessary for the growing of crops or raising of fowl or animals.
- **Rule 207-**For the Sacramento Valley Air Basin and the Mountain Counties Air Basin portions of the Placer County Air Pollution Control District a person shall not release or discharge into the atmosphere from any source or single processing unit, exclusive of sources emitting combustion contaminants only, particulate matter emissions in excess of: 0.1 grains per cubic foot of gas at PCAPCD standard conditions.
- **Rule 217—Cutback and Emulsified Asphalt Paving Materials.** A person shall not manufacture for sale nor use for paving, road construction, or road maintenance any: rapid cure cutback asphalt; slow cure cutback asphalt containing organic compounds which evaporate at 500°F or lower as determined by current American Society for Testing and Materials (ASTM) Method D402; medium cure cutback asphalt except as provided in Section 1.2.; or emulsified asphalt containing organic compounds which evaporate at 500°F or lower as determined by current ASTM Method D244, in excess of 3% by volume.
- **Rule 218—Application of Architectural Coatings.** No person shall: (i) manufacture, blend, or repackage for sale within PCAPCD; (ii) supply, sell, or offer for sale within PCAPCD; or (iii) solicit for application or apply within PCAPCD, any architectural coating with a volatile organic carbon (VOC) content in excess of the corresponding specified manufacturer's maximum recommendation. "Manufacturer's maximum recommendation" means the maximum recommendation for thinning that is indicated on the label or lid of the coating container.
- **Rule 225- Wood Burning Appliances** No person shall sell or supply new wood burning appliances unless it is a U.S. EPA phase II Certified wood burning appliance, pellet-fueled wood burning heater, masonry heater, or determined to meet the U.S. EPA standard for particulate matter emissions standards.

- **Rule 228—Fugitive Dust.**
  - Visible Emissions Not Allowed Beyond the Boundary Line: A person shall not cause or allow the emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area (including disturbance as a result of the raising and/or keeping of animals or by vehicle use), such that the presence of such dust remains visible in the atmosphere beyond the boundary line of the emission source.
  - Visible Emissions from Active Operations: In addition to the requirements of Rule 202, Visible Emissions, a person shall not cause or allow fugitive dust generated by active operations, an open storage pile, or a disturbed surface area, such that the fugitive dust is of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke as dark or darker in shade as that designated as number 2 on the Ringelmann Chart, as published by the United States Bureau of Mines.
  - Concentration Limit: A person shall not cause or allow PM_{10} levels to exceed 50 micrograms per cubic meter ($\mu g/m^3$) (24-hour average) when determined, by simultaneous sampling, as the difference between upwind and downwind samples collected on high-volume particulate matter samplers or other EPA-approved equivalent method for PM_{10} monitoring.
  - Track-Out onto Paved Public Roadways: Visible roadway dust as a result of active operations, spillage from transport trucks, and the track-out of bulk material onto public paved roadways shall be minimized and removed.
    - The track-out of bulk material onto public paved roadways as a result of operations, or erosion, shall be minimized by the use of track-out and erosion control, minimization, and preventative measures, and removed within 1 hour from adjacent streets any time track-out extends for a cumulative distance of greater than 50 feet onto any paved public road during active operations.
    - All visible roadway dust tracked-out upon public paved roadways as a result of active operations shall be removed at the conclusion of each work day when active operations cease, or every 24 hours for continuous operations. Wet sweeping or a High Efficiency Particulate Air (HEPA) filter equipped vacuum device shall be used for roadway dust removal.
    - Any material tracked-out, or carried by erosion, and clean-up water, shall be prevented from entering waterways or storm water inlets as required to comply with water quality control requirements.
  - Minimum Dust Control Requirements: The following dust mitigation measures are to be initiated at the start and maintained throughout the duration of the construction or grading activity, including any construction or grading for road construction or maintenance.
    - Unpaved areas subject to vehicle traffic must be stabilized by being kept wet, treated with a chemical dust suppressant, or covered.
    - The speed of any vehicles and equipment traveling across unpaved areas must be no more than 15 miles per hour unless the road surface and surrounding area is sufficiently stabilized to prevent vehicles and equipment traveling more than 15 miles per hour from emitting dust exceeding Ringelmann 2 or visible emissions from crossing the project boundary line.
    - Storage piles and disturbed areas not subject to vehicular traffic must be stabilized by being kept wet, treated with a chemical dust suppressant, or covered when material is not being added to or removed from the pile.
    - Prior to any ground disturbance, including grading, excavating, and land clearing, sufficient water must be applied to the area to be disturbed to prevent emitting dust exceeding Ringelmann 2 and to minimize visible emissions from crossing the boundary line.

- Construction vehicles leaving the site shall be cleaned to prevent dust, silt, mud, and dirt, from being released or tracked off-site.
- When wind speeds are high enough to result in dust emissions crossing the boundary line, despite the application of dust mitigation measures, grading and earthmoving operations shall be suspended.
- No trucks are allowed to transport excavated material off-site unless the trucks are maintained such that no spillage can occur from holes or other openings in cargo compartments, and loads are either covered with tarps; or wetted and loaded such that the material does not touch the front, back, or sides of the cargo compartment at any point less than 6 inches from the top and that no point of the load extends above the top of the cargo compartment.

- Wind-Driven Fugitive Dust Control: A person shall take action(s), such as surface stabilization, establishment of a vegetative cover, or paving, to minimize wind-driven dust from inactive disturbed surface areas.

- **Rule 501—General Permit Requirements.** Any person operating an article, machine, equipment, or other contrivance, the use of which may cause, eliminate, reduce, or control the issuance of air contaminants, shall first obtain a written permit from the Air Pollution Control Officer (APCO). Stationary sources subject to the requirements of Rule 507, Federal Operating Permit Program, must also obtain a Title V permit pursuant to the requirements and procedures of that rule.

- **Rule 502—New Source Review and Rule 507—Federal Operating Permit.** All stationary sources that possess the potential to emit TACs or certain levels of criteria air pollutants or precursors are required to attain applicable permits and are subject to particular emissions controls based on the types and amounts of pollutant emissions.

Air Quality Plans

PCAPCD, in coordination with the air quality management districts and air pollution control districts of El Dorado, Sacramento, Solano, Sutter, and Yolo Counties, prepared and submitted the *1991 Air Quality Attainment Plan* (AQAP). The plan complies with the requirements set forth in the CCAA, which specifically addressed the nonattainment status for ozone and, to a lesser extent, CO and PM_{10}. The CCAA also requires a triennial assessment of the extent of air quality improvements and emission reductions achieved through the use of control measures. As part of the assessment, the attainment plan must be reviewed and, if necessary, revised to correct for deficiencies in progress and to incorporate new data or projections.

The requirement of the CCAA for a first triennial progress report and revision of the 1991 AQAP was fulfilled with the preparation and adoption of the *1994 Ozone Attainment Plan* (OAP). The OAP stresses attainment of ozone standards and focuses on strategies for reducing emissions of ozone precursors (i.e., ROG and NO_X). It promotes active public involvement, enforcement of compliance with PCAPCD rules and regulations, education for professionals in the public and private sectors, development and promotion of transportation and land use programs designed to reduce vehicle miles travelled (VMT) within the region, and implementation of stationary- and mobile-source control measures. Additional triennial reports were also prepared in 1997, 2000, 2003, and 2009 in compliance with the CCAA; these reports act as incremental updates to the AQAP.

City of Roseville General Plan

The following goals, objectives, and policies are included in the City of Roseville General Plan Air Quality and Climate Change Element (City of Roseville 2010).

Goals

- **Air Quality Goal 1.** Improve Roseville's air quality by: a) Achieving and maintaining ambient air quality standards established by EPA and the ARB; and b) Minimizing public exposure to toxic or hazardous air pollutants and any pollutants that create a public nuisance though irritation to the senses (such as unpleasant odors).
- **Air Quality Goal 2.** Integrate air quality planning with the land use and transportation planning process.
- **Air Quality Goal 3.** Encourage the coordination and integration of all forms of public transport while reducing motor vehicle emissions through a decrease in the average daily trips and vehicle miles traveled and by increasing the commute vehicle occupancy rate by 50% to 1.5 or more persons per vehicle.
- **Air Quality Goal 4.** Increase the capacity of the transportation system, including the roadway system and alternate modes of transportation.
- **Air Quality Goal 5.** Provide adequate pedestrian and bikeway facilities for present and future transportation needs.
- **Air Quality Goal 6.** Promote a well-designed and efficient light rail and transit system.
- **Air Quality Goal 7.** While recognizing that the automobile is the primary form of transportation, the City of Roseville should make a commitment to shift from the automobile to other modes of transportation.

Policies

- **Air Quality Policy 1.** Cooperate with other agencies to develop a consistent and effective approach to air pollution planning.
- **Air Quality Policy 2.** Work with PCAPCD to monitor all air pollutants of concern on a continuous basis.
- **Air Quality Policy 3.** Develop consistent and accurate procedures for evaluating the air quality impacts of new projects.
- **Air Quality Policy 4.** As part of the development review process, develop mitigation measures to minimize stationary and area source emissions.
- **Air Quality Policy 5.** Develop transportation systems that minimize vehicle delay and air pollution.
- **Air Quality Policy 6.** Develop consistent and accurate procedures for mitigating transportation emissions from new and existing projects.
- **Air Quality Policy 7.** Encourage alternative modes of transportation including pedestrian, bicycle, and transit.
- **Air Quality Policy 8.** Separate air pollution-sensitive land uses from sources of air pollution.
- **Air Quality Policy 9.** Encourage land use policies that maintain and improve air quality.
- **Air Quality Policy 10.** Conserve energy and reduce air emissions by encouraging energy efficient building designs and transportation systems.

City of Roseville Development Standards

The City maintains policies and guidelines regarding grading, erosion control, inspection, and permitting. Section 16.20.040 of the Roseville Municipal Code regulates stockpiling and grading, and addresses condition under which permits and grading plans are required. Section 16.20.070 identifies grading plan performance standards.

A grading plan shall comply with the following criteria:

A. Fill or cut slopes with a height exceeding five feet shall not exceed a slope of 4:1.

B. When grading around native oak trees:

1. Cut or fill slopes exceeding two feet in height shall not be permitted within a distance of 1.5 times the radius of the tree's protected zone.

2. The grade shall not be raised or lowered around more than 50 percent of the protected zone; and

3. The grading shall not change the drainage pattern within a distance of 1.5 times the radius of the tree's protected zone.

Section 16.20.020 requires that all grading be performed in accordance with either City of Roseville Improvement Standards or Chapter 16 of the Zoning Ordinance, whichever, is more restrictive. The Public Works Department requires that a grading permit be obtained prior to grading activities. At that time the Applicant must submit, for review and approval, Improvement and/or Grading Plans along with a site-specific Stormwater Pollution Prevention Plan (SWPPP). Slopes or banks along creek channels must be designed with proper slope protection to prevent soil erosion and channel-bank undercutting. The City has also adopted standards that would apply to project s within public right-of-way or easements.

1.3 IMPACT ANALYSIS

This section describes the project's construction-related (short-term) and operation-related (long-term) effects on air quality. The discussion includes the criteria for determining the level of significance of the effects and a description of the methods and assumptions used to conduct the analysis.

1.3.1 METHODS OF ANALYSIS

Short-term construction-generated emissions of criteria air pollutants and ozone precursors were assessed in accordance with methods recommended by PCAPCD. Where quantification of mass emissions is required, estimates were modeled using the URBEMIS 2007 Version 9.2.4 computer program (URBEMIS) (Rimpo and Associates 2008), which is approved by PCAPCD. URBEMIS was used to determine whether short-term construction-related emissions of criteria air pollutants associated with development of the proposed land uses on the project site would exceed applicable thresholds and where mitigation would be required. Modeling was based on project-specific data, when available. However, when project-specific information (e.g., amount of land to be disturbed/graded per day, types of equipment to be used, number of construction employees) was not available, reasonable assumptions and default settings were used to estimate criteria air pollutant and precursor emissions. A detailed list of modeling assumptions is provided in Appendix A.

Long-term (i.e., operational) regional emissions of criteria air pollutants and precursors, including mobile- and area-source emissions, were also quantified using the URBEMIS. URBEMIS allows land use selections that include project location specifics and trip generation rates. URBEMIS accounts for area-source emissions from the use of natural gas, landscape maintenance equipment, and consumer products and from mobile-source emissions associated with vehicle trip generation. Project-generated emissions were modeled based on general information provided in the project description and trip generation from the transportation analysis prepared for this project (Fehr and Peers 2011). Trip rates presented in the traffic analysis account for internal trips and therefore no adjustments for pass-by trips were made in the URBEMIS model.

The potential for vehicle trips generated by the proposed project to contribute to exceedances of the NAAQS and CAAQS at congested intersections in the project area is evaluated using the screening methodology recommended by the Sacramento Metropolitan Air Quality Management District (SMAQMD). SMAQMD's methodology is used in the absence of guidance from PCAPCD. Applying SMAQMD's screening methodology to the proposed project is appropriate because the meteorology conditions, ambient CO levels, and vehicle fleet mix of the Roseville area are similar to those of Sacramento County.

Construction-related emissions of TACs were evaluated based on the mass of $PM_{2.5}$ exhaust emitted by heavy-duty construction equipment, which is considered a surrogate for diesel PM, the duration of equipment use at any single location, the proximity of nearby sensitive receptors.

The potential for stationary sources that emit TACs to be developed on the project site to impact existing and future planned nearby sensitive receptors was also analyzed qualitatively. The analysis discusses those PCAPCD rules that regulate the influence of health risk exposure from stationary TAC sources.

The potential for sensitive receptors and sources of TACs to be located in close proximity to each other was evaluated using guidance from an ARB publication, *Air Quality and Land Use Handbook: A Community Health Perspective* (ARB 2005). The handbook provides guidance concerning land use compatibility with sources of TAC emissions. The handbook offers recommendations for the siting of sensitive receptors near uses associated with TACs, such as freeways and high-traffic roads, commercial distribution centers, rail yards, ports, refineries, dry cleaners, gasoline stations, and industrial facilities. The handbook is advisory and not regulatory, but it offers the recommendations identified below that are pertinent to the project.

- Avoid siting residential land uses or schools within 1,000 feet of a major service and maintenance rail yard.
- Avoid siting new commercial trucking facilities that accommodate more than 100 trucks per day, or 40 trucks equipped with transportation refrigeration units (TRUs), within 1,000 feet of sensitive receptors (e.g., residences, schools, or parks).
- Avoid siting new sensitive land uses within 300 feet of a large gasoline station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50-foot separation is recommended for typical gasoline-dispensing facilities.
- Avoid siting new sensitive land uses within 300 feet of any dry-cleaning operation using perchloroethylene (perc). For operations with two or more machines, provide 500 feet. For operations with three or more machines, consult the local air district (i.e., PCAPCD). Do not site new sensitive land uses in the same building with dry-cleaning operations that use perc.
- Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads carrying 100,000 vehicles per day, or rural roads carrying 50,000 vehicles per day.
- Obtain facility-specific information where there are questions about siting a sensitive land use close to an industrial facility, including the amount of pollutant emitted and its toxicity, distance to nearby receptors, and types of emissions controls in place.

It is important to note, however, that ARB's Handbook are considered screening level guidance and do not contain recommended thresholds of significance. However, the City has decided to use these screening levels as the threshold of significance for evaluating roadside TAC exposure in this analysis. The City believes that the decision to use ARB's recommended screening criteria as a threshold of significance is appropriate, in part, due to expected future changes in the inventory of mobile-source TAC emissions in the SVAB. In 2000, the total SVAB-wide average risk from inhalation of TACs of 520 chances in one million, as determined by ARB, accounts

for emissions of 10 select TACs that pose the greatest risk in California based primarily on ambient air quality data from all sources (e.g., stationary, area, on-road mobile, other mobile, and natural). According to ARB's emissions inventory for 2000, approximately 23% of the total acetaldehyde emissions for that year, 43% of benzene, 39% of 1,3-butadiene, 31% of formaldehyde, and 28% of diesel PM emitted in the SVAB were associated with on-road mobile sources (ARB 2009a). Based on these percentages and the individual health risks as determined by ARB in 2000 for each TAC, approximately 27.5% (143 chances in one million) of the total SVAB estimated inhalation risk of 520 chances in one million was associated with on-road mobile sources, 70% of the risk being attributable to diesel PM alone. According to ARB, implementation of the risk reduction plan to reduce diesel PM is estimated to drop concentrations and associated health risk by 75% and 85% in 2010 and 2020, respectively, from the estimated 2000 level (ARB 2009a).

Nonetheless, the City does not intend for its use of the screening criteria in ARB's handbook as thresholds of significance to establish a precedent for the CEQA or NEPA analyses performed for other projects in the region, in part, because ARB is expected to continue to develop guidance and rules regarding mobile-source TAC emissions as future studies of roadside concentrations of TACs become available.

The potential for construction and operation the proposed project to result in excessive exposure of receptors with odorous emissions is analyzed qualitatively, with consideration to the types of odor sources in the project area and the types of land uses proposed on the project site.

1.3.2 THRESHOLDS OF SIGNIFICANCE

Per Appendix G of the CEQA Guidelines, air quality impacts are considered significant if implementation of the proposed project would do any of the following:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable NAAQS or CAAQS (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number or people.

As stated in Appendix G, the significance criteria established by the applicable air quality management district may be relied on to make the above determinations. Thus, in accordance with PCAPCD-recommended thresholds for evaluating project-related air quality impacts, implementation of the proposed project would be considered significant if operation of the proposed land uses for the project site would:

- Generate short-term construction-related criteria air pollutant or precursor emissions that exceed the PCAPCD-recommended threshold of 82 pounds per day (lb/day) for NO_x, or 82 lb/day for ROG, or 82 lb/day for PM_{10};
- Generate long-term regional criteria air pollutant or precursor emissions that exceed the PCAPCD recommended threshold of 82 lb/day for NO_X, or 82 lb/day for ROG, or 82 lb/day for PM_{10};
- Contribute to localized concentrations of air pollutants at nearby receptors that would exceed applicable ambient air quality standards;

- Expose sensitive receptors to TAC emissions that exceed an incremental increase of 10 in 1 million for the carcinogenic risk (i.e., the risk of contracting cancer) and/or a noncarcinogenic Hazard Index of 1.0 at the Maximally Exposed Individual (MEI). This threshold of significance applies to projects that would introduce new stationary or area sources of TAC emissions in close proximity to existing or future planned sensitive receptors. PCAPCD does not have a recommended threshold of significance for evaluating projects that would locate sensitive receptors near existing sources of TAC emissions such as a freeway, high-volume roadway, or rail yard. For the purposes of this analysis, the City will use applicable screening criteria recommended by ARB as thresholds of significance to evaluate instances in which the proposed project would locate a sensitive receptor in close proximity to a freeway, high-volume roadway, or a TAC-emitting land use such as a gasoline station or a dry-cleaning operation that uses perchloroethylene;
- Generate localized concentrations of CO that exceed the PCAPCD recommended threshold of 550 lb/day and that exceed the 1-hour CAAQS of 20 (ppm) or the 8-hour CAAQS of 9 ppm;
- Expose sensitive receptors to excessive nuisance odors, as defined under PCAPCD Rule 205 (as mentioned in the Regulatory Setting above).

1.3.3 IMPACTS AND MITIGATION MEASURES

IMPACT 1-1	**Generation of Short-Term Construction-Related Emissions of Criteria Air Pollutants and Precursors.** Construction activities associated with the project would generate intermittent emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$.Because of the relatively large size of the project, construction-generated emissions of ROG and PM_{10} would exceed PCAPCD-recommended thresholds and could contribute to emissions concentrations that exceed the NAAQS and CAAQS. Thus, project-generated, construction-related emissions of criteria air pollutants and precursors could violate or contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, and/or conflict with air quality planning efforts.

Construction emissions are considered short term and temporary in duration, but have the potential to represent a significant impact with respect to air quality. PM_{10} and $PM_{2.}5$ are among the pollutants of greatest concern with respect to construction activities. Particulate emissions from construction activities can lead to adverse health effects and nuisance concerns, such as reduced visibility and soiling of exposed surfaces. Particulate emissions can result from a variety of construction activities, including excavation, grading, vehicle travel on paved and unpaved surfaces, and vehicle and equipment exhaust. Construction emissions of PM_{10} can vary greatly depending on the level of activity, the specific operations taking place, the number and types of equipment operated, local soil conditions, weather conditions, and the amount of earth disturbance (e.g., site grading, excavation, cut-and-fill).

Emissions of ozone precursors, ROG and NO_X, are primarily generated from mobile sources and vary as a function of vehicle trips associated with delivery of construction materials, any importing and exporting of soil or other earthen materials, vendor trips, and worker commute trips; and the types and number of heavy-duty, off-road equipment used and the intensity and frequency of their operation. A large portion of construction-related ROG emissions also results from the application of asphalt and architectural coatings. Thus, ROG emissions would vary based on the amount of coatings and paving applied each day.

Project-generated emissions of criteria air pollutants (e.g., PM_{10} and $PM_{2.5}$) and precursors (i.e., ROG and NO_X) were modeled based on general information provided in the project description and default PCAPCD-recommended settings and parameters attributable to the proposed land use types and site location. Construction of the land uses proposed on the approximately 400-acre project site could begin as early as 2014 and full buildout of the project area would occur over a 20- to 30-year period. Based on discussions with City staff it was conservatively assumed that up to 20% of the proposed land uses could be built in any one-year period (Pease, pers. comm. 2011). Based on the seasonal nature of construction it was further assumed that construction of most individual land uses would occur during the spring, summer and Fall months.

Table 1-4 summarizes the modeled worst-case daily emissions of criteria air pollutants and precursors associated with construction of the proposed project. Refer to Appendix A for a detailed summary of the modeling assumptions, inputs, and outputs.

Table 1-4 Summary of Modeled Maximum Daily Criteria Air Pollutant and Precursor Emissions from Construction Activities

Construction Activity	Emissions (lb/day)				
	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Unmitigated	156	35	64	133	29
Mitigated	156[1]	30	64[1]	34	9
PCAPCD Thresholds of Significance	82	82	550	82	NA

Notes:
lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = particulate matter with aerodynamic diameter less than 10 microns; $PM_{2.5}$ = particulate matter with aerodynamic diameter less than 2.5 microns; PCAPCD = Placer County Air Pollution Control District; yr= year.
[1] Mitigation that addressed exhaust emissions of PM_{10} and NO_X from off-road equipment would also reduce exhaust emissions of ROG equipment by approximately 5%, or 0.1 lb/day, which is not reflected in the table due to rounding; however, nearly all ROG emissions associated with construction activities are evaporative emissions of ROG from the application of architectural coatings and from asphalt paving. This mitigation would also result in a reduction in CO; however, the reduction achieved by this measure cannot be quantified.
Detailed assumptions and modeling output files are included in Appendix A.
Source: Modeling Conducted by Ascent Environmental 2011.

As shown in Table 1-4, the maximum daily level of construction-generated ROG and PM_{10} emissions would exceed the applicable PCAPCD thresholds and could contribute to emission concentrations that exceed the NAAQS and CAAQS. Thus, project-generated, construction-related emissions of criteria air pollutants and precursors could violate or contribute substantially to the nonattainment status in the region for ozone, expose sensitive receptors to substantial pollutant concentrations, and/or conflict with air quality planning efforts. As a result, this would be a **significant impact**.

While the projected levels of construction-generated emissions of NO_x would not be anticipated to exceed threshold of 82 lb/day, as shown in Table 1-4, they would likely occur at the same time construction of other phases of the SVSP is taking place. According to the SVSP the mitigated levels of NO_x emissions associated with construction of would range from 35.0-79.9 lb/day depending on year and area being developed. As a result, combined, or cumulative, levels of construction-related NO_x emissions would exceed the 82 lb/day threshold and be a significant impact. Therefore, NO_x emissions generated by construction of the project site would be **cumulatively considerable** in addition to emissions of ROG and PM_{10}.

Mitigation Measure 1-1

To reduce short-term construction emissions, applicant(s) or their contractors shall submit to PCAPCD a Construction Emission / Dust Control Plan at least 30 days prior to grading, excavation, or other ground

disturbance activity. The plan must explain how all construction activities will comply with the minimum requirements in sections 300 and 400 of PCAPCD Rule 228, Fugitive Dust Emissions; Rule 202, Visible Emissions; Rule 218, Architectural Coatings. The applicant(s) shall provide to the City a copy of the plan and evidence that the plan was submitted to PCAPCD. The applicant(s) shall not break ground prior to receiving PCAPCD approval of the Construction Emission/Dust Control Plan and delivering that approval to the City. However, if PCAPCD does not respond within 20 days, the plan shall be considered approved by PCAPCD.

The plan shall include all measures necessary to comply with PCAPCD Rules 202 and 228, any other PCAPCD rules applicable at the time, as well as the dust control measures and exhaust control measures provided below. The measures listed below are identical to the measures required by Mitigation Measure 4.4-1 of the SVSP EIR, unless otherwise noted.

Fugitive PM Dust Control Measures

- *In order to control dust, operational watering trucks shall be on site during times when ground disturbance activity is performed, including excavation, grading, and travel on unpaved surfaces. (This measure was not required by the SVSP EIR.)*

- *Cover or maintain at least two feet of free board space on haul trucks transporting soil, sand, or other loose material on the site. Any haul trucks that would be traveling along freeways or major roadways shall be covered. (The first sentence of this measure was required by the SVSP EIR; however, the second sentence was not.)*

- *Suspend excavation, grading, and/or demolition activity using off-road equipment when wind speeds exceed 15 mph. (The SVSP EIR included a measure that requires grading activity to be suspended during high winds but not during excavation or demolition activity.)*

- *Sweep streets as necessary if silt is carried off-site to adjacent public thoroughfares or occurs as a result of hauling.*

- *Dispose of surplus excavated material in accordance with local ordinances and use sound engineering practices.*

- *Schedule activities to minimize the amounts of exposed excavated soil during and after the end of work periods, to the extent feasible.*

- *Phase grading into smaller areas to prevent the susceptibility of larger areas to erosion or wind disturbance over extended periods of time, to the extent feasible.*

- *Pave, apply gravel, or apply soil binders to any on-site haul roads, employee parking areas, and equipment staging areas. Soil binders shall be non-toxic in accordance with State and local regulations. (A measure in the SVSP EIR required that soil binders be spread on unpaved roads and parking areas but did not include the alternatives of applying gravel or paving.)*

- *Apply approved chemical soil stabilizers or vegetated mats, according to manufacturers' specifications, to all-inactive construction areas (previously graded areas which remain inactive for 96 hours or longer).*

- *Reestablish ground cover on exposed, disturbed surfaces (e.g., graded areas) on site through seeding and watering as soon as possible.*

- *Clean earth moving construction equipment with water or sweep clean, a minimum of once per day consistent with National Pollutant Discharge Elimination System Best Management Practices and the Roseville Grading Ordinance. Construction vehicles leaving the site shall be cleaned, as needed, to prevent dust, silt, mud, and dirt from being released or tracked offsite.*

Exhaust Emission Control Measures

- *The Construction Emission/Dust Control Plan shall include a comprehensive inventory (i.e., make, model, year, emission rating) of all heavy-duty off-road equipment (50 horsepower (HP) or greater) that will be used an aggregate of 40 or more hours for the construction project. The project representative shall provide PCAPCD with the anticipated construction timeline including start date, name, and phone number of the project manager and on-site foreman. The plan shall demonstrate that the heavy-duty (i.e., 50 horsepower, or greater) off-road vehicles to be used in the construction project, including owned, leased and subcontractor vehicles, would achieve a project wide fleet-average 20% NO_x reduction and 45% particulate reduction compared to the most recent statewide fleet average. Acceptable options for reducing emissions may include use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as they become available. Contractors can use the Construction Mitigation Calculator worksheet model developed by the Sacramento Metropolitan Air Quality Management District web site to determine if their off-road equipment fleet meets the requirements listed in this measure (SMAQMD 2010b).*

- *All construction equipment shall be maintained in good operating condition. The prime contractor shall ensure that all construction equipment is being properly serviced and maintained as per the manufacturer's specifications. Maintenance records shall be available at the construction site for verification.*

- *An applicant representative who is certified by ARB to perform Visible Emissions Evaluations (VEE), shall routinely (i.e., once per week) evaluate project-related off-road equipment emissions for compliance with PCAPCD Rule 202.*

- *Idling of all on-road and off-road diesel equipment on the site shall be limited to a maximum of 5 minutes. The applicant(s) shall provide clear signage that posts this requirement for workers at the entrances to the site.*

- *Staging areas for off-road equipment and areas where on-road delivery trucks load and unload materials shall be located as far as possible from nearby sensitive receptors (i.e., residential units, schools, and hospitals). (This measure was not included in the SVSP EIR for construction activity.)*

- *To the extent feasible, construction contractors shall use electric construction power for construction operations, in lieu of diesel-powered generators to provide adequate power to any construction equipment, as feasible . (In order to provide clarity, this measure is included instead of the measure in the SVSP EIR that requires construction contractors to utilize existing power sources [e.g., power poles]).During construction, no open burning of removed vegetation shall be allowed unless permitted by the PCAPCD. All removed vegetative material shall be either chipped on site or taken to an appropriate recycling site, biomass power plant, or if a site is not available, a licensed disposal site. (This measure was not included in the SVSP EIR.)*

Significance after Mitigation

The dust control measures in Mitigation Measure 1-1 would reduce short-term construction-related emissions of fugitive PM_{10} dust by approximately 75% (SMAQMD 2010a). The exhaust control measures in Mitigation Measure 1-1 would reduce exhaust emissions of NO_x, PM_{10}, and ROG from off-road construction equipment by 20%, 45%, and 5%, respectively. As a result, the mitigated maximum daily emissions of PM_{10} would be less than PCAPCD's threshold of 82 lb/day, as shown in Table 1-4. Maximum daily emission of NO_x would also be reduced and because exhaust emissions from off-road construction equipment would be substantially lower than the statewide fleet, thee emissions would not be cumulatively considerable. Maximum daily emissions of ROG, however, would not be reduced to a level below the PCAPCD's threshold of 82 lb/day. Therefore, this impact would be **significant and unavoidable.**

IMPACT 1-2 **Generation of Long-Term Operational (Regional) Emissions of Criteria Air Pollutants and Precursors.** Operational area- and mobile-source emissions from project implementation would exceed the PCAPCD-recommended threshold of 82 lb/day for ROG, NO_X, and PM_{10}, and would result in or substantially contribute to emissions concentrations that exceed the NAAQS or CAAQS for ozone and PM_{10}.

Operation of the land uses proposed on the project site would result in long-term regional emissions of ROG, NO_X, and PM_{10} associated with area sources, such as natural gas emissions, landscaping, applications of architectural coatings, in addition to operational vehicle-exhaust emissions. Full buildout of the project site could occur as soon as 2025.

Modeled operational emissions for the proposed project are presented in Table 1-5. Refer to Appendix A for a detailed summary of the URBEMIS modeling assumptions, inputs, and outputs. Mobile-source emissions were modeled using trip generation rates provided in the traffic study prepared for the project (Fehr and Peers 2011). The trip generation rates are project-specific because they take into account those land use planning measures identified in the SVSP that aim to reduce vehicle trips to the extent that these reductions can be quantified.

Table 1-5 Summary of Modeled Long-Term Operational Emissions of Criteria Air Pollutant and Precursors

Operations (2025 Buildout)	ROG (lb/day)	NO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Mobile-Source Emissions	134	110	460	87
Area-Source Emissions	140	29	0.2	0.2
Total Operational	273	129	460.2	87.2
PCAPCD Thresholds of Significance	82	82	82	NA

Notes:
lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = particulate matter with aerodynamic diameter less than 10 microns; $PM_{2.5}$ = particulate matter with aerodynamic diameter less than 2.5 microns; PCAPCD = Placer County Air Pollution Control District; yr= year.
Values may not sum to match total due to rounding.
Detailed assumptions and modeling output files are included in Appendix A.
Source: Modeling Conducted by Ascent Environmental 2011.

As shown in Table 1-5, operation of the proposed project under full buildout would result in an increase in unmitigated long-term regional emissions of approximately 273 lb/day of ROG, 129 lb/day of NO_X, and 460 lb/day of PM_{10}, and 87 lb/day of $PM_{2.5}$. Operational related emissions would exceed the PCAPCD-recommended threshold of 82 lb/day for ROG, NO_X, and PM_{10}, and would result in or substantially contribute to emissions

concentrations that exceed the NAAQS or CAAQS. In addition, because development of the project site is not included in an existing approved general plan, and operational emissions of criteria air pollutants and precursors associated with land use development on the site are not accounted for in applicable air quality plans, implementation of the proposed project could conflict with air quality planning efforts. As a result, this would be a **significant impact**.

Mitigation Measure 1-2

These measures shall be implemented through project design, conditions of approval, or through the City's inspection processes. This process is intended to ensure that best available and practical approaches are used to reduce operational emissions in the applications and design review for specific tentative map and permits. The following is a listing of measures that shall be implemented by the project applicant(s) for the purpose of reducing vehicle and operational emissions. Funding of each measure shall be provided by project applicant(s).

- *Provide tree plantings that meet or exceed the requirements of the City's Community Design Guidelines to provide shading of buildings and parking lots.*
- *Landscape with native drought-resistant plants (ground covers, shrubs and trees) with particular consideration of plantings that are not reliant on gas-powered landscape maintenance equipment.*
- *Require all flat roofs on non-residential structures to have a white or silver cap sheet to reduce energy demand.*
- *Provide electric vehicle charging stations in preferential locations of parking lots for non-residential land uses (e.g., close to building entrances, in shaded locations). Also provide signage prohibiting parking for non-electric vehicles within these designated spaces.*
- *Provide vanpool parking only spaces and preferential parking for carpools to accommodate carpools and vanpools in parking lots of employment land uses (e.g., office buildings, business-professional uses)*
- *All truck loading docks shall be equipped with one 110/208 volt power outlet for every two-dock doors. Signs shall be posted stating "Diesel trucks are prohibited from idling more than five minutes and trucks requiring auxiliary power shall connect to the 110/208-volt outlets to run auxiliary equipment".*
- *Design streets to maximize pedestrian access to transit stops.*
- *Require site design to maximize access to transit lines, to accommodate bus travel, and to provide lighted shelters at transit access points.*
- *Include photovoltaic systems in project design and/or participate in Roseville Electric incentive programs for energy-efficient development.*
- *Electrical outlets shall be installed on the exterior walls of both the front and back of all detached single-family and duplex residences to enable the use of electric landscape maintenance equipment.*
- *Gas line outlets shall be installed in the rear of single family and duplex homes (i.e., in the backyards) and in the common outdoor activity areas of multi-family residential land uses for use of outdoor cooking appliances, such as gas burning barbeques.*

- *Install low-NO_X hot water heaters (beyond District Rule 246 requirements) or tankless water heaters in all residential land uses.*

- *Provide notice to original purchasers of single-family and duplex residential units of incentive and rebate programs available through Roseville Electric or other providers that encourage the purchase of electric landscape maintenance equipment.*

- *Prior to approval of Tentative Maps provide notice to homebuyers through CC&Rs or other mechanisms to inform them that only gas fireplaces would be permitted. Where propane or natural gas service is not available, only EPA Phase II certified wood-burning devices shall be allowed in single family residences. The emission potential from each residence shall not exceed 7.5 grams per hour. Wood-burning or Pellet appliances shall not be permitted in multi-family residential buildings.*

Significance after Mitigation

While implementation of Mitigation Measure 1-2 would reduce operational-related emissions of criteria air pollutants and precursors, the reductions achieved by these measures cannot be estimated because detailed specifications about the emissions-generating activities engaged in by the residents, workers, and customers at those land uses are not known at this time. For instance, providing gas line outlets in the rear of single family and duplex homes would enable residents to use natural gas-powered outdoor cooking grills instead of higher-emitting charcoal grills. While it is certain that natural gas-powered grills have lower emissions that charcoal grills, the exact reduction amount is dependent on multiple factors including frequency and duration of use. The sizes of the reductions achieved by many of the measures listed under Mitigation Measure 1-2 would be a function of operational behaviors. Nonetheless, it is anticipated that the reduction in overall operational emissions achieved by these measures would be nominal.

Previously adopted project-specific mitigation that was identified in the SVSP EIR would apply to the project site. The project has been designed to incorporate measures to reduce reliance on the automobile. Dedicated right of way on Santucci Boulevard would be set aside for bus rapid transit. A transit center and park-and-ride lot would be part of the commercial center at Pleasant Grove and Santucci Boulevards (parcel WB-41). An integrated paseo system would provide off-street bicycle and pedestrian access throughout the project area connecting other portions of the SVSP area to the south with the Class I bicycle trails and paseo system in the West Plan to the north. These design measures would reduce mobile-source emissions and the extent that these reductions can be quantified is reflected in the trip generation rates developed by the traffic study for the proposed project (Fehr & Peers 2011). Thus, there is no other feasible mitigation available to reduce emissions generated by vehicle trips generated by the proposed project. Therefore, operational emissions of criteria air pollutants and precursors would be **significant and unavoidable.**

IMPACT 1-3	*Generation of Local Mobile-Source CO Emissions.* Project-generated local mobile-source CO emissions would not result in or substantially contribute to concentrations that exceed the 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm.

The primary mobile-source pollutant of localized concern is CO. Local mobile-source CO emissions near roadway intersections are a direct function of traffic volume, speed, and delay. Transport of CO is extremely limited because it disperses rapidly with distance from the source under normal meteorological conditions. However, under certain specific meteorological conditions, CO concentrations near roadways and/or intersections may reach unhealthy levels at nearby sensitive land uses, such as residential units, hospitals, schools, and childcare facilities. Thus, high local CO concentrations are considered to have a direct influence on the receptors they

affect. Modeling of CO concentrations is typically recommended for areas located near signalized roadway intersections that are projected to operate at an unacceptable level of service (LOS) (i.e., LOS E or F) during peak traffic hours (Garza, Graney, and Sperling 1997).

Intersections controlled by stop signs do not experience high enough traffic volumes and associated congestion to be the site of violations of the AAQS; therefore, CO modeling is not recommended for unsignalized intersections (Garza, Graney, and Sperling 1997). Because the intersections controlled by stop signs would accommodate fewer vehicles than signalized intersections, it is reasonable to conclude that congestion at the intersections controlled by stop signs would not result in CO concentrations that exceed the AAQS.

The SMAQMD recommends screening criteria in its *Guide to Air Quality Assessment in Sacramento County* that provide lead agencies with a conservative indication of whether project-generated vehicle trips would result in the generation of CO emissions that exceed or contribute to an exceedance of the CAAQS for CO (SMAQMD 2010a). While the PCAPCD, the local agency in charge of air quality considerations in western Placer County, has not established specific guidelines for addressing impacts from CO concentrations, CEQA still requires an evaluation of impacts from CO concentration. SMAQMD's screening criteria was developed to help lead agencies analyze potential CO impacts and identify whether site-specific CO dispersion modeling is necessary. As explained above, applying SMAQMD's screening methodology to the proposed project is appropriate because the meteorology conditions, ambient CO levels, and vehicle fleet mix of the Roseville area are similar to those of Sacramento County. SMADQMD's recommended screening criteria are divided into the following two tiers:

First Tier Screening. The project would result in a less-than-significant impact to air quality for local CO if:

- Traffic generated by the project would not result in deterioration of intersection LOS to LOS E or F; or
- The project would not contribute additional traffic to an intersection that already operates at LOS of E or F.

Second Tier Screening. If all of the following criteria are met, the project would result in a less-than-significant impact to air quality for local CO.

- The project would not result in an affected intersection experiencing more than 31,600 vehicles per hour;
- The project would not contribute traffic to a tunnel, parking garage, bridge underpass, urban street canyon, or below-grade roadway; or other locations where horizontal or vertical mixing of air would be substantially limited; and
- The mix of vehicle types at the intersection is not anticipated to be substantially different from the County average (as identified by the EMFAC or URBEMIS models).

The traffic analysis prepared for the proposed project included an LOS analysis for all intersections within the study area that could potentially be adversely affected by the proposed project (Fehr & Peers 2011). The analysis evaluated existing traffic conditions plus proposed project conditions, and cumulative traffic conditions (i.e., project buildout in 2025) plus project conditions. Results of the analysis determined that the proposed project conditions would result in the deterioration of some intersections to LOS E or F. These results are summarized below in Table 1-6.

Table 1-6 Level of Service at Intersections-Existing Plus Project Conditions

Intersection	Jurisdiction	Existing LOS		Existing + Project LOS	
		(AM)	(PM)	(AM)	(PM)
Existing-Plus-Project Conditions					
Locust Road/Baseline Road	Placer County	C	E	C	F
Walerga/PFE Road	Placer County	D	C	E	D
Pleasant Grove Road South/ Riego Road	Sutter County	C	D	C	E
Cumulative-Plus-Project Conditions (2025)					
Blue Oaks Boulevard/New Meadow Drive	Roseville	D	C	E	C
Blue Oaks Boulevard/Diamond Creek Boulevard	Roseville	C	E	C	F
Galleria Boulevard/Roseville Parkway	Roseville	C	E	C	F
Pleasant Grove Boulevard/Fiddyment Road	Roseville	C	E	C	F

Source: Fehr and Peers 2011.

Based on the traffic analysis prepared for the proposed project (Table 1-6), some signalized intersections in the vicinity of the project site are predicted to operate at an unacceptable LOS under build out conditions (Fehr and Peers 2011). However, because none of the intersections would be anticipated to accommodate volumes of traffic that would exceed 31,600 vehicles in any single hour (Fehr and Peers 2011), all affected roadways would be at-grade, and the mix of vehicles traveling on these roadways is not anticipated to be substantially different in western Placer County, the project would not result in CO concentrations that would exceed or contribute to an exceedance of the CAAQS or NAAQS. Furthermore, due to stricter vehicle emissions standards in newer cars, new technology, and increased fuel economy, future CO emissions from on-road vehicles under future build out conditions (year 2025) would be substantially lower than those under existing conditions. Thus, even though the proposed project would reduce the LOS at various intersections due to increased traffic congestion, project-generated local mobile-source CO emissions would not result in or substantially contribute to concentrations that exceed the 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm. As a result, this impact would be **less than significant**.

Mitigation Measure

No Mitigation is required.

IMPACT 1-4 *Exposure of Sensitive Receptors to Short- and Long-Term Emissions of Toxic Air Contaminants.* Project implementation would result in exposure of sensitive receptors to short-term emissions of TACs from diesel-powered equipment used during construction. Project implementation would also have the potential to result in the development of stationary sources of TACs or land uses that harbor high-TAC emitting activities and would expose nearby sensitive receptors to high levels of health risk.

The exposure of sensitive receptors to emissions of TACs from on-site sources during construction and operation of the proposed project are discussed separately below.

Short-Term Construction-Related Emissions of Toxic Air Contaminants

Construction-related activities would result in temporary, short-term project-generated emissions of diesel PM from the exhaust of off-road heavy-duty diesel equipment used for site preparation (e.g., demolition, grading, excavation, grading, and clearing); paving; application of architectural coatings; and other miscellaneous activities. According to ARB, the potential cancer risk from the inhalation of diesel PM outweighs the potential for non-cancer health impacts (ARB 2003). Based on the URBEMIS modeling performed for the analysis of mass emissions of criteria air pollutants and precursors under Impact 1-1, off-road diesel-powered equipment operated during project construction would generate up to 1.3 lb/day of diesel PM exhaust emissions at the project site during peak days of construction activity. Refer to Appendix A for a detailed assumptions and calculations.

The dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. It is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the exposed individual. Thus, the risks estimated for an exposed individual are higher if a fixed exposure occurs over a longer period. According to the Office of Environmental Health Hazard Assessment (OEHHA), HRAs, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the duration of exposure (OEHHA 2001). The use of mobilized equipment for project construction activities would be temporary, and would dissipate with increasing distance from the source. Moreover, all construction equipment would not operate at the same time or location and, therefore, not necessarily expose the same nearby receptors to increased levels of diesel PM. Nonetheless, some sensitive receptors could be exposed to increased levels of diesel PM. While no sensitive receptors are currently located in close proximity to the project site, some residential land uses and schools may be developed and inhabited on adjacent properties before construction of the land uses proposed on the project site is completed. Also, new residential units and an elementary school could be constructed and become operational on the project site while construction of remaining land uses continues on the property. For these reasons, sensitive receptors could be exposed to diesel PM generated by project-related construction activities, which are anticipated to occur over a 20- to 30-year period. Even with the dispersive properties of diesel PM (Zhu et al. 2002), construction activities could expose sensitive receptors to levels that exceed applicable standards because of the potentially close proximity of on-site heavy-duty equipment to future planned residents and other sensitive receptors. Therefore, this would be a **significant impact**.

Long-Term Operation-Related Emissions of Toxic Air Contaminants

While the proposed project proposes specific land use types on the project site, the particular types of facilities that would be developed on commercial land uses is not known at this time. Development of some of the land uses proposed on the project site would likely include sources of TACs that would be required to obtain permits to operate under PCAPCD Rule 501, General Permit Requirements and Rule 507, Federal Operating Permit. These sources could include, but are not be limited to, a diesel-engine generator for emergency power generation; central heating boilers; kitchen equipment at restaurants; and dry cleaning equipment. Such stationary sources of TACs would be subject to PCAPCD requirements for toxics. Before granting a permit for these sources, PCAPCD would perform or refer to a formal health risk assessment to ensure the operation of such sources would not result in the exposure of sensitive receptors to levels of TAC emissions that would result in an incremental increase of 10 in 1 million for the carcinogenic risk and/or a noncarcinogenic Hazard Index of 1.0 at any receptor.

Implementation of the proposed project would result in the siting of residents and an elementary school on the project site, both of which are considered sensitive land uses. As explained above, the potential for sensitive

receptors and sources of TACs to be located in close proximity to each other was evaluated using guidance from an ARB publication, *Air Quality and Land Use Handbook: A Community Health Perspective* (ARB 2005). More specifically, the handbook recommends the following guidance that may be pertinent to the land uses proposed on the project site:

- Avoid siting residential land uses or schools within 1,000 feet of a major service and maintenance rail yard.
- Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads carrying 100,000 vehicles per day, or rural roads carrying 50,000 vehicles per day.
- Avoid siting new commercial trucking facilities that accommodate more than 100 trucks per day, or 40 trucks equipped with transportation refrigeration units (TRUs), within 1,000 feet of sensitive receptors (e.g., residences, schools, or parks).
- Avoid siting new sensitive land uses within 300 feet of a large gasoline station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50-foot separation is recommended for typical gasoline-dispensing facilities.
- Avoid siting new sensitive land uses within 300 feet of any dry-cleaning operation using perchloroethylene (perc). For operations with two or more machines, provide 500 feet. For operations with three or more machines, consult the local air district (i.e., PCAPCD). Do not site new sensitive land uses in the same building with dry-cleaning operations that use perc.
- Obtain facility-specific information where there are questions about siting a sensitive land use close to an industrial facility, including the amount of pollutant emitted and its toxicity, distance to nearby receptors, and types of emissions controls in place.

The project site is not located near any rail lines, rail facilities, freeways or major roadways. The property is more than 2.5 miles northwest of the Roseville Rail Yard, more than 3 miles northwest of Interstate 80, approximately 4 miles from State Route 65, and more than 5 miles east of State Route 99/10. According to the traffic report, none of the arterial roadways in the traffic study area are projected to have traffic volumes greater than 50,000 average daily trips, including the volumes on Baseline Road, Fiddyment Road, and Pleasant Grove Boulevard (Fehr & Peers 2011). Furthermore, the City zoning code would not allow truck distribution centers, high-volume gasoline stations, large production dry cleaning facilities, or any other industrial facilities to be operated anywhere inside the SVSP boundaries. For these reasons, the proposed project would not have the potential to result in the incompatible locating of sensitive receptors and TAC-emitting land uses that do not comply with ARB's recommended setback distances. As a result, this would be a **less-than-significant impact**.

Mitigation Measure 1-4

In order to reduce exposure to construction-generated emissions of diesel PM, project applicant(s) shall require all their construction contractors to implement the Exhaust Emission Control Measures listed under Mitigation Measure 1-1.

Significance after Mitigation

Implementation of the Exhaust Emission Control Measures for on-site construction activity, as required by Mitigation measure 1-4, would reduce short-term construction-related emissions of PM_{10} exhaust by 45%. Reductions in exhaust emissions of $PM_{2.5}$, which is diesel PM, would be similar. Thus, maximum daily emissions of diesel PM would be reduced to approximately 0.7 lb/day during peak construction periods. On-site emissions of diesel PM would also be reduced by the limiting of equipment idling; use of electric power sources, where feasible; proper maintenance of construction equipment; and routine VEE monitoring to ensure equipment

operates properly. The requirement to stage equipment as far from sensitive receptors as possible would also reduce diesel PM exposure to those receptors. Because these measures would substantially reduce the dose of diesel PM exposure to nearby sensitive receptors, this impact would be reduced to a **less-than-significant** level.

IMPACT 1-5	*Exposure of Sensitive Receptors to Excessive Odors.* Neither the short-term construction nor the long-term operation of the proposed project would result in the exposure of sensitive receptors to excessive or unusual odorous emissions.

The exposure of sensitive receptors (e.g., existing and proposed residential units, schools, and parks) to odorous emissions from project-related construction activity and operations of facilities developed on the property are discussed under separate headings below.

Short-Term Construction-Related Odorous Emissions

Some project-related construction could result in temporary generation of objectionable odors associated with diesel exhaust, asphalt paving, and the application of architectural coatings, may be considered offensive to some individuals. Exposure to odorous emissions from these types of activities may occur when some on-site land uses undergo construction after some of the other proposed land uses are already constructed and become operational (e.g., after residents are built and then become inhabited). However, because odors would be temporary and would generally disperse rapidly with distance from the source, these construction-related activities would not result in the frequent exposure of on-site receptors, or any off-site receptors, to objectionable odorous emissions. As a result, this impact would be **less than significant.**

Long-Term Operation-Related Odorous Emissions

No common sources of nuisance odors, such as wastewater treatment facilities, waste-disposal facilities, or dairies are proposed on the project site. However, truck deliveries to commercial uses could expose individuals to diesel exhaust that some may find to be objectionable and sewer lift stations could intermittently and temporarily emit objectionable odors. Additionally, commercial uses could provide development of convenience uses that may include sources of odorous emissions (e.g., fast-food restaurants, gasoline stations, dry-cleaning facilities) that would be perceived as offensive to some individuals. The operation of such sources could expose a substantial number of proposed on-site receptors to objectionable odorous emissions. However, these sources are typical of an urban environment and not considered a nuisance or a major source of odorous emissions because they do not elicit complaints from the public. No unusual odor-producing uses are proposed on the project site or in the surrounding vicinity; no major odor sources are located or planned near the project site; and the project site and surrounding properties are not currently used for grazing or other odor-producing agricultural activities. Therefore, this impact would be **less than significant**.

Mitigation Measure

No mitigation is required.

2 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

2.1 ENVIRONMENTAL SETTING

Emissions of greenhouse gases (GHGs) have the potential to adversely affect the environment because such emissions contribute, on a cumulative basis, to global climate change. The proper context for addressing this issue in a CEQA analysis is as a discussion of cumulative impacts, because although the emissions of one single project would not result in global climate change, GHG emissions from multiple projects throughout the world could result in a cumulative impact with respect to global climate change. In turn, global climate change has the potential to result in rising sea levels, which can inundate low-lying areas; to affect rainfall and snowfall, leading to changes in water supply; to affect habitat, leading to adverse effects on biological resources; and to result in other effects.

Although the impact of GHGs is cumulative, it is different from typical cumulative impact analyses. GHG emissions are generated by anthropogenic (i.e., human-made) and biogenic sources throughout the world, and to that end are an ultimate cumulative impact. The cumulative impact analyses for other resource areas focus on a more local scale—the project combined with other projects within the viewshed, the forest resource area, or the regional air basin—depending on resource issue. Therefore, this issue is presented at some depth, and focuses on the project's contribution to this global issue.

This section presents the current state of climate change science and an overview of GHG emissions sources in California; a summary of applicable regulations; and a description of project-generated GHG emissions and their contribution to global climate change. The analysis estimates and analyzes the GHG emissions associated with project-related construction activities and operation of the proposed project and also identifies the potential effects of global climate change on the project based on available scientific data.

ATTRIBUTING CLIMATE CHANGE—THE PHYSICAL SCIENTIFIC BASIS

Certain gases in the earth's atmosphere, classified as 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. This absorbed radiation is then emitted from the earth as low-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), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about 1 day), GHGs have long atmospheric lifetimes (1 year to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe.

Although the exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO_2 emissions, approximately 54% is sequestered through ocean uptake, uptake by northern hemisphere forest regrowth, and other terrestrial sinks within a year, whereas the remaining 46% of human-caused CO_2 emissions remains stored in the atmosphere (Seinfeld and Pandis 1998).

Similarly, impacts of GHGs are borne globally, as opposed to localized air quality effects of criteria air pollutants and toxic air contaminants. The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; suffice it to say, the quantity is enormous, and no single project alone would measurably contribute to a noticeable incremental change in the global average temperature, or to global, local, or micro climate. From the standpoint of CEQA, GHG impacts related to global climate change are inherently cumulative.

ATTRIBUTING CLIMATE CHANGE—GREENHOUSE GAS EMISSION SOURCES

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial and agricultural emissions sectors (ARB 2008). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (ARB 2010c). Emissions of CO_2 are byproducts of fossil fuel combustion. CH_4, a highly potent GHG, results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) is largely associated with agricultural practices and landfills. N_2O is also largely attributable to agricultural practices and soil management. CO_2 sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution, respectively, two of the most common processes of CO_2 sequestration.

According to different ranking systems, California is the 12th to 16th largest emitter of CO_2 in the world (CEC 2006a). California produced 484 million metric tons (MMT) of CO_2 equivalent (CO_2e) in 2004 at its peak over the inventory period, and produced 478 MMT in 2008 (ARB 2010c). CO_2e 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 (GWP) of a GHG, is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, as described in Appendix C, “Calculation References,” of the General Reporting Protocol of the California Climate Action Registry (CCAR) (2009), 1 ton of CH_4 has the same contribution to the greenhouse effect as approximately 21 tons of CO_2. Therefore, CH_4 is a much more potent GHG than CO_2. Expressing emissions in CO_2e 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 2008, accounting for 37% of total GHG emissions in the state (ARB 2010c). This sector was followed by the electric power sector (including both in-state and out-of-state sources) (24%) and the industrial sector (19%) (ARB 2010c).

2.2 REGULATORY SETTING

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

EPA is the federal agency responsible for implementing the Clean Air Act (CAA). The U.S. Supreme Court ruled on April 2, 2007, that CO_2 is an air pollutant as defined under the CAA, and that EPA has the authority to regulate

emissions of GHGs. In response to the mounting issue of climate change, EPA has taken actions to regulate, monitor, and potentially reduce GHG emissions.

MANDATORY GREENHOUSE GAS REPORTING RULE

On September 22, 2009, EPA issued a final rule for mandatory reporting of GHGs from large GHG emissions sources in the United States. In general, this national reporting requirement will provide EPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons (MT) or more of CO_2 per year. This publicly available data will allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost-effective opportunities to reduce emissions in the future. Reporting is at the facility level, except that certain suppliers of fossil fuels and industrial greenhouse gases along with vehicle and engine manufacturers will report at the corporate level. An estimated 85% of the total U.S. GHG emissions, from approximately 10,000 facilities, are covered by this final rule.

NATIONAL PROGRAM TO CUT GREENHOUSE GAS EMISSIONS AND IMPROVE FUEL ECONOMY FOR CARS AND TRUCKS

On September 15, 2009, EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) proposed a new national program that would reduce GHG emissions and improve fuel economy for all new cars and trucks sold in the United States. EPA proposed the first-ever national GHG emissions standards under the CAA, and NHTSA proposed Corporate Average Fuel Economy standards under the Energy Policy and Conservation Act. This proposed national program would allow automobile manufacturers to build a single light-duty national fleet that satisfies all requirements under both federal programs and the standards of California and other states.

ENDANGERMENT AND CAUSE OR CONTRIBUTE FINDINGS

On December 7, 2009, EPA adopted its Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the CAA (Endangerment Finding). The Endangerment Finding is based on Section 202(a) of the CAA, which states that the Administrator (of EPA) should regulate and develop standards for "emission[s] of air pollution from any class of classes of new motor vehicles or new motor vehicle engines, which in [its] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." The rule addresses Section 202(a) in two distinct findings. The first addresses whether or not the concentrations of the six key GHGs (i.e., CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations. The second addresses whether or not the combined emissions of GHGs from new motor vehicles and motor vehicle engines contribute to atmospheric concentrations of GHGs and therefore the threat of climate change.

The Administrator found that atmospheric concentrations of GHGs endanger the public health and welfare within the meaning of Section 202(a) of the CAA. The evidence supporting this finding consists of human activity resulting in "high atmospheric levels" of GHG emissions, which are very likely responsible for increases in average temperatures and other climatic changes. Furthermore, the observed and projected results of climate change (e.g., higher likelihood of heat waves, wild fires, droughts, sea level rise, and higher intensity storms) are a threat to the public health and welfare. Therefore, GHGs were found to endanger the public health and welfare of current and future generations.

The Administrator also found that GHG emissions from new motor vehicles and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare. EPA's final findings respond to the

2007 U.S. Supreme Court decision that GHGs fit within the CAA definition of air pollutants. The findings do not in and of themselves impose any emission reduction requirements but rather allow EPA to finalize the GHG standards proposed earlier in 2009 for new light-duty vehicles as part of the joint rulemaking with the U.S. Department of Transportation.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

ARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the CCAA, which was adopted in 1988.

Various statewide and local initiatives to reduce the state's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of global climate change are not yet fully understood, global climate change is under way, and there is a real potential for severe adverse environmental, social, and economic effects in the long term. Because every nation emits GHGs and therefore makes an incremental cumulative contribution to global climate change, cooperation on a global scale will be required to reduce the rate of GHG emissions to a level that can help to slow or stop the human-caused increase in average global temperatures and associated changes in climatic conditions.

ASSEMBLY BILL 1493

In 2002, then-Governor Gray Davis signed Assembly Bill (AB) 1493. AB 1493 required that ARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty trucks and other vehicles determined by ARB to be vehicles whose primary use is noncommercial personal transportation in the state."

To meet the requirements of AB 1493, in 2004 ARB approved amendments to the California Code of Regulations (CCR) adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 (13 CCR 1900, 1961), and adoption of Section 1961.1 (13 CCR 1961.1) required automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily for the transportation of persons), beginning with the 2009 model year. Implementation of AB 1493 lapsed because of delays in receiving proper approvals from EPA to implement this law under the CAA. California received the necessary approvals June 30, 2009; however, the state has agreed to allow the federal government to implement similar legislation (see "National Program to Cut Greenhouse Gas Emissions and Improve Fuel Economy for Cars and Trucks," above).

EXECUTIVE ORDER S-3-05

Executive Order S-3-05, which was signed by Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, exacerbate California's air quality problems, and potentially cause a rise in sea level. To combat those concerns, the executive order established total GHG emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80% below the 1990 level by 2050.

ASSEMBLY BILL 32, THE CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006

In September 2006, Governor Schwarzenegger signed AB 32, the California Global Warming Solutions Act of 2006. AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources.

CLIMATE CHANGE SCOPING PLAN

In December 2008, ARB adopted its Climate Change Scoping Plan, which contains the main strategies California will implement to achieve reduction of approximately 118 million metric tons (MMT) of CO_2e, or approximately 22% from the state's projected 2020 emission level of 545 MMT of CO_2e under a business-as-usual scenario (this is a reduction of 47 MMT CO_2e, or almost 10%, from 2008 emissions). ARB's original 2020 projection was 596 MMT CO_2e, but this revised 2020 projection takes into account the economic downturn that occurred in 2008 (ARB 2011c). In August 2011, the Scoping Plan was re-approved by ARB, and includes the Final Supplement to the Scoping Plan Functional Equivalent Document (FED), which further-examined various alternatives to Scoping Plan measures. The Scoping Plan also includes ARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. ARB estimates the largest reductions in GHG emissions to be achieved by implementing the following measures and standards (ARB 2011c):

- improved emissions standards for light-duty vehicles (estimated reductions of 26.1 MMT CO_2e),
- the Low-Carbon Fuel Standard (15.0 MMT CO_2e),
- energy efficiency measures in buildings and appliances (11.9 MMT CO_2e), and
- a renewable portfolio and electricity standards for electricity production (23.4 MMT CO_2e).

ARB has not yet determined what amount of GHG reductions it recommends from local government operations; however, the Scoping Plan does state that land use planning and urban growth decisions will play an important role in the state's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. (Meanwhile, ARB is also developing an additional protocol for community emissions.) ARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The Scoping Plan states that the ultimate GHG reduction assignment to local government operations is to be determined (ARB 2008). With regard to land use planning, the Scoping Plan expects approximately 3.0 MMT CO_2e will be achieved associated with implementation of SB 375, which is discussed further below (ARB 2011c).

EXECUTIVE ORDER S-1-07

Executive Order S-1-07, which was signed by Governor Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California, at over 40% of statewide emissions. It establishes a goal that the carbon intensity of transportation fuels sold in California should be reduced by a minimum of 10% by 2020. This order also directed ARB to determine whether this Low Carbon Fuel Standard could be adopted as a discrete early action measure after meeting the mandates in AB 32. ARB adopted the Low Carbon Fuel Standard on April 23, 2009.

SENATE BILL 1368

SB 1368 is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a GHG performance standard for baseload generation from investor-owned utilities by February 1, 2007. The California Energy Commission (CEC) was required by SB 1368 to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emission rate from a baseload combined-cycle natural gas–fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.

SENATE BILLS 1078 AND 107 AND EXECUTIVE ORDER S-14-08

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20% of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Energy Standard to 33% renewable power by 2020.

SENATE BILL 97

As directed by SB 97, the Natural Resources Agency adopted amendments to the State CEQA Guidelines for GHG emissions on December 30, 2009. On February 16, 2010, the Office of Administrative Law approved the amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The amendments became effective on March 18, 2010.

SENATE BILL 375

SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan (RTP). ARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years, but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG emission reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012.

CITY OF ROSEVILLE COMMUNITY-WIDE SUSTAINABILITY ACTION PLAN

The City of Roseville has prepared a Draft Community-wide Sustainability Action Plan (SAP) (City of Roseville 2011). The SAP includes a city-wide emissions inventory and outlines a road-map to reduce GHGs. The GHG inventory conducted for baseline year 2008 identified communitywide emissions of approximately 1,202,383 MT CO_2e. Mobile sources, commercial and industrial energy use, and residential energy use (i.e., electricity and natural gas consumption) accounted for 44%, 24%, and 22% of the total inventory. Under a forecasted business-as-usual scenario, communitywide GHG emissions are projected to increase to 1,385,942 MT CO_2e in the year 2020 to accommodate buildout under the Roseville General Plan's. Adoption of the SAP is anticipated to be considered by the City Council in 2012.

2.3 IMPACT ANALYSIS

This section describes the project's construction-related (short-term) and operation-related (long-term) emissions of GHGs. The discussion includes the criteria for determining the level of significance of the effects and a description of the methods and assumptions used to conduct the analysis.

2.3.1 METHODS OF ANALYSIS

At the time of writing this analysis, ARB, PCAPCD, and the City have not formally adopted a recommended methodology for evaluating GHG emissions associated with new land use development. Though PCAPCD has not developed a threshold of significance for determining whether project-related GHG emissions are considered significant, it does recommend that lead agencies estimate GHG emissions associated with temporary and short-term, project-related construction activities, as well as the long-term, operational emissions associated with a project, including mobile- and area-source GHG emissions and direct, off-site emissions associated with the project's consumption of electricity and water.

Thus, short-term construction-related and long-term operational area- and mobile-source emissions of GHGs were estimated using URBEMIS; a model widely-used in regional air quality analysis. These emissions were modeled based on general information provided in the project description and using trip generation rates from the transportation analysis prepared for this project (Fehr & Peers 2011). The total level of GHGs associated with project construction was amortized over the projected life of the buildings and facilities that would be developed on the project site (i.e., 30 years).

Indirect emissions associated with operational electricity consumption were estimated using a methodology recommended in the California Climate Action Registry's (CCAR) General Reporting Protocol, version 3.1 (CCAR 2009).This estimate was based on the projected annual electricity demand provided in the utilities report prepared for the project (Capitol Utility Specialists 2011) and the composite emission factor for Roseville Electric utility. Indirect energy-related emissions associated with water consumption were also estimated using projected water consumption data from the utilities report and associated energy consumption rates published by the California Energy Commission (CEC 2006b).

It is important to note that all CO_2 emissions from project operation may not necessarily be considered "new" emissions, given that a project itself does not create "new" emitters (people) of GHGs, at least not in the traditional sense. In other words, the GHG emissions from a residential project are not necessarily all new GHG emissions in the local area, state, or world; to a large degree, a new residential development, accommodates household relocations. In this sense, residential development projects can be seen as reacting to increased demand from the growing population and economy, and are not in themselves creators of economic or population growth. Emissions of GHGs are, however, influenced by the location and design of projects, to the extent that they can influence travel to and from the land uses that are developed, and to the degree the development and facilities are designed to maximize energy efficiency and GHG efficiency.

The methodology used to analyze the project's contribution to global climate change includes a calculation of GHG emissions and a discussion about the context in which they can be evaluated. The primary purpose of calculating the project's GHG emissions is for informational and comparison purposes, as ARB, PCAPCD, and the City have not adopted a quantifiable threshold for evaluating whether project-generated GHG's would be considered a significant impact. However, CEQA requires that the GHG emissions associated with a proposed project be analyzed.

2.3.2 THRESHOLDS OF SIGNIFICANCE

Per Appendix G of the CEQA Guidelines, GHG or climate change impacts are considered significant if implementation of the proposed project would do any of the following:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

An individual project cannot generate enough GHG emissions to significantly influence global climate change. A project participates in this potential impact to the extent that its incremental contribution, combined with the cumulative contributions of all other sources of GHGs, when taken together, cause global climate change impacts.

For the purposes of this analysis GHG emissions from the proposed project are quantified and then discussed. The discussion focuses on whether the associated emissions would substantially help or hinder the state's ability to attain the goals identified in AB 32 (i.e., reduction of statewide GHG emissions to 1990 levels by 2020). The analysis recognizes that the impact that GHG emissions have on global climate change does not depend on whether they are generated by stationary, mobile, or area sources, or whether they are generated in one region or another. As stated above, the mandate of AB 32 demonstrates California's commitment to reducing GHG emissions and the state's associated contribution to climate change, without intending to limit population or economic growth within the state. Thus, to achieve the goals of AB 32, which are tied to mass GHG emission levels of a specific benchmark year (i.e., 1990), California would have to achieve a lower rate of emissions per unit of population (per person) and/or per level of economic activity (e.g., per job) than its current rate. Furthermore, to accommodate future population and economic growth, the state would have to achieve an even lower rate of emissions per unit than it achieved in 1990. (The goal—to achieve 1990 quantities of GHG emissions by 2020—will need to be accomplished despite 30 years of population and economic growth beyond 1990.) For this reason, land use developments need to be GHG "efficient" to attain AB 32 goals while accommodating population and job growth. Thus, this analysis focuses on the annual operational GHG emissions per service population (SP), or annual GHG/SP, where SP is the number of residents accommodated by residential land uses developed on the project site plus the number of jobs supported by the non-residential land uses on the project site. The benchmark for this metric is estimated to be approximately 4.6 MT CO_2e/SP/year (BAAQMD 2010). Though this benchmark was developed by another air district, it can be applied to land use developments throughout California because it was estimated based on future expected growth in the state's population and economy and the mass emissions reduction target mandated by AB 32 for the year 2020 (BAAQMD 2010). Development of the benchmark assumed that only certain sectors of the statewide GHG emissions inventory are related to land use planning and development design decisions. For instance, GHG emissions produced by the forestry sector are not accounted for in this metric because the proposed project would not result in the removal or addition of forests or state forestland. Additionally, analysis using an efficiency-based metric in this analysis is consistent with the discussion in ARB's Scoping Plan of the importance of GHG efficiency in land use planning that must be achieved to attain the mandated reductions in mass annual GHG emission levels (ARB 2008). However, although the Scoping Plan discusses efficiency in terms of (imperial) tons per person, it does not explicitly discuss ways to account for projected growth in the state's population or projected growth in the state's economy. Moreover, the metric of mass GHG emissions per capita would not be useful for understanding the efficiency of nonresidential land uses (e.g., commercial, industrial, educational).

Because the CO_2e /SP/year metric accounts for future population growth, future economic growth, and mass emission targets, future land use development projects that would not be more GHG efficient than "business as usual" would conflict with the spirit of AB 32 policy.

Nonetheless, one of the primary challenges to establishing a reasonable threshold and determining impacts (and mitigation) relates to enactment of AB 32 and other GHG emission-reduction legislations. As previously described, much of this legislation requires ARB and others to establish standards that relate to energy efficiency, carbon levels in fuels, smokestack emissions, and regional transportation planning (i.e., SB 375). While some of these standards have been established, others are in the development process and may be a few to several years away from implementation. The project, however, would also be in development for multiple decades (i.e., approximately 20 to 30 years), and during its lifetime would be subject to these as-yet undeveloped thresholds. There is a lag time between enactment of these legislative fixes and the regulations that will implement them. As a consequence, local governmental agencies are left to struggle with trying to discern the extent to which their decisions can and will influence GHG emissions, versus what GHG reductions will be achieved by still-to-be-developed regulations. For instance, a local lead agency can base a threshold on generation of emissions below some business-as-usual target, but it is difficult to ascertain whether these regulations will largely result in substantial reductions that hit the target, or whether local agencies will need to impose additional measures. This challenge is discussed in more detail in the "Impacts and Mitigation Measures" section below.

2.3.3 Impacts and Mitigation Measures

IMPACT 2-1	**Generation of GHG Emissions.** Construction and operation of the land uses proposed on the project site would generate GHG emissions, which would contribute considerably to cumulative GHG emissions.

Heavy-duty off-road equipment, materials transport, and worker commutes during construction of the land uses proposed on the project site would result in exhaust emissions of GHGs. GHG emissions generated by construction would be primarily in the form of CO_2. Although emissions of other GHGs, such as CH_4 and N_2O, are important with respect to global climate change, the emission levels of these other GHGs from on- and off-road vehicles used during construction are relatively small compared with CO_2 emissions, even when factoring in the relatively larger global warming potential of CH_4 and N_2O.

Construction-generated GHG emissions were modeled based on the types and quantities of various land uses proposed under the Westbrook Amendment and default PCAPCD-recommended settings and parameters attributable to the proposed land use types and site location. In short, modeling was conducted using the same assumptions for estimating construction-generated emissions of criteria air pollutants and precursors, which are listed in the discussion under Impact 1-1.

Construction of the land uses proposed on the approximately 400-acre project site could begin as early as 2014 and full buildout of the project area would occur over a 20- to 30-year period. Given that exhaust emission rates of the construction equipment fleet in the state are expected to decrease over time due to ARB-lead efforts, annual construction emissions were estimated using the earliest calendar when construction would begin (2014) in order to generate conservative estimates. It is anticipated, however, that in later years, advancements in engine technology, retrofits, and turnover in the equipment fleet would result in increased fuel efficiency, potentially more alternatively fueled equipment, and lower levels of GHG emissions. Also, the URBEMIS model does not account for reductions in CO_2 emission rates that would affect future construction activity due to the

regulatory environment that is expected to evolve under AB 32. For instance, ARB's Scoping Plan identifies the need to expand efficiency strategies and low carbon fuels for heavy-duty and off-road vehicles (ARB 2008). According to the estimates provided by URBEMIS, a total of 3,507 MT of CO_2 would be generated from construction of all the land uses proposed on the project site, as shown in Table 2-1. Conservatively assuming a 30-year operational life of the buildings and facilities that would be constructed, the amortized level of construction-generated emissions would be approximately 129 MT CO_2/year.

GHG emissions would also be generated throughout the operational life of the proposed project. Operational emissions would be generated by area-, mobile-, and stationary-sources. Area-source emissions would be associated with activities such as combustion of natural gas for space and water heating, maintenance of landscaping and grounds, waste disposal, and other sources. Mobile-source emissions of GHGs would include project-generated vehicle trips for residents, employees, and visitors. In addition, increases in stationary-source emissions could occur at off-site utility providers from electricity generation that would supply power to the proposed land uses. Thus, the GHGs associated with the consumption of electricity by the proposed land uses are considered an indirect source. On-site consumption of water would also result in indirect GHG emissions because of the electricity consumption associated with the off-site conveyance, distribution, and treatment of that water. GHGs associated with consumption of non-recycled and recycled water by the proposed project were estimated based on the Potable Water Master Plan (HydroScience Engineers 2011a) and Recycled Water Mast Plan prepared for the project site (HydroScience Engineers 2011b).

GHG emissions generated by operation of the proposed land uses would be primarily in the form of CO_2. Although emissions of other GHGs, such as CH_4 and N_2O, are important with respect to global climate change, the emissions levels of these GHGs from the sources considered for this project are relatively small compared with CO_2 emissions, even when factoring in the relatively larger global warming potential of CH_4 and N_2O.

At the time of writing this analysis, emission factors and calculation methods for GHGs from development projects have not been formally adopted for use by the ARB, PCAPCD, or the City. However, PCAPCD does recommend that direct and indirect emissions of GHGs from a project be quantified and disclosed, including area- and mobile-source emissions, and indirect emissions from in-state energy production and water consumption. This approach is considered to be reasonable; no other "more reasonable" approaches have been recommended. Therefore, it is appropriate to estimate the levels of GHGs generated from these sources using the methodologies described above.

The proposed project would also result in the loss of some trees and grasslands, which are a form of carbon storage and they sequester carbon from the atmosphere; however, the project would include vegetative landscaping, counterbalancing this loss. It would not be possible, at this scale, to determine if more or less vegetation would be on the site after development than before, so the loss in vegetation is not quantified for this analysis.

Operational GHG emissions were estimated for full buildout of the project site, in the year 2025, and are presented in Table 2-1. The annual operational emissions level of the proposed project was estimated using the best available methodologies and emission factors available at the time of writing this analysis. However, for many operational GHG emission sources GHG emission rates for future years are not yet developed, in part, because regulations continue to evolve under the mandate of AB 32. The URBEMIS model, as well as other GHG estimation protocols, does not yet account for the impact reductions of the future regulatory environment and future technological improvements that will result in GHG efficiencies. Thus, this analysis uses the emissions estimates modeled for full buildout as a proxy for evaluating GHG emissions associated with development of the project site.

As shown in Table 2-1, estimated GHG emissions associated with operation of the land uses proposed on the project site would total approximately 52,861 MT CO_2e per year. At full buildout, an estimated 5,154 residents would be living on the project site and the non-residential land uses would support an estimated 1,139 jobs. When estimated CO_2e emissions are normalized with respect to service population (i.e., residents plus jobs), the GHG efficiency of operations would be 8.4 MT CO_2e/SP/year under full buildout. For sake of reference, the Bay Area Air Quality Management District has established an efficiency-based significance threshold of 4.6 MT CO2e/SP/year, which is based on the projected GHG inventory for the entire state and the projected population and employment levels in the state (BAAQMD 2010).

In many respects, however, the GHG efficiency of 8.4 MT CO_2e /SP/year estimated for the proposed project is representative of the project's GHG efficiency under a business-as-usual scenario and could possibly be higher than what would likely occur. First, the level of mobile-source emissions, which was estimated to be more than 80% of the total operational emissions is based on the VMT estimated by the traffic study, which is conservative. The total VMT estimated by the traffic study includes all trips associated with the proposed project, including trips that originate or terminate outside the project site. Many of these trips that would occur with or without the project, but to be conservative, the traffic study attributes all of them to the project's land uses. Thus, some portion of the estimated mobile-source emissions is associated with trips that would merely replace trips that would otherwise take place elsewhere in the Sacramento region.

Table 2-1 Summary of Modeled Project-Related GHG Emissions

Construction-Related GHG Emissions	
Total Construction Emissions	3,507 MT CO_2
Amortization Period	30 years
Amortized Construction Emissions	129 MT CO_2/year
Operational GHG Emissions under Full Buildout (2025)	
Buildout (2025)	**CO_2 MT/year**
Transportation (mobile sources)	43,015[1]
Area Sources	7,917
Electricity Consumption	1,262
Water Conveyance, Treatment, Distribution, and Wastewater Treatment	550
Amortized Construction Emissions	88
Total Operational Emissions	**52,861**
Service Population (residents + jobs)	**6,293 SP**
GHG Efficiency	**8.4 MT CO_2e/SP/year**
GHG Efficiency Threshold	**4.6 MT CO_2e/SP/year**

Notes: CO_2 = carbon dioxide; GHG = greenhouse gas; MT = metric tons; MT/yr = metric tons per year; SP = Service Population, which is the number of residents supported by the projected plus the number of jobs supported by the project. Values may not sum to match total due to rounding.
[1] The estimate of transportation-related GHG emissions is based on the trip generation rates identified in the traffic study prepared for the project (Fehr and Peers 2011), which take into account those features that would reduce vehicle trips. These include providing opportunities for Bus Rapid Transit lanes on Santucci Boulevard, a transit center and park-and-ride lot as part of the commercial center at Pleasant Grove and Santucci Boulevards, a system of open space and paseos that provide off-street pedestrian and bicycle connections throughout the community.
See Appendix A for detailed modeling results.
Source: Modeling Conducted by Ascent Environmental 2011.

Furthermore, the VMT estimate accounts for only some (not all) of the trip reduction features that would be part of the project design. The proposed project includes some "smart growth" concepts, such as a mix of uses configured for convenient bike and pedestrian access, an extensive network of bike and pedestrian connections and integration of transit infrastructure. The transportation model used in the traffic analysis functions at a regional scale, so all the nuances of the land use planning under the proposed project are not necessarily reflected in the estimate of net VMT. In addition, the emissions rates used to estimate mobile-source GHG emissions do not account for GHG reductions that would result from the Low Carbon Fuel Standard, which was adopted as a discrete early-action measure of AB 32, or the CAA waiver that California received from EPA allowing the state to adopt more stringent fuel efficiency standards for passenger vehicles and light trucks (AB 1493, which is discussed in the "Regulatory Setting" section above).

The project site is located within the area identified in the Sacramento Area Council of Governments (SACOG) Preferred Blueprint Scenario, which is intended to reduce overall VMT and GHG emissions in the region, and it is anticipated that development within the City would be consistent with this policy. The project would be subject to the City's *Smart Choices, Strategies to Implement the Blueprint* project adopted by the City Council in March 2005.

With regard to another segment of operational GHG emissions shown in Table 2-1, indirect GHG emissions related to the consumption of fossil fuel-based electricity, these estimated emissions do not account for reductions that will result from future regulatory changes under AB 32. The estimate of these emissions is not discounted to reflect the alternative-energy mandate of SB 107, which requires electric utilities to provide at least 20% of its electricity supply from renewable sources by 2010 and 30% by 2020; this mandate would be fully implemented before full buildout of the proposed project. Because Roseville Electric is still procuring enough renewable energy to meet this goal, the estimated rate of GHG emissions from electricity is expected to decrease between now and 2020. In addition, SB 1368 requires more stringent emissions performance standards for new power plants, both in-state and out-of-state, that will supply electricity to California consumers. Thus, implementation of SB 1368 would also reduce GHG emissions associated with electricity consumption.

Further reductions are also expected from other regulatory measures that would be developed under the mandate of AB 32, as identified and recommended in ARB's Scoping Plan (ARB 2011c). In general, the Scoping Plan focuses on achieving the state's GHG reduction goals with regulations that improve the efficiency of motor vehicles and the production (and consumption) of electricity. Thus, even with the implementation of no project-specific mitigation, the rate of GHG emissions from development on the project site are projected to decrease in subsequent years as the regulatory environment progresses under AB 32.

Additionally, new technology improvements may become available or the feasibility of existing technologies may improve. Nonetheless, a complete picture of the future regulatory environment is unknown at this time. GHG reduction measures promulgated under the AB 32 mandate may not be sufficient to cause future development to achieve ARB's recommended 30% reduction from business-as-usual emissions levels projected for 2020 (as discussed in the Scoping Plan) or any other mass emission-based or service efficiency-based GHG goal.

Also worth consideration is that, for the moment, the total annual GHG emissions level associated with operation of the proposed project alternatives would exceed 25,000 MT CO_2/year throughout its operational life, which is the mandatory reporting level for stationary sources as part of implementation of AB 32. In comparison to this reporting level, the amount of operational GHG emissions of the proposed project would be considered substantial.

Because the total GHG emissions associated with project operations would be considered substantial, and due to the uncertainty about whether the future regulations developed through implementation of AB 32 would improve the GHG efficiency of the project such that it would achieve GHG-efficiency of 4.6 MT CO_2e/SP/year, the proposed project would result in a cumulatively **considerable contribution to a significant cumulative impact** related to its long-term operational GHGs.

Mitigation Measure 2-1a

In order to reduce construction-related emissions to reduce GHGs, project applicant(s) shall require all their construction contractors to implement the Exhaust Emission Control Measures listed under Mitigation Measure 1-1.

Mitigation Measure 2-1B

Mitigation Measure 1-2 shall be implemented through project design, conditions of approval or through the City's inspection processes in order to reduce operational emissions of GHGs.

Mitigation Measure 2-1C

Applicants shall consider the following measures to reduce GHG emissions associated with electricity and water consumption. These measures were not required in the SVSP EIR. Some of these measures, however, are related to some of the optional GHG reduction methods listed under Mitigation Measure 4.5-2 of the SVSP EIR, as noted below, and provide additional clarity and measureable performance standards. These measures are based on an increased collective understanding of the feasibility and effectiveness of various GHG reduction measures. Since the program-level analysis of GHGs was developed in the SVSP EIR, local municipalities and developers have identified new feasible and cost-effective project-level measures that result in GHG reductions, in part, due to the formulation of community-wide GHG reduction plans (a.k.a., climate action plans) by many cities and counties in the state.

- *Limit the amount of turf area requiring irrigation at all residential land uses; parks; landscape corridors and paseos; and along rights of way such that irrigation demand is reduced by a minimum of 28%, 18%, 43%; and 45%, respectively. These limits apply to the total volume of water used for irrigation, regardless of whether any irrigation water is recycled water. The baseline for these reductions should be based on the values listed in Table 1 of the Westbrook Water Conservation Plan (HydroScience Engineers 2011c). This plan also provides details about the feasibility of implementing this measure at these land use types. In addition, the amount of turf area requiring irrigation at all commercial land uses such that irrigation demand is reduced from baseline levels by a minimum of 28%. (These performance standards accomplish multiple measures listed under Mitigation Measure 4.5-2 of the SVSP EIR, including use of water-efficient landscapes with native, drought-resistant species in all public area and commercial landscaping; the use of water-efficient turf in parks and other turf-dependant spaces; and designing buildings and lots to be water-efficient.)*

- *Install smart irrigation control systems for all turf and landscaping areas that require irrigation. Smart irrigation control systems avoid overwatering by restricting the frequency and application rate of irrigation. Smart irrigation control systems can account for variations in whether and soil moisture conditions. Details about the feasibility of implementing this measure are provided in the Westbrook Water Conservation Plan (HydroScience Engineers 2011c). (This measure is consistent with the option listed under Mitigation Measure 4.5-2 of the SVSP suggesting the installation of water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls.)*

- *Install the infrastructure to use reclaimed water for landscape irrigation at non-single family residential and uses. The measure is considered feasible according to the Westbrook Recycled Water Master Plan (HydroScience Engineers 2011b). (This measure is consistent with the item under Mitigation measure 4.5-2 of the SVSP that calls for the installation of infrastructure to use reclaimed water for landscape irrigation).*

- *Install recirculating hot water systems for indoor potable water use in all residential land uses. Details about the feasibility of implementing this measure are provided in the Westbrook Water Conservation Plan (HydroScience Engineers 2011c).*

Mitigation Measure 2-1D

The City shall ensure that each increment of new development within the project site requiring a discretionary approval (e.g., proposed tentative map, conditional use permit), is subject to a project-specific environmental review by City staff and will require operation of each phase of development to achieve the AB 32-based efficiency goal of 4.6 MT CO_2e/SP/year.

The City shall require feasible reduction measures that, in combination with existing and future regulatory measures developed under AB 32, will reduce GHG emissions associated with the operation of future project development phases and supporting roadway and infrastructure improvements that are part of the proposed project by an amount sufficient to achieve the AB 32-based goal of 4.6 MT CO_2e/SP/year.. The feasibility of potential GHG reduction measures shall be evaluated by the City at the time each phase of development is proposed in order to allow for ongoing innovations in GHG reduction technologies, as well as incentives and/or requirements created in the regulatory environment.

Prior to City approval of any tentative map of for new development of individual lots within the project area, the project applicant(s) shall submit to the City a list of feasible energy-efficient design standards to be considered in the project-specific environmental review. These energy conservation measures, which will be incorporated into the design, construction, and operational aspects of each increment of development, would result in a reduction in overall project energy consumption and GHGs. The project-specific environmental review shall further identify potentially feasible GHG reduction measures to reflect the current state of the regulatory environment, which will continuously evolve under the mandate of AB 32. The City will review and ensure inclusion of the design features in the proposed project before the applicant(s) can receive the City's discretionary approval for the applicable increment of development. In determining what measures should appropriately be imposed by the City under the circumstances, the City shall consider the following factors:

- *the extent to which rates of GHG emissions generated by motor vehicles traveling to, from, and within the project site are projected to decrease over time as a result of regulations, policies, and/or plans that have already been adopted or may be adopted in the future by ARB pursuant to AB 32, or by EPA;*

- *the extent to which mobile-source GHG emissions, which at the time of writing this analysis comprise a substantial portion of the state's GHG inventory, can also be reduced through design measures that result in trip reductions and reductions in trip length;*

- *the extent to which GHG emissions emitted by the mix of power generation supplying electricity to Roseville Electric, the electrical utility that will serve the project site, are projected to decrease pursuant to the Renewables Portfolio Standard required by SB 1078 and SB 107, and the subsequent Renewable Energy Standard by 2020, as well as any future regulations, policies, and/or plans adopted by the federal and State governments that reduce GHG emissions from power generation;*

- *the extent to which any stationary sources of GHG emissions that would be operated on a proposed land use are already subject to regulations, policies, and/or plans that reduce GHG emissions, particularly any future regulations that will be developed as part of ARB's implementation of AB 32, mandatory reporting requirements, or cap-and-trade requirements, or other pertinent regulations on stationary sources that have the indirect effect of reducing GHG emissions;*

- *the extent to which the feasibility of existing GHG reduction technologies may change in the future, and to which innovation in GHG reduction technologies will continue effecting cost-benefit analyses that determine economic feasibility; and*

- *whether the total costs of proposed mitigation for GHG emissions, together with other mitigation measures required for the proposed development, are so great that a reasonably prudent property owner would not proceed with the project in the face of such costs.*

In considering how much, and what kind of, measures are necessary in light of these factors, the City shall consider and implement, as appropriate, the following non-exclusive and non-exhaustive list of measures. GHG emission reduction strategies and their respective feasibility are likely to evolve over time. These measures are derived from multiple sources including the Mitigation Measure Summary in Appendix B of the California Air Pollution Control Officer's Association (CAPCOA) white paper, CEQA & Climate Change *(CAPCOA 2008); CAPCOA's* Model Policies for Greenhouse Gases in General Plans *(CAPCOA 2009); CPCOA's* Quantifying Greenhouse Gas Reduction Measures *(CAPCOA 2010); and the California Attorney General's Office publication,* The California Environmental Quality Act: Addressing Global Warming Impacts at the Local Agency Level *(California Attorney General's Office 2010). The measures listed below are identical to the GHG reduction options listed under Mitigation Measure 4.5-2 of the SVSP EIR, unless otherwise noted.*

Energy Efficiency

- *Include additional clean alternative energy features to promote energy self-sufficiency (e.g., photovoltaic cells, solar thermal electricity systems, small wind turbines).*

- *Site buildings to take advantage of shade and prevailing winds and design landscaping and sun screens to reduce energy use.*

- *Install efficient lighting in all buildings (including residential). Also install lighting control systems, where practical. Design buildings to use daylight as an integral part of lighting systems.*

- *Install light-colored "cool" pavements, and strategically located shade trees along all bicycle and pedestrian routes.*

Water Conservation and Efficiency

- *Install water-efficient fixtures and appliances in buildings to reduce indoor water use.*

- *Prohibit businesses from using pressure washers for cleaning driveways, parking lots, sidewalks, and street surfaces. These restrictions should be included in the Covenants, Conditions, and Restrictions of the community.*

- *Provide education about water conservation and available programs and incentives.*

- *To reduce stormwater runoff, which typically bogs down wastewater treatment systems and increases their energy consumption, construct driveways to single family detached residences and parking lots and driveways of multifamily residential uses with pervious surfaces. Possible designs include*

Hollywood drives (two concrete strips with vegetation or aggregate in between) and/or the use of porous concrete, porous asphalt, turf blocks, or pervious pavers.

- *Comply with any applicable water conservation ordinances.*

Solid Waste Measures

- *Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard).*
- *Provide interior and exterior storage areas for recyclables and green waste at all buildings.*
- *Provide adequate recycling containers in public areas, including parks, school grounds, golf courses, and pedestrian zones in areas of mixed-use development.*
- *Provide education and publicity about reducing waste and available recycling services.*

Transportation and Motor Vehicles

- *Promote ride-sharing programs and employment centers (e.g., by designating a certain percentage of parking spaces for ride-sharing vehicles, designating adequate passenger loading and unloading zones and waiting areas for ride-share vehicles, and providing a Web site or message board for coordinating ride-sharing).*
- *Provide the necessary facilities and infrastructure in all land use types to encourage the use of low- or zero-emission vehicles (e.g., electric vehicle charging facilities and conveniently located alternative fueling stations).*
- *Require commercial and retail land uses to provide prioritized parking for electric vehicles, hybrid vehicles, and alternative fuel vehicles.*
- *At industrial and commercial land uses, all forklifts, "yard trucks," or vehicles that are predominately used on-site at non-residential land uses shall be electric-powered or powered by biofuels (such as biodiesel [B100]) that are produced from waste products, or shall use other technologies that do not rely on direct fossil fuel consumption.*
- *Implement roundabouts instead at intersections instead of stop signs.*
- *Install light-colored "cool" pavements, and strategically located shade trees along all bicycle and pedestrian routes.*

Significance After Mitigation

The exhaust emission control measures required by Mitigation Measure 1-1 will help minimize the combustion of fossil fuels by heavy-duty construction equipment and associated GHG emissions.

The energy efficiency measures required by Mitigation Measure 1-2 will reduce energy demand by buildings developed on the project site and GHG emissions associated with energy consumption.

By acknowledging that the regulatory environment will continue to progress and that new GHG-efficient technologies will continue to be innovated over time, Mitigation Measure 2-1d requires the implementation of project-specific mitigation measures that are appropriate and feasible during each phase or increment of project development. Although Mitigation Measure 2-1d would require the implementation of all feasible GHG

reduction measures known at the time of each development proposal that is subject to discretionary action by the City, whether this measure would result in operational GHG efficiency of 4.6 MT CO_2e/SP/year is unknown at this time. As the preceding discussion suggests, much of the difficulty in achieving a GHG efficiency of 4.6 MT CO_2e/SP/year through measures imposed by the City reflects the reality that the vast majority of GHG emissions associated with development of the project site would be attributable to the combustion of fossil fuels, either in motor vehicles or in electricity-generating power plants. The state, it is clear, must make significant strides in changing the make-up of transportation fuels and power plant fuels if it is to achieve compliance with AB 32. Based on the most recent update to the Scoping Plan (ARB 2011c), however, it is reasonable to expect that the state should be able to make such strides through regulations and policies adopted pursuant to AB 32. Given the long period of time needed for build-out of the project, these regulations and policies should be effective in reducing GHG emissions from vehicles and power plants during the period of time in which the City approves the vast majority of project development entitlements needed for development pursuant to, and consistent with, the proposed project. As these regulations and policies gradually become effective, the task of achieving GHG efficiency of 4.6 MT CO_2e/SP/year should become comparatively easier. However, the precise level of reductions is difficult to calculate for all phases of development, and therefore would be speculative at this time. As a precaution, this analysis concludes that the proposed project's incremental contribution to long-term operational GHG emissions is cumulatively considerable and **significant and unavoidable**.

IMPACT 2-2	Impacts of Climate Change on the Westbrook Amendment Land Uses. Climate change is expected to result in a variety of effects to the project site including changes to water supply, increased risk of flooding, and increased frequency and intensity of wildfire. Negative effects on residents, resources, and structures could result.

As discussed previously in this section, human-induced increases in GHG concentrations in the atmosphere have led to increased global average temperatures (global warming) through the intensification of the greenhouse effect, and associated changes in local, regional, and global average climatic conditions.

Although there is a strong scientific consensus that global climate change is occurring and is influenced by human activity, there is less certainty as to the timing, severity, and potential consequences of the climate phenomena. Scientists have identified several ways in which global climate change could alter the physical environment in California (IPCC 2007, CEC 2006c, DWR 2006). These include:

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

These changes may translate into a variety of issues and concerns that may affect the proposed land uses on the project site, including but not limited to:

- decreased water supply, reliability, and quality;
- increased frequency and intensity of wildfire as a result of changing precipitation patterns and temperatures;
- increased risk of flooding and landslide associated with changes to precipitation patterns;

- Increased air pollution and related effects on human health; and
- Increased energy demand associated with increased temperatures.

Although climate change is an issue of global scale and the impacts described above are likely to occur whether or not the proposed project is adopted, implementation of the proposed project would influence the degree to which climate change affects the residents and workers in the proposed land uses, ecosystems, and the economy. Development associated with buildout of the project site could subject an increased number of persons and structures to potential hazards, such as water supply issues. Because the project site is located sufficiently far above sea level, it is not anticipated that the property would be affected by sea level rise. Because the land surrounding the project site is largely agricultural and not heavily vegetated, increased exposure to wildfire is also not anticipated.

Although development of the project site may increase exposure to such risks and hardships, development of under the Westbrook Amendment includes a variety of measures that would assist the City in avoiding, adapting to, and being resilient in the face of climate change-associated impacts. These measures are shown below:

- **Emergency Water Supply.** An on-site injection/extraction 2.6 million gallon per day well will be built as part of the proposed land use plan to help provide the City with an emergency water supply during dry years or during fire flows, and allow for the eventual use of an Aquifer Storage and Recovery (ASR) project.
- **Recycled Water.** The project site will receive recycled water from the Pleasant Grove Wastewater Treatment Plant which will be used to irrigate landscaping at parks, schools, commercial, business professional, and multi-family projects, as well as publicly landscaped areas such as roadway landscaped corridors and medians.
- **Smart/centrally controlled irrigation controls.** Irrigation controls will restrict irrigation to only the times and water application rates that are necessary to maintain landscaping. They account for changes in the demand in water which varies with weather patterns. They will be required for residential, small commercial and quasi-public parcels subject to turf reduction measures, and centrally controlled irrigation controllers for larger commercial and publicly maintained parcels.
- **Recirculating Hot water systems.** These systems use a recirculating pump on a home's hot water line system, reducing the time necessary to receive hot water at any hot water faucet. This type of system will be included on all residential units to generate additional plan-wide water conservation.
- **Turf Reduction.** In front yards of residential areas and in public spaces such as parks and street landscape corridors turf limits will be imposed. These areas will have low water plant species that use between 65-75% less water than the average lawn.

The inclusion of the features of the proposed project described above would reduce the extent and severity of climate change-associated impacts on project site by providing methods for adapting to these changes. Therefore, this impact is considered **less than significant**.

Mitigation Measure

No Mitigation is required.

3 REFERENCES

ARB. *See* California Air Resources Board

Bay Area Air Quality Management District. 2010 (June). California Environmental Quality Act Air Quality Guidelines. Available: <http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/Draft_BAAQMD_CEQA_Guidelines_May_2010_Final.ashx>.

BAAQMD. *See* Bay Area Air Quality Management District.

California Air Pollution Control Officers Association. 2008 (January). *CEQA and Climate Change*. Sacramento, CA. Available: <http://www.capcoa.org/CEQA/CAPCOA%20White%20Paper.pdf>.

California Air Pollution Control Officers Association. 2009 (January). *Model Policies for Greenhouse Gases in General Plans*. Sacramento, CA. Available: <http://www.capcoa.org/wp-content/uploads/downloads/2010/05/CAPCOA-ModelPolicies-6-12-09-915am.pdf>.

California Air Resources Board (ARB). 2000. California Air Resources Board. 2000 (October). *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.* Sacramento, CA. Available: <http://www.arb.ca.gov/diesel/documents/rrpfinal.pdf >. Accessed September 9, 2011.

California Air Resources Board (ARB). 2003. *HARP User Guide.* Sacramento, CA.

California Air Resources Board (ARB). 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. Available: <http://www.arb.ca.gov/ch/handbook.pdf>.

California Air Resources Board (ARB). 2008. *Climate Change Scoping Plan*. Sacramento, CA. Available: <http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm>. Accessed September 26, 2011.

California Air Resources Board (ARB). 2009a. *California Almanac of Emissions and Air Quality*. Available: <http://www.arb.ca.gov/aqd/almanac/almanac09/almanac09.htm>.

California Air Resources Board (ARB). 2009b.*Western Placer County 2010 Estimated Annual Average Emissions*. Available: <http://www.arb.ca.gov/app/emsinv/emssumcat.php>.

California Air Resources Board (ARB). 2010a. *Ambient Air Quality Standards*. Available: <http://www.arb.ca.gov/research/aaqs/aaqs2.pdf>.

California Air Resources Board (ARB). 2010b. *Attainment Designations*. Available: <http://www.arb.ca.gov/desig/adm/adm.htm>.

California Air Resources Board (ARB). 2010c. *Trends in California Greenhouse Gas Emissions for 2000 to 2008*. Available: <http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_trends_00-08_2010-05-12.pdf>.

California Air Resources Board (ARB). 2011a. *Air Quality Data*. Available: <http://www.arb.ca.gov/adam/>.

California Air Resources Board (ARB). 2011b. *Facility Search Engine*. Available: <http://www.arb.ca.gov/app/emsinv/facinfo/facdet.php?co_=34&ab_=SV&facid_=61&dis_=SAC&dbyr=2008&dd=>.

California Air Resources Board (ARB). 2011c. *Status of Scoping Plan Recommended Measures*. Available: <http://www.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf>.

California Attorney General's Office. 2010 (January). *Addressing Climate Change at the Project Level.* Available: <http://ag.ca.gov/globalwarming/pdf/GW_mitigation_measures.pdf>.

California Climate Action Registry. 2009 (January). *California Climate Action Registry General Reporting Protocol*, Version 3.1. Los Angeles, CA. Available: <http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf>.

California Energy Commission. 2006a (December). *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004.* Staff Final Report. Publication CEC-600-2006-013-SF. Sacramento, CA. Available: <http://www.climatechange.ca.gov/inventory/index.html>.

California Energy Commission. 2006b (December). *Refining Estimates of Water-Related Energy Use in California*. Publication CEC-500-2006-118. Available: <http://www.energy.ca.gov/pier/project_reports/CEC-500-2006-118.html>.

California Energy Commission. 2006c (July). *Our Changing Climate: Assessing the Risks to California*. Publication CEC-500-2006-077. Available: <http://www.energy.ca.gov/2006publications/CEC-500-2006-077/CEC-500-2006-077.PDF>.

Capitol Utility Specialists. 2011 (Updated September 23). *Sierra Vista Specific Plan Technical Dry Utilities Study* (Revision 6).

CEC. *See* California Energy Commission.

City of Roseville 2010. *Sierra Vista Specific Plan Draft EIR*. Adopted on May 19, 2010. Accessed 9/12/2011. Available: <http://www.roseville.ca.us/planning/major_development_projects/sierra_vista_specific_plan/svsp_eir.asp>

City of Roseville. 2010. *General Plan 2025*. Adopted May 5, 2010. Available: <http://www.roseville.ca.us/planning/general_plan_n_development_guidelines.asp>.

City of Roseville. 2011 (October). *Communitywide Sustainability Action Plan*. Available: <http://www.roseville.ca.us/civica/filebank/blobdload.asp?BlobID=18780>. Accessed October 14, 2011.

California Department of Water Resources. 2006 (July). *Progress on Incorporating Climate Change into Management of California's Water Resources* (Technical Memorandum Report). Available: <http://baydeltaoffice.water.ca.gov/climatechange/reports.cfm>.

DWR. *See* California Department of Water Resources.

EPA. *See* U.S. Environmental Protection Agency.

Fehr and Peers 2011 (September 1). *Draft Traffic Impact Study for the Westbrook Property*. Roseville, CA

Garza, V., P. Graney, and D. Sperling. 1997. University of California, Davis (UC Davis) Institute of Transportation Studies (ITS) Transportation. *Project-Level Carbon Monoxide Protocol*. California Department of Transportation. Available: <http://www.dot.ca.gov/hq/env/air/pages/coprot.htm>. Last modified May 5, 2008. Accessed September 27, 2011.

HydroScience Engineers, Inc. 2011a (September). *Westbrook, a Portion of the Sierra Vista Specific Plan – Potable Water Master Plan*.

HydroScience Engineers, Inc. 2011b (September). *Westbrook, a Portion of the Sierra Vista Specific Plan - Recycled Water Master Plan*.

HydroScience Engineers, Inc. 2011c (May 5). *Westbrook, a Portion of the Sierra Vista Specific Plan – Water Conservation Plan*. A technical memorandum by Jacky Bowen and Curtis Lam.

Intergovernmental Panel on Climate Change. 2007 (February). *Climate Change 2007: The Physical Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC*. Geneva, Switzerland. Available: <http://www.ipcc.ch/ipccreports/ar4-wg1.htm >.

IPCC. *See* Intergovernmental Panel on Climate Change.

OEHHA. *See* Office of Environmental Health Hazard Assessment.

Office of Environmental Health Hazard Assessment (OEHHA). 2001. *A Guide to Health Risk Assessment.* Available: <http://www.oehha.org/pdf/HRSguide2001.pdf>. Accessed September 26, 2011.

Pease, Kathy. Senior Planner. City of Roseville Planning and Redevelopment Department, Roseville, CA. September 12, 2011—Telephone conversation with Austin Kerr of Ascent Environmental regarding the timing of proposed development on the Westbrook property.

Rimpo and Associates. 2008. *Urban Emissions Model (URBEMIS2007) for Windows*, Version 9.2.4. Available: <http://www.urbemis.com>.

Sacramento Metropolitan Air Quality Management District. 2010a. *CEQA Guide to Air Quality Assessment*. Available: <http://www.airquality.org/ceqa/ceqaguideupdate.shtml>. Accessed September 27,2011.

Sacramento Metropolitan Air Quality Management District. 2010b (May). *Construction Mitigation Calculator*. Available: <http://www.airquality.org/ceqa/mitigation.shtml>. Last updated May 2010.

Seinfeld, J. H., and S. N. Pandis. 1998. *Atmospheric Chemistry and Physics*. John Wiley & Sons, Inc. New York, NY.

U.S. Environmental Protection Agency (EPA). 2011. *Criteria Air Pollutant Information*. Available: <http://www.epa.gov/air/urbanair/>.

Western Regional Climate Center (WRCC). 2011a. *Climate Summary for Sacramento Station*. Available: <http://www.wrcc.dri.edu/summary/smf.ca.html>. Accessed August 17, 2011.

Western Regional Climate Center (WRCC). 2011b. *Wind Direction Data*. Available: <http://wrcc.dri.edu/htmlfiles/westwinddir.html#CALIFORNIA>. Accessed August 17, 2011.

WRCC. *See* Western Regional Climate Center.

Zhu et. al. 2002. *Study of Ultrafine Particles Near a Major Highway with Heavy-duty Diesel Traffic*. Atmospheric Environment 36 (2002) 4323–4335.

Appendix A

Emissions Calculations and Modeling

Westbrook Proposed Land Use [1]	URBEMIS Equavalent Land Use	Acres	Square Ft	D.U.	FAR Assumptions[2]	
LDR (Low Density Residential)	Single Family Housing	145.7	6,346,692	705		
MDR (Medium Density Residential)	Single Family Housing	83.6	3,641,616	635		
HDR (High Density Residential)	Condo/townhouse general	27.6	1,202,256	689		
CC (Commercial)	Strip Mall	37	1,611,720		402,930	Square feet
CMU (Commercial Mix Use-Retail/Office 50/50)[3]	Strip Mall/General Office	6.3	274,428		109,771	Square feet
Public(School)	Elementary School	10	435,600			
Public (Well site)	General Light Industry	0.3	13,068			
Park	City Park	15.5	675,180			

Notes:
1. Land use acreage and dwelling units from Proposed Westbrook Amendment Land Use Plan (City of Roseville 2011)
2. FAR assumptions were based on assumptions in Sierra Vista Specific Plan EIR (2009) Retail 25% CMU 40% FAR
3. For CC and CMU FAR were calculated based on total acreage, then CMU square footage was divided equally into retail and office

URBEMIS Land Use Totals	Acres	Square Ft
Single Family Residential	229.3	11,190,564
Condo/Apartments	27.6	1,202,256
Retail (CC+ 50% of CMU)	40.15	1,748,934
Office	3.15	54,886
Elementary School	10	435,600
Parks (3)	15.5	675,180
Light Industry (well)	0.3	13,068
Total	326	

URBEMIS INPUTS		
Land Use	Quantity	Units
Single Family Residential	1,340	Dwelling Units
Condo/Apartments	689	Dwelling Units
Retail (402,930 sf retail +50% of 109771 sf CMU Office)	457,816	Square feet
Office (50% of CMU)[2]	54,886	Square feet
Elementary School	10	Acres
Parks (3)	16	Acres
Light Industry (well)	13,068	Square feet

	value	units
Total Housing	2,029	dwelling units
average housing size	2.54	residents/household
Residential Population	5,154	residents
Total Retail/Office area	512,701	sq ft
employment ratio	450	sq ft/job
employment	1,139	jobs

URBEMIS Output Calculations	ROG lbs/day	NOX lbs/day	CO lbs/day	PM10 lbs/day	PM 2.5 lbs/day	CO2 Short ton/yr	CO2 MT Ton/yr
2014 Total (100% Construction)	780	177	318	663	145	3654	3314
2014 (20% Construction)	156	35.4	63.6	132.6	29		663

Notes:Assumed 20% of construction in 2014

Mitigation Calculation	PM 10 Dust	PM 10 Exhaust	Pm 2.5 Dust	PM 2.5 Exhaust	ROG	Nox	CO
total emissions	654	9	137	8.29	704	172	317
20% of emissions	130.8	1.8	27.4	1.658	140.8	34.4	63.4
Mitigation (75% reduction)	32.7		6.85				
	34.5		8.508		140.8	34.4	63.4

Other Assumptions:
Soil Hauling, 20 cubic yards/acre

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Summary Report for Annual Emissions (Tons/Year)

File Name: P:\Projects\2011\11010069.01 - Roseville, City of - Westbrook AQ & CCA\4_Deliverables in progress\Deliverable_1\01_ Prepared by authors\Air\Appendix Items\Westbrook Construction.urb924

Project Name: Westbrook Construction

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (tons/year unmitigated)	51.45	11.71	20.98	0.03	43.16	0.60	43.76	9.03	0.55	9.58	3,866.74
2014 TOTALS (tons/year mitigated)	46.49	11.38	20.98	0.03	9.89	0.46	10.35	2.08	0.42	2.50	3,866.74
Percent Reduction	9.63	2.81	0.00	0.00	77.09	22.88	76.35	76.93	23.14	73.86	0.00

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	41.21	6.84	96.86	0.27	14.16	13.63	8,790.87

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	41.21	6.84	96.86	0.27	14.16	13.63	8,790.87

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Detail Report for Annual Construction Unmitigated Emissions (Tons/Year)

File Name: P:\Projects\2011\11010069.01 - Roseville, City of - Westbrook AQ & CCA\4_Deliverables in progress\Deliverable_1\01_ Prepared by authors\Air\Appendix Items\Westbrook Construction.urb924

Project Name: Westbrook Construction

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10 Total	PM2.5 Dust	PM2.5 Exhaust	PM2.5 Total	CO2

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2014	51.45	11.71	20.98	0.03	43.16	0.60	43.76	9.03	0.55	9.58	3,866.74
Asphalt 04/01/2014-10/01/2014	0.29	1.24	0.79	0.00	0.00	0.10	0.10	0.00	0.09	0.09	150.73
Paving Off-Gas	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.17	1.03	0.66	0.00	0.00	0.09	0.09	0.00	0.08	0.08	93.64
Paving On Road Diesel	0.02	0.21	0.07	0.00	0.00	0.01	0.01	0.00	0.01	0.01	48.64
Paving Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.45
Building 04/01/2014-10/01/2014	0.74	3.61	15.78	0.03	0.12	0.19	0.31	0.04	0.17	0.21	2,801.32
Building Off Road Diesel	0.19	1.16	0.86	0.00	0.00	0.07	0.07	0.00	0.07	0.07	149.11
Building Vendor Trips	0.15	1.77	1.48	0.01	0.02	0.07	0.09	0.01	0.06	0.07	568.50
Building Worker Trips	0.40	0.68	13.43	0.02	0.10	0.05	0.15	0.04	0.04	0.07	2,083.70
Coating 04/01/2014-10/01/2014	49.56	0.02	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	59.22
Architectural Coating	49.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.02	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	59.22
Fine Grading 04/01/2014-10/01/2014	0.86	6.83	4.03	0.00	43.03	0.32	43.35	8.99	0.29	9.28	855.47
Fine Grading Dust	0.00	0.00	0.00	0.00	43.03	0.00	43.03	8.99	0.00	8.99	0.00
Fine Grading Off Road Diesel	0.85	6.77	3.85	0.00	0.00	0.31	0.31	0.00	0.29	0.29	816.99
Fine Grading On Road Diesel	0.00	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.12
Fine Grading Worker Trips	0.00	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.35

Phase Assumptions

Phase: Fine Grading 4/1/2014 - 10/1/2014 - Default Fine Site Grading Description

Total Acres Disturbed: 326.05

Maximum Daily Acreage Disturbed: 32.6

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 49.39

Off-Road Equipment:

4 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

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2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day
3 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day
3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day
1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 4/1/2014 - 10/1/2014 - Default Paving Description
Acres to be Paved: 81.51
Off-Road Equipment:
1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day
2 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day
2 Rollers (95 hp) operating at a 0.56 load factor for 6 hours per day

Phase: Building Construction 4/1/2014 - 10/1/2014 - Default Building Construction Description
Off-Road Equipment:
1 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day
3 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day
1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day
3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day
1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 4/1/2014 - 10/1/2014 - Default Architectural Coating Description
Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250
Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250
Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250
Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

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Summary Report for Summer Emissions (Pounds/Day)

File Name: P:\Projects\2011\11010069.01 - Roseville, City of - Westbrook AQ & CCA\4_Deliverables in progress\Deliverable_1\01_ Prepared by authors\Air\Appendix Items\Westbrook Construction.urb924

Project Name: Westbrook Construction

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (lbs/day unmitigated)	779.48	177.35	317.89	0.41	653.96	9.11	663.07	136.86	8.29	145.15	58,586.98
2014 TOTALS (lbs/day mitigated)	704.41	172.36	317.89	0.41	149.80	7.02	156.82	31.57	6.37	37.94	58,586.98

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	140.02	28.90	83.58	0.00	0.24	0.24	35,514.93

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	140.02	28.90	83.58	0.00	0.24	0.24	35,514.93

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Detail Report for Summer Construction Unmitigated Emissions (Pounds/Day)

File Name: P:\Projects\2011\11010069.01 - Roseville, City of - Westbrook AQ & CCA\4_Deliverables in progress\Deliverable_1\01_ Prepared by authors\Air\Appendix Items\Westbrook Construction.urb924

Project Name: Westbrook Construction

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10 Total	PM2.5 Dust	PM2.5 Exhaust	PM2.5 Total	CO2

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Time Slice 4/1/2014-10/1/2014 Active Days: 132	779.48	177.35	317.89	0.41	653.96	9.11	663.07	136.86	8.29	145.15	58,586.98
Asphalt 04/01/2014-10/01/2014	4.41	18.78	11.99	0.01	0.03	1.46	1.49	0.01	1.34	1.35	2,283.84
Paving Off-Gas	1.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.54	15.61	10.07	0.00	0.00	1.34	1.34	0.00	1.24	1.24	1,418.81
Paving On Road Diesel	0.23	3.13	1.10	0.01	0.03	0.11	0.14	0.01	0.10	0.11	736.99
Paving Worker Trips	0.02	0.04	0.83	0.00	0.01	0.00	0.01	0.00	0.00	0.00	128.03
Building 04/01/2014-10/01/2014	11.22	54.74	239.02	0.39	1.86	2.85	4.71	0.66	2.54	3.20	42,444.19
Building Off Road Diesel	2.93	17.65	13.06	0.00	0.00	1.11	1.11	0.00	1.02	1.02	2,259.28
Building Vendor Trips	2.24	26.78	22.46	0.08	0.32	1.03	1.34	0.11	0.94	1.05	8,613.67
Building Worker Trips	6.05	10.32	203.49	0.31	1.54	0.72	2.26	0.56	0.58	1.13	31,571.23
Coating 04/01/2014-10/01/2014	750.86	0.29	5.78	0.01	0.04	0.02	0.06	0.02	0.02	0.03	897.34
Architectural Coating	750.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.17	0.29	5.78	0.01	0.04	0.02	0.06	0.02	0.02	0.03	897.34
Fine Grading 04/01/2014-10/01/2014	12.99	103.54	61.09	0.01	652.03	4.77	656.80	136.17	4.39	140.56	12,961.62
Fine Grading Dust	0.00	0.00	0.00	0.00	652.00	0.00	652.00	136.16	0.00	136.16	0.00
Fine Grading Off Road Diesel	12.85	102.57	58.32	0.00	0.00	4.73	4.73	0.00	4.36	4.36	12,378.67
Fine Grading On Road Diesel	0.06	0.84	0.30	0.00	0.01	0.03	0.04	0.00	0.03	0.03	198.86
Fine Grading Worker Trips	0.07	0.13	2.48	0.00	0.02	0.01	0.03	0.01	0.01	0.01	384.09

Phase Assumptions

Phase: Fine Grading 4/1/2014 - 10/1/2014 - Default Fine Site Grading Description

Total Acres Disturbed: 326.05

Maximum Daily Acreage Disturbed: 32.6

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 49.39

Off-Road Equipment:

4 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

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2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day
3 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day
3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day
1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 4/1/2014 - 10/1/2014 - Default Paving Description
Acres to be Paved: 81.51
Off-Road Equipment:
1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day
2 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day
2 Rollers (95 hp) operating at a 0.56 load factor for 6 hours per day

Phase: Building Construction 4/1/2014 - 10/1/2014 - Default Building Construction Description
Off-Road Equipment:
1 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day
3 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day
1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day
3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day
1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 4/1/2014 - 10/1/2014 - Default Architectural Coating Description
Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250
Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250
Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250
Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

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Detail Report for Summer Area Source Unmitigated Emissions (Pounds/Day)

File Name: P:\Projects\2011\11010069.01 - Roseville, City of - Westbrook AQ & CCA\4_Deliverables in progress\Deliverable_1\01_ Prepared by authors\Air\Appendix Items\Westbrook Operational.urb924

Project Name: Westbrook Operations

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	2.12	27.82	14.26	0.00	0.05	0.05	35,067.73
Hearth - No Summer Emissions							
Landscape	11.55	0.80	69.09	0.00	0.19	0.19	112.90
Consumer Products	99.26						
Architectural Coatings	26.83						
TOTALS (lbs/day, unmitigated)	139.76	28.62	83.35	0.00	0.24	0.24	35,180.63

Area Source Changes to Defaults

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Area Source Unmitigated Emissions (Tons/Year)

File Name: P:\Projects\2011\11010069.01 - Roseville, City of - Westbrook AQ & CCA\4_Deliverables in progress\Deliverable_1\01_ Prepared by authors\Air\Appendix Items\Westbrook Operational.urb924

Project Name: Westbrook Operations

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.39	5.08	2.60	0.00	0.01	0.01	6,399.86
Hearth	16.72	1.64	88.00	0.27	14.13	13.60	2,319.84
Landscape	1.04	0.07	6.22	0.00	0.02	0.02	10.16
Consumer Products	18.12						
Architectural Coatings	4.90						
TOTALS (tons/year, unmitigated)	41.17	6.79	96.82	0.27	14.16	13.63	8,729.86

Area Source Changes to Defaults

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: P:\Projects\2011\11010069.01 - Roseville, City of - Westbrook AQ & CCA\4_Deliverables in progress\Deliverable_1\01_ Prepared by authors\Air\Appendix Items\Westbrook Operational.urb924

Project Name: Westbrook Operations

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	41.17	6.79	96.82	0.27	14.16	13.63	8,729.86

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	24.84	23.26	237.27	0.46	83.96	15.94	47,425.18

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	66.01	30.05	334.09	0.73	98.12	29.57	56,155.04

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: P:\Projects\2011\11010069.01 - Roseville, City of - Westbrook AQ & CCA\4_Deliverables in progress\Deliverable_1\01_ Prepared by authors\Air\Appendix Items\Westbrook Operational.urb924

Project Name: Westbrook Operations

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	9.63	8.92	92.64	0.18	32.30	6.14	18,331.90
Condo/townhouse general	3.69	3.31	34.40	0.07	12.00	2.28	6,807.58
Elementary school	0.96	0.51	5.13	0.01	1.83	0.35	1,030.08
City park	0.03	0.02	0.22	0.00	0.08	0.02	44.76
Strip mall	10.33	10.32	103.03	0.20	37.10	7.03	20,841.97
General office building	0.17	0.16	1.65	0.00	0.58	0.11	330.02
General light industry	0.03	0.02	0.20	0.00	0.07	0.01	38.87
TOTALS (tons/year, unmitigated)	24.84	23.26	237.27	0.46	83.96	15.94	47,425.18

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2025 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	229.00	9.00	dwelling units	1,340.00	12,060.00	103,109.38
Condo/townhouse general	27.60	6.50	dwelling units	689.00	4,478.50	38,289.83
Elementary school		1.00	students	750.00	750.00	5,835.00
City park		2.20	acres	15.50	34.10	254.30
Strip mall		35.00	1000 sq ft	457.89	16,026.15	118,481.33
General office building		17.70	1000 sq ft	13.00	230.10	1,864.39
General light industry		2.00	1000 sq ft	13.00	26.00	219.05
					33,604.85	268,053.28

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	40.3	0.0	100.0	0.0
Light Truck < 3750 lbs	13.9	0.0	97.8	2.2
Light Truck 3751-5750 lbs	22.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.0	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.6	0.0	76.9	23.1
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	1.0	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	5.5	34.5	65.5	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.3	0.0	84.6	15.4

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Elementary school				20.0	10.0	70.0
City park				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0

Operational Changes to Defaults

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Summary Report for Summer Emissions (Pounds/Day)

File Name: P:\Projects\2011\11010069.01 - Roseville, City of - Westbrook AQ & CCA\4_Deliverables in progress\Deliverable_1\01_ Prepared by authors\Air\Appendix Items\Westbrook Operational.urb924

Project Name: Westbrook Operations

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	139.76	28.62	83.35	0.00	0.24	0.24	35,180.63

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	133.67	110.21	1,263.61	2.65	460.03	87.30	271,831.02

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	273.43	138.83	1,346.96	2.65	460.27	87.54	307,011.65

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Urbemis 2007 Version 9.2.4

Detail Report for Summer Operational Unmitigated Emissions (Pounds/Day)

File Name: P:\Projects\2011\11010069.01 - Roseville, City of - Westbrook AQ & CCA\4_Deliverables in progress\Deliverable_1\01_ Prepared by authors\Air\Appendix Items\Westbrook Operational.urb924

Project Name: Westbrook Operations

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	52.04	42.24	495.37	1.03	177.00	33.62	105,052.01
Condo/townhouse general	20.31	15.68	183.96	0.38	65.73	12.49	39,011.23
Elementary school	6.38	2.40	27.28	0.06	10.01	1.90	5,904.78
City park	0.19	0.10	1.17	0.00	0.44	0.08	256.62
Strip mall	53.71	48.93	545.97	1.16	203.27	38.53	119,492.07
General office building	0.88	0.77	8.81	0.02	3.20	0.61	1,891.54
General light industry	0.16	0.09	1.05	0.00	0.38	0.07	222.77
TOTALS (lbs/day, unmitigated)	133.67	110.21	1,263.61	2.65	460.03	87.30	271,831.02

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2025 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	229.00	9.00	dwelling units	1,340.00	12,060.00	103,109.38
Condo/townhouse general	27.60	6.50	dwelling units	689.00	4,478.50	38,289.83
Elementary school		1.00	students	750.00	750.00	5,835.00
City park		2.20	acres	15.50	34.10	254.30
Strip mall		35.00	1000 sq ft	457.89	16,026.15	118,481.33
General office building		17.70	1000 sq ft	13.00	230.10	1,864.39
General light industry		2.00	1000 sq ft	13.00	26.00	219.05
					33,604.85	268,053.28

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	40.3	0.0	100.0	0.0
Light Truck < 3750 lbs	13.9	0.0	97.8	2.2
Light Truck 3751-5750 lbs	22.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.0	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.6	0.0	76.9	23.1
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	1.0	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	5.5	34.5	65.5	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.3	0.0	84.6	15.4

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Elementary school				20.0	10.0	70.0
City park				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0

Operational Changes to Defaults

Project Name GHG Emissions Estimates

- sq ft

Construction - URBEMIS GHG Emissions Modeling Results

Total (all construction)	3,867	tons	3,507	MT
amortization period	30	years		
amortized construction emiss.	129	tons/year	117	MT

Operation - URBEMIS GHG Emissions Modeling Results

Area-Source Emissions	tons/yr	MT/yr
URBEMIS output	8,730	7,918

Mobile-Source Emissions	tons/yr	MT/yr
URBEMIS output	47,425	43,015

Indirect GHG Emissions Modeling Results

Indirect Emissions from Electricity Consumption 1, 2

MWh/yr	Region	Emission Factor (lb CO2/MWh)	GWP	Emission Factor (lb CH4/MWh)	GWP	Emission Factor (lb N2O/MWh)	GWP	Total CO2e (Metric Tons/year)
3,504	Roseville Electric	793.8	1	NA	21	NA	310	**1,262**

Indirect Emissions from Potable Water Use (includes conveyance, treatment, distribution, and wastewater treatment) 1,3

	Water Demand (AFY)	KWh/million gallons*	Mg/year	Total KWh/yr	MWh/yr	Region	Emission Factor (lb CO2/MWh)	GWP	Emission Factor (lb CH4/MWh)	GWP	Emission Factor (lb N2O/MWh)	GWP	Total CO2e (Metric Tons/year)
wo/conservation	976	5,411	273	1,478,718	1,479	CAMX	724.12	1	0.0302	21	0.0081	310	**488**
w/conservation	867	5,411	243	1,313,574	1,314	CAMX	724.12	1	0.0302	21	0.0081	310	**433**

Indirect Emissions from Recycled Water Use (includes treatment, distribution, and wastewater treatment) 1,3

	Water Demand (AFY)	KWh/million gallons*	Mg/year	Total KWh/yr	MWh/yr	Region	Emission Factor (lb CO2/MWh)	GWP	Emission Factor (lb CH4/MWh)	GWP	Emission Factor (lb N2O/MWh)	GWP	Total CO2e (Metric Tons/year)
wo/conservation	186	3,294	52	171,552	172	Roseville Electric	793.8	1	NA	21	NA	310	62
w/conservation	117	3,294	33	107,911	108	Roseville Electric	793.8	1	NA	21	NA	310	39

*Indoor use in Northern California

Water demand values were estimated in the *Potable Water.Master Plan* (September 2011) and *Recycled Water Master Plan* (Ausgust 2011) prepared by HydroScience Engineers, Inc.

	AFY	Total CO2e (Metric Tons/year)
Potable and Recycled Water Consumption Subtotal, without/Conservation	1,162	550
Potable and Recycled Water Consumption Subtotal, with/Conservation	984	472
Difference	178	77

Total Operational GHG Emissions (MT/yr) 52,861 GHG/SP 8.4 MT/SP/yr

residents: 5,154 jobs: 1,139 Serv Pop: 6,293 employees+population

Sources:

1 California Climate Action Registry [CCAR] General Reporting Protocol v 3.1 January 2009. Appendix C. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

2 California Energy Commission [CEC] 2009. California Commercial End Use Survey. http://capabilities.itron.com/CeusWeb/Chart.aspx[6/8/2010 2:19:09 PM]

3 California Energy Commission [CEC] 2006 (December). Refining Estimates of Water-Related Energy Use in California. CEC-500-2006-118

Conversion Factors:

1 ton	0.907 MT	2204.62 lb
1 AF	0.28 mg	
1 yr	365 days	
1 MW	8765.81277 MWh/yr	

GHG Emissions Assocated with Electricity Consumption

	value	units	Source/Notes
average electricity demand	0.4	MVA	Utilities Study by Capitol Utility Specialists, Table 3
power conversion rate	1.00	MW/MVA	http://en.wikipedia.org/wiki/Volt-ampere
average electricity demand	0.4	MW	conversion calculation
time conversion rate	24	hr/day	clock
time conversion rate	365	days/year	Earth
Avg. annual consumption of electricity	3,504	MW-hr/year	calculation
CO_2 emission rate for electricity consumption	793.8	lb/MW-hr	2007 Utility-Specific Emisssion Factor for Roseville Electric from CCAR
CO_2 emissions from electricity consumption	2,781,475	lb/year	calculation
mass conversion rate	2,204.62	lb/MT	onlineconversion.com/weight_common.htm
GHG emissions from electricity consumption*	**1,262**	**MT/year**	calculation

*Emission factors for Roseville Electric for CH4 and N2O were not available. However, the emissions of CH4 and N2O are expected to be nominal.

Table 5: Reduced Landscape Turf Water Savings – Residential

Land Use Designation	Annual Front Yard Demand[1,2] (AFY)	Annual Front Yard Turf Demand (AFY)	Reduced Turf Annual Front Yard Demand (AFY)	Water Savings for Reduced Turf (AFY)	Water System Savings	Percent Reduction in Water Demand
Low Density Residential	97	95	70	27	Potable	28%
Medium Density Residential	62	61	45	17	Potable	28%
High Density Residential	18	18	13	5	Recycled	28%
Total	177	174	128	49		28%

Notes:

1. From Table 3.
2. Demands for High Density Residential parcels represent full irrigation demand since there is no distinction between front yard and back yard

Source: HydroScience Engineers, Inc. 2011c (May 5). *Westbrook, a Portion of the Sierra Vista Specific Plan – Water Conservation Plan.* A technical memorandum by Jacky Bowen and Curtis Lam.

Table 6: Reduced Landscape Turf Water Savings – Non-Residential

Land Use Designation	Annual Irrigation Demand[2] (AFY)	Base Turf Area[1]	New Turf Area[1]	Low Water Use Area[1]	Reduced Irrigation Demand (AFY)	Water Savings for Reduced Turf (AFY)	Water System Savings	Percent Reduction in Water Demand
Parks	44	0.8	0.6	0.2	36	8	Recycled	18%
Landscape corridor	53	0.8	0.3	0.5	30	23	Recycled	43%
Paseo[3]	0	0.8	0.3	0.5	0	0	Recycled	
Right of way	38	0.8	0.3	0.5	21	17	Recycled	45%
Total	135				87	48		

Notes:

1. Original demand includes the turf reduction water conservation measures that were previously described.

Air Quality Emissions Calculations Comparison of Alternatives

Westbrook Development - Comparison of Alternatives, Unmitigated Construction Emissions

Alternative	Res Acreage	% of proposed	Res Units	% of proposed	NonRes Acreage	% of proposed
Proposed	245.3	100.0%	2029	100.0%	53.8	100.0%
Red Foot/Inc Der	153.4	62.5%	1890	93.1%	51.8	96.3%
Red Foot/Same D	157.9	64.4%	1405	69.2%	51.8	96.3%
Central Preserve	173.1	70.6%	1495	73.7%	51.3	95.4%
One Acre Fill	140.3	57.2%	1340	66.0%	34.8	64.7%
Half Acre Fill	129.3	52.7%	1256	61.9%	31.1	57.8%
Offsite	169	68.9%	1350	66.5%	76.1	141.4%
No Action	176.6	72.0%	1505	74.2%	41.4	77.0%

Alternative	ROG	NOx	CO	SOx	PM10	PM2.5
Proposed	156	35	64		133	29
Red Foot/Inc Der	150.2	33.7	61.6	0.0	128.1	27.9
Red Foot/Same D	150.2	33.7	61.6	0.0	128.1	27.9
Central Preserve	148.8	33.4	61.0	0.0	126.8	27.7
One Acre Fill	100.9	22.6	41.4	0.0	86.0	18.8
Half Acre Fill	90.2	20.2	37.0	0.0	76.9	16.8
Offsite	220.7	49.5	90.5	0.0	188.1	41.0
No Action	120.0	26.9	49.2	0.0	102.3	22.3

Westbrook Development - Comparison of Alternatives, Mitigated Construction Emissions

Alternative	Res Acreage	% of proposed	Res Units	% of proposed	NonRes Acreage	% of proposed
Proposed	245.3	100.0%	2029	100.0%	53.8	100.0%
Red Foot/Inc Der	153.4	62.5%	1890	93.1%	51.8	96.3%
Red Foot/Same D	157.9	64.4%	1405	69.2%	51.8	96.3%
Central Preserve	173.1	70.6%	1495	73.7%	51.3	95.4%
One Acre Fill	140.3	57.2%	1340	66.0%	34.8	64.7%
Half Acre Fill	129.3	52.7%	1256	61.9%	31.1	57.8%
Offsite	169	68.9%	1350	66.5%	76.1	141.4%
No Action	176.6	72.0%	1505	74.2%	41.4	77.0%

Alternative	ROG	NOx	CO	SOx	PM10	PM2.5
Proposed	156	30	64		34	9
Red Foot/Inc Der	150.2	28.9	61.6	0.0	32.7	8.7
Red Foot/Same D	150.2	28.9	61.6	0.0	32.7	8.7
Central Preserve	148.8	28.6	61.0	0.0	32.4	8.6
One Acre Fill	100.9	19.4	41.4	0.0	22.0	5.8
Half Acre Fill	90.2	17.3	37.0	0.0	19.7	5.2
Offsite	220.7	42.4	90.5	0.0	48.1	12.7
No Action	120.0	23.1	49.2	0.0	26.2	6.9

Greenhouse Gas Emissions Calculations Comparison of Alternatives

Westbrook Development - Comparison of Alternatives Greenhouse Gas Emissions from Construction

Alternative	Res Acreage	% of proposed	Res Units	% of proposed	NonRes Acreage	% of proposed
Proposed	245.3	100.0%	2029	100.0%	53.8	100.0%
Red Foot/Inc Den	153.4	62.5%	1890	93.1%	51.8	96.3%
Red Foot/Same Den	157.9	64.4%	1405	69.2%	51.8	96.3%
Central Preserve	173.1	70.6%	1495	73.7%	51.3	95.4%
One Acre Fill	140.3	57.2%	1340	66.0%	34.8	64.7%
Half Acre Fill	129.3	52.7%	1256	61.9%	31.1	57.8%
Offsite	169	68.9%	1350	66.5%	76.1	141.4%
No Action	176.6	72.0%	1505	74.2%	41.4	77.0%

Operational Emissions Calculated by Proportion of Proposed Res Units

Alternative	Amortized Construction Emissions	Total Construction Emissions
Proposed	129.00	3,507.00
Red Foot/Inc Den	120.16	3,266.75
Red Foot/Same Den	89.33	2,428.45
Central Preserve	95.05	2,584.01
One Acre Fill	85.19	2,316.11
Half Acre Fill	79.85	2,170.92
Offsite	85.83	2,333.39
No Action	95.69	2,601.30

Operational Emissions Calculated by Proportion of Proposed Comm Acreage

Alternative	Amortized Construction Emissions	Total Construction Emissions
Proposed	129.00	3,507.00
Red Foot/Inc Den	124.20	3,376.63
Red Foot/Same Den	124.20	3,376.63
Central Preserve	123.01	3,344.04
One Acre Fill	83.44	2,268.47
Half Acre Fill	74.57	2,027.28
Offsite	182.47	4,960.64
No Action	99.27	2,698.70

Average of Values Above

Alternative	Amortized Construction Emissions	Total Construction Emissions
Proposed	129.00	3,507.00
Red Foot/Inc Den	122.18	3,321.69
Red Foot/Same Den	106.77	2,902.54
Central Preserve	109.03	2,964.02
One Acre Fill	84.32	2,292.29
Half Acre Fill	77.21	2,099.10
Offsite	134.15	3,647.02
No Action	97.48	2,650.00

Westbrook Development - Comparison of Alternatives Greenhouse Gas Emissions from 2025 Buildout

Alternative	Res Acreage	% of proposed	Res Units	% of proposed	Comm Acreage	% of proposed
Proposed	245.3	100.0%	2029	100.0%	53.8	100.0%
Red Foot/Inc Den	153.4	62.5%	1890	93.1%	51.8	96.3%
Red Foot/Same Den	157.9	64.4%	1405	69.2%	51.8	96.3%
Central Preserve	173.1	70.6%	1495	73.7%	51.3	95.4%
One Acre Fill	140.3	57.2%	1340	66.0%	34.8	64.7%
Half Acre Fill	129.3	52.7%	1256	61.9%	31.1	57.8%
Offsite	169	68.9%	1350	66.5%	76.1	141.4%
No Action	176.6	72.0%	1505	74.2%	41.4	77.0%

Operational Emissions Calculated by Proportion of Proposed Res Units

Alternative	Source	Mobile Sources	Area Sources	Electricity	Water Conveyance, Treatment, Distribution, and Wastewater Treatement	Amortized Construction Emissions	Total
Proposed	Area	43,015.00	4,917.00	1,262.00	550.00	88.00	49,832.00
Red Foot/Inc Den	Area	40,068.19	4,580.15	1,175.54	512.32	81.97	46,418.18
Red Foot/Same Den	Area	29,786.14	3,404.82	873.88	380.85	60.94	34,506.63
Central Preserve	Area	31,694.15	3,622.93	929.86	405.25	64.84	36,717.02
One Acre Fill	Area	28,408.13	3,247.30	833.45	363.23	58.12	32,910.24
Half Acre Fill	Area	26,627.32	3,043.74	781.21	340.46	54.47	30,847.21
Offsite	Area	28,620.13	3,271.54	839.67	365.94	58.55	33,155.84
No Action	Area	31,906.15	3,647.16	936.08	407.96	65.27	36,962.62

Operational Emissions Calculated by Proportion of Proposed Comm Acreage

Alternative	Source	Mobile Sources	Area Sources	Electricity	Water Conveyance, Treatment, Distribution, and Wastewater Treatement	Amortized Construction Emissions	Total
Proposed	Area	43,015.00	4,917.00	1,262.00	550.00	88.00	49,832.00
Red Foot/Inc Den	Area	41,415.93	4,734.21	1,215.09	529.55	84.73	47,979.51
Red Foot/Same Den	Area	41,415.93	4,734.21	1,215.09	529.55	84.73	47,979.51
Central Preserve	Area	41,016.16	4,688.51	1,203.36	524.44	83.91	47,516.39
One Acre Fill	Area	27,823.83	3,180.51	816.31	355.76	56.92	32,233.34
Half Acre Fill	Area	24,865.55	2,842.36	729.52	317.94	50.87	28,806.23
Offsite	Area	60,844.64	6,955.09	1,785.10	777.97	124.48	70,487.27
No Action	Area	33,100.76	3,783.71	971.13	423.23	67.72	38,346.56

Average of Values Above

Alternative	Source	Mobile Sources	Area Sources	Electricity	Water Conveyance, Treatment, Distribution, and Wastewater Treatement	Amortized Construction Emissions	Total
Proposed	Area	43,015	4,917	1,262	550	88	49,832
Red Foot/Inc Den	Area	40,742	4,657	1,195	521	83	47,199
Red Foot/Same Den	Area	35,601	4,070	1,044	455	73	41,243
Central Preserve	Area	36,355	4,156	1,067	465	74	42,117
One Acre Fill	Area	28,116	3,214	825	359	58	32,572
Half Acre Fill	Area	25,746	2,943	755	329	53	29,827
Offsite	Area	44,732	5,113	1,312	572	92	51,822
No Action	Area	32,503	3,715	954	416	66	37,655

APPENDIX 3.4

Biological Resources Documentation

Effects of Changed Water Management Operations on Fisheries and Water Quality Impacts Previously Disclosed in the Water Forum Proposal EIR

SIERRA VISTA SPECIFIC PLAN EIR TECHNICAL MEMORANDUM: EFFECTS OF CHANGED WATER MANAGEMENT OPERATIONS ON FISHERIES AND WATER QUALITY IMPACTS PREVIOUSLY DISCLOSED IN THE WATER FORUM PROPOSAL EIR

Prepared for:

City of Roseville
Environmental Utilities Department

Prepared by:

ROBERTSON - BRYAN, INC.
Solutions for Progress

and

HDR

October 2009

SIERRA VISTA SPECIFIC PLAN EIR TECHNICAL MEMORANDUM: EFFECTS OF CHANGED WATER MANAGEMENT OPERATIONS ON FISHERIES AND WATER QUALITY IMPACTS PREVIOUSLY DISCLOSED IN THE WATER FORUM PROPOSAL EIR

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1. Introduction

1.1 Background

1.1.1 Sierra Vista Specific Plan

The Sierra Vista Specific Plan (SVSP) is an approximately 2,064 acre mixed-use development project plan proposed in Placer County, California, south and west of the City of Roseville (City). The project site is located approximately 5 miles west of downtown Roseville, 6 miles west of Interstate 80 and State Route 65, and 10 miles northeast of the City of Sacramento. The proposed specific plan project (Project) would include development of a mix of land uses, including 6,650 residential units, approximately 216 acres of commercial and office uses, approximately 61 acres of public/quasi-public, 267 acres of open space uses, and 97 acres of parks. The majority of the proposed project site, which is currently undeveloped annual grasslands that were historically used for seasonal cattle grazing, is within the City's Sphere of Influence, which was expanded in 2004, as part of the West Roseville Specific Plan (WRSP) annexation.

1.1.2 Water Supply for the Sierra Vista Development

The City is a signatory to the Water Forum Agreement (WFA), which provides a framework for future surface water and groundwater supplies in the region through the year 2030. The City's WFA specifies the maximum allowable surface water diversions based on unimpaired flows into Folsom Lake with diversions by the City restricted during drier and driest years, with the objective of supporting environmental needs in the lower American River (LAR).

Although the City's water contract entitlements total 66,000 acre-feet per year (AFY), the diversions from the American River are limited by the WFA to 58,900 AFY in normal/wet years. This includes 54,900 AFY of diversion by the City of Roseville plus 4,000 AFY of San Juan Water District water from PCWA's Middle Fork Project that is reallocated to the City during normal/wet years. In critically dry years, the maximum City diversion from the American River is limited to 39,800 AFY with a requirement for an additional 20,000 AFY of water to be made available for release by Placer County Water Agency (PCWA) through re-operation of its Middle Fork project. In drier years, the City may divert an amount between 58,900 and 39,800 AFY from the American River based on unimpaired flow into Folsom Lake with similar release requirements from PCWA.

At buildout of the City's current General Plan, water demands are estimated to reach approximately 58,582 AFY. The Project would include development of new residential, commercial, business professional, and school uses that would require water. The total water demand for the Project is estimated to be 3,612 AFY, which includes 2% for system loss, 4 AFY (with losses) for the Urban Reserve parcels, and a water demand reduction of 729 AFY for water conservation measures. Implementation of the SVSP project in combination with projected water demand for buildout of the City would be 62,194 AFY (58,582 AFY + 3,612 AFY). By subtracting the City's anticipated recycled water usage at buildout of 4,388 AFY (i.e., 563 AFY for SVSP and 3,825 AFY for other City areas) from the City's "with-Project" demand of 62,194 AFY, the net with-SVSP surface water demand is 57,806 AFY.

In a normal water year, the WFA assumes there is 58,900 AFY available from the American River. Although buildout demand are not expected to reach 58,900 AFY (but rather 57,806 AFY), to allow for a conservative CEQA approach, the City assumes a buildout 58,900 AFY, the amount allotted to the City via the WFA, as the City plus Project net buildout water demand.

Based on over 107 years of historical hydrology (and WFA restrictions), the 58,900 AFY contract surface water supply is assumed to be available to the City in about 83 percent of the years. In about 17 percent of the years, quantities from 58,900 AFY to a minimum of 39,800 AFY of surface water would be available per the WFA. Thus, in drought years, supplemental supplies potentially totaling up to 19,100 AFY (the difference between the average/wet year supply and the dry year supply) is needed to make up for the dry year and critically dry year deficiencies.

To meet water supply demands during dry and critically dry years, the City may utilize other supplies like recycled water and groundwater and implement the water conservation strategies outlined in the Roseville Municipal Code (RMC). Recycled water offsets the use of surface water supplies by reducing the City's reliance on American River supplies by filling irrigation demands that would otherwise use surface water supplies. Groundwater is used to make up any additional water supply shortfall. The RMC identifies "stages" of conservation designed to achieve a specific amount of reduction in water use to match available supplies for that year and outlines five drought stages with specific actions a water customer can implement to achieve a 10 to 50 percent water reduction.

Because the City's "with-Project" net buildout water demand is less than the amount of water allotted to the City in the WFA, and because the City can utilize recycled water, groundwater and water conservation strategies to offset potential decreases in American River water during dry and critically dry years, the water supply for the Project falls within the City's 2030 demand as agreed to under the WFA and as assessed, for CEQA purposes, under the Water Forum Proposal Environmental Impact Report (WFP EIR) which was certified in 1999.

1.1.3 Sierra Vista Specific Plan (Project) EIR

Pursuant to CEQA, the City is preparing an EIR for the Project that evaluates the environmental impacts of the Project. The SVSP EIR examines the potential effects of a proposed project that includes: 1) amending a 2,064-acre area, immediately west of the City corporate boundaries, north of Baseline Road, west of Fiddyment Road in unincorporated Placer County into the City's jurisdiction (annexation); 2) expanding approximately 353 acres of the City's sphere of influence (SOI) over a small portion of the western boundary, and 3) adopting the SVSP and associated entitlements. The EIR includes extensive analysis of the potential environmental impacts of the water supply strategy for the Project.

The water supply section of the Administrative Draft SVSP EIR (ADEIR) relies heavily upon the WFP EIR, which was certified in October 1999, for addressing project-specific impacts associated with supplying water to the Sierra Vista development, as discussed above. Although water supply for the City at buildout, including the 3,612 AFY for the Project, still fall within the 58,900 AFY American River demand allocated to the City under the Water Forum Agreement,

the ADEIR needs to include discussion that fully complies with the California Supreme Court's 2007 decision in *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (40 Cal.4th 412) and confirms or updates the impact determinations of the WFP EIR based upon current regional water supply issues/changed conditions.

1.2 Purpose and Intended Use of this Document

This Technical Memorandum (TM) addresses changed water supply/water management conditions in the region and evaluates whether these changed conditions and Central Valley Project (CVP) and State Water Project (SWP) operations would make the impacts to fisheries resources and water quality from the WFA demands (which include diversion of the City's full American River demand) more severe than previously disclosed in the WFP EIR. Specifically, this TM has two main purposes:

- Identify potential and reasonably foreseeable changes in CVP/SWP operations resulting from changed water supply/water management conditions and decisions (such as the recent NOAA Fisheries and USFWS Biological Opinions on the Operations Criteria and Plan (OCAP)), and any associated changes in:
    - system hydrology, and
    - the probable quantity and dry-year reliability of deliveries under the WFA, and Roseville's purveyor-specific agreement in particular.
- Identify, on a qualitative basis, any changes in the severity of the project-specific fisheries and water quality impacts that were identified in the WFP EIR, and identify any new and thus previously undisclosed fisheries or water quality impacts associated with the City's use of its American River supply, part of which will be used to meet the SVSP Project demand.

Findings from these assessments will be used to either validate the reliance of the SVSP EIR on the WFP EIR for assessing the fisheries and water quality impacts of the City's full buildout water supply demand on the American River, lower Sacramento River, and Delta, or determine that updates to the previous WFA project-specific impacts determinations are warranted, due to changed regional hydrologic and water supply conditions.

2 Recent Regulatory Decisions and other Proposed Actions that may Affect Future CVP/SWP Operations

The one constant in the universe of California water is that there is constant change responding to policy, regulatory, and judicial decisions. The ten years that have passed since the WFP EIR was prepared in 1999 have been a particularly dynamic period in the history of Central Valley Project (CVP) water operations. A listing of significant events during this period that affected CVP operations includes the following.

- 1999 - San Joaquin River Agreement; Agreement for providing San Joaquin River flows and exports
- 1999 - Department of Interior (DOI) Final Decision Accounting of Central Valley Improvement Project (CVPIA) 3406 (b)(2); Defined metrics and accounting for CVPIA 3406(b)(2) operations
- 2000 - State Water Resources Control Board (SWRCB) Revised Water Right Decision 1641; Revised order to provide for operations of the CVP and SWP to protect Bay-Delta water quality
- 2000 - CALFED Record of Decision (ROD); Presented a long-term plan and strategy designed to fix the Bay-Delta
- 2000 - Trinity River ROD; Defined minimum flow regime of 369,000 acre-feet in critical dry years ranging up to 816,000 acre-feet in wet years
- 2001 - CVPIA ROD; Implemented provisions of CVPIA including allocating 800,000 acre-feet of CVP yield for environmental purposes
- 2001 - National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) Biological Opinion for Spring-Run Chinook Salmon and Steelhead; Established criteria for operations to protect spring-run chinook salmon and steelhead
- 2002 - NOAA Fisheries Biological Opinion for Spring-Run Chinook Salmon and Steelhead; Established criteria for operations to protect spring-run chinook salmon and steelhead
- 2003 - Revised DOI Final Decision Accounting of CVPIA 3406 (b)(2); Defined metrics and accounting for CVPIA 3406(b)(2) operations
- 2004 - NOAA Fisheries Biological Opinion for Spring-Run Chinook Salmon and Steelhead; Established criteria for operations to protect spring-run chinook salmon and steelhead
- 2005 - U.S. Fish and Wildlife Service (USFWS) Biological Opinion for Reinitiation of Formal and Early Section 7 Endangered Species Consultation on the Coordinated Operations of the Central Valley Project and State Water Project and the Operational Criteria and Plan to Address Potential Critical Habitat Issues
- 2007 - Judge Wanger issued a summary judgment that invalidated the 2005 USFWS Biological Opinion and ordered a new biological opinion be developed by September 15, 2008
- 2007 - Judge Wanger issued an interim order to direct actions at the export facilities to protect delta smelt until a new biological opinion is completed
- 2008 - USFWS Biological Opinion on the effects of the continued operation of the Federal Central Valley Project and the California State Water Project on the delta smelt and its designated critical habitat
- 2008 - Judge Wanger issued a memorandum decision and order that invalidated the 2004 NOAA Fisheries Biological Opinion and ordered a new biological opinion be developed
- 2009 – NOAA Fisheries Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project

While this inventory of actions illustrates the many changes affecting operations of the CVP and SWP, implementation of most of them have been shown through quantitative analyses, to be

achievable within the flexibility of CVP/SWP operations contemplated in the WFP EIR. However, effects of the most recent actions, specifically the 2008 and 2009 OCAP Biological Opinions and the 2007 Wanger Decision are not yet quantifiable (at the time this Technical Memorandum was prepared) with existing analysis tools and, therefore, can only be assessed on a qualitative basis at this time.

2.1 USFWS Biological Opinion on the OCAP and Wanger Decisions

The operation of CVP/SWP is described in the OCAP. As updated in 2004, the OCAP provides a detailed description of the coordinated operations of the CVP and SWP based on historical data and serves as a starting point for planning project operations in the future. Under the federal Endangered Species Act (ESA), USFWS must produce formal Biological Opinions analyzing the impact of OCAP implementation on ESA-listed species (including the delta smelt). In effect, the ESA authorizes USFWS to require changes to the OCAP for the protection of the delta smelt and other federally listed species.

In 2005, USFWS issued a Biological Opinion for OCAP, and concluded that CVP/SWP operations did not jeopardize delta smelt populations. However, that opinion was struck down by a federal judge (Judge Wanger) following a lawsuit filed by environmentalists. USFWS was ultimately ordered to revise the Biological Opinion. The court also severely restricted CVP and SWP pumping in the Delta (Wanger Decision) pending the USFWS's completion of the new Biological Opinion. Those restrictions took effect in December 2007.

In December 2008, USFWS released a new Biological Opinion concluding that CVP and SWP operations would jeopardize the continued existence of endangered delta smelt. USFWS further detailed a "reasonable and prudent alternative" (RPA) to the proposed OCAP protocol that would, it claimed, protect the delta smelt and its habitat from the adverse effects of pumping operations. The "reasonable and prudent alternative" would restrict Delta pumping operations and would thus limit deliveries of water to CVP/SWP contractors south of the Delta. Extrapolating from the text of the RPA there are several Actions (1, 2, and 3) that will affect Delta exports by virtue of limitations on Old and Middle River ("OMR") flows, and Action 4 requiring additional X2[1] flows in the fall months that will affect reservoir releases.

2.2 NOAA Fisheries Biological Opinion on the OCAP

Like the USFWS, under the ESA, NOAA Fisheries must produce a formal Biological Opinion analyzing the impact of OCAP implementation on ESA-listed species under NOAA's jurisdiction, in this case including; endangered Sacramento River winter-run chinook salmon, threatened Central Valley spring-run chinook salmon, threatened Central Valley steelhead, and threatened Southern Distinct Population Segment (DPS) of North American green sturgeon. As

[1] X2 is the location of the 2 parts per thousand salinity contour (isohaline), one meter off the bottom of the estuary, as measured in kilometers upstream from the Golden Gate Bridge. The abundance of several estuarine species has been correlated with X2. Maintaining the location of X2 is accomplished via Project reservoir releases that increase inflow to the Delta thus "pushing" X2 towards the Golden Gate Bridge.

stated earlier, in effect, the ESA authorizes NOAA Fisheries to require changes to the OCAP for the protection of the federally listed species identified above.

In October 2004, NOAA Fisheries issued a Biological Opinion for OCAP, and concluded that CVP/SWP operations were not likely to jeopardize the continued existence of the Sacramento River winter-run chinook salmon, spring-run chinook salmon, and Central Valley steelhead populations. In April, 2008, that opinion was struck down by a federal judge (Judge Wanger) following a lawsuit filed by Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources, and others. The court found that NOAA Fisheries failed to analyze multiple factors and the 2004 Biological Opinion was remanded to NOAA Fisheries and the Reclamation for further consultation.

In June 2009, NOAA Fisheries released a new Biological Opinion concluding that CVP and SWP operations would jeopardize the continued existence of endangered Sacramento River winter-run chinook salmon, threatened Central Valley spring-run chinook salmon, threatened Central Valley steelhead, threatened Southern Distinct Population Segment (DPS) of North American green sturgeon, and Southern Resident killer whales. NOAA Fisheries further detailed a "reasonable and prudent alternative" to the proposed OCAP protocol that would, it claimed, protect these species and their habitat from the adverse effects CVP/SWP. The "reasonable and prudent alternative" would restrict Delta pumping operations and NOAA Fisheries estimated that deliveries of water to CVP/SWP contractors south of the Delta would be reduced by 5% to 7% of average annual exports. The RPA includes multiple actions applied to various CVP-influenced watersheds.

2.3 Other Reasonably Foreseeable Actions that may Affect CVP/SWP Operations

The foregoing listed and described actions are primarily the result of federal regulatory requirements. Other, reasonably foreseeable actions and initiatives that can potentially affect CVP/SWP operations include:

- El Dorado Water & Power Authority (EDWPA) Supplemental Water Supply Project. This project proposes to perfect water rights senior to U.S. Bureau of Reclamation (Reclamation) water rights, and would divert 40,000 acre-feet of water upstream of, or directly from Folsom Reservoir, thereby potentially reducing the CVP water supply to others in the American River basin.
- Bay Delta Conservation Plan (BDCP). The Bay Delta Conservation Plan is a planning and environmental permitting process to restore habitat for Delta fisheries in a way that reliably delivers water supplies to 25 million Californians. The BDCP is:
    - identifying conservation strategies to improve the overall ecological health of the Delta;
    - identifying ecologically friendly ways to move fresh water through and/or around the Delta; and
    - addressing toxic pollutants, invasive species, and impairments to water quality.

The BDCP is being developed under the federal ESA and the California Natural Community Conservation Planning Act (NCCPA) and will undergo extensive environmental analysis that will include opportunities for public review and comment. As the BDCP evaluates alternatives necessary to restore the Delta ecosystem while providing water supply reliability, state and federal agencies are developing a joint Environmental Impact Report/Statement (EIR/EIS) to determine the environmental impacts of the BDCP. Presently, the alternatives are being formulated but are not yet public. The draft EIR/EIS is expected to be ready for public review and comment no sooner than early 2010.

- Folsom Flood Control. The Corps of Engineers has been directed by Congress to update the Folsom Dam and Reservoir Water Control Manual to recognize the Auxiliary Spillway presently under construction at Folsom Dam. The implementation of the new spillway will reduce the risk of flooding in Sacramento, compared to the existing interim flood control operation, while potentially increasing water supplies to CVP contractors.

- Climate Change. Two aspects of climate change directly affecting CVP/SWP operations are of concern: 1) sea level rise, and 2) changes to the temporal/spatial/state (rain or snow) distribution of precipitation. The CALFED has a strong science program that assists in narrowing uncertainty in climate impacts so the best information is available on water issues to policy-makers. For example, the CALFED Independent Science Board (ISB) recently prepared a memo recommending which sea level rise projections are most appropriate for ongoing Delta planning. In addition, the CALFED Science Program has funded an effort to develop and apply a model-based approach for evaluating plausible future scenarios of the Bay-Delta-River-Watershed system. The Department of Water Resources (DWR) is developing a policy considering its existing demands in managing water resources for the state with meeting the state's climate policy goals. Despite the numerous on-going activities, this information cannot yet be quantified as effects on the CVP/SWP.

- Interagency Ecological Program (IEP). A consortium of nine state and federal agencies has been monitoring aquatic organisms and water quality in the San Francisco estuary for decades. Since late 2004, scientific and public attention has focused on the unexpected decline of several pelagic (open-water) fishes (delta smelt, longfin smelt, striped bass, and threadfin shad) in the freshwater portion of the estuary known as the Delta.

  This decline has collectively become known as the Pelagic Organism Decline (POD). In 2005, the IEP formed a multi-agency POD Management Team tasked with designing and managing a comprehensive study to evaluate the causes of the decline and to synthesize and report the results. The causes under investigation include stock-recruitment effects, a decline in habitat quality; increased mortality rates; and reduced food availability due to invasive species.

  The SWRCB continues to hold workshops and receive information regarding POD, climate change, and San Joaquin salinity and flows, and will coordinate updates of the Bay-Delta Plan with on-going development of the comprehensive Salinity Management Plan.

The effects of the preceding list of actions and initiatives on the CVP/SWP are, at this time, insufficiently defined to allow quantifiable identification of probable effects on CVP/SWP operations.

3 Implications of Recent Regulatory Decisions and Other Proposed Actions to CVP/SWP Operations and Resulting System Hydrology

3.1 Effects on CVP/SWP Operations

In the years following the certification of the WFP EIR, numerous regulatory and development actions have occurred that altered, to some extent, the operation of the CVP/SWP, and a list of many of those actions is presented in Section 2. This section reviews changes in operations with respect to a baseline consistent with that described as the "Water Forum Agreement" in the WFP EIR.

Defining the changes would be straightforward if unambiguous modeling studies were available to describe the progression of events from 1999 to present. Unfortunately, such is not the case. So many changes have been made to the modeling tools and basic underlying hydrologic input during the last ten years, that quantitative comparisons to identify the effects of a single action are not possible. Consequently, we are left with bits and pieces of information gleaned from previous analyses and inferences based on the opinions of Project operators and professional opinion. Where possible, quantifiable effects are reported in the following sections; however, much of what is expressed is, by necessity, qualitative, though it reflects the professional opinions of sophisticated observers immediately familiar with the CVP/SWP operations.

3.1.1 Key Changes to Existing Condition CVP/SWP Operations Compared to that Used for the WFP EIR

Identifying assumption changes in the modeled Base Condition for the WFP EIR, with those applied in present "Current Condition" modeling, can be achieved by looking at the modeling technical support documents. For this purpose it is appropriate to compare the PROSIM Model WFP EIR assumptions with the CALSIMII 2008 OCAP Biological Assessment Study 7.0 assumptions (**Table 3-1**). Study 7.0 captures all of the intervening regulatory changes occurring between 1999 and 2008, but does not include the Wanger Decision, USFWS 2008 OCAP Biological Opinion, or NOAA Fisheries 2009 OCAP Biological Opinion.

Because this study was prepared during the development of Reclamation's Biological Assessment for the OCAP, it does not contain the subsequent RPAs identified by USFWS and NOAA Fisheries in their respective Biological Opinions. Reclamation in concert with DWR, USFWS, and NOAA Fisheries is presently working on modifying the CALSIMII analytical model to incorporate the RPAs into the modeling code. This activity is not yet complete and is, therefore, unavailable for operations analyses. Thus, the best model information available is that contained in Study 7.0., consequently, this best available information was used in support of this TM.

Table 3-1. Existing Conditions.

	WFP EIR 1999	OCAP BA Study 7.0 2008
Model	PROSIM	CALSIMII
Period of Simulation	1922 - 1991	1922 - 2003
SWP Demands	Variable 3.6 Million Acre Feet (MAF)/Yr	Variable 3.1 - 4.2 MAF/Yr
CVP Demands		
North of Delta	Based on 1995 Land Use & Max Historic Use	Land-use based, limited by contract amounts
American River	WFA Current Use Estimate	Land-use based, limited by contract amounts
EBMUD	0	0
South of Delta	3.1 MAF	3.5 MAF
CVP Water Allocation		
CVP Settlement / Exchange	100% - 75% Based on Shasta Index	100% - 75% Based on Shasta Index
CVP Ag	100% - 10% Based on Supply	100% - 0% Based on Supply
CVP M&I	100% - 50% Based on Supply	100% - 50% Based on Supply
Refuge	100% - 50% Based on Supply	100% - 75% Based on Shasta Index
Instream Flow Requirements		
Trinity River	340 Thousand Acre Feet (TAF)	Trinity EIS Preferred Alternative (369-815 TAF/year)
Sacramento River	November 20, 1997 AFRP	Flows for SWRCB WR 90-5 temperature control, and USFWS discretionary use of CVPIA 3406(b)(2)
Clear Creek	November 20, 1997 AFRP	Downstream water rights, 1963 USBR Proposal to USFWS and NPS, and USFWS discretionary use of CVPIA 3406(b)(2)
Yuba River	Available Yuba River Data	Yuba Accord Adjusted Data
American River	November 20, 1997 AFRP	Minimum Instream Flow Management Standard
Delta Requirements	Delta Accord	SWRCB D-1641
Temperature Modeling		
Optimal Cold Water Pool Management	Yes	Yes
Folsom Lake TCD	No	Yes
Flood Control at Folsom	400/670	400/670
Hydrology	160-98 (PROSIM)	160-98 (CALSIMII)

EBMUD = East Bay Municipal Utility District.
AFRP = USFWS Anadromous Fish Restoration Program.
TCD = Urban water intake temperature control device.
OCAP BA + Operations Criteria and Plan Biological Assessment.

3.1.2 Key Changes to the 2030 Cumulative Condition CVP/SWP Operations Compared to that Used for the WFP EIR

Identifying assumption changes in the modeled Cumulative Condition for the WFP EIR, with those applied in present Future Condition modeling, can be achieved by looking at the modeling technical report descriptions. For this purpose it is appropriate to compare the PROSIM Model WFP EIR assumptions with the CALSIMII 2008 OCAP Biological Assessment Study 8.0 assumptions (**Table 3-2**). Study 8.0 captures all of the intervening regulatory changes occurring between 1999 and 2008, foreseeable future projects, but does not include the Wanger Decision, USFWS 2008 OCAP Biological Opinion, or NOAA Fisheries 2009 OCAP Biological Opinion. This is because the effects of the USWFS Biological Opinion on CVP/SWP operations were not fully understood or integrated into modeling Study 8.0 in 2008 when the modeling was performed, and because the NOAA Fisheries 2009 OCAP Biological Opinion was not available at the time.

Moreover, there are additional anticipated future events/actions that have been identified for which there is no explicit data available to compare, specifically the BDCP, EDWPA Supplemental Water Supply Project, and climate change. Therefore, quantifying their effects on CVP/SWP operations under the future cumulative conditions is not currently possible. **Because the BDCP, EDWPA Supplemental Water Supply Project and climate change would collectively have profound effects on CVP/SWP operations and resulting system hydrology, yet these effects remain unclear at this time, the future cumulative condition that includes these actions/phenomena remains speculative at this time.**

Table 3-2. Cumulative Conditions.

	WFP EIR 1999	Study 8.0 2008
Model	PROSIM	CALSIMII
Period of Simulation	1922 - 1991	1922 - 2003
SWP Demands	Variable 4.2 MAF/Yr.	Variable 3.1 - 4.2 MAF/Yr
CVP Demands		
North of Delta	Based on 2020 Land Use & Max Historic Use	Land-use based, full build out of CVP contract amounts
American River	WFA	Land-use based, limited by contract amounts
EBMUD	EBMUD 8/3/98 Proposal	133 TAF
South of Delta	3.1 MAF	3.5 MAF
CVP Water Allocation		
CVP Settlement / Exchange	100% - 75% Based on Shasta Index	100% - 75% Based on Shasta Index
CVP Ag	100% - 10% Based on Supply	100% - 0% Based on Supply
CVP M&I	100% - 50% Based on Supply	100% - 50% Based on Supply
Refuge	100% - 50% Based on Supply	100% - 75% Based on Shasta Index
Instream Flow Requirements		
Trinity River	390 - 750 TAF	Trinity EIS Preferred Alternative (369-815 TAF/year)
Sacramento River	November 20, 1997 AFRP	Flows for SWRCB WR 90-5 temperature control, and USFWS discretionary use of CVPIA 3406(b)(2)
Clear Creek	November 20, 1997 AFRP	Downstream water rights, 1963 USBR Proposal to USFWS and NPS, and USFWS discretionary use of CVPIA 3406(b)(2)
Yuba River	Available Yuba River Data	Yuba Accord Adjusted Data
American River	November 20, 1997 AFRP	Minimum Instream Flow Management Standard
Delta Requirements	Delta Accord	SWRCB D-1641
Temperature Modeling		
Optimal Cold Water Pool Management	Yes	Yes
Folsom Lake TCD	Yes	Yes
Flood Control at Folsom	400/670	400/670
Hydrology	160-98 (PROSIM)	160-98 (CALSIMII)

EBMUD = East Bay Municipal Utility District.
AFRP = USFWS Anadromous Fish Restoration Program.
TCD = Urban water intake temperature control device.
OCAP BA = Operations Criteria and Plan Biological Assessment.
NPS= National Park Service.

3.2 Anticipated Changes to System Hydrology Compared to that Used for the WFP EIR

The information presented in **Table 3.1** identifies significant assumption changes between existing condition studies. Although the assumptions change, the effect on CVP/SWP operations may or may not be recognizable. In this section, quantitative and qualitative effects on current CVP/SWP operations are associated with the various assumption changes.

3.2.1 PROSIM to CALSIMII

Subsequent to the preparation of the 1999 WFP EIR, Reclamation and DWR completed the development and acceptance of a new CVP/SWP system-wide model that replaced the PROSIM model. The new model, now referred to as CALSIMII, incorporated new algorithms for surface and groundwater operations, as well as updated hydrology, which better characterized the CVP/SWP operations. The change in modeling tools affected CVP/SWP performance in a variety of ways due to hydrology and model logic differences. Work performed for the City of Roseville, at the time that the shift to CALSIMII occurred, concluded that:

- Statistically, Folsom Reservoir storage is lower in the PROSIM simulation during all examined periods of the year.
- Statistically, Nimbus Dam release is equivalent in the PROSIM and CALSIMII simulations during the October through November and July through September periods, and PROSIM releases are greater in the December through March and April through June periods.
- The two periods in which PROSIM releases are greater are those in which average monthly flows are greatest for both simulations.
- The frequency and magnitude of potential environmental impacts is typically relatively small during the December through June period.
- Statistically, Watt Avenue water temperature is higher in the PROSIM simulation during the April through June and July through September periods, equivalent to the CALSIMII simulation during the October through November period, and lower than the CALSIMII simulation during the December through March period.
- Every month of the December through March period is less than 54°F in both simulations. Although specific thermal requirements of anadromous salmonids vary by species and life stage, water temperatures ≤ 54°F are protective of all the life stages of anadromous salmonids present in the lower American River during this time period (Rich 1987; McCullough et al. 2001; NOAA Fisheries 1993, 2000, 2001, 2002);
- During the hottest months of the year (i.e., April through September), water temperatures are higher in the PROSIM simulation than the CALSIMII simulation. Because anadromous salmonids are coldwater species, the warmer temperatures of the PROSIM simulation suggest an increased number of negative effects on anadromous salmonids than would be identified in the CALSIMII simulation, therefore, providing a more conservative estimation of potential thermal impacts on these species.

In general, the switch from PROSIM to CALSIM affects simulated reservoir storages, reservoir releases and CVP/SWP deliveries to Project contractors. These changes, some of which are identified above, are mostly associated with the frequency for which a given storage/release/delivery parameter might be expected to occur. There is little difference in the

model results at the extremes of these parameters, but over the course of a modeled year or years, the balancing of available reservoir water sources and subsequent project operations are portrayed differently in response to the advances in modeling. CALSIMII best represents the current conditions/simulated operations for planning and assessment purposes.

3.2.2 Period of Simulation

The period of simulation for CALSIMII increased by 12 years by including the years 1992 through 2003. Of these 12 years, 2 years were classified as critical water years, 2 water years were dry, 0 (zero) were below normal, 3 years were above normal, and 5 were wet years. This distribution of year types is somewhat "wetter" than the 1922-1991 period, but the dry years were no drier than those in the 1922-1991 period and the wet years were no wetter than those in the 1922-1992 period.

- *Folsom Reservoir Storage:* not expected to have a significant effect on assumptions drawn from 1922-1991 period.
- *Lower American River Flows at Nimbus Dam:* not expected to have a significant effect on assumptions drawn from 1922-1991 period.
- *Other CVP Reservoir Storage:* not expected to have a significant effect on assumptions drawn from 1922-1991 period.
- *Lower Sacramento River Flow at Freeport:* not expected to have a significant effect on assumptions drawn from 1922-1991 period.
- *Delta Inflow:* not expected to have a significant effect on assumptions drawn from 1922-1991 period.

3.2.3 CVP Demands

CVP demands north of the Delta are essentially equivalent between the studies. South of Delta CVP demands are higher in recent modeling. These higher demands could affect Folsom Reservoir storage in some years by requiring additional release. However, because the inflow to storage ratio for Folsom Reservoir is quite high, Folsom is operated as an annual reservoir, meaning that it is not expected to store water for future years, but rather is operated to maintain at least minimally acceptable storage in the fall months in order to provide minimum levels of instream flows below Nimbus Dam, American River water rights deliveries, and flood protection for each upcoming winter. In nearly all years the storage will recover by the following spring. Other upstream CVP reservoirs do carry over storage as insurance for a following dry year. These reservoirs could experience lower storage but would remain within the range of operations identified in the WFP EIR.

- *Folsom Reservoir Storage:* not be expected to cause Folsom Reservoir storage levels to be outside the range identified in the WFP EIR.
- *Lower American River Flows at Nimbus Dam:* not be expected to cause American river flows outside the range identified in the WFP EIR.
- *Other CVP Reservoir Storage:* not be expected to cause other CVP reservoir storage levels to be outside the range identified in the WFP EIR.
- *Lower Sacramento River Flow at Freeport:* not be expected to cause Sacramento River flows at Freeport outside the range identified in the WFP EIR.

- *Delta Inflow:* not be expected to cause Delta Inflows outside the range identified in the WFP EIR.

3.2.4 SWP Demands

SWP demands south of the Delta are variable in recent modeling studies, being greater in some years and smaller in some years. SWP demands are met from surplus Delta inflow and releases from Oroville Reservoir. Effects of these demand changes on CVP operations are negligible.

- *Folsom Reservoir Storage:* effects on Folsom Reservoir storage are inconsequential.
- *Lower American River Flows at Nimbus Dam:* effects on American River flows are insignificant.
- *Other CVP Reservoir Storage:* effects on other CVP reservoir storages are insignificant.
- *Lower Sacramento River Flow at Freeport:* effects on Sacramento River flows at Freeport are insignificant.
- *Delta Inflow:* effects on Delta Inflow are insignificant.

3.2.5 CVP Water Allocations

CVP water allocations reflect the application of water shortages to CVP customers based on contract type. CVP water shortage policy has evolved through time in response in part to regulatory changes and to increased demands. Studies subsequent to the WFP EIR have assumed different shortage policies for agriculture and refuge water supplies. CVP M&I water shortage criteria has remained within the same 0% to 50% range; however, the frequency for which any given delivery allocation occurs within this range has changed. Generally, CVP allocations are higher in the WFP EIR as the result of the combination of modeling tool and assumption changes used for more recent modeling tends to reduce project flexibility in meeting system wide demands.

- *Folsom Reservoir Storage:* effects on Folsom Reservoir storage are insignificant.
- *Lower American River Flows at Nimbus Dam:* effects on American River flows are insignificant.
- *Other CVP Reservoir Storage:* effects on other CVP reservoir storages are insignificant.
- *Lower Sacramento River Flow at Freeport:* effects on Sacramento River flows at Freeport are insignificant.
- *Delta Inflow:* effects on Delta Inflow are insignificant.

3.2.6 Trinity River Flow Requirements

The Trinity River flows are somewhat lower in the WFP EIR modeling than in recent studies. With higher flow requirements in more recent studies, the availability for cross basin export to the Sacramento River is diminished, creating a potential for increased Shasta reservoir releases. This results in less water available for CVP project purposes. Because of the hierarchy of water user contracts, this would be expected to increase the frequency of export Ag water shortages. The effect on M&I water users is much less pronounced, although some additional shortages would be expected.

- *Folsom Reservoir Storage:* effects on Folsom Reservoir storage are insignificant.

- *Other CVP Reservoir Storage:* effects on other CVP reservoir storage are common but within the range of elevations identified in the WFP EIR.
- *Lower American River Flows at Nimbus Dam:* effects on American River Flows are insignificant.
- *Lower Sacramento River Flow at Freeport:* effects on Sacramento River flows at Freeport are common but within the range of flows identified in the WFP EIR.
- *Delta Inflow:* effects on Delta inflow are common but within the range of inflows identified in the WFP EIR.

3.2.7 Clear Creek Flow Requirements

In the WFP EIR, the USFWS Anadromous Fisheries Restoration Program (AFRP) Clear Creek flows were supported by CVPIA 3406(b)(2) water. These flows were subsequently made more permanent by CVPIA policy and USFWS Biological Opinions. The magnitude of any changes in Clear Creek flow requirements between studies, with respect to Sacramento River operations, is too small to influence overall CVP/SWP operations.

- *Folsom Reservoir Storage:* effects on Folsom Reservoir storage are insignificant.
- *Lower American River Flows at Nimbus Dam:* effects on American River flows are insignificant.
- *Other CVP Reservoir Storage:* effects on other CVP Reservoir storage are insignificant.
- *Lower Sacramento River Flow at Freeport:* effects on Sacramento River flow at Freeport are insignificant.
- *Delta Inflow:* effects on Delta inflows is insignificant.

3.2.8 Sacramento River Flow Requirements

The Sacramento River flow requirements are those necessary to meet a minimum level of flow and temperature performance. Frequently, flows exceed the minimums as a result of flood control, navigation, Delta water quality, or Delta export requirements. Although changes are to be expected in some months, the difference in CVP/SWP operations between the WFP EIR and more recent modeling caused by this assumption change is small.

- *Folsom Reservoir Storage:* effects on Folsom Reservoir storage are insignificant.
- *Lower American River Flows at Nimbus Dam:* effects on American River flows are insignificant.
- *Other CVP Reservoir Storage:* effects on other CVP reservoir storages are small, and within the range of elevations identified in the WFP EIR.
- *Lower Sacramento River Flow at Freeport:* effects on Sacramento River flow at Freeport are small, and within the range of flows identified in the WFP EIR.
- *Delta Inflow:* effects on Sacramento River flow are small, and within the range of inflow identified in the WFP EIR.

3.2.9 Yuba River Flow Requirements

The Yuba Accord combines increased instream fisheries flows with increased supplemental water supplies for export in the Delta. Because the Yuba River Accord was not in existence at

the time of the WFP EIR modeling it was not included. Effects of the accord are focused on the Yuba River, lower Sacramento River and Delta exports.

- *Folsom Reservoir Storage:* the Yuba Accord does not affect Folsom Reservoir operations.
- *Lower American River Flows at Nimbus Dam:* the Yuba Accord does not affect American River flows at Nimbus.
- *Other CVP Reservoir Storage:* the Yuba Accord effects on storage in other CVP reservoirs are occasional, but within the range identified in the WFP EIR.
- *Lower Sacramento River Flow at Freeport:* The Yuba Accord results in higher Sacramento River flows at Freeport.
- *Delta Inflow:* The Yuba Accord results in higher Delta inflow.

3.2.10 American River Flow Requirements

American River minimum flow requirements in the WFP EIR are quite different from current flows. Since the WFP EIR was certified, the Water Forum in conjunction with Reclamation and federal and state resource agencies developed a lower American River Flow Management Standard (FMS). Reclamation has voluntarily operated to the minimum instream flow component[2] of the FMS for the last two years and has represented in its modeling of American River operations for existing conditions, its intention to continue doing so. The FMS has two underlying co-equal objectives, providing a safe and reliable water supply for the region, and preserving the fishery, wildlife, recreational and aesthetic values of the lower American River. While different in magnitude from those flows contemplated in the WFP EIR, present FMS flows provide a level of compliance with the co-equal objectives equivalent to the WFP EIR.

It also is important to note, that just as is the case for Sacramento River flows, frequently meeting other CVP purposes causes flows in excess of the minimums. On the American River this is particularly evident in months outside of the fall (October through December period).

- *Folsom Reservoir Storage*: effects on Folsom storage are occasional, in most years lower storage is restored by reservoir inflow in the spring, and within the range of elevations identified in the WFP EIR.
- *Lower American River Flows at Nimbus Dam:* effects on American River flows are occasional, but within the range of flows identified in the WFP EIR.
- *Other CVP Reservoir Storage:* effects of on Other CVP storages are occasional, but within the range of elevations identified in the WFP EIR.
- *Lower Sacramento River Flow at Freeport:* effects on Sacramento River flows at Freeport are occasional, but within the range of flows identified in the WFP EIR.
- *Delta Inflow:* effects on Delta inflow are occasional, but within the range of flows identified in the WFP EIR.

[2] The flow component of the FMS was included in the 2009 NOAA Fisheries OCAP Biological Opinion RPA and is, therefore, a directive of the ESA process. Further acknowledgement of the FMS may be forthcoming in actions before the SWRCB, although this effort has not yet been initiated.

3.2.11 Delta Water Quality Requirements

The December 1994 Bay-Delta Accord, formally known as the "Principles for Agreement on Bay-Delta Standards Between the State and Federal Governments," brought together urban, agricultural, and environmental interests around a consensus on setting new Bay-Delta water quality standards (including flow requirements for the Sacramento and San Joaquin Rivers). This facilitated coordinating the operations in the SWP and the CVP to help achieve those standards, and developing new long-term approaches to address a variety of fish and wildlife, water supply, and water quality issues involving the Bay-Delta. Among other things, the Bay-Delta Accord was intended to reduce uncertainties in how the ESA would be applied going forward as a tool for managing Bay-Delta water resources.

The accord provided for an integrated ecosystem approach to management of the Bay- Delta that would allow for protection of species without impairing seasonal water supply allocations. In May 1995, the California State Water Resources Control Board (State Water Board) adopted a final Water Quality Control Plan for the Bay-Delta (1995 Bay-Delta Plan). The 1995 Bay-Delta Plan incorporated the basic standards and strategies laid out in the 1994 Bay-Delta Accord. In addition, the State Water Board initiated one of the longest and most complicated water rights proceeding in state history to modify previously issued permits (principally held by the CVP and the SWP) for the long-term appropriation of water from the Delta and to manage that resource in a reliable and environmentally sensitive way. The State Board's water rights proceeding resulted in the adoption of Water Rights Decision 1641 (D-641) on Dec. 29, 1999 (revised on March 15, 2000).

For modeling purposes, D-1641 can be assumed as codifying the Bay-Delta Accord principles. Thus, there is no recognizable change in the modeling.

- *Folsom Reservoir Storage:* effects on Folsom Reservoir storage are insignificant
- *Lower American River Flows at Nimbus Dam:* effects on American River flows are insignificant
- *Other CVP Reservoir Storage:* effects on other CVP Reservoir storage are insignificant
- *Lower Sacramento River Flow at Freeport:* effects on Sacramento River flow at Freeport are insignificant
- *Delta Inflow:* effects on Delta inflows is insignificant

3.2.12 Wanger Decision

The CVP/SWP operational changes required by the Wanger Decision addressing the 2004 OCAP USFWS OCAP Biological Opinion for delta smelt was not in effect at the time of the WFP EIR. Had it been so, the resultant effect in CVP/SWP operations would have been a reduction in CVP/SWP Delta exports associated with not exceeding maximum prescribed net upstream flow in Old and Middle Rivers. This reduction in exports would have affected CVP and SWP delivery allocations and potentially and/or resulted in additional releases from upstream reservoirs.

- *Folsom Reservoir Storage:* effects of the Wanger Decision on Folsom Reservoir storage would likely be occasionally lower storage, in most years restored by reservoir inflow in the spring, but within the range of elevations identified in the WFP EIR.

- *Lower American River Flows at Nimbus Dam:* effects on American River flows at Nimbus would be occasional (+/-), but within the range of flows identified in the WFP EIR.
- *Other CVP Reservoir Storage:* effects of the Wanger Decision on Other CVP reservoir storages would likely be occasionally lower storage, but within the range of elevations identified in the WFP EIR.
- *Lower Sacramento River Flow at Freeport:* effects on Sacramento River flows at Freeport would be occasional (+/-), but within the range of flows identified in the WFP EIR.
- *Delta Inflow:* effects on Delta inflow would be occasional (+/-), but within the range of inflows identified in the WFP EIR.

3.2.13 USFWS 2008 OCAP Biological Opinion for Delta Smelt

The USFWS Biological Opinion is not presently included in current modeling at any level of development. Modelers are in the process of incorporating the Reasonable and Prudent Alternative (RPA) for this Biological Opinion into CALSIMII so that its effects may be quantified. Extrapolating from the text of the RPA there are several Actions (1, 2, and 3) that will affect Delta exports by virtue of limitations on Old and Middle River ("OMR") flows, and Action 4 requiring additional X2 flows in the fall months that will affect reservoir releases. RPA Actions 1 through 4 address the following measures:

- RPA Action 1: limits exports at the Project pumps so that the average daily OMR flow is no more negative than -2,000 cfs for a total duration of 14 days, with a 5-day running average no more negative than -2,500 cfs (within 25 percent). This action would occur at some time within the December – March window.
- RPA Action 2: requires that the range of net daily OMR flows will be no more negative than -1,250 to -5,000 cfs. This action would occur immediately following Action 1.
- RPA Action 3: requires that net daily OMR flow will be no more negative than -1,250 to -5,000 cfs based on a 14-day running average with a simultaneous 5-day running average within 25 percent of the applicable requirement for OMR. This action would occur at the onset of spawning and extending to as late as June 30.
- RPA Action 4: improves fall estuarine habitat for delta smelt by managing of X2 through increasing Delta outflow during fall when the preceding water year was wetter than normal. This action would occur on September 1 through November 30.

Folsom reservoir storage will likely be lower in the fall as a result of these RPAs; however, in most years the storage would recover by spring.

- *Folsom Reservoir Storage:* Folsom Reservoir storage will likely be frequently lower in the fall as a result of the RPAs; however, in most years the storage would recover by spring, and be within the range of elevations identified in the WFP EIR.
- *Lower American River Flows at Nimbus Dam:* effects on American River flows at Nimbus particularly in the fall months could be frequent (+/-), but within the range of flows identified in the WFP EIR.

- *Other CVP Reservoir Storage:* other CVP reservoir storage will likely be frequently lower in the fall as a result of the RPAs; however, it should remain within the range of elevations identified in the WFP EIR .
- *Lower Sacramento River Flow at Freeport:* effects on Sacramento River flows at Freeport, particularly in the fall months, could be frequently higher, but within the range of flows identified in the WFP EIR.
- *Delta Inflow:* effects on Delta inflow, particularly in the fall months could be frequently higher, but within the range of flows identified in the WFP EIR.

3.2.14 NOAA Fisheries 2009 OCAP Biological Opinion

The NOAA Fisheries Biological Opinion is also not presently included in current modeling at any level of development. As with the USFWS Opinion, modelers are in the process of incorporating the Reasonable and Prudent Alternative (RPA) for this Opinion into CALSIMII so that its effects may be quantified. Extrapolating from the text of the RPA there are multiple Actions applied to various CVP-influenced watersheds.

RPA Action I is specific to the Sacramento River, primarily affecting Shasta reservoir storage operations necessary to achieve water temperature requirements in the Sacramento River below Keswick Dam. RPA Action II applies to the American River and is quite similar with respect to flows, to the Flow Management Standard used in recent modeling. RPA Action III applies to the San Joaquin River operations. RPA Action IV applies to Delta operations and includes requirements for Delta Cross Channel Gate operations and OMR flows. Included within the RPA actions are other components dealing with fish passage and physical feature changes. Actions I and IV are those which will have the most effects on CVP operations with respect to reservoir storage and CVP water deliveries.

- *Folsom Reservoir Storage:* Folsom reservoir storage will be lower in the fall as a result of the RPAs; however, it is likely in most years the storage would recover by spring, and be within the range of elevations identified in the WFP EIR.
- *Lower American River Flows at Nimbus Dam:* effects on American River flows at Nimbus particularly in the fall months could be frequently (+/-), but within the range of flows identified in the WFP EIR.
- *Other CVP Reservoir Storage:* other CVP reservoir storage, particularly Shasta, will be frequently higher as a result of the RPAs; however, it is likely in most years the storage would be within the range of elevations identified in the WFP EIR.
- *Lower Sacramento River Flow at Freeport:* effects on Sacramento River flows at Freeport, could frequently be (+/-), but within the range of flows identified in the WFP EIR.
- *Delta Inflow:* effects on Delta inflow, could frequently be (+/-), but within the range of flows identified in the WFP EIR.

3.2.15 Summary of Changes in System Hydrology at Existing Conditions

Table 3-3 shows a summary matrix of the anticipated changes in system hydrology and changes in key storage and flow parameters of importance to the assessment of fisheries resources and

water quality impacts in the WFP EIR. These changes reflect a qualitative assessment of effects promulgated by the identified changed conditions. It may be seen in the table that a given change in condition does not always indicate a "negative" effect on a key parameter, but frequency of effects are variable. In some cases the lack of effect is a function of operational flexibility within the CVP/SWP, while in other cases there are temporal effects that occur but without any overall annual effect.

While the table is indicative of individual parameter effects, it is necessary for the assessment of environmental impacts to combine the individual effects and determine the net effect. Therefore, Table 3-3 includes a final row that provides the estimated net change in the key storage and flow parameters, based on all changed conditions identified and discussed herein.

Overall, the effects of the multiple analytical, regulatory, and hydrologic changes of the past ten years have not radically changed the performance of CVP facilities with respect to American River operations identified in the WFP EIR. Folsom Reservoir levels remain within the WFP EIR limits, as do minimum and typical lower American River flows.

There are many similarities between the operations identified in the WFP EIR and those that presently exist. There are identified increases in water demands by contractors, but these have taken place coincident with regulatory actions intended to maintain or improve conditions for the environment. Consequently, the environmental protections envisioned by the WFP EIR remain.

Today, the operation of the CVP/SWP is significantly guided by the USFWS and NOAA Fisheries OCAP Biological Opinions. The Biological Opinions limit many aspects of CVP/SWP reservoir storage, river release, and contractor diversions. Because there is a finite water supply, and environmental protections are not discretionary, ultimately, these limitations manifest themselves in reduced contractor diversions in some conditions. By virtue of the CVP contract priorities based on a contractor's geographical location and intended use for the water, diversion reductions are applied when water supplies are limited. The majority of the delivery reduction effects will occur to the export contractors south of the Delta who will experience much more frequent reductions and greater cuts to deliveries.

Table 3-3. Summary of Changes and Key CALSIMII Modeling Outputs.

Changed Condition	Key Parameters for Impact Assessment				
	Folsom Reservoir Storage	Lower American River Flows	Other CVP Reservoir Storage	Lower Sacramento River Flow	Delta Inflow
PROSIM to CALSIMII	+	○/-	○	○	○
Period of Simulation	○	○	○	○	○
CVP Demands: (North of Delta/South of Delta)	○/-	○/-	○/-	○/+	○/+
SWP Demands	○	○	○	○	○
CVP Water Allocations	○	○	○	○	○
Trinity River Flow Requirements	○	○	+/-	+/-	+/-
Clear Ck Flow Requirements	○	○	○	○	○
Sacramento River Flow Requirements	○	○	+/-	+/-	+/-
Yuba River Flow Requirements	None	None	+/-	+	+
American River Flow Requirements	+/-	**+/–**	+/-	+/-	+/-
Delta Water Quality Requirements	○	○	○	○	○
Wanger Decision	**–**	+/-	-	+/-	+/-
USFWS 2008 OCAP Biological Opinion	**–**	**+/–**	**–**	**+**	**+**
NOAA Fisheries 2009 OCAP Biological Opinion	**–**	**+/–**	**+**	**+/–**	**+/–**
Overall Net Effects	+/-	+/-	+/-	**+/–**	**+/–**

Notes:
None = The changed condition does not affect the parameter.
○ = No appreciable change.
-, +, and +/- = Overall occasional decreases (-), increases (+), or both (+/-) relative to WFP EIR.
–, **+**, and **+/–** = Overall frequent decreases (**–**), increases (**+**), or both (**+/–**) relative to WFP EIR.

4 Evaluation of Fisheries and Water Quality Impacts Identified in the Water Forum EIR in light of Anticipated CVP/SWP System Hydrologic Changes

This section provides an assessment to determine whether the fisheries and water quality impact determinations disclosed in the WFP EIR would differ today, due to changes in current baseline conditions as a result of changed CVP/SWP operations and system hydrological conditions described in Section 3, that were not present when the WFP EIR was prepared. As indicated in Section 3, the potential changes in CVP operations and system hydrological conditions have not been assessed quantitatively through revised CALSIMII modeling. Likewise, related modeling with Reclamation's reservoir and river temperature models, or early life-stage salmon mortality, has not been conducted. A key reason for this is because the resource agencies, including Reclamation and DWR, have not yet determined how CVP/SWP operations are to be modified to adequately address the USFWS and NOAA Fisheries Biological Opinions on OCAP discussed above, nor has Reclamation or any other party codified the "Reasonable and Prudent Alternatives" of the 2008 and 2009 Biological Opinions into CALSIMII. In other words, CALSIMII, the standard tool used to model the effects of a project on CVP/SWP system operations and resulting system-wide hydrologic conditions has not been updated to account for implementation by the agencies of the USFWS and NOAA Fisheries Biological Opinions on OCAP. Therefore, this evaluation, by necessity, was performed in a qualitative manner by leading experts.

Based on the anticipated changes to system operations and hydrology, the key factors upon which the WFP EIR impact determinations were based were reevaluated to determine whether there would be any new previously undisclosed significant impacts requiring mitigation, or whether the impacts would be substantially more severe than previously disclosed. Lastly, the assessment considered whether any new significant impacts rise to the level that would warrant new quantitative analyses with the CALSIMII model (or Reclamation's related models) to provide and adequate impact assessment for the purposes of assessing the effects of the SVSP Project's 3,612 AFY water supply, which is part of the City's overall American River water supply previously assessed under the WFP EIR.

4.1 Fisheries Impacts

The WFP EIR, Chapter 4.5, "Fisheries Resources and Aquatic Habitat," addressed a total of seventeen individual numbered impacts. This section provides a qualitative assessment of each numbered impact based on the present understanding of CVP/SWP operations and resulting system hydrology upon which WFA demands, including the City of Roseville's American River demands, would be imposed. The impact discussions are organized by the general location where the primary effects would occur, which are Folsom Reservoir and Lake Natoma, Lower American River, Upper CVP Reservoirs, Sacramento River, and the Delta.

4.1.1 Folsom Reservoir and Lake Natoma

Impacts to Folsom Reservoir Coldwater and Warmwater Species (WFP EIR Impacts 4.5-1 and 4.5-2). The WFP EIR found the impacts in Folsom Reservoir to coldwater fisheries to be less than significant, and impacts to warmwater species to be potentially significant due to reduced availability of littoral habitat. Mitigation for the impact to warmwater fisheries was identified in the WFP EIR. However, it was determined that due to uncertainty regarding future conditions, the impact would remain significant and unavoidable following mitigation.

Based on the assessment of changes to CVP/SWP operations and anticipated resultant changes to hydrologic conditions identified in Table 3.3 above, the seasonal reductions in Folsom Reservoir storage levels would be more frequent and occasionally of greater magnitude, relative to conditions modeled in the WFP EIR. Minimum storage levels in late fall, and storage levels in the spring following reservoir refilling during the winter, are expected to change minimally. Under current conditions and system operations, WFA demands would be anticipated to result in a similar pattern of seasonal reductions in Folsom Reservoir storage as previously determined in the WFP EIR.

Anticipated changes in seasonal storage levels within the reservoir's normal operational range would not cause substantial adverse effects on habitat quality or quantity or prey availability for coldwater species. Thus, the anticipated incremental changes to Folsom Reservoir storage, due to changed conditions and WFA demands, would not change the impact determination for Folsom Reservoir coldwater fisheries, relative to that made in the WFP EIR. Likewise, the anticipated seasonal changes to reservoir storage and surface elevations would result in similar reductions to littoral habitat for warmwater species as previously determined in the WFP EIR. Therefore, the reduced reservoir storage and elevations would not be expected to cause new or substantially more severe impacts to Folsom Reservoir warmwater fisheries, relative to that determined in the WFP EIR, and thus this impact would remain potentially significant under current conditions as originally characterized in the WFP EIR.

Impact to Coldwater and Warmwater Species in Lake Natoma (Impact 4.5-3) and Temperature Impacts to Nimbus Fish Hatchery Operations and Fish Production (Impact 4.5-4). The WFP EIR found the impacts to coldwater and warmwater fish populations in Lake Natoma to be less than significant. The impacts to operations and fish production of the Nimbus Fish Hatchery also were less than significant.

Based on the assessment of changes to CVP/SWP operations and anticipated resultant changes to hydrologic conditions identified in Table 3.3 above, the seasonal reservoir storage, elevations, and flows through Lake Natoma would not change appreciably from those defined in the WFP EIR. As a regulating after bay for power production at Folsom Dam, Lake Natoma storage and surface elevation fluctuations would remain similar under current conditions and operations, and any changes in Lake Natoma operations as a result of WFA demands would be negligible, as previously determined in the WFP EIR. The WFP EIR found that water temperature patterns within Lake Natoma would be somewhat cooler during the June through September period as a result of a new temperature control device (TCD) for the Folsom Dam urban water intake structure and optimal coldwater pool management. The TCD was installed in 2003 and thus represents a new baseline for thermal conditions within the lake.

Based on the anticipated minimal changes to Lake Natoma storage, surface elevation fluctuations, and temperatures that may occur, due to changed conditions and system operations, WFA demands imposed on the changed conditions and system operations would not be expected to cause any new significant impacts to Lake Natoma's coldwater and warmwater fish populations or Nimbus Fish Hatchery operations and fish production, relative to those determined in the WFP EIR. Therefore, these impacts would remain less than significant under current conditions and operations as originally characterized in the WFP EIR.

4.1.2 Lower American River

Impact to Fall-run Chinook Salmon (WFP EIR Impact 4.5-5). The WFP EIR found the impacts to fall-run chinook salmon to be potentially significant, primarily as a result of frequent reductions in lower American River (LAR) flows during October through December. Mitigation for the impact was identified in the WFP EIR. However, it was determined that due to uncertainty regarding future conditions, the impact would remain significant and unavoidable following mitigation.

Based on the assessment of changes to CVP/SWP operations and anticipated resultant changes to hydrologic conditions identified in Table 3.3 above, seasonal LAR flows would be occasionally different (either higher or lower) relative to conditions modeled in the WFP EIR. CVP's implementation of the LAR Flow Management Standard (FMS) and the NOAA Fisheries 2009 OCAP Biological Opinion are specifically for the purpose of modifying operations to benefit LAR coldwater fish resources. Under current conditions and system operations, WFA demands would be anticipated to result in a similar pattern of seasonal reductions in LAR flows as previously determined in the WFP EIR. Therefore, the seasonal LAR flows would be expected to be similar to that assessed in the WFP EIR and there may be some flow improvement related to meeting the life-cycle needs of the fall-run chinook salmon resulting from the FMS and NOAA Fisheries 2009 OCAP Biological Opinion.

When imposed on the changed conditions, WFA demands are anticipated to result in reduced LAR flows in October through December period, as previously determined in the WFP EIR, which may reduce available spawning habitat and lead to redd superimposition and reduced size of the initial year-class. The anticipated incremental changes to LAR flows, due to changed conditions and WFA demands, would be expected to result in similar, or possibly lesser, seasonal reductions in spawning habitat availability. The changes in LAR flows would not be expected to result in new or substantially more severe impacts to fall-run chinook salmon, relative to those determined in the WFP EIR. Therefore, this impact would remain potentially significant under current conditions and operations as originally characterized in the WFP EIR.

Impact to Steelhead (WFP EIR Impacts 4.5-6). The WFP EIR found the impact to steelhead to be less than significant.

Based on the assessment of changes to CVP/SWP operations and anticipated resultant changes to hydrologic conditions identified in Table 3.3 above, the seasonal LAR flows would occasionally be both higher and lower, relative to conditions modeled in the WFP EIR. As noted for the discussion of fall-run chinook salmon, the seasonal LAR flows would be similar to those

assessed in the WFP EIR and there may be some flow improvement related to meet the life-cycle needs (including thermal needs) of the steelhead population as a result of CVP's implementation of requirements in the NOAA Fisheries 2009 OCAP Biological Opinion and/or the FMS. The WFA demands would be anticipated to result in similar seasonal reductions in LAR flows and increases in LAR water temperatures as previously determined in the WFP EIR.

The WFP EIR found that the TCD and optimal coldwater pool management would reduce temperatures in the juvenile steelhead rearing period of June through September and offset potential flow-related effects (e.g., reduced juvenile rearing habitat). Based on the anticipated occasional changes to LAR flows, due to changed conditions and system operations, and implementation of the TCD at Folsom Dam and optimal coldwater pool management, WFA demands would not be expected to cause any new significant impacts to steelhead. Therefore, these impacts would remain less than significant under current conditions and operations as originally characterized in the WFP EIR.

Flow- and Temperature-Related Impacts to Splittail (Impact 4.5-7). The WFP EIR found flow-related impacts to splittail to be potentially significant as a result of reductions in inundated riparian spawning habitat in the LAR during the February through May period. Mitigation for the significant impact was identified in the WFP EIR. However, it was determined that due to uncertainty regarding future conditions, the impact would remain significant and unavoidable following mitigation.

Based on the assessment of changes to CVP/SWP operations and anticipated resultant changes to hydrologic conditions identified in Table 3.3 above, the seasonal LAR flows would occasionally be both higher and lower relative to conditions modeled in the WFP EIR. As noted above, the seasonal LAR flows would be similar to those assessed in the WFP EIR and the WFA demands would be anticipated to result in similar seasonal reductions in LAR flows, particularly during the February through May period, which is a period of flood-control operations.

WFA demands would be anticipated to result in reduced LAR flows in the February through May period, as previously determined in the WFP EIR, which may reduce available spawning habitat for splittail. The anticipated incremental reduction in spawning habitat availability for splittail is not expected to change substantially under current conditions and operations, relative to that identified under the WFP EIR. Consequently, WFA demands imposed on the changed conditions and system operations would not be expected to result in new or substantially more severe impacts to splittail, relative to those determined in the WFP EIR. Therefore, this impact would remain potentially significant under current conditions as originally characterized in the WFP EIR.

Flow- and Temperature-Related Impacts to American Shad (Impact 4.5-8) and Striped Bass (Impact 4.5-9). The WFP EIR found the impacts to shad and striped bass to be less than significant.

Based on the assessment of changes to CVP/SWP operations and anticipated resultant changes to hydrologic conditions identified in Table 3.3 above, the seasonal LAR flows would occasionally be both higher and lower, relative to conditions modeled in the WFP EIR. As noted above, the

May and June LAR flows are not expected to be substantially reduced, relative to those identified in the WFP EIR, due to changed conditions and system operations. The WFA demands would be anticipated to result in similar seasonal reductions in LAR flows.

When imposed on the changed conditions, WFA demands would be anticipated to result in only minimal reductions in the suitable range of LAR flows in the May and June period for attraction and spawning of American shad, as previously determined in the WFP EIR. Likewise, the minimal changes in LAR flows in May and June would not substantially reduce striped bass spawning and rearing activity within the LAR. Based on the anticipated occasional changes to LAR flows, due to changed conditions and system operations, WFA demands imposed on the changed conditions and system operations would not be expected to cause any new significant impacts to American shad or striped bass. Therefore, these impacts would remain less than significant under current conditions and operations as originally characterized in the WFP EIR.

4.1.3 Other CVP Reservoir Storage

Impacts to Coldwater and Warmwater Species in Shasta Reservoir (WFP EIR Impacts 4.5-10 and 4.5-11), Trinity Reservoir (WFP EIR Impacts 4.5-12 and 4.5-13), and Keswick Reservoir (WFP EIR Impacts 4.5-14). The WFP EIR found the impacts to coldwater and warmwater fisheries in Shasta Reservoir, Trinity Reservoir, and Keswick Reservoir to be less than significant.

Based on the assessment of changes to CVP/SWP operations and anticipated resultant changes to hydrologic conditions identified in Table 3.3 above, the seasonal reductions in storage levels at Trinity Reservoir would be more frequent and generally of greater magnitude, relative to conditions modeled in the WFP EIR. Likewise, CVP operations in response to some changed conditions may result in more frequent seasonal reductions in storage levels at Shasta Reservoir. However, as a result of the NOAA Fisheries 2009 OCAP Biological Opinion, seasonal Shasta Reservoir storage may be maintained at higher levels relative to conditions assessed in the WFP EIR. Overall, the minimum storage levels in late fall and storage levels in the spring following reservoir refilling during the winter are often expected to be similar in upper CVP reservoirs relative to that identified in the WFP EIR. No measurable changes would be expected to occur in Keswick Reservoir storage or elevation because, as a regulating afterbay of Shasta Reservoir, its operations would not change notably. Additionally, under current conditions and system operations, WFA demands would be anticipated to result in a similar pattern of generally small and infrequent reductions in seasonal Shasta Reservoir and Trinity Reservoir storage levels, as previously determined in the WFP EIR.

Anticipated minimal WFA-related changes in seasonal storage levels within the normal operational range of Shasta Reservoir and Trinity Reservoir would not adversely affect the habitat or prey for coldwater species. Likewise, the incremental effects of WFA demands would not substantially reduce seasonal near-shore habitat availability in the March through September period, or spring nest-building activity, of warmwater species. Thus, the anticipated incremental changes to upper CVP reservoir storage, due to changed conditions and WFA demands, would not change the impact determination for coldwater or warmwater fisheries in upper Shasta Reservoir and Trinity Reservoir, relative to that made in the WFP EIR. As disclosed in the WFP EIR, potential flow and temperature effects in Keswick Reservoir would not be expected to

occur because its operations as a regulating reservoir would not change. Therefore, the potential impacts to upper CVP reservoirs would remain less than significant under current conditions and operations as originally characterized in the WFP EIR.

4.1.4 Sacramento River

Flow-Related Impacts to Sacramento River Fisheries (WFP EIR Impacts 4.5-15). The WFP EIR found the flow-related impacts to fisheries resources in the upper and lower Sacramento River to be less than significant.

Based on the assessment of changes to CVP/SWP operations and anticipated resultant changes to hydrologic conditions identified in Table 3.3 above, the seasonal flows in the upper and lower Sacramento River would frequently be both higher and lower, relative to conditions modeled in the WFP EIR. In particular, flows may frequently be higher in the fall months as a result of CVP's implementation of requirements in the USFWS 2008 OCAP Biological Opinion, which requires additional Delta inflows for improved habitat quality as reflected by the "X2" location objectives. The WFA demands would be anticipated to result in generally small and infrequent reductions in seasonal Sacramento River flows as previously determined in the WFP EIR.

As previously determined in the WFP EIR, flows in the upper Sacramento River would not be expected to be reduced below levels for protection of winter-run chinook salmon rearing and downstream passage in the October through March period as a result of WFA demands. WFA demands would be anticipated to result in only minimal and occasional flow reductions in the lower Sacramento River, such that there would be no substantial reductions in physical habitat availability, or reduced immigration of adult or emigration of juvenile anadromous fishes. Based on the anticipated occasional changes to Sacramento River flows, due to changed conditions and system operations, WFA demands imposed on the changed conditions and system operations would not be expected to cause any new significant impacts to Sacramento River fisheries resources. Therefore, this impact would remain less than significant under current conditions and operations as originally characterized in the WFP EIR.

Temperature-Related Impacts to Sacramento River Fisheries (WFP EIR Impacts 4.5-16). The WFP EIR found the temperature-related impacts to fish resources in the lower Sacramento River to be less than significant.

Based on the assessment of changes to CVP/SWP operations and anticipated resultant changes to hydrologic conditions identified in Table 3.3 above, the seasonal flows in the Sacramento River would frequently be both higher and lower, relative to conditions modeled in the WFP EIR. In particular, flows may frequently be higher in the fall months as a result of CVP's implementation of X2 requirements in the USFWS 2008 OCAP Biological Opinion. Additionally, there may be some flow- and temperature-related improvements associated with CVP requirements for the winter-run chinook salmon populations in the NOAA Fisheries 2009 OCAP Biological Opinion. The WFA demands would be anticipated to result in generally small and infrequent reductions in seasonal Sacramento River flows, and thus temperatures, as previously determined in the WFP EIR.

As previously determined in the WFP EIR, there would be no substantial changes to average temperature below Keswick Dam for any month of the year, for the number of years exceeding 56ºF in the upper Sacramento River during the April through September period. Additionally, there would be no substantial decreases in annual early life stage survival of fall-run, late fall-run, winter-run, or spring-run chinook salmon in any individual year. Based on the anticipated occasional changes to Sacramento River flows, due to changed conditions and system operations, WFA demands imposed on the changed conditions and system operations would not be expected to cause any new significant temperature-related impacts to fish resources of the Sacramento River. Therefore, this impact would remain less than significant under current conditions and operations as originally characterized in the WFP EIR.

4.1.5 Delta

Impacts to Delta Fish Populations (WFP EIR Impacts 4.5-17). The WFP EIR found the impacts to Delta fish resources to be less than significant.

Based on the assessment of changes to CVP/SWP operations and anticipated resultant changes to hydrologic conditions identified in Table 3.3 above, the seasonal Delta inflows would frequently be both higher and lower, relative to conditions modeled in the WFP EIR. In particular, Delta inflows may frequently be higher in the fall months as a result of CVP's implementation of X2 requirements in the USFWS 2008 OCAP Biological Opinion. Additionally, there may be some Delta operations-related improvements to meet the life-cycle needs of ESA-listed fish species as a result of CVP's implementation of requirements in the USFWS 2008 OCAP Biological Opinion and NOAA Fisheries 2009 OCAP Biological Opinion. The WFA demands would be anticipated to result in generally small and relatively infrequent reductions in Delta inflows as previously determined in the WFP EIR.

As previously determined in the WFP EIR, there would be no substantial flow-related upstream shifts in the X2 position during the February through June period. Additionally, there would be no anticipated substantial changes in CVP's Delta export-to-inflow ratio. Based on the anticipated occasional changes to Delta inflows, due to changed conditions and system operations, WFA demands imposed on the changed conditions and system operations would not be expected to cause any new significant habitat-related impacts to fish resources in the Delta. Therefore, this impact would remain less than significant under current conditions and operations as originally characterized in the WFP EIR.

4.2 Water Quality Impacts

The WFP EIR, Chapter 4.4, "Water Quality," addressed a total of two individual numbered impacts. This section provides a qualitative assessment of each numbered impact based on the present understanding of CVP/SWP operations and resulting system hydrology upon which WFA demands, including the City of Roseville's American River demands, would be imposed.

4.2.1 Lower American River and Folsom Reservoir Water Quality (WFP EIR Impact 4.4-1)

The WFP EIR found the WFA-related impacts to water quality in Folsom Reservoir and the LAR to be less than significant.

Based on the assessment of changes to CVP/SWP operations and anticipated resultant changes to hydrologic conditions identified in Table 3.3 above, seasonal reductions in Folsom Reservoir storage levels would be more frequent, and seasonal LAR flows would be occasionally different (both higher and lower), relative to conditions modeled in the WFP EIR. Under current conditions and system operations, WFA demands would be anticipated to result in a similar pattern of seasonal reductions in Folsom Reservoir storage and LAR flows as previously determined in the WFP EIR.

As previously determined in the WFP EIR, reduced reservoir storage and LAR flows would be expected to result in minor increases in concentrations of contaminants (e.g., nutrients, pathogens, turbidity, or priority trace metal and organic compounds) due to reduced dilution capacity. Based on the anticipated reductions to Folsom Reservoir storage and LAR flows, due to changed conditions and system operations, WFA demands imposed on the changed conditions and system operations would not be expected to cause any new significant impacts to water quality. Therefore, this impact would remain less than significant under current conditions and operations as originally characterized in the WFP EIR.

4.2.2 Lower Sacramento River and Delta Water Quality (WFP EIR Impact 4.4-2)

The WFP EIR found the indirect water quality impacts to the lower Sacramento River to be potentially significant, primarily as a result of increased urban runoff and domestic wastewater discharge from the Sacramento Regional County Sanitation District's Sacramento Region Wastewater Treatment Plant (SRWTP) associated with the development and growth supported by increased WFA deliveries. Mitigation for the impact was identified in the WFP EIR. However, it was determined that due to uncertainty regarding future conditions, namely uncertainty in level of treatment of the additional urban runoff and municipal wastewater flows, the impact would remain significant and unavoidable following mitigation.

Based on the assessment of changes to CVP/SWP operations and anticipated resultant changes to hydrologic conditions identified in Table 3.3 above, the lower Sacramento River flows and Delta inflows would frequently be both higher and lower, relative to conditions modeled in the WFP EIR. Flows would be frequently higher in the fall months as a result of CVP's implementation of X2 requirements in the USFWS 2008 OCAP Biological Opinion. The WFA demands imposed on the changed conditions would be anticipated to result in generally small and occasional reductions in lower Sacramento River flows and Delta inflows as previously determined in the WFP EIR.

As previously determined in the WFP EIR, increased urbanization in the area served by WFA purveyors would indirectly result in substantial increases in the amount of treated effluent discharged from the SRWTP into the Sacramento River at Freeport. Coupled with seasonal flows, minor increases in concentrations of contaminants (e.g., nutrients, pathogens, turbidity, or

priority trace metal and organic compounds) could occur due to reduced dilution capacity. The imposing of WFA demands on current conditions and operations would be expected to result in similar water quality effects as those disclosed under the WFP EIR. The changed system conditions and operations would not be expected to result in new or substantially more severe water quality impacts, relative to that determined in the WFP EIR. Therefore, this impact would remain potentially significant under current conditions as originally characterized in the WFP EIR.

5 Evaluation of Roseville's Water Supply and Reliability in light of Anticipated CVP/SWP System Operational Changes

In general, with the progression of time and imposition of new and revised regulatory actions affecting CVP/SWP operations, the ability to "flex" project operations to maintain historical performance and hydrologic conditions has been eroded. There is now, virtually no action that does not precipitate some effect on water storage, reservoir releases, and/or water deliveries. Given that most often, storage or releases are requirements for complying with regulatory standards, the "give" in the systems becomes water deliveries.

Even when there was more flexibility in the CVP/SWP systems than exists today, increased demands on project water resources created occasional change in the frequency and/or magnitude of annual water deliveries. The magnitude of annual water diversions on the American River is still increasing. However, CVP operations can still honor senior American River water rights in all years and meet full American River CVP water contractor diversions in many years.

What has changed on the American River is the frequency of water shortages (years with less than full CVP contract deliveries). Compared to those identified in the WFP EIR, modeled future CVP deliveries will be less than full more frequently and shortages in those years may be greater, but the range of annual deliveries can be expected to comport with that shown in the WFP EIR.

In short, the City of Roseville's 58,900 AFY water supply from the American River remains highly reliable under the WFA and anticipated current and future CVP operations. However, the percent of time under dry and critical water year conditions that deliveries from the American River may be reduced below the City's full demand may occur somewhat more often in the future than previously identified, and as identified in the WFP EIR.

Based on over 82 years of historical hydrology (and WFA restrictions), the 58,900 AFY contract surface water supply is assumed to be available to the City in about 83 percent of the years. In about 17 percent of the years, quantities from 58,900 AFY to a minimum of 39,800 AFY of surface water would be available per the WFA. Thus, in drought years, supplemental supplies potentially totaling up to 19,100 AFY (the difference between the average/wet year supply and the dry year supply) are needed to make up for the dry year and critical year deficiencies

To meet water supply demands during dry and critical water years, the City may utilize other supplies like recycled water and groundwater and implement the water conservation strategies outlined in the Roseville Municipal Code (RMC). Recycled water offsets the use of surface

water supplies by reducing the City's reliance on American River supplies by filling irrigation demands that would otherwise use surface water supplies. Groundwater is used to make up any additional water supply shortfall.

Based on the above, the City's water supply reliability for the SVSP Project remains very high.

5.1 Water Supply Reliability Under Future Cumulative Conditions

As described in Section 3.1.2, quantifying the effects of future cumulative conditions and related CVP/SWP operations, in consideration of the future implementation of the BDCP, EDWPA Supplemental Water Supply Project, and implementation of the USFWS 2008 OCAP Biological Opinion and the NOAA Fisheries 2009 OCAP Biological Opinion, is not currently possible. The effects of these future projects are not fully understood and, thus, have not been fully integrated into the current versions of DWR's CALSIMII water supply operations model. In addition to the new regulatory requirements and future projects that may arise under the BDCP, climate change also may affect water supply conditions. Future climate change will affect the characteristics of runoff into CVP reservoirs (both in timing and volume) as well as exacerbate water quality conditions in the Delta as a result of sea level rise. Climate change without infrastructure changes will certainly lead to additional reductions in CVP water supplies. Consequently, the future cumulative conditions may have profound effects on CVP/SWP operations and resulting system hydrology, yet these effects remain unclear at this time.

History has shown that the availability of unused surface water supplies suitable for beneficial uses has diminished with time. In the American River basin, the contracted CVP surface water supplies that the City of Roseville depends on have been affected by this reduction in unused surface water. Water supplies that were believed to exist and be available for contractor deliveries when water supply contracts were initially signed, and subsequently renewed, are now insufficient to meet 100% deliveries as frequently as once assumed. Allocation reductions to Delta exports already are more frequent than in the past, and deliveries to these contractors are most tenuous because they are at the furthest extreme of the CVP delivery system, and can receive supplies only after all of the environmental requirements are met upstream of their location. At Roseville's location in the system, deliveries are indirectly affected by Reclamation's reservation of American River (Folsom) water to serve a portion of downstream flow, water quality, and environmental requirements placed on the CVP, but Roseville's diversions are not dependent on the American River meeting all of the downstream needs.

CVP's obligations to ongoing changes in environmental protections, changes to CVP water supply obligations, increased demand for previously unused surface water supplies, and climate change, collectively will affect Roseville's water supply. Compared to historical deliveries, there will be fewer years in the future when the CVP will be able to deliver 100% of Roseville's contract supply. At this moment in time, the environmental actions designed to maintain or restore historical ecological values in the American River will continue (i.e., through the OCAP Biological Opinions), while at the same time viable CVP water supplies will be available to the City of Roseville.

Summary of Impacts and Mitigation Measures in the Water Forum Proposal EIR

2. EXECUTIVE SUMMARY

2.1 INTRODUCTION

The ***Water Forum***, a diverse group of water agencies, business groups, agricultural interests, environmentalists, citizen groups, and local governments (also known as stakeholders), has been working since the fall of 1993 evaluating future water needs and supplies in the Sacramento area, including parts of Sacramento, Placer and El Dorado counties. The Water Forum has formulated a ***Water Forum Proposal*** (WFP) for the effective long-term management of the region's water resources. This proposal is incorporated in the Water Forum Action Plan which is being circulated concurrently with this document. The WFP was formulated based on the two coequal objectives of the Water Forum: 1) provide a reliable and safe water supply for the region's economic health and planned development through the year 2030; and 2) preserve the fishery, wildlife, recreational, and aesthetic values of the Lower American River.

The environmental analysis in this EIR is based on an evaluation of how environmental conditions would be expected to change as a result of implementing the WFP. As a first-tier, Program EIR of the WFP, the impact analysis addresses both the impacts resulting from the WFP and a cumulative evaluation of all the participating purveyors' water resource actions in the region, along with many other water management actions outside the region.

Public response to the Draft EIR will be important input for the Water Forum. Based on comments and final negotiations, the stakeholder representatives will finalize the Water Forum EIR and revise their recommendations for the WFP accordingly. These will be presented to stakeholder boards for their approval as a Memorandum of Understanding in the summer of 1999.

This section summarizes information contained in the ***Draft Environmental Impact Report*** on the WFP, including elements of the WFP, environmental impacts, mitigation measures, and alternatives.

2.2 THE EIR PROCESS

The ***Lead Agencies***, or public agencies that have responsibility for certifying the WFP EIR, are the City and County of Sacramento. Other public agency stakeholders may rely on the EIR when considering their approval of the WFP, and if so, are considered ***Responsible Agencies***. The purpose of a Program EIR is to identify and assess the environmental impacts of a series of actions that comprise an overall program, such as the WFP. The EIR has been prepared pursuant to the California Environmental Quality Act (CEQA), Public Resources Code §21000, *et seq.*, and State CEQA Guidelines, California Code of Regulations §15000, *et seq.* It is anticipated that subsequent actions by Lead and Responsible Agencies to implement the WFP will be reviewed in light of the Program EIR to determine what additional environmental documentation must be prepared, pursuant to the tiering provisions of the State CEQA Guidelines (§15152).

The Draft EIR has been released for public review to receive comments from interested parties on its completeness and adequacy in disclosing the environmental effects of the WFP. Written responses to significant environmental points raised in the comments will be prepared and published. Together, the Draft EIR and the responses to comments will constitute the Final EIR, which will be forwarded to the Sacramento City Council and Sacramento County Board of Supervisors for certification with regard to CEQA adequacy.

2.3 SUMMARY OF THE WATER FORUM PROPOSAL

2.3.1 Location of EIR Study Areas

Water Forum stakeholders represent water-related interests in the cities of Sacramento, Folsom, Galt, and Citrus Heights; the County of Sacramento; the City of Roseville, South Placer County and western El Dorado County (see Exhibit 3-1). For purposes of the EIR, three study areas are considered: the direct effect study area, the indirect effect study area, and the water service study area.

Preservation of the Lower American River is one of the coequal objectives of the WFP. The direct effect study area, therefore, consists of those areas that would be directly affected by additional surface water diversions from the American River. Such diversions would occur above Folsom Reservoir, from Folsom Reservoir proper, Lake Natoma, and from the Lower American River, defined as the reach from Nimbus Dam to the confluence with the Sacramento River. Therefore, the direct effect study area consists of the in-stream and riparian areas of these surface water resources (see Exhibit 3-2).

The indirect effect study area is the broader geographic area that encompasses the surface water resources and facilities outside of the Lower American River that may be affected by the WFP. This area includes the Central Valley Project (CVP) and State Water Project (SWP) systems both upstream of the confluence of the Sacramento and American rivers (exclusive of the direct effect study area), along with associated reservoirs and rivers, and downstream of the confluence, into and including the Sacramento-San Joaquin Delta (see Exhibit 3-3).

The water service study area consists of the communities served by Water Forum stakeholders, and is coincident with the boundaries of stakeholder purveyors in the cities of Sacramento, Folsom, Citrus Heights, and Galt; County of Sacramento (excluding the Delta); the City of Roseville; South Placer County and western El Dorado County (refer to Exhibit 3-1).

2.3.2 Elements of the Water Forum Proposal

To achieve the Water Forum's coequal objectives, a comprehensive package of linked actions has been developed to make more water available for consumption while protecting the natural resources of the Lower American River from environmental damage. This approach requires the support and participation of each of the Water Forum stakeholders. The WFP was developed

over a period of years by representatives of the Water Forum stakeholder groups, and includes seven elements:

Element	
I	**Increased Surface Water Diversions**
II	**Actions to Meet Customers 'Needs While Reducing Diversion Impacts on the Lower American River in Drier Years**
III	**Support for an Improved Pattern of Fishery Flow Releases from Folsom Reservoir**
IV	**Lower American River Habitat Management Element**
V	**Water Conservation**
VI	**Groundwater Management**
VII	**Water Forum Successor Effort**

Element I: Increased Surface Water Diversions

This element provides for increased surface water diversions. These increased diversions will be needed to serve planned growth through the year 2030 even with the active conservation programs and the recommended sustainable use of the groundwater which are also part of the WFP. As part of the WFP, all signatory organizations would support the diversions agreed to for each supplier as summarized in Table 3-1. All signatory organizations would also support the facilities needed to divert, treat and distribute this water. Support for increased diversions is linked to the suppliers' endorsement and, where appropriate, participation in each of the seven elements.

Element II: Actions to Meet Customers 'Needs While Reducing Diversion Impacts on the Lower American River in Drier Years

This element is to ensure that sufficient water supplies will be available to customers in dry years as well as wet years, and that suppliers continue to meet their customers' needs to the year 2030 while minimizing diversion impacts on the Lower American River in the drier and driest years. It is envisioned that Lower American River diversions above the H Street Bridge in average and wetter years will increase from the current level of about 216,500 acre-feet (AF) annually to about 481,000 AF annually. This represents a significant portion of the total annual flow of the American River which averages about 2.6 million AF with a range of less than 400,000 AF to greater than 6.3 million AF. Actions to meet customers 'needs while reducing diversion impacts on the Lower American River in drier years include: conjunctive use of groundwater basins consistent with the sustainable yield objectives; utilizing other surface water resources; reoperation of reservoirs on the Middle Fork of the American River; increased conservation during drier and driest years; and reclamation. Some of these actions would also help reduce impacts outside of the American River watershed.

Element III: Support for an Improved Pattern of Fishery Flow Releases from Folsom Reservoir

This element supports needed assurances for continued implementation of a pattern of water releases from Folsom Reservoir that more closely matches the needs of anadromous fish, in particular fall run chinook salmon, which need more cool water in the fall and are not present in the American River in the summer.

Beginning in December 1994, the Water Forum convened a Fish Biologists' Working Session of fish experts with special knowledge of the Lower American River. Their charge was to develop recommendations for an improved pattern of releases from Folsom Reservoir. Participants included representatives from the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), State Water Resources Control Board (SWRCB), U.S. Bureau of Reclamation (USBR), and representatives from the Water Forum. The group came to general agreement regarding which fish species in the Lower American River should be given priority when there are constraints in water availability and developed an Improved Pattern by which available water can be released from Folsom Reservoir in a "fish friendly" manner consistent with the reservoir's flood control objectives.

The Central Valley Project Improvement Act was passed in 1992. This law authorized fish and wildlife restoration as an additional purpose of the Central Valley Project. It also required the federal government to develop an Anadromous Fish Restoration Program (AFRP) plan including implementation of an improved pattern of fishery flow releases from Folsom Reservoir to benefit anadromous fish. The Water Forum recommendations were considered by the U.S. Department of the Interior when it developed its recommendations for AFRP flows for the Lower American River.

Since 1995 USBR, in consultation with the USFWS and CDFG, has attempted on a voluntary basis to release water from Folsom Reservoir in a manner consistent with the flow objectives for the Lower American River to the extent USBR's available water supply has permitted it to do so. Their AFRP flow objectives for the Lower American River are set forth in the November 20, 1997 "Department of the Interior Final Administrative Proposal on the Management of Section 3406 (b) (2) Water." They are essentially the same as the Improved Pattern of Fishery Flow Releases developed by the Fish Biologists' Working Session which was convened by the Water Forum. It is recognized that as additional information becomes available in the future it could be beneficial to further refine this Improved Pattern.

For purposes of the Water Forum Proposal, the Improved Pattern of Fishery Flow Releases is defined as the AFRP flow objective for the Lower American River as set forth in the November 20, 1997 "Department of the Interior Final Administrative Proposal on the Management of Section 3406 (b) (2) Water."

Signatories agree to recommend that the updated Lower American River standard be included in the USBR's permit for operation of Folsom and Nimbus dams. It will incorporate two of the Water Forum Proposal provisions:

(1) Agreement on water diversions upstream of Nimbus Dam under varying hydrologic conditions; and

(2) The Improved Pattern of Fishery Flow Releases which would be implemented essentially the same as the AFRP Lower American River flow objectives in the November 20, 1997 Final Administrative Proposal.

Element IV: Lower American River Habitat Management Element

This element, combined with an "Improved Pattern of Fishery Flow Releases from Folsom Reservoir" and "Actions to Meet Customers' Needs While Reducing Diversion Impacts on the Lower American River in the Drier Years," is included to mitigate the impacts of the increased diversions on the Lower American River. The Water Forum Habitat Management Element (HME) will be part of a coordinated multi-agency Lower American River ecosystem partnership established by a Memorandum of Understanding. Agencies expected to participate include: the Water Forum Successor Effort (legally administered by the City of Sacramento under the auspices of the City-County Office of Metropolitan Water Planning); the Sacramento Area Flood Control Agency (SAFCA); CALFED (or its successor); USBR (responsible for administering the Central Valley Project [CVP] and the Central Valley Project Improvement Act [CVPIA]); USFWS; National Marine Fisheries Service (NMFS); CDFG; and the Sacramento County Parks Department (which administers the Lower American River Parkway Plan). The multi-agency program will contain four components that together will address flow, temperature, and physical habitat issues for the Lower American River:

- Habitat Management Plan Development, Updating, and Technical Assistance;
- Projects that benefit the Lower American River Ecosystem;
- Monitoring and Evaluation Program; and
- Project-Specific Mitigation (which will remain the responsibility of each supplier).

In addition, because summertime recreation flows in the Lower American River are expected to be adversely affected by increased diversions, the Water Forum Proposal also includes commitments to fund projects to mitigate recreational impacts.

Element V: Water Conservation

The Water Conservation Element of the WFP promotes more efficient use of limited water resources. This element is essential to meeting both of the coequal objectives of the Water Forum. Conserved water will be available to help supply the region's water needs and will

minimize the need for increased groundwater pumping and increased use of surface water, including water diverted from the American River.

Major components of the Water Conservation Element include: residential water meters; other water conservation programs similar to the Best Management Practices included in the statewide Memorandum of Understanding Regarding Urban Water Conservation; public involvement; water conservation plans; and agricultural water conservation. The water conservation practices in the element have been defined considering the specific circumstances of the Water Forum stakeholders. The element does not preclude implementing other, more aggressive conservation approaches to the extent additional, feasible measures become available in the future.

Element VI: Groundwater Management

This element provides a framework by which the groundwater resource in Sacramento County can be protected and used in a sustainable manner and a mechanism for coordination with those adjacent counties that share the groundwater basin. A key provision of the element includes recommendations on "sustainable yield," which is the amount of water that can be safely pumped from the basin over a long period of time without damaging the aquifer. Estimated average annual sustainable yield recommendations for each of the three sub-areas of the basin are: North Area: 131,000 AF; South Area: 273,000 AF; and Galt Area: 115,000 AF. Recommendations for locally controlled groundwater management include monitoring groundwater withdrawal and "conjunctive use", or the planned use of surface water in conjunction with groundwater.

The Sacramento North Area Groundwater Management Authority was established in August, 1998 through adoption of a joint powers authority using the existing authority of the City of Sacramento, the City of Folsom, the City of Citrus Heights, and the County of Sacramento. The Authority will be charged with facilitating conjunctive use programs and maintaining long-term sustainable yield. Discussions about groundwater management in the South Area and the Galt Area will be undertaken by the Water Forum Successor Effort.

The groundwater management governance structure should facilitate participation by water agencies with specific and relevant interest in the groundwater governance structure outside of Sacramento County and encourage cooperation and collaboration with such agencies.

Element VII: Water Forum Successor Effort

In order to ensure implementation of the WFP, a Water Forum Successor Effort will be created with membership consisting of those organizations signatory to the WFP. Its responsibilities will be to oversee, monitor, and report on implementation of the WFP. The Water Forum Successor Effort will not have any authority to govern or regulate.

2.3.3 Essential Actions to be Carried Out by Other Agencies

Three projects anticipated to be carried out by other agencies are essential for the overall WFP:

- Temperature Control Device for the urban water intake from Folsom Dam;
- Optimal use of the cold water pool in Folsom Reservoir; and
- Improved Pattern of Fishery Flow Releases from Folsom Reservoir.

In the analysis of the WFP impacts, each of these projects is assumed to be in place in the future.

2.3.4 Process for Environmental Review and Adoption of the Water Forum Agreement

The environmental review process and the WFP process are taking place concurrently in a manner that allows the integration of public and agency comments into the planning process. The public and agency review of the Draft EIR and the stakeholders' review of the Agreement will provide comments that will be used in refining the WFP. As the CEQA Lead Agencies, the City and County of Sacramento each have the authority to certify the Final EIR. After Final EIR certification, the stakeholders of the Water Forum will be asked to approve the Agreement and agree to participate in its implementation. If the public agency stakeholders rely on the EIR in deciding whether to approve the Agreement they will act as Responsible Agencies under CEQA. The Agreement will be implemented by the Water Forum Successor Effort representing the stakeholders who adopt the proposal.

After approval of the Agreement by the Water Forum stakeholders, the Final EIR will be forwarded to other agencies for their consideration in connection with (1) their responsibilities as State Trustee Agencies, as defined by State CEQA Guidelines §15386 and/or (2) separate, subsequent actions potentially needed for the plan's implementation. State Trustee Agencies and other affected state agencies include: California Department of Water Resources (DWR), State Water Resources Control Board (SWRCB), State Lands Commission (S.C.), CDFG, California Department of Parks and Recreation, and State Historic Preservation Office (SHPO). Federal agencies which may have separate, subsequent actions related to the plan's implementation include the USBR, USFWS, NMFS, and U. S. Army Corps of Engineers (USACE). The Final EIR will provide program-level technical analysis which may support environmental review of implementation actions and their project-level environmental documents.

2.3.5 Approach for Environmental Analysis Recognizing Mitigating Features of the Water Forum Proposal

In reviewing the environmental impacts and mitigation measures described in this document, it is important to understand the context in which the WFP was developed. Because one of the Water Forum's coequal objectives is the preservation of the fishery, wildlife, recreational and aesthetic values of the Lower American River, the WFP is designed to minimize adverse environmental impacts to the extent feasible. The WFP contains seven elements, each integral

to the overall agreement. Element I, Increased Surface Water Diversions, provides for increased diversions from the Lower American River. The remaining six elements all, in one way or another, are intended to reduce the adverse impacts of those increased diversions. Therefore, the project itself reduces the impacts to the environment, through negotiated measures throughout the proposal.

For example, Element II, Actions to Meet Customers 'Needs While Reducing Diversion Impacts on the Lower American River in Drier Years, contains provisions by which purveyors agree to reduce their diversions from the Lower American River by specified levels in defined drier years. These actions include extraordinary conservation during the driest years beyond that included in Element V of the WFP. These cutbacks will decrease the severity of the adverse impacts to the river in drier years. These reduced levels of diversions are an integral part of the WFP, and the modeling of impacts in this EIR assumes these reductions. In addition, in defined "driest" years (also known as "conference years"), the WFP signatories will meet and confer regarding diversions and river flows.

Similarly, Element III, Support for a Improved Pattern of Fishery Flow Releases From Folsom Reservoir, provides for the operation of Folsom in a manner that more closely matches the needs of anadromous fish, particularly fall run chinook salmon. One of the essential requirements of the WFP is that this improved flow standard be incorporated into the long-term management of Folsom and Nimbus Dams.

Element IV, the Habitat Management Element (HME), provides for Water Forum participation and funding of a multi-agency Habitat Management Program (HMP) for the Lower American River. The WFP supports habitat improvements and other ecosystem-enhancing projects for the river, which are to be contained in the Implementation Plan of the HMP, described in more detail in Appendix B to this EIR. The HME also includes commitments to fund projects to mitigate adverse recreational impacts of the WFP identified in this Draft EIR.

However, because the details of the Water Forum Successor Effort's Implementation Plan for the Habitat Management Program are still being worked out, this Draft EIR, in identifying the adverse impacts of the WFP, does *not* include the benefits of the habitat improvement components of the HMP.

It does, however, assume the implementation of an Improved Pattern of Fishery Flow Releases, the Folsom Dam Temperature Control Device, and Folsom Reservoir Optimal Cold Water Pool Management all of which are necessary for the WFP to be effective. Therefore, this EIR describes aspects of the proposed HMP that will provide additional benefit to the Lower American River beyond what is the basis of impact analysis of the EIR.

Element V, the Water Conservation Element of the WFP, commits purveyors to specified water conservation programs. The diversions identified in the WFP reflect the reduced demand resulting from these conservation programs.

Element VI, the Groundwater Management Element, includes conjunctive use programs that provide for storing water in the wet years so that groundwater can safely be used in dry years, conserving surface water supplies.

Several of the elements in the WFP would reduce impacts on, CVP and State Water Project (SWP) water deliveries, CVP hydropower generation, Shasta Reservoir, and Folsom Reservoir. These elements of the WFP include Water Conservation, Groundwater Management, and some of the Actions That Meet Customers 'Needs While Reducing Diversion Impacts on the Lower American River in Drier Years. The analysis on this Draft EIR reflects implementation of all of the elements.

Based on the State CEQA Guidelines, the impact assessment approach is focused on identifying potential impacts due to implementation of the WFP. It is important to note that there are numerous programs underway or planned to improve fishery conditions for Sacramento River Valley fisheries, particularly salmonid fisheries, including the AFRP of the CVPIA and the Ecosystem Restoration Program Plan of the CALFED Bay-Delta Program.

When implemented over the next several decades, these and other future programs are expected to improve fishery conditions. However, it is not possible at this time to quantify all the benefits of those programs. **This means that the quantitative analyses and impact determinations in the Water Forum Proposal EIR do not reflect anticipated benefits of those programs.**

The EIR identifies environmental impacts and additional mitigation measures, to further reduce adverse impacts, for consideration by the Water Forum stakeholders. As described below, certain impacts are considered significant and unavoidable.

2.3.6 Response to Impacts on the Sacramento River and the Bay-Delta

As discussed previously, the WFP already includes many provisions that would reduce impacts. These include potential aquatic impacts of increased diversions on the Sacramento River and the Bay-Delta. Even with these actions, unless additional water supplies are developed or diversions are reduced, there would still be remaining impacts on the Sacramento River and the Bay-Delta, especially under cumulative conditions, based on the scenario addressed in this EIR (refer to Table 2-3 and Chapter 6).

When purveyors in the American River watershed exercise area-of-origin water rights, it will reduce the amount of water available from Folsom Reservoir for use by USBR in meeting Sacramento River and Bay-Delta environmental and water delivery obligations. The USBR will have to operate its entire system, including Shasta and Folsom Reservoirs, differently in order to meet those obligations. Unless additional supplies are developed or diversions are reduced, this would result in impacts on the Sacramento River, above and below the American River, and the Bay-Delta.

The USBR will be involved in almost all of the diversion projects included in the WFP. In some cases the USBR needs to issue a contract for a new water supply. In other cases, it has to sign a Warren Act agreement or grant a right-of-way.

In order to take any of these actions, the USBR is required to consult with the resource agencies under Section 7 of the Endangered Species Act (ESA). In addition to Water Forum actions, the consultation will also cover the USBR's entire Operational Criteria and Plan (OCAP) for the CVP.

Under the ESA, the USBR is prohibited from taking any actions that will jeopardize the continued existence of threatened or endangered species. Resource agencies participate in the ESA process by developing biologic objectives for species listed or proposed for listing. Biological objectives serve as specific performance criteria which are included in the biological opinions under the ESA. The USBR is required by the ESA to operate the CVP in a way that meets the biologic objectives set for each species listed or proposed for listing.

Because resource agencies are in the process of developing these biological objectives, it is impossible to specify performance criteria at this time. That uncertainty is combined with uncertainty over the extent and effectiveness of several future actions to protect Sacramento River and Bay-Delta resources. Therefore, it is impossible at this time to formulate specific mitigation measures for Sacramento River or Bay-Delta aquatic impacts or to assign responsibility for the mitigation.

The Water Forum Proposal EIR is a Program EIR and it is recognized that individual projects included in the WFP will need to comply with CEQA and, where applicable, the National Environmental Policy Act (NEPA) and the state and federal Endangered Species Acts. Compliance with the state and federal Endangered Species Acts may result in diversion restrictions or other conditions beyond those that are included in the WFP.

2.4 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Table 2-1, beginning on page 2-13 contains a list of WFP impacts by issue. Table 2-2, beginning on page 2-16, contains a more detailed summary of environmental impacts identified in the EIR, mitigation measures, and level of significance after mitigation. Key impact conclusions are summarized below.

2.4.1 Lower American River and Folsom Reservoir Impacts

As described above, the WFP includes features that help preserve the values of the Lower American River, and also serve to reduce impacts on other resources, including Folsom Reservoir. These features, such as water conservation, dry-year diversion restrictions, revised pattern of releases for fisheries, and conjunctive use of surface and groundwater, reduce many environmental impacts of proposed diversions; however, they cannot entirely avoid significant

effects. The environmental analysis of the direct effect study area identified significant and potentially significant impacts within the Lower American River and Folsom Reservoir, including effects to certain fisheries recreational opportunities, and cultural resources.

Effects to fisheries include flow-related impacts to chinook salmon in the Lower American River which are proposed as threatened under the federal ESA. These impacts are considered potentially significant and mitigation is suggested as a part of the Habitat Mitigation Element. Potentially significant effects to Sacramento splittail of the Lower American River also occur.

In Folsom Reservoir, a potentially significant effect to warmwater fisheries is expected because of the reduction of littoral habitat and spawning success caused by more frequent declines in lake levels; mitigation measures to improve littoral habitat are identified. Coldwater fisheries in the reservoir are not significantly affected.

Effects to recreation opportunities include more frequent periods of inadequate recreation flows in the Lower American River during the summer which affects rafting and boating. In Folsom Reservoir, more frequent lake level declines result in significant impacts to boat ramp operations, use of marina wet slips, and opportunities for swimming at designated beaches.

The EIR also identifies adverse effects on cultural resources of Folsom Reservoir due varying water levels and increased cycles of inundation and exposure of cultural resources sites.

Potential mitigation is identified for each of these impacts. These and other impacts to the Lower American River and Folsom Reservoir identified in this EIR are presented in Tables 2-1 and 2-2.

2.4.2 Out-of-Area Impacts

The Draft EIR identifies that, under future (2030) conditions which include the WFP and other potential future system-wide actions (e.g., 2030 out-of-basin CVP/SWP demands, increased Sacramento Valley demands, and increased Trinity River flows), impacts outside the American River system would occur. These include impacts to water supply, water quality, and power supply.

The USBR may have to operate the CVP differently under a revised CVP-OCAP in the future when purveyors in the Water Forum exercise their water entitlements including water rights and CVP-contracted entitlements. DWR may also need to modify operation of the SWP, and, together with the USBR, may revise their Coordinated Operations Agreement (COA) in response to these changing conditions. The changed operation could affect their ability to meet their environmental and water supply obligations, including protection of the Sacramento River and Bay-Delta. For instance, deliveries to some CVP contractors, including some Water Forum purveyors, could be subject to greater and more frequent deficiencies being imposed by the USBR. It is also recognized that under some conditions, and depending on certain operational assumption, the analysis might indicate that there is an over-allocation of specific CVP resources.

CVP and SWP contractors north and south of the Delta would be affected to varying degrees. Modeling analysis of 2030 conditions with the WFP diversions showed reduced water available for delivery to municipal and industrial, and agricultural contractors north and south of the Delta, in some years and in varying magnitudes. Statutory and policy protections for the areas of origin, however, allow for implementation of the WFP (see Section 4.3, Water Supply). The assumptions on which these modeling results are based are explained in Appendix G.

Potentially significant impacts to Sacramento River and Delta water quality were also identified due to reduced flows in the Sacramento River in some years with implementation of the WFP. Reduced flows could cause seasonal elevations in river water temperatures and increased pollutant concentrations due to reduced dilution capacity.

Minor power supply impacts would also occur as a result of implementation of the WFP. Modeling indicates an overall reduction of less than 1% of annual average CVP energy production.

2.4.3 Water Service Study Area Impacts

Implementation of the WFP would not directly alter land uses in the water service study area. It would, however, allow water purveyors in the Sacramento region to provide a safe and reliable water supply for the region's planned development through the year 2030. Land use decisions would continue to be made by city and county government decision-makers. The WFP would accommodate substantial development, however, as it would remove water supply as an obstacle to growth. Therefore, the WFP is considered to be growth inducing in the water service study area, as defined by the State CEQA Guidelines.

This EIR cannot assess the precise impacts of the regional growth that may be facilitated by the WFP because of the many variables involved. With respect to land use designations already approved in adopted general plans, environmental analysis has already been completed in the general plan EIRs. Under the provisions of the State CEQA Guidelines (§15152[b]), the analysis in already certified general plan EIRs need not be repeated in a later EIR. For future development projects, more project-specific environmental review and analysis of impacts and mitigation measures will be required before such projects are approved.

Table 2-1 Water Forum Proposal Impact Summary	
Resource Category	**WFP Impact After Mitigation**
GROUNDWATER RESOURCES	
Groundwater Quality	LESS THAN SIGNIFICANT
Movement of Groundwater Contaminants	LESS THAN SIGNIFICANT
Land Subsidence	LESS THAN SIGNIFICANT
Efficiency of Wells	LESS THAN SIGNIFICANT
WATER SUPPLY	
Decrease in Deliveries to SWP Customers	SIGNIFICANT
Decrease in Deliveries to CVP Customers	SIGNIFICANT
WATER QUALITY	
Lower American River and Folsom Reservoir Water Quality	LESS THAN SIGNIFICANT
Sacramento River and Delta Water Quality	POTENTIALLY SIGNIFICANT
FISHERIES RESOURCES AND AQUATIC HABITAT	
Impacts to Folsom Reservoir's Coldwater Fisheries	LESS THAN SIGNIFICANT
Impacts to Folsom Reservoir's Warmwater Fisheries	POTENTIALLY SIGNIFICANT
Impacts to the Warmwater and Coldwater Fisheries of Lake Natoma	LESS THAN SIGNIFICANT
Temperature Impacts to Nimbus Fisheries Hatchery Operations and Fish Production	LESS THAN SIGNIFICANT
Fall-run Chinook Salmon	POTENTIALLY SIGNIFICANT
Lower American River Steelhead	LESS THAN SIGNIFICANT
Flow- and Temperature-Related Impacts to Splittail (February Through May)	POTENTIALLY SIGNIFICANT
Flow- and Temperature-Related Impacts to American Shad (May and June)	LESS THAN SIGNIFICANT
Flow- and Temperature-Related Impacts to the Striped Bass Sport Fishery (May and June)	LESS THAN SIGNIFICANT
Impacts to Shasta Reservoir's Coldwater Fisheries	LESS THAN SIGNIFICANT
Impacts to Trinity Reservoir's Coldwater Fisheries	LESS THAN SIGNIFICANT
Impacts to Shasta Reservoir's Warmwater Fisheries	LESS THAN SIGNIFICANT
Impacts to Trinity Reservoir's Warmwater Fisheries	LESS THAN SIGNIFICANT
Impacts to Keswick Reservoir Fisheries	LESS THAN SIGNIFICANT
Flow-related Impacts to Sacramento River Fisheries	LESS THAN SIGNIFICANT
Temperature-Related Impacts to Sacramento River Fisheries Resources	LESS THAN SIGNIFICANT
Delta Fish Populations	LESS THAN SIGNIFICANT

Table 2-1 Water Forum Proposal Impact Summary	
Resource Category	**WFP Impact After Mitigation**
FLOOD CONTROL	
Ability to Meet Flood Control Diagrams of CVP/SWP Reservoirs	LESS THAN SIGNIFICANT
Increased Stress on Lower American River Flood Control Structures	LESS THAN SIGNIFICANT
Increased Exposure to Flood Hazards	LESS THAN SIGNIFICANT
Substantial Change in Floodplain Characteristics	LESS THAN SIGNIFICANT
Changes in River Channel Geometry or Gradients Leading to Changes in Bank Erosion, Aggradation, Segradation, or Meander Processes	LESS THAN SIGNIFICANT
HYDROPOWER SUPPLY	
CVP Hydropower Capacity and Generation	LESS THAN SIGNIFICANT
Increased Energy Requirements for Diverters Pumping From Folsom Reservoir	LESS THAN SIGNIFICANT (ECONOMICALLY SIGNIFICANT)
VEGETATION AND WILDLIFE	
Lower American River Riparian Vegetation	LESS THAN SIGNIFICANT
Lower American River Backwater Ponds	LESS THAN SIGNIFICANT
Vegetation Associated With Reservoirs	LESS THAN SIGNIFICANT
Vegetation Associated With the Upper Sacramento River	LESS THAN SIGNIFICANT
Vegetation Associated With the Lower Sacramento and the Delta	LESS THAN SIGNIFICANT
Special-Status Species of Riparian and Open Water Habitats	LESS THAN SIGNIFICANT
Special-Status Species Dependent on Lower American River Backwater Pond/Marsh Habitats	LESS THAN SIGNIFICANT
Elderberry Shrubs and Valley Elderberry Longhorn Beetle	LESS THAN SIGNIFICANT
Sacramento-San Joaquin Delta Habitats of Special-Status Species (Non-fish)	LESS THAN SIGNIFICANT
RECREATION	
Reduced Rafting and Boating Opportunities on the Lower American River	SIGNIFICANT
Lake Natoma Recreation Opportunities	LESS THAN SIGNIFICANT
Reduced Folsom Reservoir Boating Opportunities	SIGNIFICANT
Reduced Availability of Folsom Reservoir Swimming Beaches	SIGNIFICANT
Shasta Lake Recreational Opportunities	LESS THAN SIGNIFICANT
Trinity Reservoir Recreation Opportunities	LESS THAN SIGNIFICANT
Recreation Opportunities on Whiskeytown and Keswick Reservoirs	LESS THAN SIGNIFICANT
Recreation Impacts on the Upper Sacramento River	LESS THAN SIGNIFICANT

Table 2-1 Water Forum Proposal Impact Summary	
Resource Category	**WFP Impact After Mitigation**
Lower Sacramento River Recreation Opportunities	LESS THAN SIGNIFICANT
Delta Recreation Opportunities	LESS THAN SIGNIFICANT
Consistency With the American River Parkway Plan	LESS THAN SIGNIFICANT
Consistency With the Lower American River's Recreational River Designations	LESS THAN SIGNIFICANT
LAND USE AND GROWTH-INDUCING IMPACTS	
Land Use Impacts on Direct and Indirect Effect Study Areas	LESS THAN SIGNIFICANT
Land Use and Growth-Inducing Impact in the Water Service Study Area	SIGNIFICANT
Consistency With General Plan	LESS THAN SIGNIFICANT
Consistency With General Plan Water Supply and Conservation Policies	LESS THAN SIGNIFICANT
AESTHETICS	
Aesthetic Value of the Lower American River	LESS THAN SIGNIFICANT
Aesthetic Value of the Upper Sacramento River, Lower Sacramento River, and Sacramento-San Joaquin Delta	LESS THAN SIGNIFICANT
Aesthetic Value of Lake Natoma, Whiskeytown, and Keswick Reservoirs	LESS THAN SIGNIFICANT
Aesthetic Value of Folsom Reservoir	LESS THAN SIGNIFICANT
Aesthetic Value of Trinity and Shasta Reservoirs	LESS THAN SIGNIFICANT
CULTURAL RESOURCES	
Effect of Varying Water Levels on Cultural Resources in Folsom Reservoir	SIGNIFICANT
Effect of Varying Flows/River Stage on Cultural Resources Along the Lower American River Bank Near Nimbus Dam	LESS THAN SIGNIFICANT
Effect of Varying Flows/River Stage on Cultural Resources Along the Lower American River Bank Near the Mouth	LESS THAN SIGNIFICANT
Effect of Varying Flows/River Stage on Cultural Resources Along the Lower American River Bank Near Freeport	LESS THAN SIGNIFICANT
SOILS AND GEOLOGY	
Changes in Geologic Substructures	LESS THAN SIGNIFICANT
Exposure to Major Geologic Hazards	LESS THAN SIGNIFICANT
Increased Soil Erosion by Wind or Water	LESS THAN SIGNIFICANT
Loss of Soil Cover	LESS THAN SIGNIFICANT

Table 2-2
SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
GROUNDWATER (Section 4.2)		
4.2-1: Groundwater Quality. Further lowering of groundwater levels is anticipated to occur until the elevation of the groundwater table would stabilize under the groundwater yield recommendations of the WFP. This lowering may result in continued deterioration of groundwater quality in the South Sacramento and Galt areas due to up-rising of poorer quality water from the lower aquifer zone. In the future, elevated manganese and iron levels may occur in groundwater but at levels that would represent an aesthetic, rather than health-related impact. Continued treatment of manganese and iron is expected for municipal wells in the future. Additionally, arsenic levels are not anticipated to exceed current Title 22 standards, and those for radon have yet to be established. This would be considered a less-than-significant impact.	No mitigation measures are required.	**less-than-significant**
4.2-2: Movement of Groundwater Contaminants. Further lowering of the groundwater levels is anticipated to occur until the elevation of the groundwater table would stabilize under the groundwater yield recommendations of the WFP. This lowering would result in no substantial increase in the rate of groundwater contaminant movement. This is a less-than-significant impact because of the small magnitude of increase expected and because the contaminated sites are currently undergoing remediation.	No mitigation measures are required.	**less-than-significant**
4.2-3: Land Subsidence. Further lowering of groundwater levels is anticipated to occur until the elevation of the groundwater table would stabilize under the groundwater yield recommendations of the WFP. This lowering of groundwater levels is unlikely to result in substantial land subsidence. Historical data on subsidence in relation to past groundwater decline indicate that the area is not susceptible to substantial land subsidence given the anticipated level of groundwater level decline in the future. The range of land	No mitigation measures are required.	**less-than-significant**

Table 2-2
SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
subsidence estimated to occur with the projected groundwater decline is 0.13 to 0.35 feet, and would occur over the course of several decades. Since no substantial land subsidence is expected to occur, this would be considered a less-than-significant impact.		
4.2-4: Efficiency of Wells. Further lowering of groundwater elevations is anticipated to occur until the elevation of the groundwater table stabilizes under the recommended sustainable yields of the WFP. This further lowering may result in reduced efficiency of existing groundwater wells due to the need to: 1) deepen many existing wells, and 2) increase pumping at deepened wells. This reduced efficiency, however, would translate into an economic, rather than environmental impact, as the volume of groundwater available and its quality are not anticipated to be substantially affected following well deepening or increased pumping. The economic effects would be the increased costs associated with the implementation of these actions. This is considered a less-than-significant impact.	No mitigation measures are required.	**less-than-significant**
WATER SUPPLY (Section 4.3)		
4.3-1: Decrease in Deliveries to SWP Customers. Implementation of the WFP could result in decreased water deliveries to SWP customers in 6 years of the 70-year record, ranging between 15 and 173 thousand acre-feet. This would represent a significant impact.	Development of additional water supplies by the SWP could reduce impacts to SWP deliveries.	**significant**
4.3-2: Decrease in Deliveries to CVP Customers. Implementation of WFP could result in a decrease in water deliveries to CVP customers in up to 27 years of the 70-year record, depending on the type of CVP contractor. This would represent a significant impact.	Development of additional water supplies by the CVP could reduce impacts to CVP deliveries.	**significant**

Table 2-2
SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
WATER QUALITY (Section 4.4)		
4.4-1: Seasonal Changes to Water Quality in Folsom Reservoir, Lake Natoma, and the Lower American River. Implementation of the WFP would directly result in seasonal reductions in Folsom Reservoir storage and Lower American River flows during most years, but would have little effect on the volume of water maintained in Lake Natoma. Volume reductions in Folsom Reservoir and the Lower American River would be expected to alter water temperatures and could increase concentrations/levels of nutrients, pathogens, TDS, TOC, turbidity, and/or priority pollutants due to reduced dilution capacity. With the exception of water temperature (see Section 4.5.3, Fisheries Resources and Aquatic Habitat, for a discussion of temperature impacts to these waterbodies), program-level assessment indicated that any direct impacts to water quality in these waterbodies resulting from seasonal reductions in Folsom Reservoir storage and/or Lower American River flows would be less than significant. No mitigation measures are required.	No mitigation measure are required.	**less-than-significant**
4.4-2: Seasonal Changes to Sacramento River and Delta Water Quality. Implementation of the WFP would result in seasonal reductions in Shasta Reservoir storage and Sacramento River flow during some years. Such hydrologic changes would be expected to cause seasonal elevations in river water temperatures in some years, and could increase concentrations/levels of nutrients, pathogens, TDS, TOC, turbidity, and/or priority pollutants in the Sacramento River due to reduced dilution capacity. Reduced river flows would reduce Delta inflow which, if sufficiently large, could alter various water quality parameters in portions of the Delta. With the possible exception of water temperature (see Section 4.5, Fisheries Resources and Aquatic Habitat, for a discussion of temperature impacts to the Sacramento River), program-level assessments indicated that any direct impacts to Sacramento River or Delta	Changes to Sacramento River and Delta water quality would be an indirect impact of increased urban development facilitated, in part, by the additional diversions of surface and groundwater defined in the WFP. Water quality mitigation measures will be developed for specific projects as they occur in the future. Responsibility for this mitigation lies with the land use planning authorities and individual project proponents, and is beyond the Water Forum's control. Water quality mitigation anticipated to occur with planned growth is addressed in the Sacramento County and other regional General Plans. In addition, the Sacramento County Regional Sanitation District, which operates the SRWTP, is currently updating its Sacramento Regional Wastewater Treatment	**potentially significant**

Table 2-2
SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
water quality, resulting from seasonal reductions in Sacramento River flow associated with the WFP, would be potentially significant.	Plan Master Plan, and plans to update this document every 5 years in the future.	
FISHERIES RESOURCES and AQUATIC HABITAT (Section 4.5)		
4.5-1: Impacts to Folsom Reservoir's Coldwater Fisheries. Additional diversions from Folsom Reservoir under the WFP would reduce reservoir storage by 10% or more, relative to the Base Condition, infrequently during the period April through August and occasionally during the period September through November. However, anticipated reductions in reservoir storage would not be expected to adversely affect the reservoir's coldwater fisheries because: 1) coldwater habitat would remain available within the reservoir during all months of all years; 2) physical habitat availability is not believed to be among the primary factors limiting coldwater fish populations; and 3) anticipated seasonal reductions in storage would not be expected to adversely affect the primary prey species utilized by coldwater fishes. This would be a less-than-significant impact.	No mitigation measures are required.	**less-than-significant**
4.5-2: Impacts to Folsom Reservoir's Warmwater Fisheries. Additional diversions from Folsom Reservoir under the WFP would frequently reduce reservoir storage (and thus water levels) during the critical spawning and rearing period (i.e., March through September), which could reduce the availability of littoral (nearshore) habitat containing vegetation. Modeling output indicates that long-term average reductions in littoral habitat availability of up to 34% could occur in September. Average reductions in littoral habitat availability of this magnitude could result in increased predation on young-of-the-year warmwater fishes, thereby reducing initial year-class strength of warmwater fishes in many years. Unless willows and other nearshore vegetation	Through plantings and related activities, encourage existing willow and other terrestrial vegetative communities to become established at lower reservoir elevations. Doing so would provide greater availability of physical structure for warmwater fish spawning and rearing in the future when spring reservoir elevations are lower than under current conditions. Artificial habitat structures (e.g., artificial synthetic structures, submerged brush and debris, fish cribs, etc.) would provide structure in littoral habitats used by warmwater fishes for spawning and early lifestage rearing. Because the majority	**potentially significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
become established at lower reservoir elevations in the future in response to seasonal reductions in water levels, population declines for largemouth bass and other warmwater species could be expected to occur. Reduced littoral habitat availability would be a potentially significant impact to Folsom Reservoir warmwater fisheries.	of the reservoir's warmwater fishes spawn in shallow water habitats (i.e., generally less than 10 feet deep), artificial structures would be placed at reservoir elevations that would likely be used by these fishes for spawning and rearing. The location and number of artificial structures placed within the reservoir would increase in proportion to the loss of littoral habitat over time. Implementing habitat structures would help minimize the effects to Folsom Reservoir's warmwater fisheries that would be expected to result from increased diversions and resultant reduced water surface elevations in Folsom Reservoir. While acknowledging operational constraints due to flood control, power production and diversions, work cooperatively with USBR operators to minimize the frequency with which reservoir elevation changes potentially resulting in nest flooding/dewatering events would occur. Monthly/weekly rates of reservoir elevation change will be documented. This information will be compared to timing and average depth of spawning for key nest-building warmwater species in Folsom Reservoir to estimate probabilities of nest flooding/dewatering events. This measure will be implemented to the degree reasonable and feasible based on its integration into the Habitat Management Program. Place artificial structures in the reservoir to compensate for loss of littoral habitats containing natural structure (e.g., inundated willows). The abundance of representative warmwater species will be monitored periodically through creel surveys and/or through catch-per-unit effort (CPUE) rates for tournament anglers to determine the extent to which warmwater fish utilize the structures. The extent to which	

Table 2-2
SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	this mitigation is to be implemented will be based on the results of these surveys. Frequency and timing of potential nest flooding/dewatering events that facilitate meeting current and future warmwater fish management goals will be determined by CDFG reservoir biologists. More specific performance criteria will be developed in the Habitat Management Program Plan. All three activities described above would, to the degree reasonable and feasible, be implemented, monitored, and maintained throughout the effective period of the Water Forum Agreement	
4.5-3: Impacts to The Warmwater and Coldwater Fisheries of Lake Natoma. Operations of Folsom Dam and Reservoir under the WFP would have minimal, if any, impact to Lake Natoma's seasonal storage, rates of elevation fluctuation, or temperature. Any changes to these lake parameters that could occur under the WFP would be expected to be minor and, therefore, would not adversely affect the lake's warmwater or coldwater fisheries. This would be a less-than-significant impact.	No mitigation measures are required.	**less-than-significant**
4.5-4: Temperature Impacts to Nimbus Fish Hatchery Operations and Fish Production. Operations of Folsom Dam and Reservoir under the WFP would generally have little effect on May temperatures below Nimbus Dam, and would typically result in equivalent or colder temperatures during the June through September period, relative to the Base Condition. Improved water temperatures would result from a Folsom Dam urban water intake structure temperature control device, and optimal coldwater pool management. On a long-term basis, the frequent and substantial temperature reductions that would occur during the June through September period (when hatchery temperatures reach seasonal highs annually) would more than offset the less frequent adverse	No mitigation measures are required.	**less-than-significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
impacts that would occur in some years. This would potentially benefit hatchery operations and resultant fish production in most years. Overall, this would be a less-than-significant impact.		
4.5-5: Fall-run Chinook Salmon. Operations of Folsom Dam and Reservoir under the WFP would result in periods of reduced flows in the lower American River during the October through December spawning period, when flows under the Base Condition would be 2,500 cfs or less. Further flow reductions occurring at already low flow levels could result in increased redd superimposition and eventual lower year-class strength. Improved water temperatures (resulting from a Folsom Dam urban water intake structure temperature control device and optimal coldwater pool management) and improved early life-stage survival, will benefit chinook salmon spawning success, as well as other life-stages. However, because of the broad, programmatic nature of the WFP, the extent to which these actions (combined with other future actions such as spawning gravel management, revised flow ramping rate criteria, etc.) will interact to counterbalance flow reductions is uncertain, as is the manner in which these actions will be implemented, managed, and coordinated. Consequently, the overall effects of the WFP on chinook salmon year-class strength also is uncertain, and therefore, is considered to represent a potentially significant impact.	The following actions would be implemented as part of the HME, which will be adopted as an integral component of the Water Forum Agreement. a) Dry Year Flow Augmentation. The Water Forum Successor Effort and the USBR would work together with Placer County Water Agency (PCWA) and the USFWS to augment Lower American River flows, particularly during the spawning period during years when impacts would occur. This measure would be implemented (within the constraints of water availability) during dry and critically dry years. The primary source of water for augmenting flows would be the purchase of American River water from upstream reservoirs operated by PCWA. b) Flow Fluctuation Criteria. Develop and implement flow fluctuation (i.e., ramping) criteria for the operation of Folsom and Nimbus dams that would reduce the frequency with which rapid flow fluctuations occur in the river. Reducing the occurrence of large, rapid flow reductions would help to minimize losses of chinook salmon due to redd dewatering (fall and winter) and fry and juvenile stranding (winter and spring), especially during periods of low flow. Flow fluctuation criteria would contribute to improving spawning and incubation success, which, in turn, would lead to an overall increase in annual production of chinook salmon. This action would off-set, in part, potential flow-related impacts to chinook salmon.	**potentially significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	c) Wetland/Slough Complex Restoration/Maintenance. Restore wetland/slough complexes occurring within habitat transitional zones between river channels, shoreline, and upland habitats. Restoration would involve grading areas for the appropriate elevations and hydrology, as well as planting appropriate vegetation, to achieve desired habitat characteristics. Because wetland/slough complexes are used by juvenile chinook salmon for rearing prior to emigration, restoration and maintenance of these complexes would increase the quantity, and possibly the quality, of rearing habitat available to juvenile chinook salmon. Thus, this action could improve juvenile rearing success prior to emigration, thereby contributing to an overall increase in annual production of chinook salmon. This action would off-set, in part, potential temperature-related impacts to juvenile steelhead. d) Instream Cover (woody debris). Most large woody debris has been, and continues to be, removed from the Lower American River by the U.S. Army Corps of Engineers to reduce potential hazards to recreationists. Discontinuation of this action in select reaches of the river would allow woody debris to accumulate. Instream woody cover is important for juvenile chinook salmon rearing as it provides structure that can be utilized to escape fish and avian predators. It also provides microhabitats with reduced current velocities where juvenile chinook salmon can feed more effectively. Increasing the amount of instream woody debris at specific sites could improve juvenile rearing success prior to emigration, thereby contributing to an overall increase in annual production. This action would off-set, in part, potential flow-related impacts to juvenile chinook salmon.	

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	e) Shaded Riverine Aquatic Habitat Protection/Management. SRA habitat can be restored along the Lower American River by constructing terraces along shorelines and planting terraces with appropriate herbaceous and woody vegetation. SRA habitat provides feeding and holding areas, escape cover, and local temperature refugia for juvenile chinook salmon. Development and implementation of a shaded riverine aquatic habitat protection/management program would facilitate improving rearing habitat. Thus, protecting and restoring SRA habitat could improve juvenile rearing success, thereby contributing to an overall increase in annual production. This action would off-set, in part, potential flow-related impacts to juvenile chinook salmon. f) Spawning Habitat Management/Maintenance. Improve spawning habitat in the Lower American River by breaking up and redistributing coarse subsurface deposits and reducing compaction and embeddedness which reduces gravel permeability. Development and implementation of a gravel management program for the Lower American River would facilitate improving spawning habitat for chinook salmon and reducing the deterioration of existing spawning gravel. This habitat improvement would be expected to increase the amount of available spawning habitat, thereby contributing to higher overall spawning and incubation success, and therefore chinook salmon production, annually. This action would off-set, in part, flow-related impacts to juvenile chinook salmon. Performance Criteria: a) Dry Year Flow Augmentation. Increase flows particularly during the period during dry and critically dry years to the maximum extent feasible, relative to non-augmented conditions. To assess whether flow augmentation is reducing	

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	flow-related impacts, flows would be monitored in the Lower American River. b) Flow Fluctuation Criteria. Reduce the frequency of large, rapid flow-reduction events throughout the year, particularly during the fall spawning and incubation period. c) Wetland/Slough Complex Restoration/Maintenance. Increase the amount of wetland/slough complex habitat in the Lower American River that is used by early life stages of chinook salmon for rearing prior to emigration. d) Instream Cover (woody debris). Increase the amount of woody debris within areas of the Lower American River channel that is used by early life stages of chinook salmon for rearing prior to emigration. e) Shaded Riverine Aquatic Habitat Protection/Management. Protect existing, and increase to the extent feasible, the amount of shaded riverine aquatic habitat within the Lower American River. f) Spawning Habitat Management. Restore armored gravels to conditions that will encourage chinook salmon to use restored areas for spawning. Timing: a) Dry Year Flow Augmentation. Flow augmentation would occur during the spawning period October through December, during dry and critically dry years. This measure would be implemented, as necessary, throughout the effective period of the Water Forum Agreement.	

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SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	b) Flow Fluctuation Criteria. Flow fluctuation criteria would be developed and implemented for the effective period of the Water Forum Agreement. c) Wetland/Slough Complex Restoration/Maintenance. Wetland/Slough complex restoration/management would be conducted throughout the effective period of the Water Forum Agreement, as warranted by the success of initial projects to be initiated during the first two years of the Agreement. d) Instream Cover (woody debris). Instream cover (woody debris) would be allowed to accumulate in the Lower American River throughout the effective period of the Water Forum Agreement. e) Shaded Riverine Aquatic Habitat Protection/Management. Shaded riverine aquatic habitat protection/management would be conducted throughout the effective period of the Water Forum Agreement, as warranted by the success of initial projects to be implemented within the first two years of the Agreement. f) Spawning Habitat Management. Spawning habitat management would be conducted throughout the effective period of the Water Forum Agreement.	
4.5-6: Lower American River Steelhead. Operations of Folsom Dam and Reservoir under the WFP would, on a long-term average basis, measurably reduce river temperatures during all months of the June through September rearing period. Reductions in the 69-year average temperature at Watt Avenue of 0.5EF would occur during June, August, and September, with a reduction of 0.8EF expected during July. This would provide significant thermal	No mitigation measures are required.	**less-than-significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
benefits to steelhead over-summering in the Lower American River during most years. Conversely, flow reductions of 20% or greater, when flows under the Base Condition would be at or below the maximum AFRP requirement for the month, would occur approximately 4% to 33% of the time during one or more months of the April through September period. Such flow reductions could reduce the quantity and/or quality of juvenile rearing habitat in some of these years. Because steelhead in the Lower American River are believed to be more limited by over-summering temperatures than flows, the frequent and substantial temperature reductions would be expected to offset the flow reductions, on a long-term basis. Consequently, the combined temperature and flow changes under the WFP would not be expected to adversely affect the long-term population trends of steelhead in the Lower American River. This would be a less-than-significant impact.		
4.5-7: Flow- and Temperature-Related Impacts to Splittail (February through May). Operations of Folsom Dam and Reservoir under the WFP would typically reduce, to some degree, the amount of riparian vegetation inundated between RM 8 and 9 (which serves as an index for the lower portion of the river) under the Base Condition. However, with few exceptions, substantial amounts of inundated riparian vegetation would remain under the WFP in years when such habitat would occur under the Base Condition. In addition, flow changes under the WFP would have little effect on the availability of in-channel spawning habitat availability, or the amount of potential spawning habitat available from the mouth up to RM 5 - the reach of the river influenced by Sacramento River stage. Also, the frequency with which suitable temperatures for splittail spawning below Watt Avenue would not change substantially under the WFP, relative to the Base Condition. Given the uncertainty as to the magnitude and extent of splittail spawning in the Lower American River, and the actual amount of potential spawning habitat a specific flow rates	The following actions would be implemented as part of the HME, which will be adopted as an integral component of the Water Forum Agreement. a) Wetland/Slough Complex Restoration/Maintenance. Restore wetland/slough complexes occurring within habitat transitional zones between river channels, shoreline, and upland habitats. Restoration would involve grading areas for the appropriate elevations and hydrology, as well as planting appropriate vegetation, to achieve desired habitat characteristics. Because wetland/slough complexes are used by splittail for spawning, restoration and maintenance of these complexes would increase the quantity, and possibly the quality, of spawning habitat available to splittail. Wetland/slough complex restoration/maintenance would reduce flow-related impacts to splittail spawning.	**potentially significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
throughout the river, the effects of flow reductions from the February through May period also are uncertain and, therefore, represent a potentially significant impact.	b) Shaded Riverine Aquatic Habitat Protection/Management. SRA habitat can be restored along the Lower American River by constructing terraces along shorelines and planting terraces with appropriate herbaceous and woody vegetation. SRA habitat provides spawning and rearing areas for splittail. Development and implementation of a shaded riverine aquatic habitat protection/management program would facilitate increasing splittail spawning and rearing habitat availability within the Lower American River. Thus, protecting and restoring SRA habitat could improve splittail spawning and juvenile rearing success, thereby contributing to an overall increase in annual production of splittail. This action would off-set, in part, potential flow-related impacts to splittail. c) Flow Fluctuation Criteria. Develop and implement flow fluctuation (i.e., ramping) criteria for the operation of Folsom and Nimbus dams that would reduce the frequency with which rapid flow fluctuations occur in the river. Reducing the occurrence of large, rapid flow reductions would help to minimize losses of splittail due to fry and juvenile stranding during the February through May period. Flow fluctuation criteria would contribute to improving early life-stage rearing success, thereby contributing to an overall increase in annual production of splittail. This action would off-set, in part, potential flow-related impacts to splittail. Performance Criteria: a) Wetland/Slough Complex Restoration/Maintenance. Increase the amount of wetland/slough complex habitat in the Lower American River that is used by splittail for spawning and rearing.	

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	b) Shaded Riverine Aquatic Habitat Protection/Management. Protect existing, and increase to the extent feasible, the amount of shaded riverine aquatic habitat within the Lower American River. c) Flow Fluctuation Criteria. Develop and implement flow fluctuation (i.e., ramping) criteria for the operation of Folsom and Nimbus dams that would reduce the frequency with which rapid flow fluctuations occur in the river. Reducing the occurrence of large, rapid flow reductions would help to minimize losses of splittail due to fry and juvenile stranding during the February through May period. Flow fluctuation criteria would contribute to improving early life-stage rearing success, thereby contributing to an overall increase in annual production of splittail. This action would off-set, in part, potential flow-related impacts to splittail.	
4.5-8: Flow- and Temperature-Related Impacts to American Shad (May and June). Operations of Folsom Dam and Reservoir under the WFP would increase the frequency with which mean monthly flows at the mouth would be below the target attraction flow of 3,000 cfs by 3% in May and 4% in June. Because American shad spawn opportunistically where suitable conditions are found, potentially attracting fewer adult spawners into the Lower American River in a few years would not be expected to adversely impact annual American shad production within the Sacramento River system. Flow reductions under the WFP in May and June could reduce the number of adult shad attracted into the river during some years. Because annual production of American shad within the Sacramento River system would not be affected, and because direct impacts to the Lower American River sport fishery would be less than substantial in most years, any flow-related impacts to American shad are considered to be less than significant. In addition, because the frequency with which suitable	No mitigation measures are required.	**less-than-significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
temperatures for American shad spawning would not differ substantially between the WFP and the Base Condition, and because river temperatures under the WFP would nearly always remain suitable for American shad rearing, temperature-related impacts to American shad also are considered to be less than significant. Overall, this would be a less-than-significant impact.		
4.5-9: Flow- and Temperature-Related Impacts to the Striped Bass Sport Fishery (May and June). Operations of Folsom Dam and Reservoir under the WFP would increase the frequency with which mean monthly flows at the mouth would be below the target flow of 1,500 cfs by 1% in May and 10% in June. Because flows at the mouth that are believed to be sufficient to maintain the striped bass fishery would be met or exceeded in most years during both May and June, and because substantial changes in the strength of the striped bass fishery would not be expected to occur in all years when mean May and/or June flows fall below 1,500 cfs, flow-related impacts to the striped bass fishery that could potentially occur under the WFP are considered to be less than significant. In addition, because the frequency with which suitable temperatures for juvenile striped bass rearing in the Lower American River would differ little between the WFP and the Base Condition during May and June, temperature-related impacts to juvenile striped bass rearing are also considered to be less than significant.	No mitigation measures are required.	**less-than-significant**
4.5-10: Impacts to Shasta Reservoir's Coldwater Fisheries. Hydrologic conditions with the WFP would not result in substantial reductions in reservoir storage throughout the April through November period of the year. Because changes to Shasta Reservoir storage would not be substantial, because physical habitat availability is not believed to be among the primary factors limiting coldwater fish populations within the reservoir, and because anticipated changes in seasonal storage would not be expected to result in substantial adverse effects on the primary prey base utilized	No mitigation measures are required.	**less-than-significant**

Table 2-2
SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
by the reservoir's coldwater fish populations, seasonal reductions in storage expected to occur under WFP would have less-than-significant impacts to Shasta Reservoir's coldwater fisheries.		
4.5-11: Impacts to Trinity Reservoir's Coldwater Fisheries. Hydrologic conditions with the WFP would not result in substantial reductions in reservoir storage throughout the April through November period of the year. Because changes to Trinity Reservoir storage would not be substantial, because physical habitat availability is not believed to be among the primary factors limiting coldwater fish populations within the reservoir, and because anticipated changes in seasonal storage would not be expected to result in substantial adverse effects on the primary prey base utilized by the reservoir's coldwater fish populations, seasonal reductions in storage expected to occur under WFP would have less-than-significant impacts to Trinity Reservoir's coldwater fisheries.	No mitigation measures are required.	**less-than-significant**
4.5-12: Impacts to Shasta Reservoir's Warmwater Fisheries. Seasonal changes in reservoir surface elevation under the WFP could result in substantial reductions in reservoir littoral habitat availability in a few years during the period March through September. However, seasonal changes in reservoir surface elevation under the WFP would generally not result in substantial reductions in long-term average reservoir littoral habitat availability during the period March through September (which are the primary spawning and initial rearing months for the reservoir's warmwater fishes of management concern). Thus, these reductions would not be of sufficient magnitude to substantially reduce long-term, average initial year-class strength of the warmwater fish populations of management concern. Consequently, seasonal reductions in littoral habitat availability would constitute a less-than-significant impact to Shasta Reservoir's warmwater	No mitigation measures are required.	**less-than-significant**

Table 2-2
SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
Fisheries. Because the frequency with which potential nest dewatering events could occur in Shasta Reservoir under the WFP would not change during any month of the March through July warmwater fish spawning period, impacts to warmwater fish nesting success under the WFP are considered to be less than significant Overall, this would constitute a less-than-significant impact.		
4.5-13: Impacts to Trinity Reservoir's Warmwater Fisheries. Under the WFP, substantial reductions in littoral habitat availability would occur infrequently throughout the March through September period. Similarly, the potential for nest dewatering events to occur in Trinity Reservoir would not change under the WFP during the March through July spawning period. Thus, additional surface water diversions under the WFP would result in less-than-significant impacts to the spawning and initial rearing success of Trinity Reservoir's nest-building, warmwater fishes. Based on these findings, implementation of the WFP would result in less-than-significant impacts to Trinity Reservoir warmwater fisheries.	No mitigation measures are required.	**less-than-significant**
4.5-14: Impacts to Keswick Reservoir Fisheries. Hydrologic conditions with the WFP would have little, if any, effect on seasonal storage, elevation, and temperature of Keswick Reservoir. Any minor changes in storage, elevation, or temperature that could occur would constitute a less-than-significant impact to Keswick Reservoir fishery resources.	No mitigation measures are required.	**less-than-significant**
4.5-15: Flow-Related Impacts to Sacramento River Fisheries. Flow reductions of more than 20% would not occur during any month under the WFP, relative to the Base Condition. Measurable reductions in the 70-year average flows released from Keswick Dam would not occur during any month of the year. In addition, flows released from Keswick Dam would never be below the 3,250 cfs minimum stipulated in the NMFS Biological Opinion for	No mitigation measures are required.	**less-than-significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
winter-run chinook salmon during the period October through March under the WFP. These findings indicate that flow changes below Keswick Dam that would occur under the WFP would result in less-than-significant impacts to upper Sacramento River fisheries resources. Under the WFP, substantial reductions in lower Sacramento River Flows at Freeport would occur infrequently during all months of the year. Consequently, any flow-related impacts to lower Sacramento River fisheries or migrating anadromous fishes that could occur under WFP are considered to be less than significant. Overall, this constitutes a less-than-significant impact.		
4.5-16: Temperature-Related Impacts to Sacramento River Fisheries Resources. Hydrologic conditions with the WFP would not result in substantial changes to the 69-year average temperature at Keswick Dam or Bend Bridge for any month of the year. Their would also be no change in the number of years exceeding 56EF at Keswick Dam under the WFP during the April through September period. Conversely, increases in water temperatures would result in temperatures at Bend Bridge to exceed 56EF in one additional year during September. However, there would be no change in winter-run chinook salmon early lifestage survival during this year. In addition, their would be no substantial decreases in annual early lifestage survival of fall-run, late fall-run, winter-run, or spring-run chinook salmon in any individual year under the WFP, relative to that under the Base Condition. Therefore, the temperature changes that would occur would not be expected to result in substantial adverse impacts to chinook salmon, or other fish species using the upper Sacramento River. Temperatures in the lower Sacramento River would not be expected to change substantially under the WFP. The number of years that mean monthly temperatures at this location would exceed 56EF, 60EF, and 70EF would be similar under the WFP and the Base Condition during the period March through November.	No mitigation measures are required.	**less-than-significant**

Table 2-2
SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
Thus, potential impacts to fish species within the lower Sacramento River would be considered less than significant. Overall, this would be considered a less-than-significant impact.		
4.5-17: Delta Fish Populations. Under the WFP, substantial reductions in Delta outflow would occur infrequently during the February through June period. Likewise, under the WFP, substantial upstream shifts in the mean monthly position of X2 also would occur infrequently during this period. Finally, Delta export to inflow ratios under the WFP would not exceed the maximum export limits for either the February through June (35% of Delta inflow) or the July through January periods (65% of Delta inflow). Overall this is considered to be a less-than-significant impact to Delta fish populations.	No mitigation measures are required.	**less-than-significant**
FLOOD CONTROL (Section 4.6)		
4.6-1: Ability to Meet Flood Control Diagrams of CVP/SWP Reservoirs. The USBR is obligated to meet the flood control diagram for Folsom and Shasta reservoirs and the Department of Water Resources (DWR) has the similar responsibility for Oroville Reservoir. Any reduction in the ability of either the USBR or DWR to meet their flood control obligations for these reservoirs would constitute a significant impact. Since implementation of the Water Forum Proposal would increase water diversions from Folsom Reservoir, thereby allowing Folsom Reservoir to start the flood control season with less water in storage than under existing conditions, and since the integrated nature of CVP/SWP operations would also result in lowered reservoir storage in Shasta and Oroville reservoirs, none of the flood control diagrams for these reservoirs would be compromised. This is considered to represent a less-than-significant impact.	No mitigation measures are required.	**less-than-significant**

Table 2-2
SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
4.6-2: Increased Stress on Lower American River Flood Control Structures. Increased releases from Nimbus Dam and hence, flows in the Lower American River, during the flood control season could affect the stability of flood control structures on the Lower American River. Higher flows could increase stress on levees and other flood control structures. However, under the Water Forum Proposal, 70-year average mean monthly flows would always be lower than the Base Condition. Therefore, downstream structures on the Lower American River would remain unaffected. This is a less than significant impact.	No mitigation measures are required.	**less-than-significant**
4.6-3: Increased Exposure to Flood Hazards. Implementation of the Water Forum Proposal would not compromise the flood protection provided by Folsom Dam or structures along the Lower American River. Future projects, undertaken by Water Forum stakeholders, and their associated construction activities, may, however, affect local flood control efforts and/or structures. New projects having the potential to affect flood control structures will have to conduct flood control analysis and comply with flood control regulations before approval. Since these future projects are not part of the Water Forum Proposal, specific project-level analysis for flood control protection would be undertaken prior to their approval, and the fact that the flood control protection provided by Folsom Dam would not be compromised, increased exposure to flood hazards is considered to be a less-than-significant impact.	No mitigation measures are required.	**less-than-significant**
4.6-4: Substantial Change in Floodplain Characteristics. No specific construction activities are associated with the Water Forum Proposal, which would affect Sacramento or American River floodplain characteristics. Any new future projects requiring construction of facilities would be required to evaluate their specific and individual impacts on flood control in a project-level study. Since the Water Forum Proposal does not include implementation of specific projects, impacts to floodplain	No mitigation measures are required.	**less-than-significant**

Table 2-2
SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
characteristics as a result of the Water Forum Proposal are considered to be less than significant.		
4.6-5: Changes in River Channel Geometry or Gradients Leading to Changes in Bank Erosion, Aggradation, Segradation, or Meander Processes. While the Water Forum Proposal does not contain construction or improvement of instream structures, future projects might include such actions. These types of actions could ultimately affect the structural integrity of levees. Any such impacts would be addressed in future design plans and, therefore, are considered to represent a less-than-significant impact under the Water Forum Proposal.	No mitigation measures are required.	**less-than-significant**
POWER SUPPLY (Section 4.7)		
4.7-1: Reduced CVP Hydropower Capacity and Generation. Implementation of the WFP would not result in reduced capacity for use by WAPA's preference customers or reduce average annual surplus capacity available for WAPA's sale. Although under the WFP, WAPA's capacity peak maximum of 1,152 megawatts would not be met in 41 of the 828 months studied, the Base Condition would also fall short of the maximum in 42 of the 828 months. Implementation of the WFP would reduce average annual CVP energy production, however. With the WFP, an average annual reduction of 30 Gwh would occur, as compared to the Base Condition. This reduction when compared to the annual average CVP energy production of 3,650 Gwh is considered a less-than-significant impact.	No mitigation measures are required.	**less-than-significant**
4.7-2: Increased Energy Requirements for Diverters Pumping From Folsom Reservoir. Implementation of the WFP would result in changes in pumping requirements for those who pump water from Folsom Reservoir. Under the WFP, it is anticipated that an increase in average annual pumping energy would be required.	No mitigation measures are required.	**less than significant (economically significant)**

Table 2-2
SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
While this impact would be environmentally less than significant, it represents an economically significant impact.		
VEGETATION and WILDLIFE (Section 4.8)		
4.8-1: Lower American River Riparian Vegetation. Compared to existing conditions, the WFP would result in lower mean monthly flows below Nimbus Dam and at the H Street bridge during the critical growing season months of April through July; however, these flows would not be reduced with sufficient magnitude and frequency to significantly alter existing riparian vegetation dependent on flows in the Lower American River. Also, the higher flows needed for seed dispersal would occur with sufficient frequency to maintain the riparian forest community. For example, during a majority of the growing season months (April - July), flows would be above the minimum flow requirement of 1765 cfs between 61% and 83% of the time, depending on the month. Because WFP conditions would not result in the thinning of the riparian corridor, or the loss of valuable border zone vegetation and habitat, this impact would be considered less than significant.	No mitigation measures are required.	**less-than-significant**
4.8-2: Lower American River Backwater Ponds. Compared to existing conditions, the WFP would result in lower mean monthly flows below Nimbus Dam and the H Street bridge during the summer; however, these flows would not be reduced with sufficient magnitude and frequency to significantly alter existing backwater habitats dependent on the Lower American River flows. For example, the overall effects of the WFP would result in a greater number of years during the 70-year hydrologic record that flows are within the minimum/optimum range of 1,300 to 4,000 cfs (between 2 and 14 years, more often in the 70-year record between March and September, depending on the month). Because flows high enough to promote recharge of the ponds would continue during	No mitigation measures are required.	**less-than-significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
the winter and/or spring, this impact would be considered less than significant.		
4.8-3: Vegetation Associated with Reservoirs. Compared to existing conditions, the WFP would result in lower mean monthly flows and, in many years, lower surface water elevations of reservoirs; however, because the draw down zone is vegetated with non-native herbaceous plants and scattered willow shrubs that do not form a contiguous riparian community, are not considered of high wildlife value, and will likely reestablish as water levels fluctuate, important habitat values are not adversely affected. For these reasons, this impact would be considered less than significant.	No mitigation measures are required.	**less-than-significant**
4.8-4: Vegetation Associated with the Upper Sacramento River. Compared to existing conditions, the WFP would result in some years with higher and some years with lower mean monthly flows on the Upper Sacramento River during the spring and summer growing season for riparian vegetation; in years with lower flows, they would not be reduced by sufficient magnitude and frequency to significantly alter existing riparian vegetation dependent on the Upper Sacramento River flows. For example, spring and summer flows on the Upper Sacramento River, under WFP conditions, vary from base conditions by less than one percent. Consequently, this impact would be considered less than significant.	No mitigation measures are required.	**less-than-significant**
4.8-5: Vegetation Associated with the Lower Sacramento River and the Delta. Compared to existing conditions, Lower Sacramento River flows would be reduced during the growing season months of some years. However, in years with lower flows, they would not be reduced by sufficient magnitude and frequency to significantly alter existing riparian habitats dependent on the Lower Sacramento River flows and Delta inflows. For example, average decreases in mean monthly flows during the peak growing	No mitigation measures are required.	**less-than-significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
season (March-July) between the base and WFP conditions range from 159.9 cfs to 492.0 cfs. As it relates to riparian vegetation effects, these reductions in flow are not considered substantial. This impact would less than significant.		
4.8-6: Special-Status Species of Riparian and Open Water Habitats. As discussed in Impacts 4.8-1 and 4.8-5, when compared to existing conditions, the WFP would result in reduced mean monthly flows during certain periods in the year. However, these flows would not be reduced by sufficient magnitude and frequency to significantly alter existing riparian vegetation dependent on the Lower American River. Because cottonwood forest vegetation would not be adversely affected and open water (river) habitat would be available, the special-status species dependent on riparian habitat would not be expected to be adversely affected; therefore, this impact would be considered less than significant.	No mitigation measures are required.	**less-than-significant**
4.8-7: Special-Status Species Dependent on Lower American River Backwater Pond/Marsh Habitats. As discussed in Impact 4.8-2, when compared to existing conditions the WFP would result in reduced mean monthly flows during certain times of the year. However, these flows would not be reduced by sufficient magnitude and frequency to significantly alter existing backwater habitats dependent on the Lower American River. Because backwater habitats would not be adversely affected, the special-status species dependent on these habitats would not be expected to be adversely affected; therefore, this impact would be considered less than significant.	No mitigation measures are required.	**less-than-significant**
4.8-8: Elderberry Shrubs and Valley Elderberry Longhorn Beetle. As discussed in Impact 4.8-2 (backwater recharge), when compared to existing conditions the WFP would result in reduced mean monthly flows during certain months of the growing season. However, these flows would not be reduced by sufficient magnitude	No mitigation measures are required.	**less-than-significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
and frequency to significantly alter existing water fluctuations (pond levels) and vegetation dependent on these ponds. For these reasons, elderberries dependent on these habitats are not expected to be adversely affected. This impact would be considered less than significant.		
4.8-9: Sacramento-San Joaquin Delta Habitats of Special-Status Species (Non-Fish). As discussed in Impact 4.8-6, when compared to existing conditions the WFP would result in reduced mean monthly flows in the Sacramento River during certain times of the year. However, these flows would not be reduced by sufficient magnitude and frequency to significantly alter existing habitats dependent on the Delta. Because Delta habitats would not be adversely affected, the special-status species dependent on these habitats would not be expected to be adversely affected; therefore, this impact would be considered less than significant.	No mitigation measures are required.	**less-than-significant**
RECREATION (Section 4.9)		
4.9-1: Reduced Rafting and Boating Opportunities on the Lower American River. Compared to base conditions, additional diversions under the WFP would result in reduced summertime mean monthly flows below Nimbus Dam with a sufficient magnitude and frequency to diminish flows available for Lower American River rafting and boating during some high rafting and boating use months of the year (June, July, and September). For instance, in these months, flows would be within the minimum/maximum flow range for rafting and boating between 3 to 4 fewer years of the 70-year record. Reduced flows would result in a significant effect to rafting and boating opportunities on the Lower American River.	The WFP includes features intended to lessen potential environmental impacts to the American River, consistent with the coequal objective to protect its natural values. These mitigating features include water conservation, dry-year diversion restrictions, and conjunctive use of ground water and surface water. Adoption of the WFP with these features would reduce flow effects on Lower American River recreation opportunities. In addition, improvements to recreation facilities in the American River Parkway are identified to compensate for the reduction in quality of and opportunity for rafting/boating on the Lower American River. Actions would occur in cooperation with the Sacramento County Department of Parks and Recreation and could include one or both of the following: (A) contributing to the purchase and development of the Uruttia property to provide	**significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	water-dependent recreation opportunities and (B) developing recreation facilities to improve water-dependent and water-enhanced recreation opportunities in the American River Parkway. The improvements would involve projects that are consistent with the American River Parkway Plan, or that would be implemented subject to an amendment to the parkway plan by Sacramento County. The measures described below could be implemented in cooperation with the Sacramento County Department of Parks and Recreation, the agency responsible for implementing the American River Parkway Plan. The measures could be part of the Habitat Management Plan adopted by the Water Forum participants as an implementation tool for the Habitat Management Element of the Water Forum Proposal. Funding for the recreation measures may include money from within or outside the Water Forum Successor Effort. Because activities by a number of agencies are underway to restore and enhance the Lower American River, this recreation mitigation should be coordinated with the broader ecosystem partnership efforts. Other agencies involved in the Lower American River may participate in funding and/or implementation of recreation mitigation, as appropriate, to promote a well-coordinated program of restoration and enhancement of the river. a) Uruttia Property. The Uruttia Property, located on the north side of the Lower American River near CalExpo, could be acquired and/or developed to provide public access, opportunities for water-dependent recreation activity related to the river (such as canoe and kayak use and instruction), and enhanced environmental values which can provide opportunities for water-enhanced recreation, such as sightseeing and nature study. The property and facilities would be incorporated into the	

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	American River Parkway and reflected by amendment in the American River Parkway Plan. b) Recreation Facility Improvements to the American River Parkway. The American River Parkway Plan describes in several Area Plans the resources and facilities intended to provide for water-dependent and water-enhanced recreation, including river access, trails, parking, swimming areas, and other facilities. The facilities could include improvement of river access for rafting/boating in the less intensively used sections of the river, such as downstream of Goethe Park; trail improvements to increase the opportunity for water-enhanced recreation, such as a linkage between the Fairbairn plant and the Sutter's Landing Park site; or interpretive resources to improve water-enhanced nature study and appreciation of the Parkway. c) Update of the American River Parkway Plan. The update could consider the flow regime resulting from the WFP and appropriate actions to take in the Parkway to support improvement of both recreation opportunities and riparian habitat. d) Enhancement of the Condition and Quality of Existing Recreation Facilities. Past and current budget constraints have limited the County's ability to maintain some existing recreation facilities. Enhancement of the condition and quality of existing facilities could improve the attraction of the Parkway for both water-dependent and water-enhanced recreation activity. The improvements to recreation facilities in the American River Parkway would accomplish the following criteria:	

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Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	C Facilities would improve opportunities for water-dependent recreation, particularly rafting/boating, such that the river is made more accessible when flows are appropriate and/or the quality of rafting/boating is improved; or facilities would improve opportunities for water-enhanced recreation, such that the quality and visitation associated with recreation activity in the Parkway is increased. C Improvements would be consistent with the American River Parkway Plan. The final selection of facilities for improvement would occur during the 18-month preparation period of the Habitat Management Plan. Facilities would be developed as soon as feasible after completion of that plan, recognizing the need to assemble funding, secure facility approvals, and prepare designs.	
4.9-2: Lake Natoma Recreation Opportunities. Additional diversions under the WFP would not result in a different pattern of lake elevation fluctuations than under base conditions, because Lake Natoma would continue to serve as a regulating reservoir below Folsom Dam. Typically, lake elevation fluctuation stays within a range of 4 to 7 feet and does not substantially affect recreation. Therefore, effects on Lake Natoma recreation opportunities would be less than significant.	No mitigation measures are required.	**less-than-significant**
4.9-3: Reduced Folsom Reservoir Boating Opportunities. Compared to base conditions, additional diversions by purveyors taking water from Folsom Reservoir and downstream under the WFP conditions would result in lower elevations of Folsom Reservoir. The declines would occur in more years than under base conditions, reducing the availability of boat ramps and marina wet	The WFP includes features intended to lessen potential environmental impacts on the Lower American River, which would also serve to decrease environmental effects to other resources. These mitigating features include water conservation, dry-year diversion restrictions, and conjunctive use of ground water and surface water. Adoption of the WFP	**significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
slips more often during the primary boating season (March - September). For instance, lake levels would decline below the 412-foot elevation necessary for marina wet slips 4 to 6 more years of the 70-year record in the summer (June through September), depending on the month. More frequently reduced lake elevations would result in a significant effect to boating opportunities on Folsom Reservoir.	with these features would reduce water surface elevation effects on Folsom Reservoir recreation. In addition, boating facility improvements would enhance boating access during periods of higher water to compensate for reduced availability of boat ramp and marina facilities from Water Forum Proposal diversions. Actions would occur in cooperation with the California Department of Parks and Recreation (CDPR) and would be consistent with the General Plan for Folsom Lake State Recreation Area (CDPR, 1978). Mitigation should also be consistent with the objectives of CDPR proposals for measures to mitigate lower lake levels from flood storage reoperation (Kranz, 1997). The actions could be added into the recreation section of the Habitat Management Plan as a means to implement them. One or more of the following recreation measures described below could be implemented in cooperation with the CDPR. Funding for the recreation measures may include money from within or outside the Water Forum Successor Effort. A number of agencies are involved in water resources and recreation facility decisions affecting Folsom Reservoir, so this recreation mitigation should be coordinated with other actions, as appropriate. Consequently, other agencies involved in Folsom Reservoir may participate in funding and/or implementation of recreation mitigation. e) <u>Boating Facilities to Increase Access and Use During Higher Water Periods</u>. Construction of boating facilities, consistent with the General Plan for Folsom Lake State Recreation Area would increase boating access and use of the reservoir during higher water periods. To compensate for reduced availability of boating facilities during lower water periods, this measure would improve boating facilities for use when higher water conditions allow for	

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	high-quality water recreation and the greater reservoir surface area availability; at higher water levels, visitation can be increased when the larger reservoir surface area can support more intensive use. Examples of potential boating facility improvements suggested by CDPR staff include boat parking and shore facilities at Dyke 8 or a launch ramp and dock at New York Cove (on the east side of the reservoir, north of Brown's Ravine). The final selection of facilities would occur in cooperation between the Water Forum Successor Effort and the CDPR. f) Improvement to the Marina Area. Construction of facility improvements in the Brown's Ravine area would enhance the operation of the marina. Improvements would be consistent with the Folsom Lake State Recreation Area General Plan. The intent of these improvements would be to help enhance marina operations during periods of sufficiently high water to offset the reduced availability of wet slips. The final selection of facilities would occur in cooperation between the Water Forum Successor Effort, the operator of the marina, and the CDPR. The improvements to recreation facilities on Folsom Reservoir will accomplish the following criteria: C Facilities serving higher water conditions will increase boating visitation to Folsom Reservoir when the surface area is large enough to support the increased use. C Marina facility improvements will help enhance operation of the marina when water level is high enough to support the wet slips. C Improvements are consistent with the General Plan for Folsom Lake State Recreation Area.	

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SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	The final selection of facilities for improvement would occur during an period following adoption of the Water Forum Proposal. Facilities would be developed as soon as feasible after completion of that plan, recognizing the need to assemble funding, secure facility approvals, and prepare designs.	
4.9-4: Reduced Availability of Folsom Reservoir Swimming Beaches. Compared to the base conditions, additional diversions under the WFP would result in more frequent declines in lake elevation below useable swim beach levels during most of the primary swimming season (June, August, September). For example, in those months lake elevations remain within the 420 to 455-foot range where swim beaches are usable in 2 to 4 fewer years of the 70-year period with the WFP. Although the availability of beaches during the remaining months of the swim season (May and July) would not be affected, the overall effect of reduced lake elevations on the availability of Folsom Reservoir swim beaches would be significant.	The WFP includes features intended to lessen potential environmental impacts on the Lower American River, which would also serve to decrease environmental effects to other resources. These mitigating features include water conservation, dry-year diversion restrictions, and conjunctive use of ground water and surface water. Adoption of the WFP with these features would reduce lake level effects on shoreline recreation and swimming. In addition, improvements to swimming or other shore recreation facilities that attract increased visitation to landside recreation areas around the reservoir should be implemented. Actions would occur in cooperation with the CDPR and would be consistent with the General Plan for Folsom Lake State Recreation Area. Mitigation should also be consistent with the objectives of CDPR proposals for measures to mitigate lower lake levels for flood storage reoperation (Krantz, 1997). The actions could be added into the recreation section of the Habitat Management Plan as a means to implement them. One or more of the following landside recreation measures described below could be implemented in cooperation with the CDPR. Funding for the recreation measures may include money from within or outside the Water Forum Successor Effort. A number of agencies are involved in water resources and recreation facility decisions affecting Folsom Reservoir, so this recreation mitigation would be coordinated with other	**significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	actions, as appropriate. Consequently, other agencies involved in Folsom Reservoir may participate in funding and/or implementation of recreation mitigation. a) Impoundments for Swimming. Construction of earthen dams at approximately 450 feet elevation at Beal's Point, Dyke 8, and/or Granite Bay would impound water for swimming opportunities close to day-use parking and concessionaires regardless of reservoir elevation. The CDPR has considered this concept as a way to provide dependable swimming opportunities throughout the summer. Water would need to be drained and replenished by pumps weekly. Because this concept would involve considerable engineering and construction, it could cause environmental effects and would be subject its own environmental review. The impoundments would also have to comply with health regulations for water contact use. As such, it is not yet certain whether this concept could be feasibly implemented at Folsom Reservoir. b) Landside Recreation Improvements. Construction of landside facilities supporting other recreation uses would help offset reduction in swimming opportunities. Facilities could include a bicycle trail connection included in the General Plan between Beal's Point and Granite Bay. Construction of this three-mile paved trail connection would substantially increase bicycle use, and therefore visitation, regardless of reservoir level, according to CDPR staff. The bicycle trail would improve access to shore facilities and remote beach areas. Also, the Water Forum Successor Effort could contribute to other shoreline recreation facility improvements, such as temporary parking, beach areas, or concession facilities	

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	for low-water access or other facilities consistent with the General Plan. c) Update of the Folsom Lake State Recreation Area General Plan. With changes in future reservoir levels, the General Plan could be updated to reflect the expected pattern of reservoir elevations. This could help update the recreation area's approach to attract and serve local and non-local recreation users. This effort would need to be led by CDPR with support of the Water Forum Successor participants. The improvements to landside recreation facilities on Folsom Reservoir would accomplish the following criteria: C Facilities could provide opportunities for swimming in low-water conditions below an elevation of 435 feet (approximate optimum swimming beach level); or facilities would increase landside recreation visitation to Folsom Reservoir with activities. C Improvements would be consistent with the General Plan for Folsom Lake State Recreation Area. C Recreation facility improvements would not conflict with habitat enhancement actions of the Habitat Management Plan. The final selection of facilities for improvement would occur during a period following adoption of the Water Forum Proposal. Facilities would be developed as soon as feasible after completion of that plan, recognizing the need to assemble funding, secure facility approvals, and prepare designs.	

Table 2-2
SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
4.9-5: Shasta Lake Recreation Opportunities. Compared to the base conditions, additional diversions under the WFP would result in some more frequent declines in lake elevation during the summer recreation season (May - September) which would decrease shoreline recreation use more often in late summer (August and September); however, the declines would not substantially reduce boat ramp availability or hinder boat-in camping activities. For instance, the number of years when all boat ramps are available would not be changed in any of the summer recreation season months. Altogether, the effect of WFP conditions on recreation opportunities of Shasta Lake during the May - September season are less than significant, compared to base conditions.	No mitigation measures are required.	**less-than-significant**
4.9-6: Trinity Reservoir Recreation Opportunities. Compared to the base conditions, additional diversions under the WFP would result in minimal declines in lake elevations in Trinity Reservoir during the summer recreation season (May - September). For example, reductions in mean monthly lake elevations would be no greater than 0.1 to 0.2 feet, depending on the month, which would not affect the availability of boat ramps at the reservoir. Consequently, with the minimal changes in lake elevations resulting from WFP diversions, no significant effect on Trinity Reservoir's recreation opportunities would occur.	No mitigation measures are required.	**less-than-significant**
4.9-7: Recreation Opportunities on Whiskeytown and Keswick Reservoirs. Whiskeytown and Keswick Reservoirs serve as regulating reservoirs, so while releases under WFP conditions would differ from base conditions, these differences would not substantially alter the existing seasonal pattern of lake elevations. Therefore, no substantial changes in recreation opportunities on Whiskeytown and Keswick Reservoirs would occur, resulting in a less-than-significant effect.	No mitigation measures are required.	**less-than-significant**

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Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
4.9-8: Recreation Impacts on the Upper Sacramento River. Compared to base conditions, in most years additional diversions under the WFP would not result in decreased flows in the upper Sacramento River during the summer recreation season (May through September). For example, during these months, flow downstream of Keswick Reservoir would be equal to or greater than the base condition in 59, 55, 41, 59, and 66 years of the 70-year record in May, June, July, August, and September, respectively. In years when flows are less than base conditions in these months, the difference would be insufficient to substantially reduce recreation opportunities. Therefore, changes in flow on the upper Sacramento River during summer recreation season would result in a less-than-significant effect on recreation opportunities.	No mitigation measures are required.	**less-than-significant**
4.9-9: Lower Sacramento River Recreation Opportunities. Compared to base conditions, in most years additional diversions under the WFP would not result in decreased flows in the lower Sacramento River during the summer recreation season (May through September). For example, during these months, flows at Freeport would be equal to or greater than the base condition in 40, 38, 43, 51, and 48 years of the 70-record in May, June, July, August, and September, respectively. In years when flows are less than base conditions in these months, the reduction in flow would seldom be more than 1.0 percent, which would be insufficient to substantially reduce recreation opportunities. Also, substantial flow would remain in the river and tidal action would diminish the influence of the reduced flows on boating, fishing, and other water-dependent recreation activities. Therefore, changes in flow on the lower Sacramento River during summer recreation season would result in a less-than-significant effect on recreation opportunities.	No mitigation measures are required.	**less-than-significant**
4.9-10: Delta Recreation Opportunities. Compared to base conditions, in most years additional diversions under the WFP	No mitigation measures are required.	**less-than-significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
would not result in decreased inflows in the Delta during the summer recreation season (May through September). For example, during these months, flows at Freeport would be equal to or greater than the base condition in 40, 38, 43, 51, and 48 years of the 70-record in May, June, July, August, and September, respectively. In years when inflows are less than base conditions in these months, the reduction in flow would seldom be more than 1.0 percent, which would be insufficient to substantially reduce recreation opportunities. Also, substantial inflow to the Delta would remain and tidal action would diminish or overshadow the influence of the reduced flows on boating, fishing, and other water-dependent recreation activities. Therefore, changes in inflow to the Delta during summer recreation season would result in a less-than-significant effect on recreation opportunities.		
4.9-11: Consistency with the American River Parkway Plan. The WFP would be consistent with the American River Parkway Plan and no significant environmental impact related to conflict with plans and policies for the avoidance of environmental effects would occur. This would be a less-than-significant impact.	No mitigation measures are required.	**less-than-significant**
4.9-12: Consistency with Lower American River's Recreational River Designations. While the WFP conditions would reduce flows available for recreation on the Lower American River during the summer months in a some additional years, adopting Mitigation Measure 4.9-1 would minimize the effect on recreation opportunities for rafting or boating during high recreation use periods. The Lower American River would retain substantial recreation value. The recreation values of the Lower American River would be protected to the maximum extent feasible and the WFP would be consistent with the State and Federal recreational river designations, resulting in a less-than-significant impact.	No mitigation measures are required.	**less-than-significant**

Table 2-2
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Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
LAND USE and GROWTH-INDUCING IMPACTS (Section 4.10)		
4.10-1: Land Use Impacts on Direct and Indirect Effect Study Areas (i.e., in-stream and adjacent areas of Folsom Reservoir, Lake Natoma, the Lower American River, and water bodies on the CVP and SWP systems). The WFP does not define specific projects (e.g., diversion or conveyance structures, treatment facilities) that would affect land uses in the direct or indirect effect study areas. It does identify a list of projects (some of which are conceptual) required to implement the WFP, and these projects will be subject to independent project and environmental review. The WFP would not grant land use authority, nor does the Water Forum possess any power over land use decisions. Therefore, adoption of the WFP would result in less-than-significant land use impacts *within the direct and indirect effect study areas.*	No mitigation measures are required.	**less-than-significant**
4.10-2: Land Use and Growth-Inducing Impact in the Water Service Study Area. Implementation of the WFP would not directly alter land uses in the water service study area. The WFP is intended to provide a safe and reliable water supply for the region's economic health and planned development through the year 2030. Land use decisions would continue to be made by city and county government decision-makers with guidance provided by adopted General Plans. The WFP would accommodate substantial development, however, as it would remove water supplies as an obstacle to growth. Therefore, the WFP is considered to be growth-inducing, as defined by CEQA, and the resulting land use and growth impacts would be significant.	The water supply included in the WFP has been determined considering the planned growth for each jurisdiction within the water service study area; as such, the WFP is consistent with the growth parameters described each city and county General Plan. The General Plan of each jurisdiction includes policies and programs for the protection of the environment and, to the extent feasible, the avoidance or mitigation of significant effects on the environment from planned growth and development. During the normal course of each jurisdiction's implementation of its General Plan policies, feasible mitigation of significant impacts from planned growth and development would occur. Because mitigation of growth-related environmental impacts is in the purview of each city and county, through their existing land use authority, and because the Water Forum itself has no such authority, the WFP cannot feasibly provide for additional mitigation of	**significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	growth-related land use and development environmental impacts.	
4.10-3: Consistency with General Plan Agricultural Land Use Policies. The WFP would not result in the reduction or forfeiture of existing surface water entitlements, the reduction or diminution of any existing groundwater rights, nor would it provide water purveyors, the Water Forum, or the Water Forum Successor Effort with any land use authority. Water Forum Proposal would not alter (i.e., reduce) agricultural lands within the jurisdictions of the water service study area and, consequently, would result in a less-than-significant impact to agriculture.	No mitigation measures are required.	**less-than-significant**
4.10-4: Consistency with General Plan Water Supply and Conservation Policies. The Water Forum Proposal would not conflict with adopted environmental plans and goals of local jurisdictions, as stated in their general plans and community plans. Rather, the WFP implements many of the General Plan policies directed at the provision of water within the water service study area jurisdictions. Consequently, the WFP would result in less-than-significant impacts to adopted environmental plans and goals of local jurisdictions.	No mitigation measures are required.	**less-than-significant**
AESTHETICS (Section 4.11)		
4.11-1: Aesthetic Value of the Lower American River. Compared to existing conditions, diversions accommodated by the WFP would not result in substantially reduced flows such that adverse visual impacts would occur. Nor would flows be reduced below that necessary to support riparian vegetation and wildlife habitat within the Lower American River corridor. Because WFP conditions would not result in the thinning of the riparian corridor, or the loss of valuable border zone vegetation and habitat, the	No mitigation measures are required.	**less-than-significant**

Table 2-2
SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
aesthetic effects of WFP conditions on the Lower American River are considered less than significant.		
4.11-2: Aesthetic Value of the Upper Sacramento River, Lower Sacramento River, and Sacramento-San Joaquin Delta. Compared to existing conditions, additional diversions under the WFP would not result in a substantial reductions in water flows such that adverse visual impacts would occur. Nor would flows be reduced below that necessary to support riparian vegetation and wildlife habitat within the upper and lower Sacramento River and the Sacramento-San Joaquin River Delta. For example, reductions in Sacramento River flows, under WFP conditions, would vary from base conditions by approximately 3% or less during the growing season months (March - October). Consequently, this impact is considered less than significant.	No mitigation measures are required.	**less-than-significant**
4.11-3: Aesthetic Value of Lake Natoma, Whiskeytown, and Keswick Reservoirs. Compared to existing conditions, implementation of the WFP would not result in substantial changes in the frequency or magnitude of surface water elevation changes at these reservoirs. Consequently, the aesthetic quality of these reservoirs would not be expected to change substantially, relative to existing conditions. This impact is considered less than significant.	No mitigation measures are required.	**less-than-significant**
4.11-4: Aesthetic Value of Folsom Reservoir. Compared to existing conditions, implementation of the WFP would result in mean monthly surface water elevation decreases of greater than 10 feet at Folsom Reservoir. However, because the frequency of such reductions would be minimal (less than 3 percent during a seventy year hydrologic cycle),the aesthetic effect of the WFP's reduction in surface water elevations at Folsom Reservoir is considered less than significant.	No mitigation measures are required.	**less-than-significant**

Table 2-2
SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
4.11-5: Aesthetic Value of Trinity and Shasta Reservoirs. Compared to existing conditions, implementation of the WFP would result in mean monthly surface water elevation decreases of less than 10 feet at Trinity and Shasta reservoirs. For example, during the 70-year hydrologic period of record, surface water elevation reductions would range from 3.3 to 4.8 feet at Trinity Reservoir and from 2.6 to 4.6 feet Shasta Reservoir. Because reduction in surface water elevations at Trinity and Shasta Reservoirs would be less than 10 feet, this impact is considered less than significant.	No mitigation measures are required.	**less-than-significant**
CULTURAL RESOURCES (Section 4.12)		
4.12-1: Effect of Varying Water Levels on Cultural Resources in Folsom Reservoir. Implementation of the WFP would result in some variation in Folsom Reservoir elevations as compared to the Base Condition. This variation would not result in increased reservoir levels of sufficient magnitude to cause either inundation of previously exposed areas, or exposure of previously inundated sites, beyond that which is occurring under the Base Condition. However, implementation of the WFP would result in significantly more cycles of inundation and drawdown in the area between 360 and 395 ft msl; this increase would constitute a significant impact to sites within that zone.	The WFP hydrologic modeling data indicates that the project would have a significant impact on cultural sites and features within the reservoir pool, especially those located between the 360 ft msl and 395 ft msl elevations. Significant impacts would include the potential exposure of previously submerged sites to increased vandalism, recreation use, wave action, and the effects of repeated inundation and drawdown. Many prehistoric and historic sites have been recorded within the reservoir basin, most of which remain unevaluated. Only about half of the reservoir has been surveyed, and many other sites undoubtedly exist in the unsurveyed areas. In 1994, Far Western and JRP Historical Consultants prepared a Research Design as part of SAFCA's Folsom Re-operation Study. That document included all of the reservoir basin between the 390-foot and the 466-foot contours. The Research Design provides, among other components, summaries of the known cultural resources within the study area; research issues applicable to those resources; and recommendations for evaluating the sites, protecting them from further damage, and mitigating unavoidable impacts.	**significant**

Table 2-2
SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	Checklists are included for evaluation of various types of sites. All unevaluated sites within the reservoir that fall within the direct impact zone of the WFP could be given additional study, using this Research Design as a guideline. Also, unsurveyed portions of the direct impact zone could be surveyed for cultural resources, as water levels permit; any additional sites and features also may require evaluation and mitigation. The appropriate agencies (i.e., Bureau of Reclamation, US Army Corp of Engineers, and the State Office of Historic Preservation) could decide that evaluation and mitigation of a *representative sample* of the sites is sufficient, although this cannot be determined without comprehensive consultation with those agencies. Recent conversations with archaeologists at the Bureau of Reclamation's Sacramento office suggest that such sampling would be acceptable to that agency.	
4.12-2: Effect of Varying Flows/River Stage on Cultural Resources Along the Lower American River Bank Near Nimbus Dam. Implementation of the WFP would result in American River flows downstream of Nimbus Dam that differ somewhat from those under the Base Condition. For nearly all months of the year, mean monthly river flows under the WFP would be lower than under the Base Condition, meaning that no new areas of the riverbank would be inundated. Because no significant sites are expected to have survived within the riverbed itself, these lower flows would not expose previously submerged (and intact) cultural resources. Therefore, changes in river flows from the WFP would have a less-than-significant impact to cultural resources along the river near Nimbus Dam.	No mitigation measures are required.	**less-than-significant**
4.12-3: Effect of Varying Flows/River Stage on Cultural Resources Along the Lower American River Near the Mouth. Implementation of the WFP would result in American River flows	No mitigation measures are required.	**less-than-significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
at the mouth that differ somewhat from those under the Base Condition. For nearly all months of the year, mean monthly river flows under the WFP would be the same as or lower than under the Base Condition, meaning that no new areas of the riverbank would be submerged. Because no significant sites are expected to have survived historically within the riverbed itself, these lower flows would not expose previously submerged (and intact) cultural resources. Therefore, changes in river flows from the WFP would have a less-than-significant impact to cultural resources along the river near the mouth.		
4.12-4: Effect of Varying Flows/River Stage on Cultural Resources Along the Lower Sacramento River Bank Near Freeport. Implementation of the WFP would result in Sacramento River flows at Freeport that differ slightly from those under the Base Condition. However, these variations are not of sufficient frequency or magnitude to cause either significant exposure or inundation of cultural resources and thus represent a less-than-significant impact to cultural resources.	No mitigation measures are required.	**less-than-significant**
SOILS and GEOLOGY (Section 4.13)		
4.13-1: Changes in Geologic Substructures. While the WFP itself would not require ground disturbing activities, implementation of the WFP over time, has the potential to substantially change geologic substructures through future construction activities associated with new water facilities (i.e., river intakes, water treatment plants, pump stations, well fields and conveyance pipelines). With the construction of these facilities, potential changes to subsurface geology could affect human safety. However, development and planning of future water facilities projects would consider geotechnical studies and implement design recommendations, as appropriate, in order to minimize any hazardous geologic changes to the underlying substrata. Therefore,	No mitigation measures are required.	**less-than-significant**

Table 2-2
SUMMARY OF PROJECT IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
changes in geologic substructures are considered less than significant.		
4.13-2: Exposure to Major Geologic Hazards. While implementation of the WFP would not result in any undue exposure to major geologic hazards, construction of future projects associated with the implementation of the WFP , has the potential to expose people or property to major geologic hazards, including unstable slopes, ground failure, subsidence, liquefaction, and lateral spreading. Given the relative stability of the geologic subsurface environment in the greater Sacramento area, and the necessary geotechnical/soils studies and proper design practices that would be required in all future projects, exposure to geologic hazards is considered to be a less-than-significant impact.	No mitigation measures are required.	**less-than-significant**
4.13-3: Increased Soil Erosion by Wind or Water. The WFP itself would not involve any construction activities that would disturb surface soils and thereby induce either wind or water erosion. However, construction activities related to future water projects associated with the implementation of the WFP could lead to short-term soil disturbing activities. With the availability of project-specific siting investigations, soils/geotechnical studies and the implementation of any necessary project-specific mitigation measures, and increased soil erosion is considered to represent a less-than-significant impact.	No mitigation measures are required.	**less-than-significant**
4.13-4: Loss of Soil Cover. While the WFP itself would not include activities that would promote soil loss, future projects could result in land conversion and subsequent soil loss. Certain project facilities where situated in open terrain, may result in the permanent loss of some soil cover. However, future projects would have to evaluate potential soil loss impacts and mitigate for any identified significant effects. Soil loss associated with the WFP is considered to represent a less-than-significant impact.	No mitigation measures are required.	**less-than-significant**

2.5 summary of CUMULATIVE impacts

An analysis of cumulative impacts considers the combined effects of the proposed project, other past and present projects, and "reasonably foreseeable probable future projects" (State CEQA Guidelines §15355). In the case of the Water Forum Proposal, this involves attempting to foresee related projects occurring over the long-term future. The Water Forum Proposal would be implemented over the next three decades. During this same time period, it is expected that many other actions will be implemented that will affect the environmental conditions of the project's direct and indirect study areas.

2.5.1 ANALYSIS OF ONE FUTURE SCENARIO FOR CUMULATIVE CONDITIONS

A large degree of speculation and uncertainty exists when attempting to characterize the study area 30 years into the future, particularly recognizing the dynamic nature of decisions about water supply and resource protection in the Sacramento and San Joaquin River system. Therefore, it is difficult to define any one scenario as the reasonably foreseeable probable future. Nonetheless, to fulfill the requirements of State CEQA Guidelines §15355 to address future cumulative conditions, the programmatic analysis of this WFP uses one scenario as a good faith effort to assess future cumulative potential effects. The scenario was developed after a year of extensive discussions between the Water Forum technical consultants and the USBR and USFWS. Given all of the competing demands for water and water resource limitations, one outcome that is not speculative is the occurrence of significant impacts of some type in the future.

The future scenario for this EIR consists of past, present, and possible future projects producing related or cumulative impacts. The cumulative condition, therefore, is defined for this EIR as the WFP and three other possible future actions or sets of actions that could be quantified, including:

> ***Increased Trinity River Flows.*** For modeling and analysis purposes, the Water Forum EIR assumes that Trinity River flows will be increased in accordance with the U.S. Bureau of Reclamation's (USBR) recent policy direction. Flows are proposed to be increased from existing levels to 390,000 acre-feet per year in drier years to 750,000 acre-feet per year in wetter years, thereby reducing exports to the Sacramento River.
>
> ***East Bay Municipal Utility District (EBMUD) Supplemental Water Supply Project.*** EBMUD's proposed project, for this analysis includes diversion of up to 112,000 acre-feet per year of American River water subject to deficiencies imposed by the Central Valley Project.
>
> ***Increased Water Demands.*** For modeling and analysis purposes, the Water Forum EIR assumes that increased water demands by State Water Project (SWP) contractors, Central Valley Project (CVP) contractors, and other Sacramento Valley water users will occur. Increased demand volumes are based on projections by USBR and the California Department of Water Resources (DWR).

The WFP EIR does not serve as the environmental document for the above actions. The impacts of each of these actions would be evaluated in project-specific environmental documentation and, where appropriate, alternatives and mitigation measures recommended to reduce significant effects.

2.5.2 UNQUANTIFIABLE ASPECTS OF FUTURE CONDITIONS

In addition to uncertainty surrounding the volume of diversions in the future (i.e., 2030), many efforts are currently underway to address unfavorable conditions in the Sacramento River and Bay-Delta that cannot currently be quantified. Populations of fish species such as Delta smelt, steelhead and winter-run chinook salmon have declined over the past decades to the point that they have been listed as threatened or endangered, and other species such as fall-run and spring-run chinook salmon have been proposed for listing. At the same time, variable water availabilities, and environmental requirements have resulted in water delivery deficiencies imposed on SWP and CVP on water contractors.

For these reasons the state and federal governments, in cooperation with local organizations, have begun implementing environmental restoration programs to reverse these biological declines. Since 1996, approximately $100 million has been expended on restoration projects, such as improving fish screens and restoring habitat. Over the next 30 years over $1.5 billion will be spent on additional improvements.

Programs underway or planned to improve Sacramento River system and Bay-Delta fisheries and habitats include the Central Valley Project Improvement Act (CVPIA) Anadromous Fish Restoration Program (AFRP), and Ecosystem Restoration Program Plan (ERPP) of the CALFED Bay-Delta Program.

The effectiveness of these programs to improve Sacramento River and Bay-Delta conditions, however, is not guaranteed. In addition, there could be future environmental stressors that cannot be predicted. For instance, introduction of non-native species into aquatic habitats could have additional adverse impacts. It is not possible to speculate in the analysis how any of these considerations could affect cumulative impacts.

Prospects for Additional or Reallocated Water Supply

Section 3406(b)(3) of the CVPIA directs the Department of the Interior to acquire additional water supplies. Specific options identified in that section include: improvements in or modifications to the operations of the project; water banking; conservation; transfers; conjunctive use; and temporary and permanent land fallowing, including purchase, lease, and option of water rights, and associated agricultural land. In addition, water bank operations can reallocate water in drier years to alleviate water delivery and environmental impacts. It is speculative at this time to predict the success of projects to acquire additional or reallocate existing water resources. It is also recognized that in the future USBR and other agencies outside the Water Forum will make numerous operational decisions based on conditions existing at the time. Therefore, the cumulative impacts analyses in this EIR are based on one set of assumptions

as to how USBR would operate CVP facilities if no additional water supply is developed, and no water is reallocated.

Insufficiency of Water Supply for Cumulative Future Needs

The cumulative impact analysis indicates that unless new water is developed or water is reallocated, there will be insufficient water for USBR to meet some of its contractual and environmental obligations in the future.

The decrease in Shasta Reservoir storage and reduction in flow below Keswick Dam is a surrogate for the volume of additional water that would have to be available in the future for environmental purposes to approximate Base Conditions. A decrease in Shasta Reservoir storage results in a reduced flow requirement below Keswick Dam, because flow requirements are based on Shasta Reservoir storage levels. Over the simulated 70-year hydrologic period Shasta Reservoir carryover storage was reduced by about 75,000 AF and flow below Keswick Dam was reduced by about 30,000 AF on an average annual basis. Combined, this represents an approximate average annual deficit of 105,000 AF, relative to the Base Condition. During the 1928 to 1934 critical period, Shasta Reservoir storage declined an average of 75,000 AF per year, resulting in a total critical period storage deficit of about one-half million AF. As a consequence of lower storage, the future cumulative simulation prescribes an average annual reduction in flow volume below Keswick Dam of about 15,000 AF, or about 100,000 AF over the critical period. Combined, the decrease in Shasta Reservoir storage and reduction in flow volume below Keswick Dam represent an annual average water deficit of about 90,000 AF and a total deficit approximating 600,000 AF for the future cumulative critical period relative to the Base Condition.

Due to the increased overall demands on the system, future cumulative condition hydrologic modeling indicates that lower deliveries to all categories of CVP contractors could occur in the future, and be most significant in the dry and driest years. Compared to the Base Condition, less water would be delivered to CVP contractors in about 30% of the years, and to SWP contractors in about 30% of the years.

CVP and SWP contract demands associated with future development will be higher than current demands. Even under the Base Condition full demands frequently are not met. One method to generally illustrate the water supply deficit to water contractors under the future cumulative condition is to estimate the amount of water associated with future delivery deficiencies if the same percentage of full demand was delivered in the future as was delivered under the Base Condition. This estimation indicates that over the 70-year hydrologic period simulated, combined CVP/SWP water delivery deficits could exceed 400,000 AF on an average annual basis. During the 1928 to 1934 critical period, combined CVP/SWP water delivery deficits approach an average of nearly 400,000 AF per year, representing a total critical period deficit of nearly 2½ million AF.

USBR remains committed to taking all necessary actions that will allow water delivery and environmental obligations to be met. The Water Forum does not recommend or advocate not meeting any environmental or water delivery obligations. Again, the analysis in this EIR is based

on a reasonable set of assumptions as to how the system would be operated if no additional water supply is developed or no water is reallocated. The EIR discusses potential cumulative effects, given the uncertainties recognized above.

Table 2-3
SUMMARY OF CUMULATIVE IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
GROUNDWATER (Section 6.2)		
6.2-1: Groundwater Quality. Because groundwater pumping within Sacramento County does not change between the two comparative future conditions, the impacts identified with the implementation of the WFP do not change from those described in Section 4.2. Under the future cumulative condition, deterioration of groundwater quality would represent a less-than-significant impact.	No mitigation measures are required.	**less-than-significant**
6.2-2: Movement of Groundwater Contaminants. Under the future cumulative condition, movement of groundwater contaminants would not increase beyond that described for the WFP. This would be a less-than-significant cumulative effect.	No mitigation measures are required.	**less-than-significant**
6.2-3: Land Subsidence . Under the future cumulative condition, land subsidence would not occur beyond that described for the WFP. This would be a less-than-significant impact.	No mitigation measures are required.	**less-than-significant**
6.2-4: Reduced Efficiency of Wells. Under the future cumulative condition, efficiency of wells would not change beyond that described for the WFP. This would be a less-than-significant impact.	No mitigation measures are required.	**less-than-significant**
WATER SUPPLY (Section 6.3)		
6.3-1: Decrease in Deliveries to SWP Customers. Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that increased deliveries to SWP customers of between 20,000 and 1,240,000 acre-feet would occur in about 49 years; and, decreased water deliveries to SWP customers of between 110,000 and 1,210,000 acre-feet would occur in about 20 years of the 70-year record. Average annual SWP	Development of additional water supplies by the SWP could reduce impacts to SWP deliveries.	**significant**

Table 2-3
SUMMARY OF CUMULATIVE IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
deliveries would increase by about 350,000 acre-feet. The delivery reduction in 20 years would represent a significant cumulative impact.		
6.3-2: Decrease in Deliveries to CVP Customers. Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that increased deliveries to CVP contractors of up to 670,000 acre-feet would occur in about 49 years of the 70-year record; and, decreased water deliveries of between 10,000 and 520,000 acre-feet in about 20 years of the 70-year record. Average annual CVP deliveries would increase by about 110,000 acre-feet. The delivery reduction in 20 years would represent a **significant cumulative impact**.	Development of additional water supplies by the CVP could reduce impacts to CVP deliveries.	**significant**
WATER QUALITY (Section 6.4)		
6.4-1: Seasonal Changes to Water Quality in Folsom Reservoir, Lake Natoma, and the Lower American River. Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that Folsom Reservoir storage and Lower American River flows would be reduced more frequently and/or by greater magnitudes as compared to the WFP alone, while constituent loading to these waterbodies would be expected to increase somewhat. Project-level urban runoff and stormwater discharge mitigation measures pursuant to federal, state, and local regulations are expected to continue to be required for new growth to occur. With the exception of water temperature (see Section 6.5.3), program-level assessment indicated that any impacts to water quality from reduced dilution and increased constituent loading would be minor, and would not be expected to cause State or federal water quality standards, objectives or criteria to be more frequently exceeded, relative to existing conditions. This would be a **less-than-significant cumulative impact**.	No mitigation measures are required.	**less-than-significant**

Table 2-3
SUMMARY OF CUMULATIVE IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
6.4-2: Seasonal Changes to Sacramento River and Delta Water Quality. Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that Sacramento River flows would be reduced more frequently and/or by greater magnitudes compared to that which would occur due to the additional diversions under the WFP alone, and constituent loading to the Sacramento River also would be expected to increase. Project-level water quality mitigation and ongoing water quality management plans and programs are expected to continue to be required such that State and federal water quality standards, objectives and criteria would not be exceeded on a more frequent basis than under existing conditions. However, substantial uncertainty exists with regard to seasonal changes in Sacramento River flow, constituent loading, and the extent and effectiveness of project-level water quality mitigation and management measures in the future, all of which are beyond the Water Forum ' s control. Because the potential for degradation of water quality in the future depends on uncertain future policy decisions and actions, this would be a potentially significant cumulative impact.	Changes to Sacramento River and Delta water quality would be an indirect impact of increased urban development facilitated, in part, by the additional diversions of surface and groundwater defined in the WFP. Water quality mitigation measures will be developed for specific projects as they occur in the future. Responsibility for this mitigation lies with the land use planning authorities and individual project proponents, and is beyond the Water Forum ' s control. Water quality mitigation anticipated to occur with planned growth is addressed in the Sacramento County and other regional General Plans. In addition, the Sacramento County Regional Sanitation District, which operates the SRWTP, is currently updating its Sacramento Regional Wastewater Treatment Plan Master Plan, and plans to update this document every 5 years in the future.	**potentially significant**
FISHERIES RESOURCES AND AQUATIC HABITAT (Section 6.5)		
6.5-1: Impacts to Folsom Reservoir ' s Coldwater Fisheries The cumulative impacts analysis is based on a set of assumptions about future cumulative conditions and does not assume any development of additional Sacramento River water supplies. Under this set of assumptions, the analysis indicates that Folsom Reservoir storage would be reduced by 10% or more, relative to the Base Condition, occasionally during some months of the April through November period. However, anticipated reductions in reservoir storage would not be expected to adversely affect the reservoir ' s coldwater fisheries because: 1) coldwater habitat would remain	No mitigation measures are required.	**less-than-significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
available within the reservoir during all months of all years; 2) physical habitat availability is not believed to be among the primary factors limiting coldwater fish populations; and 3) anticipated seasonal reductions in storage would not be expected to adversely affect the primary prey species utilized by coldwater fishes. This would be a less-than-significant future cumulative impact.		
6.5-2: Impacts to Folsom Reservoir ' s Warmwater Fisheries. Under the set of assumptions used for the cumulative impacts analysis, Folsom Reservoir storage (and thus water levels) could frequently be reduced during the critical warmwater fish spawning and rearing period (i.e., March through September), which could reduce the availability of littoral (nearshore) habitat containing vegetation. Modeling output indicates that long-term average reductions in littoral habitat availability of up to approximately 50% could occur in September. Reductions in littoral habitat availability of this magnitude could result in increased predation on young-of-the-year warmwater fishes, thereby reducing long-term initial year-class strength of warmwater fishes. Unless willows and other nearshore vegetation become established at lower reservoir elevations in the future in response to seasonal reductions in water levels, long-term year class production of warmwater fishes would be reduced. Reduced littoral habitat availability would be a potentially significant future cumulative impact to Folsom Reservoir warmwater fisheries.	Through plantings and related activities, encourage existing willow and other terrestrial vegetative communities to become established at lower reservoir elevations. Doing so would provide greater availability of physical structure for warmwater fish spawning and rearing in the future when spring reservoir elevations are lower than under current conditions. Artificial habitat structures (e.g., artificial synthetic structures, submerged brush and debris, fish cribs, etc.) would provide structure in littoral habitats used by warmwater fishes for spawning and early lifestage rearing. Because the majority of the reservoir ' s warmwater fishes spawn in shallow water habitats (i.e., generally less than 10 feet deep), artificial structures would be placed at reservoir elevations that would likely be used by these fishes for spawning and rearing. The location and number of artificial structures placed within the reservoir would increase in proportion to the loss of littoral habitat over time. Implementing habitat structures would help minimize the effects to Folsom Reservoir ' s warmwater fisheries that would be expected to result from increased diversions and resultant reduced water surface elevations in Folsom Reservoir. While acknowledging operational constraints due to flood control, power production and diversions, work cooperatively with USBR operators to minimize the frequency with which	**potentially significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	reservoir elevation changes potentially resulting in nest flooding/dewatering events would occur. Monthly/weekly rates of reservoir elevation change will be documented. This information will be compared to timing and average depth of spawning for key nest-building warmwater species in Folsom Reservoir to estimate probabilities of nest flooding/dewatering events. This measure will be implemented to the degree reasonable and feasible based on its integration into the Habitat Management Program. Place artificial structures in the reservoir to compensate for loss of littoral habitats containing natural structure (e.g., inundated willows). The abundance of representative warmwater species will be monitored periodically through creel surveys and/or through catch-per-unit effort (CPUE) rates for tournament anglers to determine the extent to which warmwater fish utilize the structures. The extent to which this mitigation is to be implemented will be based on the results of these surveys. Frequency and timing of potential nest flooding/dewatering events that facilitate meeting current and future warmwater fish management goals will be determined by CDFG reservoir biologists. More specific performance criteria will be developed in the Habitat Management Program Plan. All three activities described above would, to the degree reasonable and feasible, be implemented, monitored, and maintained throughout the effective period of the Water Forum Agreement	
6.5-3: Impacts to The Warmwater and Coldwater Fisheries of Lake Natoma. Under the specific set of cumulative assumptions, the analysis indicates that operations of Folsom Dam and Reservoir	No mitigation measures are required.	**less-than-significant**

Table 2-3
SUMMARY OF CUMULATIVE IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
would have minimal, if any, impact to Lake Natoma ' s seasonal storage, rates of elevation fluctuation, or temperature. Any changes to these lake parameters that could occur under the future cumulative condition would not adversely affect the lake ' s warmwater or coldwater fisheries. This would be a less-than-significant future cumulative impact.		
6.5-4: Temperature Impacts to Nimbus Fish Hatchery Operations and Fish Production. Under the specific set of cumulative assumptions, the analysis indicates that operations of Folsom Dam and Reservoir would generally have little effect on May temperatures below Nimbus Dam, but would typically result in equivalent or colder temperatures during the June through September period, relative to the Base Condition. On a long-term basis, the frequent and measurable temperature reductions that would occur during the June through September period (when hatchery temperatures reach seasonal highs annually) would more than offset the infrequent adverse impacts resulting from increased temperature. This would potentially benefit long-term hatchery operations and resultant fish production. Overall, this would be a less-than-significant future cumulative impact.	No mitigation measures are required.	**less-than-significant**
6.5-5: Fall-run Chinook Salmon. The cumulative impacts analysis is based on a set of assumptions about future cumulative conditions and does not assume any development of additional Sacramento River water supplies. Under this set of assumptions, operations of Folsom Dam and Reservoir would result in periods of reduced flows in the lower American River during the October through December spawning period, when flows under the Base Condition would be 2,500 cfs or less. Further flow reductions occurring at already low flow levels could result in increased redd superimposition and eventual lower year-class strength. Improved water temperatures (resulting from a Folsom Dam urban water intake structure and optimal coldwater pool management) and	The following actions would be implemented as part of the HME, which will be adopted as an integral component of the Water Forum Agreement. a) Dry Year Flow Augmentation. The Water Forum Successor Effort and the USBR would work together with Placer County Water Agency (PCWA) and the USFWS to augment Lower American River flows, particularly during the spawning period during years when impacts would occur. This measure would be implemented (within the constraints of water availability) during dry and critically dry years. The primary source of water for augmenting flows would be the	**potentially significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
improved early lifestage survival will benefit chinook salmon spawning success, as well as other lifestages. However, because of the broad, programmatic nature of the WFP, the extent to which these actions (combined with other future actions such as spawning gravel management, revised flow ramping rate criteria, etc.) will interact to counterbalance flow reductions is uncertain, as is the manner in which these actions will be implemented, managed and coordinated without a comprehensive Habitat Management Program Plan for the Lower American River. Consequently, the overall effect of 2030 w/ WFP on chinook salmon year-class strength also is uncertain and, therefore, is considered to represent a potentially significant impact.	purchase of American River water from upstream reservoirs operated by PCWA. b) Flow Fluctuation Criteria. Develop and implement flow fluctuation (i.e., ramping) criteria for the operation of Folsom and Nimbus dams that would reduce the frequency with which rapid flow fluctuations occur in the river. Reducing the occurrence of large, rapid flow reductions would help to minimize losses of chinook salmon due to redd dewatering (fall and winter) and fry and juvenile stranding (winter and spring), especially during periods of low flow. Flow fluctuation criteria would contribute to improving spawning and incubation success, which, in turn, would lead to an overall increase in annual production of chinook salmon. This action would off-set, in part, potential flow-related impacts to chinook salmon. c) Wetland/Slough Complex Restoration/Maintenance. Restore wetland/slough complexes occurring within habitat transitional zones between river channels, shoreline, and upland habitats. Restoration would involve grading areas for the appropriate elevations and hydrology, as well as planting appropriate vegetation, to achieve desired habitat characteristics. Because wetland/slough complexes are used by juvenile chinook salmon for rearing prior to emigration, restoration and maintenance of these complexes would increase the quantity, and possibly the quality, of rearing habitat available to juvenile chinook salmon. Thus, this action could improve juvenile rearing success prior to emigration, thereby contributing to an overall increase in annual production of chinook salmon. This action would off-set, in part, potential temperature-related impacts to juvenile steelhead.	

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	d) Instream Cover (woody debris). Most large woody debris has been, and continues to be, removed from the Lower American River by the U.S. Army Corps of Engineers to reduce potential hazards to recreationists. Discontinuation of this action in select reaches of the river would allow woody debris to accumulate. Instream woody cover is important for juvenile chinook salmon rearing as it provides structure that can be utilized to escape fish and avian predators. It also provides microhabitats with reduced current velocities where juvenile chinook salmon can feed more effectively. Increasing the amount of instream woody debris at specific sites could improve juvenile rearing success prior to emigration, thereby contributing to an overall increase in annual production. This action would off-set, in part, potential flow-related impacts to juvenile chinook salmon. e) Shaded Riverine Aquatic Habitat Protection/Management. SRA habitat can be restored along the Lower American River by constructing terraces along shorelines and planting terraces with appropriate herbaceous and woody vegetation. SRA habitat provides feeding and holding areas, escape cover, and local temperature refugia for juvenile chinook salmon. Development and implementation of a shaded riverine aquatic habitat protection/management program would facilitate improving rearing habitat. Thus, protecting and restoring SRA habitat could improve juvenile rearing success, thereby contributing to an overall increase in annual production. This action would off-set, in part, potential flow-related impacts to juvenile chinook salmon. f) Spawning Habitat Management/Maintenance. Improve spawning habitat in the Lower American River by breaking up and redistributing coarse subsurface deposits and reducing compaction and embeddedness which reduces gravel	

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	permeability. Development and implementation of a gravel management program for the Lower American River would facilitate improving spawning habitat for chinook salmon and reducing the deterioration of existing spawning gravel. This habitat improvement would be expected to increase the amount of available spawning habitat, thereby contributing to higher overall spawning and incubation success, and therefore chinook salmon production, annually. This action would off-set, in part, flow-related impacts to juvenile chinook salmon. Performance Criteria: a) Dry Year Flow Augmentation. Increase flows particularly during the period during dry and critically dry years to the maximum extent feasible, relative to non-augmented conditions. To assess whether flow augmentation is reducing flow-related impacts, flows would be monitored in the Lower American River. b) Flow Fluctuation Criteria. Reduce the frequency of large, rapid flow-reduction events throughout the year, particularly during the fall spawning and incubation period. c) Wetland/Slough Complex Restoration/Maintenance. Increase the amount of wetland/slough complex habitat in the Lower American River that is used by early life stages of chinook salmon for rearing prior to emigration. d) Instream Cover (woody debris). Increase the amount of woody debris within areas of the Lower American River channel that is used by early life stages of chinook salmon for rearing prior to emigration.	

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	e) Shaded Riverine Aquatic Habitat Protection/Management. Protect existing, and increase to the extent feasible, the amount of shaded riverine aquatic habitat within the Lower American River. f) Spawning Habitat Management. Restore armored gravels to conditions that will encourage chinook salmon to use restored areas for spawning. Timing: a) Dry Year Flow Augmentation. Flow augmentation would occur during the spawning period October through December, during dry and critically dry years. This measure would be implemented, as necessary, throughout the effective period of the Water Forum Agreement. b) Flow Fluctuation Criteria. Flow fluctuation criteria would be developed and implemented for the effective period of the Water Forum Agreement. c) Wetland/Slough Complex Restoration/Maintenance. Wetland/Slough complex restoration/management would be conducted throughout the effective period of the Water Forum Agreement, as warranted by the success of initial projects to be initiated during the first two years of the Agreement. d) Instream Cover (woody debris). Instream cover (woody debris) would be allowed to accumulate in the Lower American River throughout the effective period of the Water Forum Agreement. e) Shaded Riverine Aquatic Habitat Protection/Management. Shaded riverine aquatic habitat protection/management	

Table 2-3
SUMMARY OF CUMULATIVE IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	would be conducted throughout the effective period of the Water Forum Agreement, as warranted by the success of initial projects to be implemented within the first two years of the Agreement. f) Spawning Habitat Management. Spawning habitat management would be conducted throughout the effective period of the Water Forum Agreement.	
6.5-6: Lower American River Steelhead. Under the cumulative analysis set of assumptions, flow reductions anticipated to occur during the April through September period would reduce the amount of juvenile rearing habitat in most years. The analysis also indicates that the 69-year average temperature at Nimbus Dam and Watt Avenue for the May through September period would decrease up to about 1°F. Although measurable temperature increases could occur in up to 10% of the years during this period, measurable temperature decreases could occur from over 30% to 95% of the time during some months of this period. Because steelhead in the Lower American River are believed to be more limited by summer rearing temperatures than flows, the frequent and substantial temperature reductions would be expected to offset the flow reductions. Consequently, the combined temperature and flow changes under the 2030 w/ WFP would not be expected to adversely affect the long-term population trends of steelhead in the Lower American River. This would be a less-than-significant future cumulative impact.	No mitigation measures are required.	**less-than-significant**
6.5-7: Flow- and Temperature-Related Impacts to Splittail (February through May). Under the cumulative analysis assumptions, the 2030 w/ WFP would typically reduce, to some degree, the amount of riparian vegetation inundated between RM 8 and 9 (which serves as an index for the lower portion of the river) under the Base Condition. However, with few exceptions,	The following actions would be implemented as part of the HME, which will be adopted as an integral component of the Water Forum Agreement. a) Wetland/Slough Complex Restoration/Maintenance. Restore wetland/slough complexes occurring within habitat	**potentially significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
substantial amounts of inundated riparian vegetation would remain under the 2030 w/WFP in years when such habitat would occur under the Base Condition. In addition, flow changes under the 2030 w/WFP would have little effect on the availability of in-channel spawning habitat availability, or the amount of potential spawning habitat available from the mouth up to RM 5 – the reach of the river influenced by Sacramento River stage. The analysis also indicates that the frequency with which suitable temperatures for splittail spawning below Watt Avenue would not change substantially under the 2030 w/WFP, relative to the Base Condition. Given the uncertainty as to the magnitude and extent of splittail spawning in the Lower American River, and the actual amount of potential spawning habitat at specific flow rates throughout the river, the effects of flow reductions from the February through May period also are uncertain and, therefore, represent a potentially significant impact. This would be a potentially significant future cumulative impact.	transitional zones between river channels, shoreline, and upland habitats. Restoration would involve grading areas for the appropriate elevations and hydrology, as well as planting appropriate vegetation, to achieve desired habitat characteristics. Because wetland/slough complexes are used by splittail for spawning, restoration and maintenance of these complexes would increase the quantity, and possibly the quality, of spawning habitat available to splittail. Wetland/slough complex restoration/maintenance would reduce flow-related impacts to splittail spawning. b) Shaded Riverine Aquatic Habitat Protection/Management. SRA habitat can be restored along the Lower American River by constructing terraces along shorelines and planting terraces with appropriate herbaceous and woody vegetation. SRA habitat provides spawning and rearing areas for splittail. Development and implementation of a shaded riverine aquatic habitat protection/management program would facilitate increasing splittail spawning and rearing habitat availability within the Lower American River. Thus, protecting and restoring SRA habitat could improve splittail spawning and juvenile rearing success, thereby contributing to an overall increase in annual production of splittail. This action would off-set, in part, potential flow-related impacts to splittail. c) Flow Fluctuation Criteria. Develop and implement flow fluctuation (i.e., ramping) criteria for the operation of Folsom and Nimbus dams that would reduce the frequency with which rapid flow fluctuations occur in the river. Reducing the occurrence of large, rapid flow reductions would help to minimize losses of splittail due to fry and juvenile stranding during the February through May period. Flow fluctuation criteria would contribute to improving early life-stage rearing	

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	success, thereby contributing to an overall increase in annual production of splittail. This action would off-set, in part, potential flow-related impacts to splittail. Performance Criteria: a) Wetland/Slough Complex Restoration/Maintenance. Increase the amount of wetland/slough complex habitat in the Lower American River that is used by splittail for spawning and rearing. b) Shaded Riverine Aquatic Habitat Protection/Management. Protect existing, and increase to the extent feasible, the amount of shaded riverine aquatic habitat within the Lower American River. c) Flow Fluctuation Criteria. Develop and implement flow fluctuation (i.e., ramping) criteria for the operation of Folsom and Nimbus dams that would reduce the frequency with which rapid flow fluctuations occur in the river. Reducing the occurrence of large, rapid flow reductions would help to minimize losses of splittail due to fry and juvenile stranding during the February through May period. Flow fluctuation criteria would contribute to improving early life-stage rearing success, thereby contributing to an overall increase in annual production of splittail. This action would off-set, in part, potential flow-related impacts to splittail.	
6.5-8: Flow- and Temperature-Related Impacts to American Shad (May and June). Under the cumulative analysis assumptions, flow reductions anticipated to occur during the May through June period would increase the frequency with which mean monthly flows at the mouth would be below the target attraction flow of 3,000 cfs by about 3 to 4%. Flow reductions under the 2030 w/WFP in May and June could reduce the number of adult shad	No mitigation measures are required.	**less-than-significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
attracted into the river during a few years. However, because American shad spawn opportunistically where suitable conditions are found, potentially attracting fewer adults spawners into the Lower American River in some years would not be expected to adversely impact annual American shad production within the Sacramento River system. Furthermore, direct impacts to the Lower American River sport fishery would be less than substantial in most years. In addition, the frequency with which suitable temperatures for American shad spawning would exist would not differ substantially between the 2030 w/WFP and the Base Condition. Consequently, the combined flow and temperature changes under 2030 w/WFP would not be expected to adversely affect the long-term population trends of American shad in the Lower American River. This would be a less-than-significant future cumulative impact.		
6.5-9: Flow- and Temperature-Related Impacts to the Striped Bass Sport Fishery (May and June). Under the cumulative analysis assumptions, flow reductions anticipated to occur during the May through June period would increase the frequency with which mean monthly flows at the mouth would be below the target attraction flow of 1,500 cfs by about 1 to 10%. However, flows at the mouth that are believed to be sufficient to maintain the striped bass fishery would be met or exceeded in most years during this period. The frequency with which suitable temperatures for juvenile striped bass rearing in the Lower American River would differ little between the 2030 w/ WFP and the Base Condition during May and June. Consequently, the combined temperature and flow changes under the 2030 w/ WFP would not be expected to adversely affect the long-term of the striped bass fishery in the lower American River. This would be a less-than-significant future cumulative impact.	No mitigation measures are required.	**less-than-significant**

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Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
6.5-10: Impacts to Shasta Reservoir ' s Coldwater Fisheries. Under the cumulative analysis assumptions, substantial reductions in reservoir storage would occur occasionally throughout the April through November period of the year. However, because physical habitat availability is not believed to be among the primary factors limiting coldwater fish populations within the reservoir, and because anticipated changes in seasonal storage would not be expected to result in substantial adverse effects on the primary prey base utilized by the reservoir's coldwater fish populations, seasonal reductions in storage expected to occur under 2030 w/ WFP would not significantly affect Shasta Reservoir's coldwater fisheries. This would represent a less-than-significant future cumulative impact.	No mitigation measures are required.	**less-than-significant**
6.5-11: Impacts to Trinity Reservoir ' s Coldwater Fisheries. Under the cumulative analysis assumptions, substantial reductions in reservoir storage would occur occasionally throughout the April through November period of the year. However, because physical habitat availability is not believed to be among the primary factors limiting coldwater fish populations within the reservoir, and because anticipated changes in seasonal storage would not be expected to result in substantial adverse effects on the primary prey base utilized by the reservoir's coldwater fish populations, seasonal reductions in storage expected to occur under 2030 w/ WFP would not substantially affect Trinity Reservoir's coldwater fisheries. This would represent a less-than-significant future cumulative impact.	No mitigation measures are required.	**less-than-significant**
6.5-12: Impacts to Shasta Reservoir ' s Warmwater Fisheries Under the cumulative analysis assumptions, the 70-year average amount of littoral habitat available to warmwater fishes would be reduced by about 11 to 36% during the July through September period (which are the initial rearing months for the reservoir's warmwater fishes of management concern), with even more substantial reductions in reservoir littoral habitat availability in some years during these months. Rates of elevation fluctuation	No feasible measures are available. It is beyond the purview of the Water Forum to independently mitigate this impact. The degree of impact will largely depend on future CVP operations. As such, the ability to mitigate lies with the USBR and will depend on those future operations.	**potentially significant**

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SUMMARY OF CUMULATIVE IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
would not change substantially under the 2030 w/ WFP, relative to the Base Condition. However, seasonal changes in 70-year average reservoir littoral habitat under the 2030 w/ WFP would be of sufficient magnitude to potentially affect long-term, average initial year-class strength of the warmwater fish populations of management concern. Reduced littoral habitat availability would be a potentially significant future cumulative impact to Shasta Reservoir warmwater fisheries.		
6.5-13: Impacts to Trinity Reservoir ' s Warmwater Fisheries Under the cumulative analysis assumptions, littoral habitat availability would be reduced by about 10 to about 20% during the March through September period, with substantial reductions in littoral habitat availability occurring frequently throughout period. On the average, the 70-year average littoral habitat would be reduced by nearly 20% from July through September. The potential for nest dewatering events to occur in Trinity Reservoir would not change substantially under the 2030 w/ WFP during the March through July spawning period. However, changes in the availability of littoral habitat under the 2030 w/ WFP would potentially result in adverse affects to the initial establishment of warmwater fish year-classes. Reduced littoral habitat availability would be a potentially significant future cumulative impact to Trinity Reservoir warmwater fisheries.	No feasible measures are available. It is beyond the purview of the Water Forum to independently mitigate this impact. The degree of impact will largely depend on future CVP operations. As such, the ability to mitigate lies with the USBR and will depend on those future operations.	**potentially significant**
6.5-14: Impacts to Keswick Reservoir Fisheries. Under the cumulative impact assumptions, hydrologic conditions with the 2030 w/ WFP would have little, if any, effect on seasonal storage, elevation, and temperature of Keswick Reservoir. Any minor changes in storage, elevation, or temperature that could occur would not substantially affect the reservoir's fishery resources. This would constitute a less-than-significant future cumulative impact.	No mitigation measures are required.	**less-than-significant**

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SUMMARY OF CUMULATIVE IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
6.5-15: Flow-Related Impacts to Sacramento River Fisheries. Under the cumulative analysis assumptions, the 70-year average flows released from Keswick Dam would not be substantially reduced during any month of the year. The analysis indicates that flow reductions of more than 10% would occur occasionally during some months and infrequently during others under 2030 w/ WFP, relative to the Base Condition. The analysis also indicates that the 3, 250 cfs minimum flow objective for Keswick Reservoir stipulated in the NMFS Biological Opinion for the protection of winter-run chinook salmon rearing and downstream passage between 1 October and 31 March would not be violated in any month of this period under either the 2030 w/ WFP or the Base Condition. Flow changes below Keswick Dam that would occur under the 2030 w/ WFP would result in less-than-significant impacts to upper Sacramento River fisheries resources. The analysis for the lower Sacramento River indicates that the 70-year average flows under 2030 w/ WFP would not be substantially reduced relative to the Base Condition. The analysis also indicates that flow reductions of more than 20% would occur occasionally during August and infrequently during all other months of the year. Consequently, any flow-related impacts to lower Sacramento River fisheries or migrating anadromous fishes that could occur under 2030 w/ WFP are considered to be less than significant. Overall, this constitutes a less-than-significant future cumulative impact.	No mitigation measures are required.	**less-than-significant**
6.5-16: Temperature-Related Impacts to Sacramento River Fisheries Resources. Under the cumulative analysis assumptions, the 69-year average temperature at Keswick Dam would increase up to approximately one-half °F during the period August through November. Mean monthly temperatures at Keswick Dam would exceed the 56°F threshold stipulated in the NMFS Biological Opinion for winter-run chinook salmon about 1% more often in September, and would exceed the 60°F threshold stipulated for October in the NMFS Biological Opinion for winter-run chinook	No feasible measures are available. It is beyond the purview of the Water Forum to independently mitigate this impact. The degree of impact will largely depend on future CVP operations. As such, the ability to mitigate lies with the USBR and will depend on those future operations.	**significant**

Table 2-3
SUMMARY OF CUMULATIVE IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
salmon 1% more often under the 2030 w/ WFP, relative to the Base Condition. Mean monthly temperatures at Bend Bridge would exceed the 56ºF threshold stipulated in the NMFS Biological Opinion for winter-run chinook salmon approximately 1% more often in April, and approximately 3% more often in May, June, and August. Although there would be no substantial change in the 69-year average early lifestage salmon survival for fall-, late fall-, winter-, and spring- run chinook salmon, substantial reductions in annual early-lifestage survival could be expected to occur under the 2030 w/ WFP, relative to annual survival estimates under the Base Condition, approximately 6% more often for winter-run and approximately 1 to 3% more often for spring-run. Substantial changes in average lower Sacramento River temperatures would not be expected over the 69-year period simulated, although individual months could exhibit substantial temperature increases.. Overall changes in water temperatures represent a significant future cumulative impact.		
6.5-17: Delta Fish Populations. Under the cumulative analysis assumptions, reductions in Delta outflow of more than 10% would occur occasionally during some months of the February through June period considered important for Delta fisheries resources. The analysis also indicates that upstream shifts of the position of X2 of 1 km or more would also occur occasionally during some months. Finally, the analysis indicates that Delta export to inflow ratios under the 2030 w/ WFP would not exceed the maximum export limits for either the February through June (35% of Delta inflow) or the July through January periods (65% of Delta inflow). Although the project would not cause X2 or Delta outflow standards to be violated, the project could result in reductions in outflow and upstream shifts in the position of X2, which could be considered a potentially significant impact to Delta fisheries resources.	No feasible measures are available. It is beyond the purview of the Water Forum to independently mitigate this impact. The degree of impact will largely depend on future CVP operations. As such, the ability to mitigate lies with the USBR and will depend on those future operations.	**potentially significant**

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Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
FLOOD CONTROL (Section 6.6)		
6.6-1: Ability to Meet Flood Control Diagrams of CVP/SWP Reservoir. Increased diversions from CVP/SWP reservoirs under the future cumulative condition would result in reduced storage during the flood control season, increasing the ability to meet flood control needs. This would be a less-than-significant future cumulative impact.	No mitigation measures are required.	**less-than-significant**
POWER SUPPLY (Section 6.7)		
6.7-1: Reduced CVP Hydropower Capacity and Generation - Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that no substantial reduction in average annual surplus capacity or capacity for use by WAPA ' s preference customers would occur. Under the future cumulative condition, WAPA ' s capacity peak maximum of 1,152 megawatts would not be met in about 47 of the 828 months studied, as compared to 42 months for the Base Condition. However, under the future cumulative condition average annual CVP energy production would be reduced. by about 225 Gwh compared to the Base Condition. This change in annual average CVP energy production which is roughly equivalent to a 5% percent reduction, is considered a significant cumulative impact.	No feasible mitigation measures are available.	**significant**
6.7-2: Changes in Pumping Requirements for Diverters at Folsom Reservoir - Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that energy requirements for those who pump water from Folsom Reservoir would increase by about 140% over existing conditions. Although not a significant environmental effect, this represents a significant cumulative economic impact.	No mitigation measures are required.	**less-than-significant (economically significant)**

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Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
VEGETATION AND WILDLIFE (Section 6.8)		
6.8-1: Special Status Species, Riparian Vegetation, and Backwater Ponds Associated with the Lower American River - Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that the range of flows within the minimum/optimal range of 1,300 to 4,000 cfs would vary by 3 or fewer years during the 70-year period of record, in comparison to base conditions. As a result, reduced flows under future cumulative conditions would not result in an adverse effect to the special-status species (including the Valley Elderberry Longhorn Beetle) that are dependent on riparian vegetation and backwater ponds associated with Lower American River. This would be a less-than-significant future cumulative impact.	No mitigation measures are required.	**less-than-significant**
6.8-2: Special Status Species and Riparian Vegetation Associated with the Sacramento River and Sacramento-San Joaquin Delta - Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that flows in the lower American River would be further reduced. However, during the critical growing season months of April through July, the number of occurrences in which mean monthly flows of the lower American River would be within the minimum/optimal flow range of 1,300 to 4,000 cfs would vary by 3 or fewer years during the 70-year period of record, in comparison to base conditions. As a result, reduced flows under future cumulative conditions would not result in an adverse effect to the special-status species (including the Valley Elderberry Longhorn Beetle) that are dependent on riparian vegetation and backwater ponds associated with Lower American River. This would be a less-than-significant future cumulative impact.	No mitigation measures are required.	**less-than-significant**
6.8-3: Vegetation Associated with Reservoirs - Under the set of assumptions for future conditions used in the EIR, the cumulative	No mitigation measures are required.	**less-than-significant**

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Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
impact analysis indicates that, in comparison to base conditions, mean monthly surface water elevations at Folsom, Shasta, and Trinity reservoirs would be reduced by less than 1% during the months of the growing season (March-October). Because the draw down zones at these reservoirs are vegetated with non-native plants that do not form a contiguous riparian community, minor fluctuations in surface water elevations would not adversely affect important habitat values at these reservoirs. Consequently, this would be a less-than-significant cumulative impact.		
RECREATION (Section 6.9)		
6.9-1: Cumulative Impacts on the Lower American River Recreation Opportunities - Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that flows in the lower American River would be even further reduced. For example, during the months of May through September, the number of occurrences in which mean monthly flows of the lower American River would be reduced below the minimum threshold of 1,750 cfs would increase by as much as 40%, in comparison to base conditions. The WFP would contribute to this cumulative impact. This would be a significant cumulative impact.	The WFP includes features intended to lessen potential environmental impacts to the American River, consistent with the coequal objective to protect its natural values. These mitigating features include water conservation, dry-year diversion restrictions, and conjunctive use of ground water and surface water. Adoption of the WFP with these features would reduce flow effects on Lower American River recreation opportunities. In addition, improvements to recreation facilities in the American River Parkway are identified to compensate for the reduction in quality of and opportunity for rafting/boating on the Lower American River. Actions would occur in cooperation with the Sacramento County Department of Parks and Recreation and could include one or both of the following: (A) contributing to the purchase and development of the Uruttia property to provide water-dependent recreation opportunities and (B) developing recreation facilities to improve water-dependent and water-enhanced recreation opportunities in the American River Parkway. The improvements would involve projects that are consistent with the American River Parkway Plan, or that would be implemented subject to an amendment to the parkway plan by Sacramento County.	**significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	The measures described below could be implemented in cooperation with the Sacramento County Department of Parks and Recreation, the agency responsible for implementing the American River Parkway Plan. The measures could be part of the Habitat Management Plan adopted by the Water Forum participants as an implementation tool for the Habitat Management Element of the Water Forum Proposal. Funding for the recreation measures may include money from within or outside the Water Forum Successor Effort. Because activities by a number of agencies are underway to restore and enhance the Lower American River, this recreation mitigation should be coordinated with the broader ecosystem partnership efforts. Other agencies involved in the Lower American River may participate in funding and/or implementation of recreation mitigation, as appropriate, to promote a well-coordinated program of restoration and enhancement of the river. a) Uruttia Property. The Uruttia Property, located on the north side of the Lower American River near CalExpo, could be acquired and/or developed to provide public access, opportunities for water-dependent recreation activity related to the river (such as canoe and kayak use and instruction), and enhanced environmental values which can provide opportunities for water-enhanced recreation, such as sightseeing and nature study. The property and facilities would be incorporated into the American River Parkway and reflected by amendment in the American River Parkway Plan. b) Recreation Facility Improvements to the American River Parkway. The American River Parkway Plan describes in several Area Plans the resources and facilities intended to provide for water-dependent and water-enhanced	

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	recreation, including river access, trails, parking, swimming areas, and other facilities. The facilities could include improvement of river access for rafting/boating in the less intensively used sections of the river, such as downstream of Goethe Park; trail improvements to increase the opportunity for water-enhanced recreation, such as a linkage between the Fairbairn plant and the Sutter ' s Landing Park site; or interpretive resources to improve water-enhanced nature study and appreciation of the Parkway. c) Update of the American River Parkway Plan. The update could consider the flow regime resulting from the WFP and appropriate actions to take in the Parkway to support improvement of both recreation opportunities and riparian habitat. d) Enhancement of the Condition and Quality of Existing Recreation Facilities. Past and current budget constraints have limited the County ' s ability to maintain some existing recreation facilities. Enhancement of the condition and quality of existing facilities could improve the attraction of the Parkway for both water-dependent and water-enhanced recreation activity. The improvements to recreation facilities in the American River Parkway would accomplish the following criteria: • Facilities would improve opportunities for water-dependent recreation, particularly rafting/boating, such that the river is made more accessible when flows are appropriate and/or the quality of rafting/boating is improved; or facilities would improve opportunities for water-enhanced recreation, such that the quality and	

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	visitation associated with recreation activity in the Parkway is increased. • Improvements would be consistent with the American River Parkway Plan. The final selection of facilities for improvement would occur during the 18-month preparation period of the Habitat Management Plan. Facilities would be developed as soon as feasible after completion of that plan, recognizing the need to assemble funding, secure facility approvals, and prepare designs.	
6.9-2: Cumulative Impacts to Folsom Reservoir Recreation Opportunities - Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that, in comparison to base conditions, surface water elevations at Folsom Reservoir would be further reduced. For example, during the recreational use period of the year (primarily May-September), the number of occurrences in which lake levels would decline below the minimum 412-foot elevation for use of marina wet slips would increase by more than 10%, in comparison to base conditions. Reduced lake levels under the cumulative condition would also adversely affect swimming beaches. The WFP would contribute to this cumulative condition and it would be a significant cumulative impact.	The WFP includes features intended to lessen potential environmental impacts on the Lower American River, which would also serve to decrease environmental effects to other resources. These mitigating features include water conservation, dry-year diversion restrictions, and conjunctive use of ground water and surface water. Adoption of the WFP with these features would reduce water surface elevation effects on Folsom Reservoir recreation. In addition, boating facility improvements would enhance boating access during periods of higher water to compensate for reduced availability of boat ramp and marina facilities from Water Forum Proposal diversions. Actions would occur in cooperation with the California Department of Parks and Recreation (CDPR) and would be consistent with the General Plan for Folsom Lake State Recreation Area (CDPR, 1978). Mitigation should also be consistent with the objectives of CDPR proposals for measures to mitigate lower lake levels from flood storage reoperation (Kranz, 1997). The actions could be added into the recreation section of the Habitat Management Plan as a means to implement them.	**significant**

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	One or more of the following recreation measures described below could be implemented in cooperation with the CDPR. Funding for the recreation measures may include money from within or outside the Water Forum Successor Effort. A number of agencies are involved in water resources and recreation facility decisions affecting Folsom Reservoir, so this recreation mitigation should be coordinated with other actions, as appropriate. Consequently, other agencies involved in Folsom Reservoir may participate in funding and/or implementation of recreation mitigation. e) Boating Facilities to Increase Access and Use During Higher Water Periods. Construction of boating facilities, consistent with the General Plan for Folsom Lake State Recreation Area would increase boating access and use of the reservoir during higher water periods. To compensate for reduced availability of boating facilities during lower water periods, this measure would improve boating facilities for use when higher water conditions allow for high-quality water recreation and the greater reservoir surface area availability; at higher water levels, visitation can be increased when the larger reservoir surface area can support more intensive use. Examples of potential boating facility improvements suggested by CDPR staff include boat parking and shore facilities at Dyke 8 or a launch ramp and dock at New York Cove (on the east side of the reservoir, north of Brown ' s Ravine). The final selection of facilities would occur in cooperation between the Water Forum Successor Effort and the CDPR. f) Improvement to the Marina Area. Construction of facility improvements in the Brown ' s Ravine area would enhance the operation of the marina. Improvements would be consistent with the Folsom Lake State	

Table 2-3
SUMMARY OF CUMULATIVE IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	Recreation Area General Plan. The intent of these improvements would be to help enhance marina operations during periods of sufficiently high water to offset the reduced availability of wet slips. The final selection of facilities would occur in cooperation between the Water Forum Successor Effort, the operator of the marina, and the CDPR. The improvements to recreation facilities on Folsom Reservoir will accomplish the following criteria: • Facilities serving higher water conditions will increase boating visitation to Folsom Reservoir when the surface area is large enough to support the increased use. • Marina facility improvements will help enhance operation of the marina when water level is high enough to support the wet slips. • Improvements are consistent with the General Plan for Folsom Lake State Recreation Area. The final selection of facilities for improvement would occur during an period following adoption of the Water Forum Proposal. Facilities would be developed as soon as feasible after completion of that plan, recognizing the need to assemble funding, secure facility approvals, and prepare designs.	
6.9-3: Sacramento River and Sacramento-San Joaquin Delta Recreation Opportunities Under Future Cumulative Conditions - Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that during the critical growing season months of April through July mean monthly flows in the Sacramento River would be reduced by approximately 3%, in comparison to base conditions. Flows would not be reduced with sufficient magnitude and frequency to adversely affect recreational opportunities associated with the Sacramento River	No mitigation measures are required.	**less-than-significant**

Table 2-3
SUMMARY OF CUMULATIVE IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
and Sacramento-San Joaquin Delta. This would be a less-than-significant cumulative impact.		
6.9-4: Lake Natoma, Whiskeytown, Keswick, Shasta, and Trinity Reservoirs Recreation Opportunities Under Future Cumulative Conditions - Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that, in comparison to base conditions, mean monthly surface water elevations at Shasta and Trinity reservoirs would be reduced by less than 1% during the recreational use period of the year (primarily May-September), which would not substantially diminish recreation opportunities. Because Lake Natoma, Whiskeytown, and Keswick reservoirs serve as regulating reservoirs, the pattern of surface water elevations changes at these reservoirs is not expected to change substantially under cumulative conditions. This would be a less-than-significant cumulative impact.	No mitigation measures are required.	**less-than-significant**
LAND USE AND GROWTH-INDUCING (Section 6.10)		
Land use designations established in the most recent general plans for the jurisdictions in the water service study area represent the maximum long-term level of growth approved by city and county decision-makers. Because the WFP addresses the region ' s water demands through the year 2030, and the buildout years of the general plans are not able to be precisely predicted, the reliable water supply provided by the WFP to each purveyor may fall short of, just meet, or exceed water demand at buildout. The diversions provided for in the WFP are intended to accommodate each agency ' s projected surface water need in 2030 considering such factors as projected growth rate, water rights, conservation levels, availability of alternative water supplies, environmental considerations, and other factors. As such, that analysis is inherently cumulative.	The water supply included in the WFP has been determined considering the planned growth for each jurisdiction within the water service study area; as such, the WFP is consistent with the growth parameters described each city and county General Plan. The General Plan of each jurisdiction includes policies and programs for the protection of the environment and, to the extent feasible, the avoidance or mitigation of significant effects on the environment from planned growth and development. During the normal course of each jurisdiction ' s implementation of its General Plan policies, feasible mitigation of significant impacts from planned growth and development would occur. Because mitigation of growth-related environmental impacts is in the purview of each city and county, through their existing land use authority, and because the Water Forum itself has no such authority, the	**significant**

Table 2-3
SUMMARY OF CUMULATIVE IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	WFP cannot feasibly provide for additional mitigation of growth-related land use and development environmental impacts.	
AESTHETICS (Section 6.11)		
6.11-1: Aesthetic Value of the Lower American River - Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that flows in the lower American River would be further reduced. However, during the critical growing season months of April through July, the number of occurrences in which mean monthly flows of the lower American River would be within the minimum/optimal flow range of 1,300 to 4,000 cfs would vary by 3 or fewer years during the 70-year period of record, in comparison to base conditions. As a result, reduced flows under future cumulative conditions would not result in an adverse effect to riparian vegetation and habitat and, as such, would not result in an adverse affect to the aesthetic quality of the lower American River. This would be a less-than-significant future cumulative impact.	No mitigation measures are required.	**less-than-significant**
6.11-2: Aesthetic Value of the Sacramento River and Sacramento-San Joaquin Delta - Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that mean monthly flows in the Sacramento River would be reduced by approximately 3%, in comparison to base conditions, during the critical growing season months of April through July. Flows would not be reduced with sufficient magnitude and frequency to significantly alter existing riparian vegetation dependent on Sacramento River flows and Delta inflows. As a result, the aesthetic quality of the Sacramento River and Sacramento-San Joaquin Delta would not be adversely affected. This would be a less-than-significant future cumulative impact.	No mitigation measures are required.	**less-than-significant**

Table 2-3
SUMMARY OF CUMULATIVE IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
6.11-3: Aesthetic Value of Reservoirs - Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that mean monthly surface water elevations at Folsom, Shasta, and Trinity reservoirs would be reduced by less than 5 feet, in comparison to base conditions. In addition, because Lake Natoma, Whiskeytown, and Keswick Reservoir serve as regulating reservoirs, future surface water elevations at these reservoirs are not expected to change substantially. Consequently, this would be a less-than-significant future cumulative impact.	No mitigation measures are required.	**less-than-significant**
CULTURAL RESOURCES (Section 6.12)		
6.12-1: Physical Deterioration of Cultural Resource Sites in Folsom Reservoir - Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that Folsom Reservoir water surface elevations would be reduced more frequently and/or by greater magnitudes compared to that occurring solely as a result of the WFP. Future reductions in 70-year monthly average water surface elevation would approximate 2 to 4 ft, relative to existing elevations. Such reductions would result in a lowered zone where water-level fluctuations would be the most pronounced. The effect of this lowered fluctuation zone on cultural resources would be to expose sites that historically had experienced a higher degree of protection from erosion and other physical destructive forces. Under the future cumulative condition, this would be a significant cumulative impact.	The WFP hydrologic modeling data indicates that the project would have a significant impact on cultural sites and features within the reservoir pool, especially those located between the 360 ft msl and 395 ft msl elevations. Significant impacts would include the potential exposure of previously submerged sites to increased vandalism, recreation use, wave action, and the effects of repeated inundation and drawdown. Many prehistoric and historic sites have been recorded within the reservoir basin, most of which remain unevaluated. Only about half of the reservoir has been surveyed, and many other sites undoubtedly exist in the unsurveyed areas. In 1994, Far Western and JRP Historical Consultants prepared a Research Design as part of SAFCA ' s Folsom Re-operation Study. That document included all of the reservoir basin between the 390-foot and the 466-foot contours. The Research Design provides, among other components, summaries of the known cultural resources within the study area; research issues applicable to those resources; and recommendations for evaluating the sites, protecting them from further damage, and mitigating unavoidable impacts.	**potentially significant**

Table 2-3
SUMMARY OF CUMULATIVE IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
	Checklists are included for evaluation of various types of sites. All unevaluated sites within the reservoir that fall within the direct impact zone of the WFP could be given additional study, using this Research Design as a guideline. Also, unsurveyed portions of the direct impact zone could be surveyed for cultural resources, as water levels permit; any additional sites and features also may require evaluation and mitigation. The appropriate agencies (i.e., Bureau of Reclamation, US Army Corp of Engineers, and the State Office of Historic Preservation) could decide that evaluation and mitigation of a *representative sample* of the sites is sufficient, although this cannot be determined without comprehensive consultation with those agencies. Recent conversations with archaeologists at the Bureau of Reclamation's Sacramento office suggest that such sampling would be acceptable to that agency.	
6.12-2: Inundation or Exposure of Cultural Resource Sites in the Lower American River - Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis indicates that river flows in the Lower American River would be reduced more frequently and/or by greater magnitudes compared to the WFP alone. With overall reductions in 70-year monthly average river flows (up to 11 percent, but generally about 5 percent), the potential for inundation of cultural resource sites along the Lower American River would be less than that existing today. Such reductions, however, would also not exceed those historically recorded, thereby avoiding further exposure of any cultural remains which are presently submerged. This would represent a less-than-significant cumulative impact.	No mitigation measures are required.	**less-than-significant**
6.12-3: Inundation or Exposure of Cultural Resource Sites in the Lower Sacramento River - Under the set of assumptions for future conditions used in the EIR, the cumulative impact analysis	No mitigation measures are required.	**less-than-significant**

Table 2-3
SUMMARY OF CUMULATIVE IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
indicates that flows in the Lower Sacramento River could be reduced more frequently and/or by greater magnitudes compared to that occurring solely as a result of the WFP. Such reductions on a 70-year monthly average, however, are anticipated to be generally less than 4 percent, relative to existing flow conditions. These reductions would be small enough that exposure of submerged cultural resources would be highly unlikely. Moreover, any cultural resources within the river banks and floodplain would not be affected since flows would, on average, be lower and it is assumed that the existing levee system would continue to provide channelized protection of the floodplain areas. This would be considered to represent a less-than-significant cumulative impact.		
SOILS AND GEOLOGY (Section 6.13)		
6.13-1: Changes in Geologic Substructures – In the future, it is anticipated that development will continue throughout the region. Associated with this anticipated development, ground disturbing activities of new construction efforts have potential to substantially change geologic substructures. With major construction projects, potential changes to subsurface geology could affect human safety. However, development and planning of future projects would consider geotechnical studies and implement design recommendations, as appropriate, in order to minimize any hazardous geologic changes to the underlying substrata. Therefore, cumulative changes in geologic substructures are considered less than significant cumulative impact.	No mitigation measures are required.	**less-than-significant**
6.13-2: Exposure to Major Geologic Hazards – In the future, it is recognized that major capital improvement and construction projects will occur with the potential to expose people or property to major geologic hazards. Given the relative stability of the geologic subsurface environment in the greater Sacramento area, exposure to geologic hazards is considered to be a less-than-significant impact.	No mitigation measures are required.	**less-than-significant**

Table 2-3
SUMMARY OF CUMULATIVE IMPACTS

Impact Before Mitigation	Potential Mitigation Measures	Significance After Mitigation
6.13-3: Increased Soil Erosion by Wind or Water – Future development activities could disturb surface soils and thereby induce either wind or water erosion. This, however, would be highly localized and temporary, potentially occurring only during construction periods. Future compliance and adherence to project-specific siting investigations, soils/geotechnical studies and the implementation of any necessary project-specific mitigation measures, would avoid long-term soil erosion. This is considered to represent a less-than-significant cumulative impact.	No mitigation measures are required.	**less-than-significant**
6.13-4: Loss of Soil Cover – In the future, increasing development across the region will undoubtedly result in a loss of soil cover. Certain projects, depending on their scale and location, may result in permanent loss of some soil cover. Protection against loss of valuable soils (for farmland purposes) is provided through the State mapping and identification system and avoided and/or mitigated through CEQA mitigation of project-specific actions. Future soil loss represents a less-than-significant cumulative impact.		**less-than-significant**

2.6 SUMMARY OF ALTERNATIVES TO THE WATER FORUM PROPOSAL

Pursuant to §15126(d) of the State CEQA Guidelines, the environmental impact report includes an analysis of a range of alternatives that could feasibly attain its basic objectives (i.e., the coequal objectives), plus three "no project" alternatives. Seven alternatives to the WFP are considered: 1) Increased Sacramento River Diversions; 2) Increased Groundwater Pumping; 3) Increased Water Reclamation; 4) More Frequent Reductions in Surface Water Diversions; 5) No Project Alternative—Independent Actions; 6) No Project Alternative—Constrained Surface Water and Groundwater; and 7) No Project Alternative—Constrained Surface Water, Unconstrained Groundwater.

2.6.1 Alternative 1 - Increased Sacramento River Diversions

Alternative 1, Increased Sacramento River Diversions, would involve transferring up to 78,000 AF of surface water diversions considered in the WFP from the Lower American River to the Sacramento River with the aim of reducing impacts on the American River. In order to reach end users, water diversion, pumping, treatment and transmission facilities would be required.

This alternative assumes water diversions from two locations on the Sacramento River: a new surface water diversion at Freeport, approximately 10 miles downstream of the confluence of the Sacramento and American rivers and a new diversion near Elkhorn, approximately 10 miles north of the confluence. New facilities would include but not be limited to water diversions and treatment plants at Freeport and Elkhorn, treated water pipelines to Folsom and Northridge Water District, a canal from Freeport to the South County area, and to the Folsom South Canal.

This alternative would result in reduced impacts on American River fisheries and recreation opportunities. Impacts related to power supply would be increased due to the cost of pumping water diverted from the Sacramento River to the service areas. Impacts of Alternative 1 on Sacramento River fisheries, water quality, flood control, vegetation and wildlife, aesthetics, cultural resources, and soils and geology would be the same, or not substantially different from impacts of the proposed WFP.

2.6.2 Alternative 2 - Increased Groundwater Pumping

Alternative 2 would involve meeting a larger portion of future demands through additional groundwater pumping. This alternative assumes that local groundwater from three subareas of the groundwater basin in the County would be extracted to meet projected growth in Sacramento County through the year 2030. An Integrated Groundwater - Surface Water Model (IGSM) was used to assess groundwater use in 2030 (assuming buildout of the County's Urban Policy Area) with the provision that a larger portion of water demand would be met from groundwater (Sacramento County Water Agency 1997).

Under this analysis, groundwater use is projected to increase from approximately 497,000 AF/Yr in the base condition, to approximately 612,000 AF/Yr in 2030. Most of the increase would occur in the South Sacramento area where substantial urban growth is planned. This alternative would reduce somewhat adverse impacts to fisheries, recreation, and other flow-related impacts

including water supply, power supply, vegetation and wildlife, and aesthetics. Groundwater, however, would be maintained at lower levels. This would increase the yield of the aquifer system, but could result in land subsidence, increased pumping costs, in-migration of poorer-quality water from the deep aquifer system or adjacent areas, decline in well productivity, and increased rate of movement of groundwater contamination.

2.6.3 Alternative 3 - Increased Water Reclamation

Alternative 3 would involve increased use of reclaimed water to offset new surface water diversions and groundwater pumping for non-potable consumptive uses such as irrigation, industrial use, and wetlands management. Specifically, reclamation studies for the County of Sacramento, the City of Roseville, and the El Dorado Irrigation District (EID), are considered in the definition of Alternative 3.

Results of the Sacramento County reclamation study concluded that the potential demand for agricultural use of reclaimed water could increase over time from approximately 150,000 AF in 1993 to approximately 263,000 AF in the year 2010, with out-of-county export of approximately 14,600 AF after 2005 due to insufficient in-County demand south of the American River (Sacramento County Regional Sanitation District 1994). Non-agricultural reclaimed water users in the County (primarily irrigators of parks, schools, roadway rights-of-way and medians, cemeteries, and golf courses) would generate a demand for 33,000 AF of reclaimed water per year, approximately 15,400 AF of which would be south of the American River. Under this alternative, reclaimed water use in Sacramento County would total approximately 263,000 AF. Conveyance, storage, and distribution facilities for reclaimed water would include pump stations, storage tanks, reservoirs, pipelines and canals. The Clay Station Reservoir site on Laguna Creek would need to be developed as the site for a 170,000 AF reclaimed water reservoir. This alternative also assumes increased reclamation in the City of Roseville and in the El Dorado Irrigation District (EID).

With these three sources of reclaimed water totaling approximately 300,000 AF/Yr by 2010, Alternative 3 considers substantially reduced groundwater pumping with some reductions in surface water diversions on the American and Sacramento rivers. Use of reclaimed water after 2010 would be expected to increase, but estimation of volume would be speculative.

Use of reclaimed water to meet some of Sacramento County's non-potable water demand would reduce groundwater pumping and some diversions from the Lower American and Sacramento River. Impacts to fisheries and recreation on the Lower American River would be somewhat reduced under Alternative 3. Impacts with regard to water quality and flood control would be the same or slightly reduced than under the WFP. Impacts with regard to water quality would be substantially reduced. This alternative would reduce return flows below the Sacramento River wastewater treatment plant. Treated effluent diverted for reclaimed water use (and thus not discharged to the Sacramento River) would decrease Delta outflows by a like amount. Therefore out-of-area water supply impacts could be substantially greater than those of the WFP.

Implementation of Alternative 3 would reduce demands on surface and groundwater resources in the project area. However, constraints to reclamation on the scale contemplated in Alternative 3 are many, and lend uncertainty to its ultimate implementation. Such constraints include regulatory permits and approvals, institutional agreements between producers of reclaimed water and other agencies; identification of markets for the resource; public health questions; and construction of treatment, storage, and conveyance facilities. Alternative 3 could not entirely substitute for any element of the WFP in any case, however, due to the limited uses of reclaimed water. Provision for additional surface water supplies to meet growing demands for potable water would still be required.

2.6.4 Alternative 4 - More Frequent Reductions in Surface Water Diversion

Under the WFP most purveyors that divert upstream of Nimbus Dam would limit their increased diversions or take other measures to reduce the impacts of diversions in about 18% of the years (i.e., years in which the projected March through November unimpaired inflow to Folsom Reservoir is less than 950,000 AF.)

Under Alternative 4, those purveyors would limit their increased diversions or take other measures to reduce the impacts of diversions in about 43% of the years (i.e., years in which March through November unimpaired inflow to Folsom Reservoir is below 1,600,000 AF). It would allow diversions similar to those described in the WFP in the remaining years.

Requiring drier year cutbacks in a greater percentage of years would result in reduced diversions from the Lower American River. Alternative 4 would result in somewhat reduced impacts to fisheries resources. Other flow-related impacts would be the same or slightly reduced, including recreation opportunities, vegetation and wildlife, water quality, power supply, visual resources, and flood control. Impacts on groundwater could be substantial as purveyors turn to groundwater in a greater number of years to make up for the shortfall in surface water supplies. This could result in impacts similar to those described under Alternative 2, Increased Groundwater Pumping, including land subsidence, increased pumping costs, in-migration of poor quality water, decline in well productivity, and increased rate of movement of groundwater contamination. Some purveyors without access to alternative sources would not have sufficient water supply to meet projected demand.

2.6.5 Alternative 5 - No Project Alternative—Independent Actions

Under Alternative 5, No Project Alternative—Independent Actions, it is assumed that purveyors would continue to pursue water supply projects. This alternative represents a condition that could occur in the year 2030 if the WFP is not implemented, and purveyors develop their own projects to meet their anticipated demands, without dry year delivery reductions, water conservation programs or Lower American River Habitat Management Element negotiated as part of the WFP. All other assumptions (e.g., 2030 out-of-basin CVP/SWP demands and increased Sacramento Valley demands, and increased Trinity River flows) will be used for comparative purposes for the Future Cumulative Condition simulation.

Implementation of Alternative 5 would result in more surface water diversions from the Lower American River, with no Water Forum-negotiated dry year restrictions, although there would be other external limitations on water availability (e.g., CVP-imposed deficiencies). On the Lower American River, impacts on fall-run chinook salmon and steelhead would be somewhat worse. Other flow related impacts would also be somewhat worse than under the WFP, including Lower American River and Folsom Reservoir recreation opportunities, water quality, flood control, CVP and SWP deliveries, visual resources, and Sacramento River fisheries.

2.6.6 Alternative 6 - No Project Alternative—Constrained Surface Water and Groundwater

Under Alternative 6, No Project Alternative—Constrained Surface Water and Groundwater, represents a condition at 2030 that could occur if diversions and groundwater pumping by Water Forum purveyors were constrained to the lesser of future demands, existing capacity, or existing water entitlements. All other assumptions (e.g., 2030 out-of-basin CVP/SWP demands and increased Sacramento Valley demands, and increased Trinity River flows) will be set at the same levels established for the Future Cumulative Condition simulation.

This alternative would not have sufficient water supply to provide for projected demand in the water service study area. Because a lower volume of water would be diverted from Folsom Reservoir, the Lower American River, and the Sacramento River as compared to the WFP, impacts on fisheries, recreation, vegetation and wildlife, CVP and SWP water deliveries, water quality, visual resources, and power supply would be reduced.

2.6.7 Alternative 7 - No Project Alternative—Constrained Surface Water, Unconstrained Groundwater

Under Alternative 7, No Project Alternative—Constrained Surface Water, Unconstrained Groundwater, represents a condition at 2030 that could occur if diversions by Water Forum purveyors were constrained to the lesser of future demands, existing capacity, or existing water entitlements. All other assumptions (e.g., 2030 out-of-basin CVP/SWP demands and increased Sacramento Valley demands, and increased Trinity River flows) will be used for comparative purposes for the Future Cumulative Condition simulation. This alternative assumes that future demands would be met through groundwater pumping where groundwater is available. As such, the impacts of this alternative are similar to Alternative 2, Increased Groundwater Pumping. The reader is referred to Section 2.6.2 for a summary of impacts of Alternative 2.

2.6.8 Alternatives Eliminated from Detailed Consideration

Several additional alternatives were considered during the planning process, but were eliminated from detailed consideration in the EIR, because they cannot feasibly attain the objectives of the proposed WFP for financial, legal, technological, and/or environmental reasons. These alternatives include Auburn Dam, Feather River diversions, and additional conservation beyond Best Management Practices.

Auburn Dam

Auburn Dam would require federal authorization and appropriation. As detailed in the American River Water Resources Investigation (ARWRI), USBR studied Auburn Dam as an alternative for meeting the region's water supply needs (SMWA/USBR, 1996; SMWA/USBR, 1997), and for regional flood control (USACE/DWR, 1991). In May 1998, USBR issued its Record of Decision regarding the proposed action for the ARWRI. The ARWRI is the subject of the Final Environmental Impact Statement (FEIS), ARWRI, California (FES 97-36, dated November 27, 1997), developed in compliance with the National Environmental Policy Act (NEPA). The adopted decision is as follows:

"Reclamation has not identified a Federal role for meeting the future water needs of the ARWRI study area; therefore, a Federal program is not being selected.

While no Federal action will be initiated to meet the water needs of the local area, USBR will, as appropriate, cooperate with local agencies as specific water management activities are proposed and implemented. USBR would exercise its statutory authorities, such as that afforded by the Central Valley Project Improvement Act, to provide assistance in implementation and cooperate in the process with local lead officials. Such cooperation may involve individual actions on the part of USBR that constitute "major Federal actions", and as such would require that USBR comply with the NEPA and other Federal statutes. Under those circumstances, USBR would prepare the required additional documentation."

Feather River Diversions

Diversions from the Feather River were considered for Placer County and parts of Sacramento County to reduce the need for American River diversions. A fatal flaw analysis was prepared to examine the feasibility of diverting water at a rate of 200 mgd (310 cfs) from the Feather River to help meet the 2030 demands of South Placer and north Sacramento counties. Based on this analysis, it was determined that several fish species would be exposed to the diversion at their most sensitive life stages (i.e., eggs, larvae, and juveniles) during downstream migration. Because this level of diversion from the Feather River would likely have significant impacts to fisheries, and a new diversion could involve a lengthy and uncertain permit process, this alternative was eliminated from detailed consideration in the EIR.

Additional Conservation Beyond Best Management Practices

The WFP includes a Water Conservation Element which sets forth the water purveyors' programs for implementing water conservation measures, or best management practices (BMPs), including residential water meter retrofit. The majority of these BMPs are similar to those identified in the Memorandum of Understanding Regarding Urban Water Conservation in California (Urban Water Conservation Council, 1994). It is assumed that by the year 2030 all water purveyors will have fully implemented all BMPs. The WFP Water Conservation Element is expected to achieve an overall conservation level of approximately 25%. Although additional conservation measures were considered, they would not be able to feasibly meet the WFP's

objectives by themselves at this time due to cost or health-related reasons. The WFP does not preclude the opportunity to implement other, more aggressive conservation approaches as they become feasible and available in the future. As a result, it is possible that enhanced conservation could occur. For instance, the California Urban Water Conservation Council continues to explore more BMPs. Although this was eliminated from detailed consideration in the EIR as an alternative to the WFP, the potential for enhanced conservation is understood by the Water Forum stakeholders.

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Biological Mitigation Plan

CONCEPTUAL MITIGATION PLAN

Westbrook Project

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CONCEPTUAL MITIGATION PLAN

Westbrook Project

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Chapter 1
Summary

The purpose of this document is to conceptually describe the mitigation measures proposed as compensation for the potential impacts to wetlands and other waters of the U.S. that would result from construction of the proposed Westbrook Project (the "Project"). The mitigation proposed herein is also intended to provide mitigation to assure that the project does not jeopardize the continued existence of any federally-listed threatened and endangered species, however, the specifics of impacts to federally-listed species is being specifically discussed in a separate Biological Assessment and is not addressed in this plan.

This plan was prepared consistent with the Corps of Engineers' ("Corps") and Environmental Protection Agency's ("EPA") regulations (the "Mitigation Guidelines") regarding compensatory mitigation for losses of aquatic resources (Corps of Engineers and Environmental Protection Agency 2008). The format of this document follows the Sacramento District Corps of Engineers' Habitat Mitigation and Monitoring Proposal Guidelines (Corps of Engineers 2004).

This plan is intended to be conceptual. It identifies the impacts of the proposed project and conceptually describes the mitigation measures proposed by the applicants. It does not provide a detailed description of the proposed mitigation measures. It is recognized that, in accordance with the Mitigation Guidelines, a detailed mitigation plan must be prepared, submitted to, and approved by the Corps prior to issuance of the Department of the Army permit.

The proposed mitigation provides for a combination of on-site and off-site wetlands preservation and on-site and off-site wetlands creation and restoration. A total of 2.9830 acres of wetlands would be preserved on-site. A total of 5.9436 acres of vernal pool preservation credits would be purchased from an approved mitigation bank within its approved service area. A total of 3.88 acres of seasonal wetlands would be created on-site. A total of 2.3979 acres of vernal pool creation and/or restoration credits would be acquired from approved mitigation banks within their approved service area. A total of 7.00 acres of seasonal wetland creation credits would be acquired from an approved mitigation bank within its approved service area.

Although, at the current time, the Applicant proposes to accomplish all off-site mitigation through the purchase of credits, the Applicant wishes to maintain the option to develop a permittee-sponsored mitigation plan to provide the proposed preservation and/or creation/ restoration mitigation measures. Where such measures are adopted, it is understood that the permittee will be required to prepare site-specific mitigation and monitoring and long-term maintenance plans and that these plans must be approved by the Corps and U.S. Fish and Wildlife Service (the "Service").

Chapter 2

Project Description

Responsible Parties

This mitigation plan is being proposed by Westpark S.V. 400, LLC ("Applicant") for Department of the Army Section 404 Permit to authorize fill in waters of the United States (U.S.) associated with the Project.

Location of Project

The ± 400-acre project area is located in the northwestern portion of the City of Roseville, Placer County, California. It is situated approximately 1.2 miles north of Baseline Road and one mile west of Fiddyment Road. Sheet 1 of 5 of the application drawings (Appendix A) is a vicinity map showing the location of the project area.

Description of the Proposed Project

The Project is a 400-acre mixed-use residential development. Sheet 3 of 5 of the application drawings (Appendix A) depicts the land plan for the Project. A mixture of land uses are planned, providing opportunities for development of new residential neighborhoods, an elementary school, parks, and several retail centers. The Project includes approximately 146 acres of low-density residential and 84 acres of medium-density residential, providing for approximately

1,340 single-family detached homes. In addition, approximately 28 acres is planned as high-density residential providing for 689 multi-family units. Of the Project's 2,029 total residential units, 10% (203 units) are set aside as affordable to very-low, low-, and moderate-income households.

Approximately 43 acres of commercial land uses are proposed, providing for development of approximately 565,000 sq. ft. of retail/office uses at several locations along Santucci Boulevard and Pleasant Grove Boulevard. Other proposed uses include a 10-acre elementary school site, approximately 16 acres for three neighborhood parks, and nearly 37 acres of open space for the preservation of natural resource areas. In addition to these uses, Westbrook provides for development of several paseos and Class I bike paths, providing an interconnected system of multi-use trails for pedestrians and cyclists to move through the plan area. Table 1 summarizes the proposed land uses comprising the Project and their respective areas.

Table 1. Summary of Proposed Land Uses and Their Areas

Land Use	***Gross Area (ac)***	***Net Area (ac)***	***Dwelling Units***
Low Density Residential	145.7	140.9	705
Medium Density Residential	83.6	79.4	635
High Density Residential	27.6	25.2	689
Commercial	43.3		
School	10.0		
Well Site	0.3		
Parks	15.5		
Open Space	36.6		
Major Roads	34.8		
Totals	**397.4**		**2,029**

Chapter 3

Description of Impacts to Aquatic Resources

Existing Resources

General Site Characteristics

The project site is characterized by gently rolling topography and large, open annual grassland areas. All of the project area has been disked, plowed and dry-farmed. The project area has been dry-farmed in at least two of the past six years. These agricultural activities have significantly affected both the upland and wetland plant communities.

The dominant plant community within the project area is ruderal non-native annual grassland. Dominant species comprising the non-native annual grassland include a variety of naturalized Mediterranean grasses including soft chess (*Bromus hordeaceus*), ripgut brome (*B. diandrus*), medusa head (*Taeniatherum caput-medusae*), wild oats (*Avena fatua*). Common herbaceous species include filarees (*Erodium spp*.), yellow star-thistle (*Centaurea solstitialis*), rose clover (*Trifolium hirtum*), cut-leaf geranium (*Geranium dissectum*), tarweed (*Holocarpha virgata*), Fitch's spikeweed (*Hemizonia fitchii*), common vetch (*Vicia sativa*), and hairy hawkbit (*Leontodon taraxacoides*).

The surface runoff within the project area flows to the north and west with the majority of the site draining to the north. The surface runoff on the eastern three-quarters of the project area flows

through a series of swales to the north. At the northern border of the study area, these swales flow into culverts that are part of the West Roseville Specific Plan developments storm drainage system. The surface runoff on the western one-quarter of the property flows through a series of swales and an intermittent stream to the west. West of the project area, surface flow drains through agricultural ditches in lands managed for rice cultivation, eventually flowing into Curry Creek.

The soil mapping units within the project area include: Cometa-Fiddyment Complex 1-5% slopes; Fiddyment-Kaseberg loams 2-9% slopes; and, San Joaquin-Cometa sandy loams 1-5% slopes. These soils occur on low terraces, are shallow to moderately deep, and underlain by hardpans except for Cometa which is underlain by a dense clay pan. The average depth to hard pan or clay pan in these soils ranges from 18" to 40". As stated previously, the project area has been historically and recently disked, plowed and dry-farmed. As a result, the soils are not compacted and are well-aerated. The disking and/or plowing has eliminated much of the natural micro-topography in many areas.

Aquatic Resources

A jurisdictional delineation of the project area was originally completed by ECORP Consulting, Inc. in 2006 and verified by the Corps of Engineers in November 2006. That verification expired November 8, 2011 and the Applicant has requested re-verification of the delineation from the Corps. Sheet 2 of 5 of the application drawings (Appendix A) is a copy of the delineation map. There is a total of 12.5470 acres of waters of the U.S. existing within the project area. This total is comprised 0.9462 acre of intermittent streams, 1.3498 acres of seasonal wetlands, 8.4368 acres of wetland swales and 1.8142 acres of vernal pools.

Two intermittent streams flow through the extreme northwest corner of the project area and converge near the western boundary of the project area. Streams are differentiated from linear wetlands (e.g. wetland swales) by the presence of defined beds and banks and

an identifiable ordinary high water line. Intermittent streams flow seasonally, but for a longer duration than ephemeral streams. Intermittent streams receive baseflow input from a seasonal perched groundwater table and, as a result, experience flow for weeks or months after rainfall events.

The seasonal wetlands are depressional wetlands that are inundated in the winter and early spring but are dry throughout the summer and fall. Depths of these seasonal wetlands range from a few inches up to 2 feet. These depressional seasonal wetlands are topographically and hydrologically similar to vernal pools (described below) but their plant communities are not dominated by species considered endemic to vernal pools. Common plant species include perennial rye (*Lolium perenne*), Mediterranean barley (*Hordeum marinum*), rabbit's-foot grass (*Polypogon monspeliensis*), mannagrass (*Glyceria declinata*), hyssop loosestrife (*Lythrum hyssopifolia*), toad rush (*Juncus bufonius*), and slender popcorn flower (*Plagiobothrys stipitatus micranthus*). These seasonal wetlands are essentially vernal pools that have been disturbed to the extent that they no longer support a vernal pool plant community.

Wetland swales are linear sloping seasonal wetlands that occur in topographic swales versus seasonal wetlands which occur in depressions. They are inundated in the winter and early spring during and for up to several weeks following rainfall events. They often have embedded depressions that pond water to a duration similar to depressional seasonal wetlands and vernal pools. The most common plants occurring within the wetland swales include perennial rye, Mediterranean barley, rabbit's-foot grass, and hyssop loosestrife.

Vernal pools are seasonally inundated wetlands occurring within topographic depression which occur both as isolated features in the landscape and in associated wetland and non-wetland swales. They typically flood to depths ranging from 2 inches to over 1 foot in the winter and early spring. The plant communities within vernal pools are typically dominated by vernal pool endemics, a majority of which are native annuals. These vernal pool endemics include

slender popcorn flower, Vasey's coyote thistle, Carters buttercup (*Ranunculus alveolatus*), double-horned downingia (*Downingia bicornuta*), and annual hairgrass (*Deschampsia danthonioides*). Depending on their depth and level of disturbance, other non-native species common to seasonal wetlands may also be present as dominants or associates.

Impacts

In calculating direct effects, it was assumed that if any portion of a non-linear, depressional wetland (i.e. seasonal wetlands and vernal pools) would be direct affected, all of it would be directly affected. For linear, sloping wetlands (i.e. wetland swales) the direct effects was calculated as that portion of the wetland within the footprint of development. Appendix B is an impact map.

For purposes of calculating impacts it was assumed that adjacent properties currently under application for a DA Permit (Conley and Federico properties) are not permitted and constructed at the time that the Westbrook project is constructed. Under this scenario, there would be fill slopes extending south onto both of these properties.

The Project would result in a total of 9.6108 acres of direct impacts to waters of the U.S. These direct impacts are comprised of 0.8730 acre vernal pools, 1.1137 acres swale depressional wetlands, 0.6244 acres seasonal wetlands and 6.9997 acres swale wetlands. Of these direct impacts, approximately 0.0292 acres (0.0008 acre swale depressional and 0.0284 wetland swale) are located on the Federico property and 0.0175 acre (0.0066 swale depressional and 0.0109 acre vernal pool) are located on the Conley property. If one or both of these properties are permitted and constructed prior to Westbrook, the impacts attributable to Westbrook would be reduced accordingly.

Chapter 4

Proposed Mitigation Measures

Goals and Objectives

The overall objective of this mitigation plan is to compensate for the loss of wetlands and other waters of the U.S. The proposed mitigation measures are intended to replace both loss of wetland area and wetland function. To the extent possible, the mitigation plan has been designed to replace lost wetlands in-kind and on-site. Where replacement of wetlands on-site is not environmentally preferable (i.e. vernal pools), the plan provides for mitigation off-site.

This plan is also intended to mitigate for potential impacts to federally-listed threatened and endangered species that have been documented as occurring within the project area or are considered likely to occur within the project area. As stated previously, a separate Biological Assessment is being prepared to more specifically address impacts to federally-listed species and to discuss the proposed mitigation measures relative to those species.

Description of Proposed Mitigation Measures

The Applicant proposes to compensate for impacts to waters of the U.S. through a combination of preservation and construction of wetlands on-site, purchase of vernal pool and seasonal wetland

restoration and creation credits (respectively) from an approved mitigation bank and purchase of vernal pool preservation credits from an approved mitigation bank.

The Applicant proposes establishment of 35.8-acre wetland preserve in the northwest corner of the project area. This wetland preserve is contiguous with much larger wetland preserves located to the north and east on the West Roseville Specific Plan development. Approximately 2.983 acres of wetlands will be preserved and managed. This total is comprised of .946 acres of intermittent channel, 0.952 acres of vernal pools, 0.725 acres of seasonal wetlands and 0.359 acres of wetland swales.

The Applicant proposes to construct approximately 3.88 acres of seasonal wetlands on-site within the wetland preserve. The wetlands will be constructed adjacent to the two intermittent channels.

The Applicant further proposes to provide 5.9436 acres of vernal pool preservation credits, 2.3979 acres of vernal pool creation/restoration credits and 7 acres of seasonal wetland creation credits from an approved mitigation bank.

On-site Preservation

The wetland preserve was sited at its proposed location because it would be situated adjacent to and contiguous with designated open space on the north and along a portion of its eastern boundary. It would be bordered by agricultural lands along its western boundary and developed lands to the south.

As stated previously, virtually all the project area has been disked and/or plowed in the past for agriculture. This has resulted in the general degradation of wetland function throughout the project area. The degradation is evident in terms of the muted micro-topography, aerated surface soils and ruderal plant communities. If the project area is not developed and wetlands not preserved and managed, it is very likely that this degradation would continue to occur in the

future. Therefore, the preservation and management of the wetlands within the proposed wetland preserve would eliminate this on-going degradation and restore (rehabilitate) wetland function in the preserved waters and wetlands.

On-site Creation

The on-site wetland creation will partially compensate for impacts to seasonal wetlands and swale wetlands. In addition to providing partial replacement of wetland losses, it is intended to restore, as much as possible, the function of the preserved streams which have been degraded by historic agricultural practices. The following objectives and/or criteria were considered in designing the proposed on-site wetland mitigation plan:

- Maximize the area of wetlands to be created after consideration of physical and logistical constraints;

- Design wetlands that maximize watershed support functions such as flood attenuation functions, surface water storage functions, water quality improvement functions and habitat connectivity;

- Design wetlands that will provide a diversity of habitats including short- and long-term inundation seasonal wetlands, emergent marshes, and riparian scrub;

- Design wetlands that are hydrologically interconnected to the existing watercourses;

- Design wetlands that promote the long-term stability of the existing watercourses in consideration of the geofluvial morphology of these watercourses;

- Design wetlands that minimize the potential to exacerbate vector breeding conditions;

- Site wetlands so that they have adequate upland buffers separating them from the proposed development; and

- Site wetlands so that they are down gradient of, and not within, the Project's water quality treatment features such as bioswales.

Using these design criteria, the location and extent of wetlands to be created on-site were conceptually mapped by Gibson & Skordal. The tentative wetland design was then reviewed by both MacKay & Somps and Civil Solutions. MacKay & Somps reviewed the plan with respect to its relation to the overall land plan. Civil Solutions reviewed the plan with respect to flood water attenuation, conveyance issues and quantified the hydrologic issues and benefits associated with the construction of the wetland features. Additionally, Civil Solutions evaluated preliminary stream stability guidance criteria to be used in their design. After incorporating the input provided by MacKay & Somps and Civil Solutions, the location and design of the proposed wetlands was revised.

Figure 1 is a conceptual plan drawing showing the proposed layout of the wetlands to be created.

A total of approximately 3.88 acres of wetlands will be constructed within the wetland preserve. The wetlands to be created will be located on low terraces excavated adjacent to two existing intermittent stream channels. The wetlands to be constructed will be located along the inside of existing stream meanders and along relatively straight reaches so as to avoid being intercepted by the natural meandering of the creek channel. The constructed wetlands will be shallow depressions located on low terraces designed to be inundated by overbank flooding during frequent storm events (less than the 2-year return interval). The connections between the stream channels and the constructed wetlands will be protected from erosion by the use of a vegetated geotextile fabric rather than structural armoring. The interior slopes adjacent to the wetlands will typically be graded to approximately 5:1 or greater except where limited by proximity to the adjacent watercourse.

The wetlands will be constructed during the dry season when surface water is not present. In constructing the wetlands, the first 4 to 6 inches of top soil from the impacted wetlands will be salvaged and stockpiled. The wetlands will then be excavated and

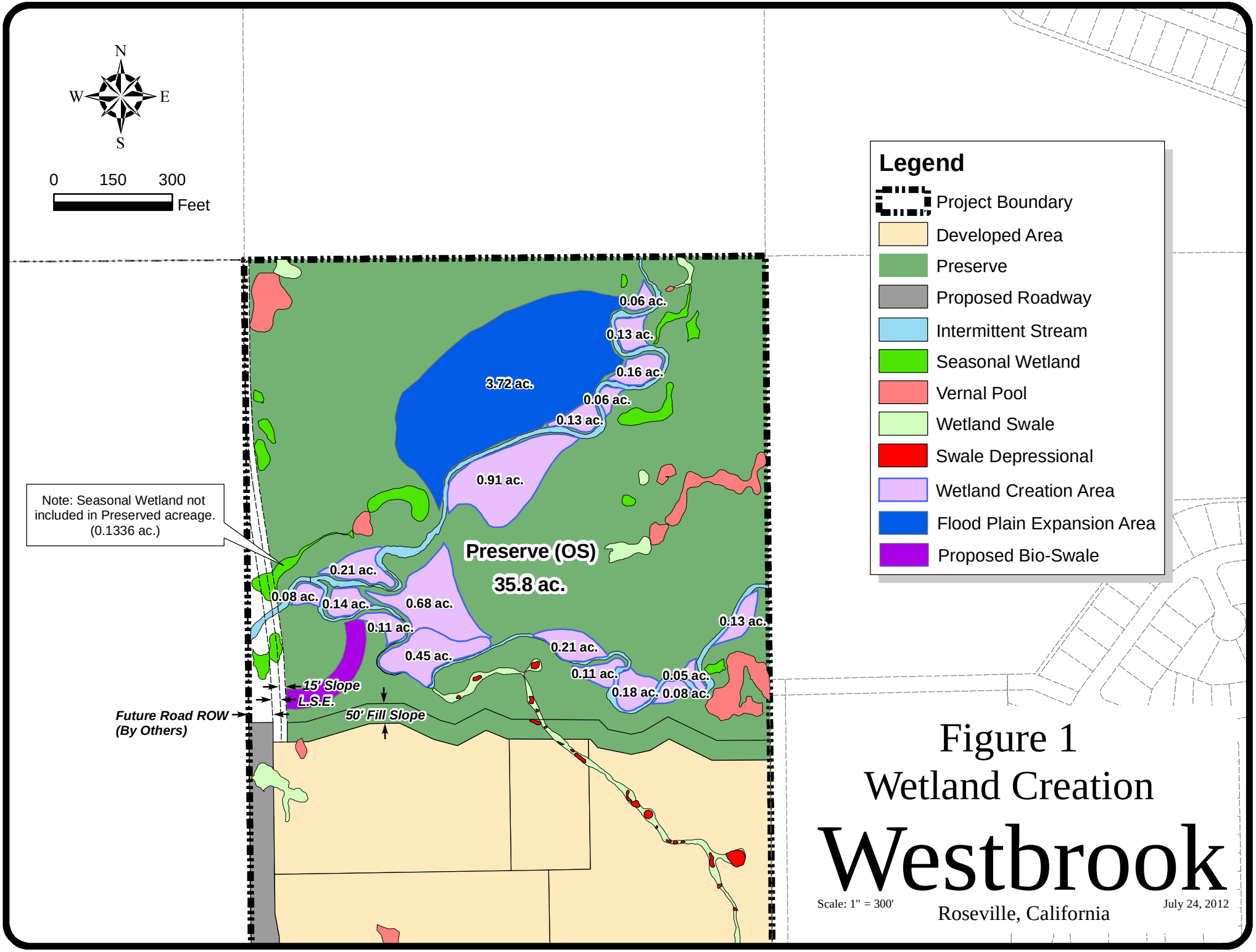


Figure 1
Wetland Creation
Westbrook

Scale: 1" = 300'

Roseville, California

July 24, 2012

graded to an elevation of approximately 4 to 6 inches below design depth. The salvaged topsoil will then be placed to final grade. Once grading is completed, the slopes of the wetland will be hydro-seeded with a mixture of upland and wetland grasses and forbs. To minimize erosion, it may also be desirable to sprinkler irrigate the constructed wetlands and side slopes to promote establishment of a vegetative cover prior to the on-set of the rainy season.

The wetlands will be designed to minimize adverse impacts to the existing low flow stream systems. Following completion of construction activities, sediment loading within the creek corridors would be expected to stabilize at current or lower rates than currently exist.

All stream low flow channels naturally migrate and evolve over time. It is likely that this will continue following construction of the Project and the on-site mitigation. The mitigation design is intended to accommodate this by locating the constructed wetlands away from the outside meander of the creeks. It is anticipated that these dynamic activities may, over time, pose a minor risk to the long-term viability of some of the created wetlands. However, this risk should be no greater than other natural locations where wetlands exist adjacent to streams.

In order to increase the volumetric flood detention capacity of the wetland preserve, the Applicant proposes to excavate an approximate 3.72-acre area of upland grassland located on the north side of the northernmost intermittent channel. The topsoil within this area will be salvaged and then the area will be excavated to an elevation slightly higher than the existing channel. Following completion of the excavation, the salvaged topsoil will be re-applied over the disturbed surface to restore the upland grassland.

Off-site Creation/Restoration

The applicants propose to secure 2.3796 acres of constructed vernal pool creation/restoration credits and 7 acres of constructed seasonal wetland creation credits from an approved mitigation bank in

western Placer County within the bank's approved service area. To date, the Applicant has secured vernal pool preservation credits from approved conservation banks in Western Placer County which total approximately 5.0 acres. Approximately 5.0 acres of preservation credits have been secured from Toad Hill Mitigation Bank by the Applicant, a portion of which are available for the Project. The Toad Hill Mitigation Bank is located within the Western Placer County Core Recovery Area.

Off-site Preservation

The applicants propose to secure 4.7021 acres of vernal pool preservation credits from an approved conservation bank in western Placer County within the bank's approved Service area. The Applicant proposes to provide these credits at the approved Toad Hill Mitigation Bank.

Implementation

Implementation Schedule

The Applicant proposes to implement the off-site mitigation measures in a phased manner commensurate with the phasing of construction. Prior to initiating construction of any phase of the project, the commensurate amount of off-site mitigation credits will be secured and proof of purchase will be provided to the Corps and the Service.

The construction of the on-site mitigation will be initiated prior to or concurrent with initiation of construction activities in waters of the U.S. Construction of the on-site mitigation will be completed no later than December 31 of that same year.

Responsibilities for Implementing Plan

The permittee will be responsible for securing the off-site preservation and creation credits in the amounts commensurate to the impacts associated with each respective permit. The permittee will also be responsible for constructing the on-site wetlands creation.

Chapter 5

Monitoring

Performance Standards

The following performance standards will be used to assess the relative success of the mitigation constructed on-site.

A minimum of 3.2 acres of the total 3.88 acres of wetlands constructed on-site must meet or exceed the following criteria for three consecutive years without human intervention.

- The constructed wetlands will exhibit a minimum of one primary or two secondary indicators of wetland hydrology (Corps of Engineers 2008).

- The plant communities in the constructed wetlands will be dominated by species with a wetland indicator status of facultative, facultative wetland, or obligate wetland (Reed 1988).

- The plant communities in the constructed wetlands will be dominated by species commonly found in the preserved wetlands within the project area.

Monitoring Protocol

The wetlands on-site will be monitored for a period of five years or until all performance criteria have been met for three successive years without human intervention, whichever is longer. The purpose of the monitoring is to assess the relative success of the mitigation as compared to performance criteria and to determine whether remedial actions are necessary to assure the performance criteria are met.

Monitoring of the constructed mitigation will include obtaining quantitative data on their hydrology and developing plant communities. Photo points will be established to qualitatively monitor trends in the developing plant communities. The areal extent of constructed wetlands will be surveyed annually using GPS technology and/or GIS technology with georeferenced aerial photography.

The monitoring of the hydrology of the constructed wetlands will be emphasized primarily in the first growing season following construction. Staff gauges will be installed at selected locations in the constructed wetlands. Sampling will be conducted at a frequency sufficient to document the depth and duration of inundation within the constructed wetlands. Once the hydrology of the constructed wetlands has been adequately characterized, additional detailed hydrology monitoring will not be conducted over subsequent growing seasons unless specific problems are identified that warrant further monitoring.

Vegetation monitoring will be conducted during each growing season throughout the monitoring period. The plant community in each of the constructed wetlands will be characterized. Each plant observed will be identified and its relative cover will be recorded. The total cover of all species will also be estimated.

Reporting

The results of each year's monitoring will be compiled into an annual monitoring report. The annual monitoring reports will present all monitoring data, assess the implications of that data, and make recommendations for remedial actions, where warranted. The annual reports will be submitted to the Corps not later than December 31st each year.

Where multiple segments of the on-site mitigation have been constructed to compensate for the impacts associated with any particular permit, the monitoring report must include all segments that have been constructed. Where a portion of those constructed wetlands are to be applied to future phases of that permit or to another permit, the monitoring report shall so note it.

Responsibilities

The permittee will be responsible for implementing all aspects of monitoring the wetlands constructed on-site. Each permittee will be responsible for submitting annual monitoring reports for the constructed wetlands, and for their success.

Chapter 6
Long-term Maintenance and Management

Prior to initiation of construction activities in wetlands and other waters of the U.S., a conservation easement will be established over the open space preserve, excluding the 50-foot wide fill slope. The conservation easement will be granted to the City of Roseville who will be responsible for the long term maintenance of the preserve. The long-term management of the preserve will be carried out under the City of Roseville's Open Space Preserve Overarching Management Plan (City of Roseville 2009) which has been previously approved by the Corps of Engineers and U.S. Fish and Wildlife Service. The conservation easement will limit activities within the open space preserves to those activities that are beneficial to the restoration, creation, and preservation of wetlands and their surrounding upland habitats and as specifically allowed for within the Final Mitigation Plan and the City of Roseville's Open Space Preserve Overarching Management Plan. Following completion of grading, a conservation easement over the 50-foot fill slope will be granted to the City of Roseville to for the long-term maintenance under the over-arching management plan. A funding mechanism, specifically a maintenance CFD as required by the City of Roseville, will be established to provide for the long-term maintenance of the preserves in perpetuity.

Once the constructed wetlands have been monitored for the required 5-year monitoring period and they have met or exceeded all performance criteria for a period of three consecutive years without human intervention, the permittee's responsibilities will have been satisfied. The open space preserves will then be dedicated to the City of Roseville.

Chapter 7
References

City of Roseville. 2009. City of Roseville Open Space Preserve Overarching Management Plan, Administrative Draft. March 10, 2010. Roseville, CA.

Corps of Engineers and Environmental Protection Agency. 2008. Compensatory Mitigation for Losses of Aquatic Resources, Final Rule. FR Vol. 73, No. 70. April 10, 2008.

Corps of Engineers. 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). ERCE/EL TR-08-28. September 2008. Vicksburg, MS.

Corps of Engineers. 2004. Habitat Mitigation and Monitoring Proposal Guidelines. Sacramento and San Francisco Districts Public Notice dated December 30, 2004. Sacramento, CA.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1. US Engineer Waterways Experiment Station. Vicksburg, MS.

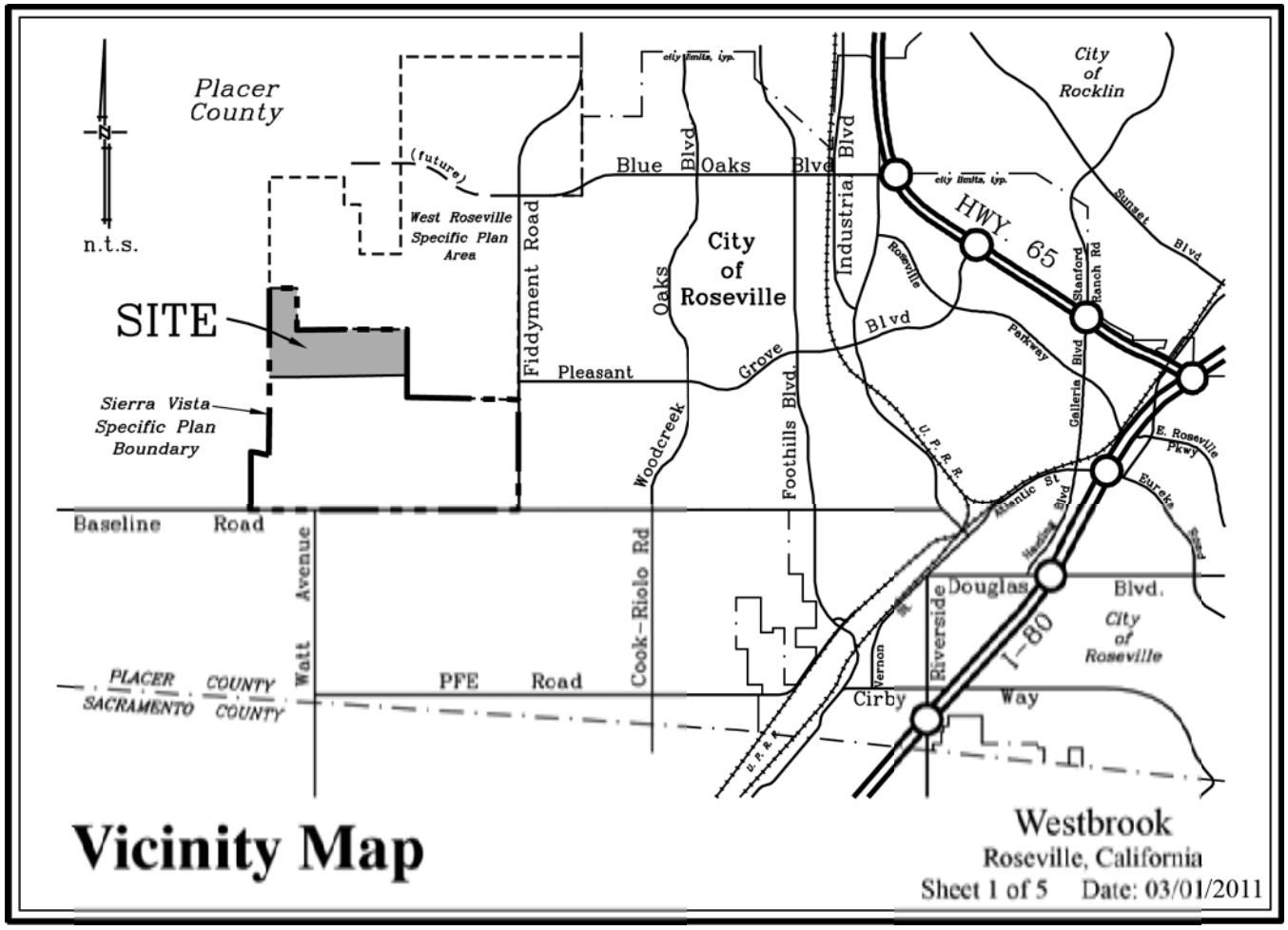
North Fork Associates. 2009. Biological Assessment for the Sierra Vista Specific Plan Project, Placer County, California. Revised June 9, 2009. Prepared for URS Corporation. San Francisco, CA.

Reed, P.B. 1988. National List of Plant Species that Occur in Wetlands: California (Region 0). Biological Report 88(26.10). May 1988. National Ecology Research Center, National Wetlands Inventory, U.S. Fish and Wildlife Service. St. Petersburg, FL.

U.S.D.A., Soil Conservation Service. 1980. Soil Survey of Placer County, Western Part. Sacramento, CA.

APPENDIX A

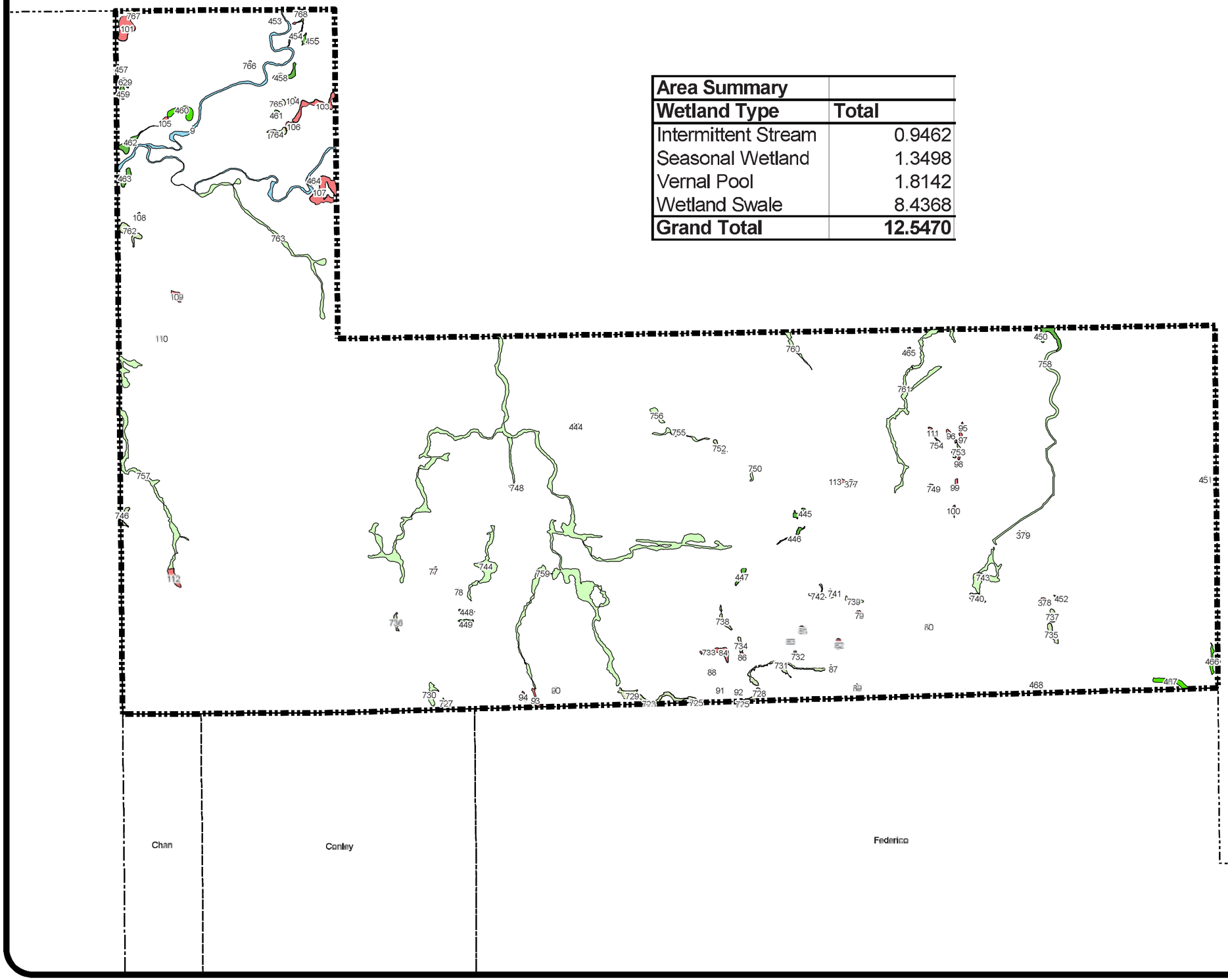
Application Drawings



Vicinity Map

Westbrook
Roseville, California
Sheet 1 of 5 Date: 03/01/2011

Area Summary	
Wetland Type	**Total**
Intermittent Stream	0.9462
Seasonal Wetland	1.3498
Vernal Pool	1.8142
Wetland Swale	8.4368
Grand Total	**12.5470**



Legend

- Project Boundary
- Ownership Line
- Intermittent Stream
- Seasonal Wetland
- Vernal Pool
- Wetland Swale

N
W E
S

0 300 600 1,200
Feet

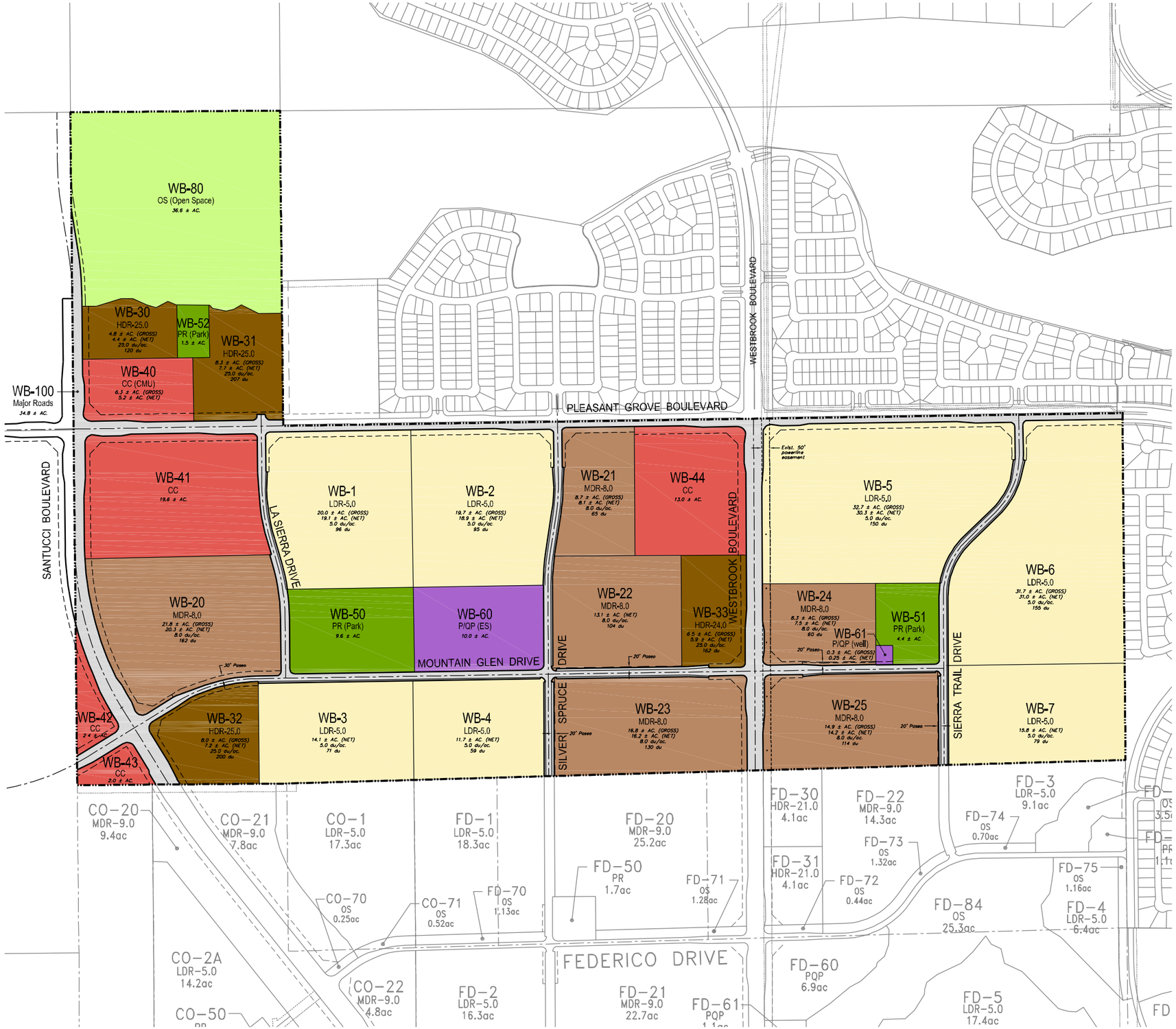
Existing Aquatic Resources

Westbrook

Scale: 1" = 600'

Roseville, California
Sheet 2 of 5

March 8, 2011



PRELIMINARY STREET GEOMETRY, ACREAGE, and DWELLING UNIT COUNTS

WESTBROOK

Land Use	Acres (gr.)	Acres (net)	D.U.
LDR	145.7	140.9	705 (1)
MDR	83.6	79.4	635 (2)
HDR	27.6	25.2	689 (3)
CC	37.0		
CC(CMU)	6.3		
P/QP (School)	10.0		
P/QP (well site)	0.3		
PARK	15.5		
OPEN SPACE	36.6		
MAJOR ROADS	34.8		
SITE TOTALS	397.4		2029

NOTES:
(1) LDR Dwelling Units based on net acres @ 5.0 d.u./ac.
(2) MDR Dwelling Units based on net acres @ 8.0 d.u./ac.
(3) HDR Dwelling Units based on gross acres @ 25.0 d.u./ac.

SIERRA VISTA LOT NUMBER KEY

LOT NUMBERS	LAND USE
1 - 19	Low Density Residential (LDR)
20 - 29	Medium Density Residential (MDR)
30 - 39	High Density Residential (HDR)
40 - 49	CC/CMU/BP
50 - 59	Park (PR)
60 - 69	Public / Quasi-Public (PQP)
70 - 79	Open Space (OS) - Paseos
80 - 89	Open Space (OS)
90 - 99	Urban Reserve (UR)
100	Major Roads

NORTH
0 300 600
SCALE: 1" = 300'

PROPOSED PROJECT LAND PLAN

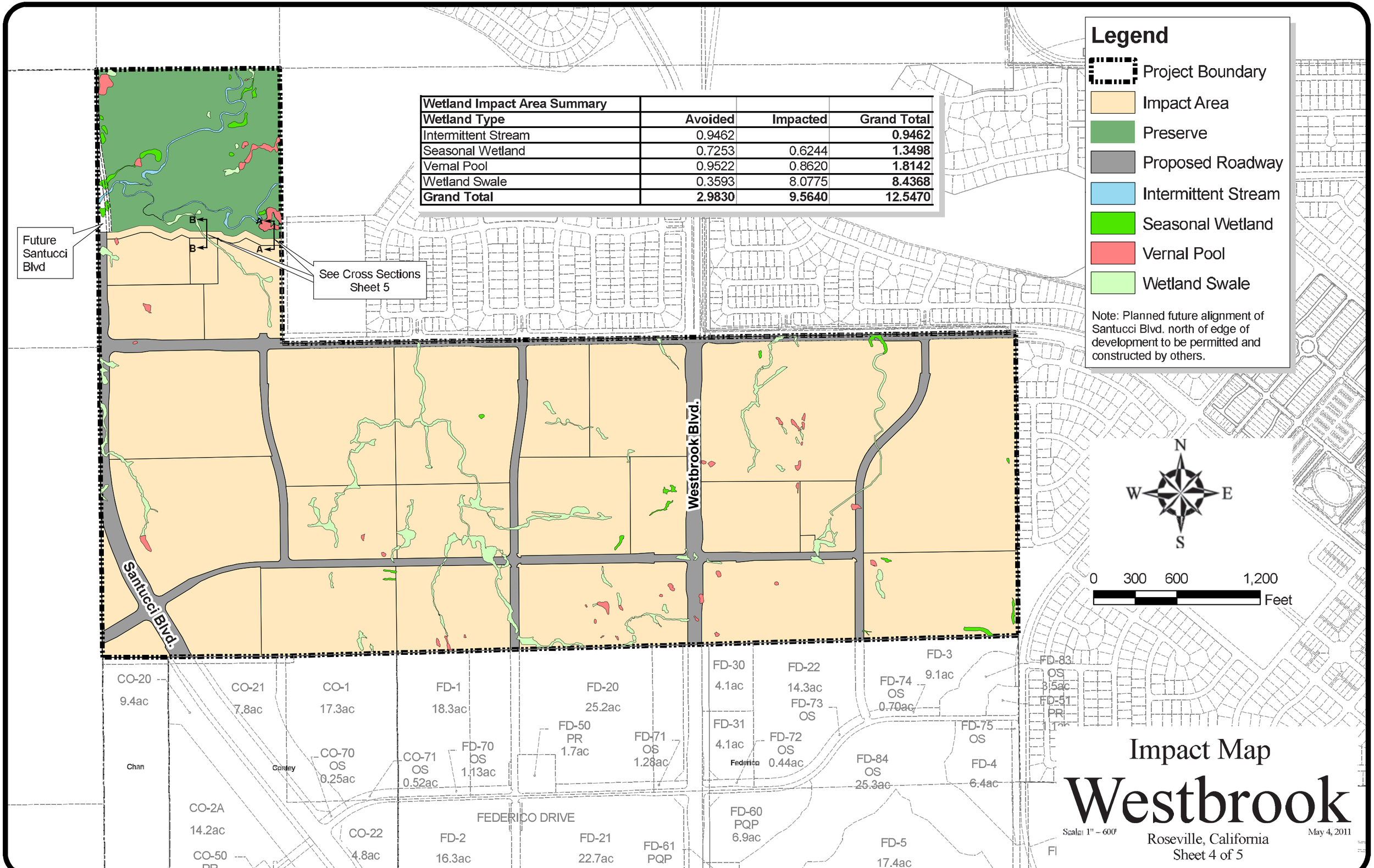
Westbrook

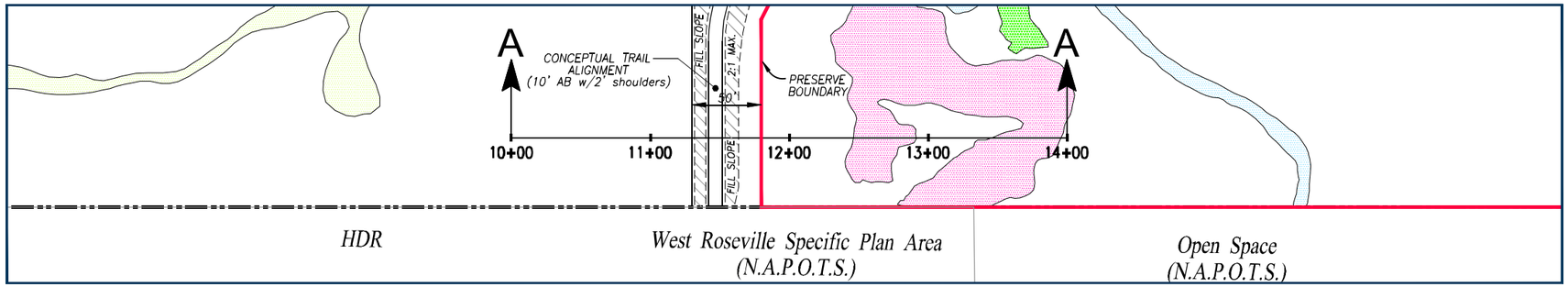
Westpark Associates
Not to Scale

MacKay & Somps Civil Engineers, Inc.
Roseville, California
March 1, 2011
Sheet 3 of 5

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS

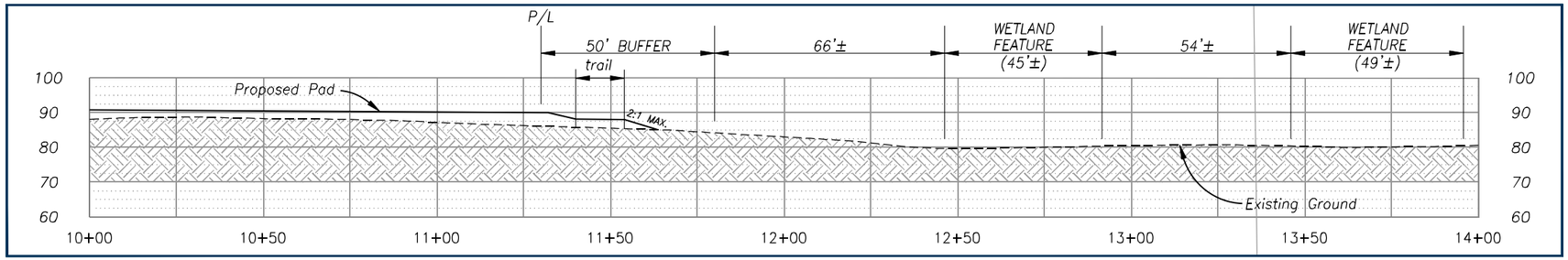
Wetland Impact Area Summary			
Wetland Type	**Avoided**	**Impacted**	**Grand Total**
Intermittent Stream	0.9462		**0.9462**
Seasonal Wetland	0.7253	0.6244	**1.3498**
Vernal Pool	0.9522	0.8620	**1.8142**
Wetland Swale	0.3593	8.0775	**8.4368**
Grand Total	**2.9830**	**9.5640**	**12.5470**





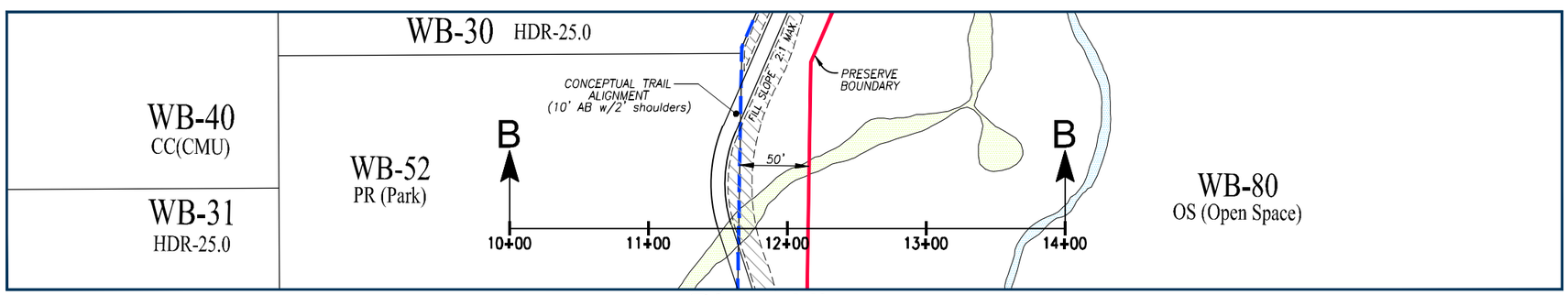
Plan View

1"=100'



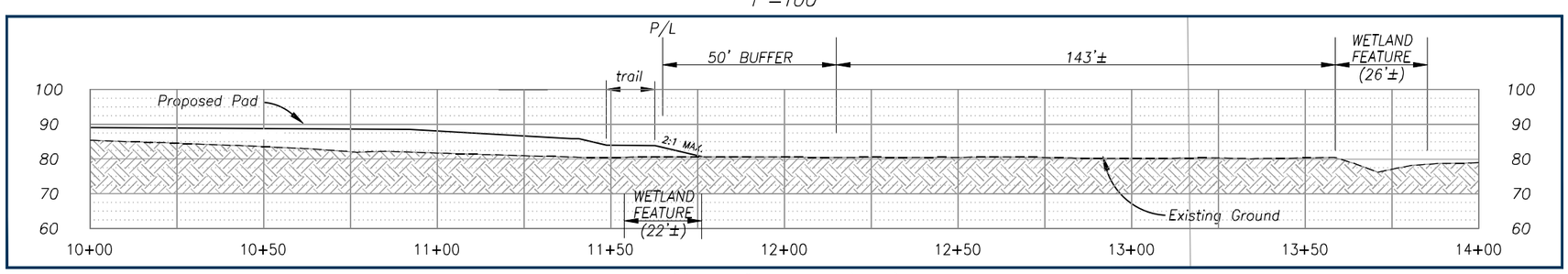
Section A-A

1"=40'



Plan View

1"=100'



Section B-B

1"=40'

N

Figure 5

TYPICAL CROSS-SECTIONS

Westbrook Property

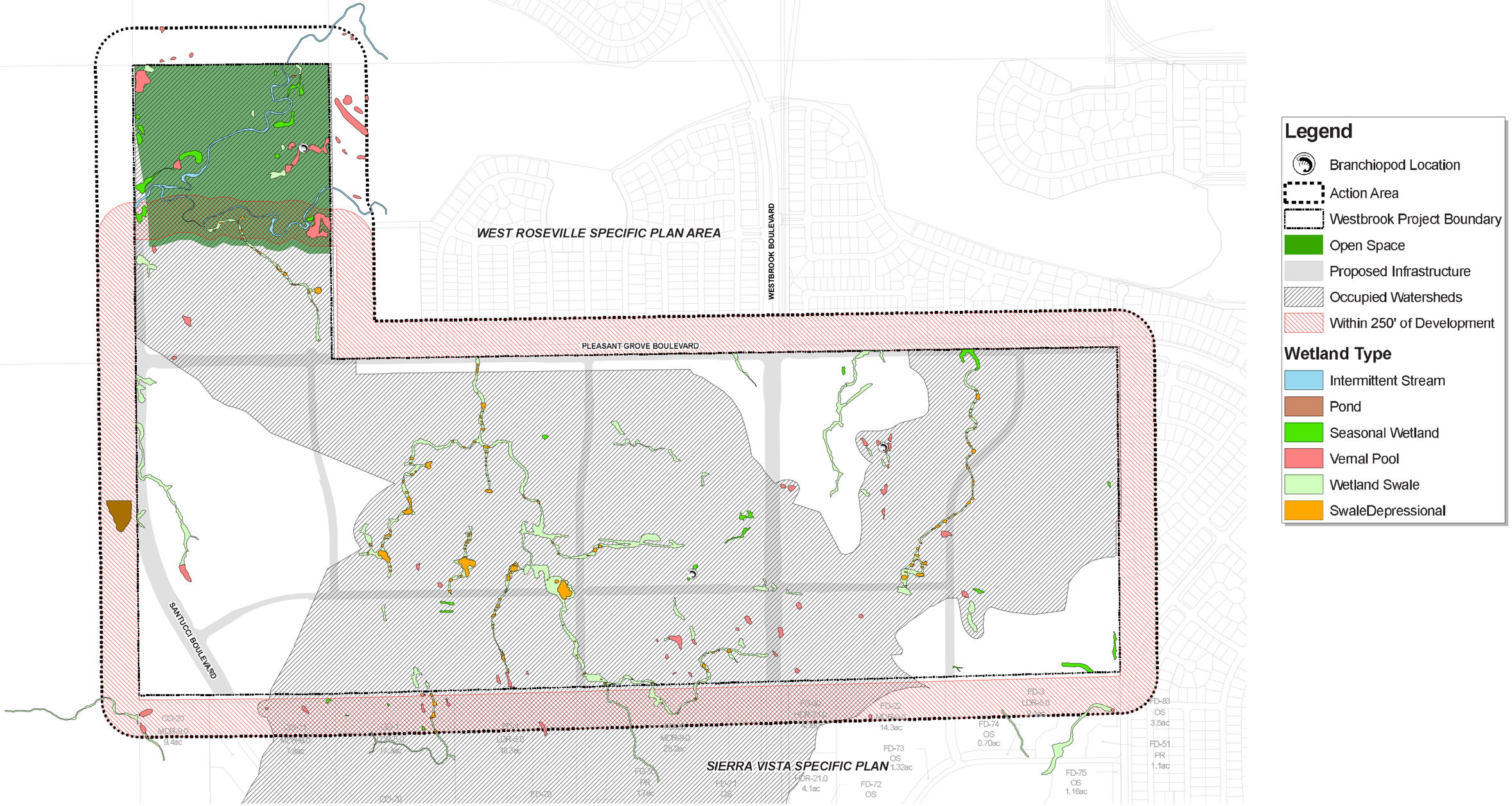
Scale: As Noted — Roseville, California — June 3, 2011

Sheet 5 of 5

6-03-2011 09:33:45 shaskell P:\18254\GISFiles\OwnerApplication\SectionA-A_WB.dwg
[1] P:\18424\topo\MS_COMBO_2011.dwg [2] P:\18254\GISFiles\OwnerApplication\support drawings\SectionA-A_40scale.dwg

APPENDIX B

Impact Map



N
W E
S

0 150 300 600 Feet

Impact Map

Westbrook

Scale: 1" = 300'

September 19, 2012

Roseville, California

Waters of the U.S. Impact and Mitigation Data for the Study Area (1990 through 2011) extracted from DA permit files (Prepared by the USACE, January 2012)

Waters of the U.S. Impact and Mitigation Data for the Study Area (1990 through 2011) extracted from DA permit files (Prepared by the USACE, January 2012)"

Number	Status Notes	Acres Waters Delineated	VP Impacts (Acres Permanent)	VP Impacts (Acres Temporary)	OAR Impacts (Acres Permanent)	OAR Impacts (Acres Temporary)	Mitigation/Impact Notes	Planting Ratios/Measures Associated with Aquatic Resource (Enhancement ?)	NFWF for impacts to (acres) VP	NFWF for impacts to (acres) OAR	Bank / Preserve VP Creation IN	Bank / Preserve VP Preservation IN	Bank / Preserve VP Creation OUT	Bank / Preserve VP Preservation OUT	Bank / Preserve VP Creation Unknown Location	Bank / Preserve VP Preservation Unknown Location	Bank / Preserve OAR Creation IN	Bank / Preserve OAR Preservation IN	Bank / Preserve OAR Creation OUT	Bank / Preserve OAR Creation Unknown Location	ON-SITE OAR Creation	ON-SITE OAR Restored	ON-SITE OAR Preserved	ON-SITE OAR Enhanced	ON-SITE VP Creation	ON-SITE VP Preserved
1901-08768	Verified	6.198			6.198		RH Q-149. Approx 30,000 cy of fill (6.198 acres) auth in WOUS. All other data uk.																			
1901-09988	SP - Authorized	61.9	4.09		11.71		Restoration acreage was originally filled - should we count as impact? YES.										0.56				32.81	11.9			9	
					11.9																					
					0.26																					
					0.2												0.2									
					0.02																					
1989-00009	Verified	18.84			0.403		Info incomplete. Assumption of OAR impacts.																			
1989-00023	SP - Authorized, NWP - Verified	31.39	4.84		9.45		X														10.3		10.39		9.9	6.62
			0.02																							
1989-00038	Verified	4			0.8		Best Available Info																			
1989-00057	Verified	1.13			0.98		Best Available Info																			
1989-00059	Verified - Multiple	29.25	5.52		3.77		Addl 11.04 VP (P) for FWS (orchard Creek)				5.2552	11.04					3.4						18.98			0.25
1989-00063	Verified	8.18	2.83		3.195		X														2.52		2.155		11.567	
1989-00070	Verified	1			1		Delineated Assumed. Best Available Info. Verification states <1 acre.																			
1990-00035	Verified	6.685	0.682		3.609		RH 0954314, 0954341. Related to 1992-00159														3.929		1.714		4.772	0.68
1990-00109	SP - Authorized	13.7	0.05		13.65		VP mit (0.5) was for Laehr proj only - (can't find Laehr, probably out of study area, w/different name). Included impact for Laehr project.														21.1				0.5	
			0.5																							
1990-00144	Verified	3.421			0.856		Best Available Info																			

Number	Status Notes	Acres Waters Delineated	VP Impacts (Acres Permanent)	VP Impacts (Acres Temporary)	OAR Impacts (Acres Permanent)	OAR Impacts (Acres Temporary)	Mitigation/Impact Notes	Planting Ratios/Measures Associated with Aquatic Resource (Enhancement ?)	NFWF for impacts to (acres) VP	NFWF for impacts to (acres) OAR	Bank / Preserve VP Creation IN	Bank / Preserve VP Preservation IN	Bank / Preserve VP Creation OUT	Bank / Preserve VP Preservation OUT	Bank / Preserve VP Creation Unknown Location	Bank / Preserve VP Preservation Unknown Location	Bank / Preserve OAR Creation IN	Bank / Preserve OAR Preservation IN	Bank / Preserve OAR Creation OUT	Bank / Preserve OAR Creation Unknown Location	ON-SITE OAR Creation	ON-SITE OAR Restored	ON-SITE OAR Preserved	ON-SITE OAR Enhanced	ON-SITE VP Creation	ON-SITE VP Preserved
1990-00173	Verified	1.725	0.495		0.09		Best Available Info. 2002-00678 revises original VP estimate.																			0.12
1990-00412	Verified	0.83			0.83		Best Available Info. Delineated assumed.																			
1990-00622	Verified	0.94	0.31		0.63		Best Available Info, no info on mit.																			
1990-00650	Verified	3.33			0.8		X														1.78					
1990-00877	Verified	5.77	0.72		1.13		RH 0960537 - 0.21 VP (P) at Orchard Creek required by FWS, but included in Mit Plan specifically called out in Corps verification. Include?					0.21									1.7				0.88	0.88
1990-00946	Verified	0.93	0.24		0.69		Best Available Info, no info on mit.																			
1990-00966	Verified	0.74			0.74		Best Available Info																			
1990-01091	Verified	0.53	0.01		0.52		Best Available Info																			
1990-01158	Verified	0.83			0.83		Best Available Info																			
1990-01205	Verified	1			1		Best Available Info. Impact types uk…Assumed to be full amount possible (<1 acre)																			
1990-01206	Verified	1.42	0.14		1.28		Delineated Assumed														1.76				0.32	
1990-01257	SP - NWP -D/I Variable	6.55	0.08		0.04		Best Available Info. Indirect 0.22 types uk. Assumed OAR. NWP verification states that mit credits were required (first line), mentioned Sheridan. No amounts specified. Mitgation figures are assumptions based on impacts (1:1).				0.08						0.04										

Number	Status Notes	Acres Waters Delineated	VP Impacts (Acres Permanent)	VP Impacts (Acres Temporary)	OAR Impacts (Acres Permanent)	OAR Impacts (Acres Temporary)	Mitigation/Impact Notes	Planting Ratios/Measures Associated with Aquatic Resource (Enhancement ?)	NFWF for impacts to (acres) VP	NFWF for impacts to (acres) OAR	Bank / Preserve VP Creation IN	Bank / Preserve VP Preservation IN	Bank / Preserve VP Creation OUT	Bank / Preserve VP Preservation OUT	Bank / Preserve VP Creation Unknown Location	Bank / Preserve VP Preservation Unknown Location	Bank / Preserve OAR Creation IN	Bank / Preserve OAR Preservation IN	Bank / Preserve OAR Creation OUT	Bank / Preserve OAR Creation Unknown Location	ON-SITE OAR Creation	ON-SITE OAR Restored	ON-SITE OAR Preserved	ON-SITE OAR Enhanced	ON-SITE VP Creation	ON-SITE VP Preserved
			4.06		0.22						8.34															2.1
1990-01259	Verified	12.17			0.89		Best Available Info. MF Roll 194, Frame 2220. Previous impacts 0.89, types uk, assumed OAR. Addl impacts eveident via DFG record, but no Corps records to support.																			
1990-01311	Verified	2.16			0.79		Best Available Info. Same site as 1992-00123. MF Roll 156, Frame 592. Addl drainage swale" impact, amt uk																			
1991-00356	Verified	0.64			0.64		Best Available Info. MF Roll 158, Frame 23.																			
1991-00466	Verified - Assoc w Highlands Reserve	1.87	0.36		0.76		Delineated assumed. Mitigated in an extension of the 131 acres of wetland preserve located on the Highlands Reserve South Property. 0.75 acres of type uk was preserved.														1.94		0.75		0.36	
1991-00582	JD/Unauth	0.1			0.1		0.10 Unauth impacts, types uk, Assumed OAR. Delineated assumed.																			
1991-00770	NWP - LOP - Mods - Used to be 1990-01113	46.519	3.44		6.33		Just off-site, another 1.747 OAR perm impacts, creation of 2.35 OAR compensation. Not part of original project delineation/area!! But delineated under 2000-00386, which is still incomplete. Include?? Addl 1.03 acre VP created or used (unclear) on-site for remedial mit for unrelated project. Include?										6.33						33.76		4.69	2.68

Number	Status Notes	Acres Waters Delineated	VP Impacts (Acres Permanent)	VP Impacts (Acres Temporary)	OAR Impacts (Acres Permanent)	OAR Impacts (Acres Temporary)	Mitigation/Impact Notes	Planting Ratios/Measures Associated with Aquatic Resource (Enhancement ?)	NFWF for impacts to (acres) VP	NFWF for impacts to (acres) OAR	Bank / Preserve VP Creation IN	Bank / Preserve VP Preservation IN	Bank / Preserve VP Creation OUT	Bank / Preserve VP Preservation OUT	Bank / Preserve VP Creation Unknown Location	Bank / Preserve VP Preservation Unknown Location	Bank / Preserve OAR Creation IN	Bank / Preserve OAR Preservation IN	Bank / Preserve OAR Creation OUT	Bank / Preserve OAR Creation Unknown Location	ON-SITE OAR Creation	ON-SITE OAR Restored	ON-SITE OAR Preserved	ON-SITE OAR Enhanced	ON-SITE VP Creation	ON-SITE VP Preserved
					0.3		This impact acreage added to original delineation, because it was included under this project number although impacts were both adjacent AND within original project. Unclear how much of each, so it's hopefully a reasonable approach.										0.309									
					0.009		This impact acreage added to original delineation, because it was included under this project number although impacts were both adjacent AND within original project. Unclear how much of each, so it's hopefully a reasonable approach.																			
1991-01022	Verified - Highlands Reserve - D/I Variable - related, see 1997-00450	16.859	2.885		2.885		RH 0960480, 0960481. Both retrieved. Best Available Info. Delineated Assumed. 5.769 impacts include VP, acreage uk. Assumption - impacts split evenly across types. Indirect 0.303 VP.																8.47	1.45	7.5	2.6
			0.02																							
1992-00098	Verified	1.2	0.2				FWS required significant preservation on-site (amt uk), + purchase of 0.4 created VP credits. RH 0960474, MF 200, 62. Delineated assumed.								0.4											0.8

Number	Status Notes	Acres Waters Delineated	VP Impacts (Acres Permanent)	VP Impacts (Acres Temporary)	OAR Impacts (Acres Permanent)	OAR Impacts (Acres Temporary)	Mitigation/Impact Notes	Planting Ratios/Measures Associated with Aquatic Resource (Enhancement ?)	NFWF for impacts to (acres) VP	NFWF for impacts to (acres) OAR	Bank / Preserve VP Creation IN	Bank / Preserve VP Preservation IN	Bank / Preserve VP Creation OUT	Bank / Preserve VP Preservation OUT	Bank / Preserve VP Creation Unknown Location	Bank / Preserve VP Preservation Unknown Location	Bank / Preserve OAR Creation IN	Bank / Preserve OAR Preservation IN	Bank / Preserve OAR Creation OUT	Bank / Preserve OAR Creation Unknown Location	ON-SITE OAR Creation	ON-SITE OAR Restored	ON-SITE OAR Preserved	ON-SITE OAR Enhanced	ON-SITE VP Creation	ON-SITE VP Preserved
1992-00123	Verified	0			0.52		Best Available Info. Same site as 1990-01311. MF Roll 181, Frame 845.														0.52		0.57			
1992-00159	Verified - Multiple	2.67	0.67		1.53		See 1990-00035. RH 0960473, no MF.														2.21		0.342		1.14	0.12
					0.008																					
1992-00174	Verified	0.98			0.65		X																			
1992-00667	Verified - NW26	0.09			0.09		Delineated Assumed. Best Available Info. MF roll 183, Frame 773. 0.09 acre impact types UK																			
1992-00792	Verified	0.09			0.09		Best Available Info. MF roll 183, Frame 1363																			
1993-00110	Verified	3.74			0.84		MF Roll 184, Frame 1543. No ORM/RAMS data														2.11					
1993-00274	Verified	14.81	0.021		1.829		RH 0960552. Associated with 1995-00589 (Twelve Bridges). Preservation from PDN - PDN was specified in verification, but acreage/operations plan was not. PDN included significant riparian enhancement/plantings - include? Preserved area supposedly under easement.				0.04										7.96		7.84			
1993-00362	Dev Bank - (Sheridan) + NWP + Mods	11.87			1.91		RH (0960547, 0960548, Robb has), 1006897. Impact types UK. Best Available Info.																			
1993-00388	Verified - Mods - See 1998-00286	14.45	3.39		4.78		X										0.34				5.88		6.21		4.28	0.07
1993-00514	Verified	11.21			0.1		Best Available Info																			
1993-00519	Verified - Multiple - See 1999-00350	22.05	4.04		2.16		RH 0960607 (Retrieved, with me), 0960608 (with me).					2.08					0.711				4.73		10.05		4.09	5.99

Number	Status Notes	Acres Waters Delineated	VP Impacts (Acres Permanent)	VP Impacts (Acres Temporary)	OAR Impacts (Acres Permanent)	OAR Impacts (Acres Temporary)	Mitigation/Impact Notes	Planting Ratios/Measures Associated with Aquatic Resource (Enhancement ?)	NFWF for impacts to (acres) VP	NFWF for impacts to (acres) OAR	Bank / Preserve VP Creation IN	Bank / Preserve VP Preservation IN	Bank / Preserve VP Creation OUT	Bank / Preserve VP Preservation OUT	Bank / Preserve VP Creation Unknown Location	Bank / Preserve VP Preservation Unknown Location	Bank / Preserve OAR Creation IN	Bank / Preserve OAR Preservation IN	Bank / Preserve OAR Creation OUT	Bank / Preserve OAR Creation Unknown Location	ON-SITE OAR Creation	ON-SITE OAR Restored	ON-SITE OAR Preserved	ON-SITE OAR Enhanced	ON-SITE VP Creation	ON-SITE VP Preserved
			0.01																							
1993-00626	Verified - Mod	8.93			1.04		Best Available Info. Addl fill (mod) of 1.04 acre type uk. Assumed OAR.Original fill uk. Known impacts incuded here (the mod), but this project is also included on unknown projects page.																			
1993-00732	Verified	0.6	0.3		0.3		Best Available Info. Impacts may include VP (Spread across both categories)																			
1994-00093	Verified	0.9	0.12		0.88		X				0.12					0.24	0.88									
1994-00181	Verified	0.3		0.25		0.026	Best Available Info																			
1994-00336	SP - Authorized - Mods	8.93	1.92		2.22		X								2.04	4	8.17						3.67			0.08
			0.12		0.92												1.96									
1994-00476	Verified	0.18		0.17		0.01	Best Available Info. Waters delineated was actually 1.45 (NWP 12). Impact acreage used instead.																			
1994-00506	Verified	0.55			0.02		Best Available Info																			
1994-00573	Verified	0.14	0.04		0.1		Best Available Info				0.04					0.08										
1994-00643	Verified - Grandfathered Aggregate Mining	40.5			40.5		Impacts UK, 40.5 WOUS delineated. Check location; 39.03271, -121.3479																			
1994-00836	Verified - CatX	0.03			0.03		Delineated Assumed. Best Available Info																			
1994-00999	Verified	0.068			0.029		Best Available Info																			
1994-01010	Verified	2.16	0.7		0.21		FWS mit, on-site preservation and bank credits purchased…Corps permit does not specify mit				0.7	1.4														

Number	Status Notes	Acres Waters Delineated	VP Impacts (Acres Permanent)	VP Impacts (Acres Temporary)	OAR Impacts (Acres Permanent)	OAR Impacts (Acres Temporary)	Mitigation/Impact Notes	Planting Ratios/Measures Associated with Aquatic Resource (Enhancement ?)	NFWF for impacts to (acres) VP	NFWF for impacts to (acres) OAR	Bank / Preserve VP Creation IN	Bank / Preserve VP Preservation IN	Bank / Preserve VP Creation OUT	Bank / Preserve VP Preservation OUT	Bank / Preserve VP Creation Unknown Location	Bank / Preserve VP Preservation Unknown Location	Bank / Preserve OAR Creation IN	Bank / Preserve OAR Preservation IN	Bank / Preserve OAR Creation OUT	Bank / Preserve OAR Creation Unknown Location	ON-SITE OAR Creation	ON-SITE OAR Restored	ON-SITE OAR Preserved	ON-SITE OAR Enhanced	ON-SITE VP Creation	ON-SITE VP Preserved
1994-01046	Verified	0.48	0.44		0.04		Best Available Info								0.44	0.88										
1995-00018	Verified - See 1996-00577 and 2005-00936	10.764	1.35		2.12		Same site as 2005-00936 and 1996-577. Delineated acreage only included here.														2.15		1.18		2.61	0.47
1995-00178	Verified - Loc UK - Owner Cav	2.96	0.86		0.85		On-site preserved was for both this project (Woodcreek North) AND 1995-00177 (Woodcreek West). Joint preserved acreage for both is included with THIS project (1995-00178).				1.201					2.702	0.51						1.1			1.24
1995-00332	Verified - addl Unauth Resolved in 1997-00605	0.61	0.32		0.29		FWS mitigation specifically called out in verification- "including, as req by FWS": 0.48 VP (Cr) and 0.96 VP (P) . Actual mit purchased 0.48 VP (Cr), 0.78 VP (P).								0.48	0.78	0.13									
1995-00337	Verified	0.02			0.02		Best Available Info																			
1995-00363	SP - Authorized - Unauth - D/I Variable	101.79	14.34		15.8	2.86	Indirect 31.10 VP and 0.45 OAR					14					7.53		10.85							
			31.1		0.45						10.72						4.95		1.43							
												11.06						1.8								
												31.15														
												0.57														
1995-00556	Verified	0.015				0.015	Delineated Assumed																			
1995-00569	Verified	1.5	0.045				X								0.045	0.09										
1995-00572	Verified	0.46			0.46		Delineated Assumed. Best Available Info. MF Roll 236, Frame 2188																			

Number	Status Notes	Acres Waters Delineated	VP Impacts (Acres Permanent)	VP Impacts (Acres Temporary)	OAR Impacts (Acres Permanent)	OAR Impacts (Acres Temporary)	Mitigation/Impact Notes	Planting Ratios/Measures Associated with Aquatic Resource (Enhancement ?)	NFWF for impacts to (acres) VP	NFWF for impacts to (acres) OAR	Bank / Preserve VP Creation IN	Bank / Preserve VP Preservation IN	Bank / Preserve VP Creation OUT	Bank / Preserve VP Preservation OUT	Bank / Preserve VP Creation Unknown Location	Bank / Preserve VP Preservation Unknown Location	Bank / Preserve OAR Creation IN	Bank / Preserve OAR Preservation IN	Bank / Preserve OAR Creation OUT	Bank / Preserve OAR Creation Unknown Location	ON-SITE OAR Creation	ON-SITE OAR Restored	ON-SITE OAR Preserved	ON-SITE OAR Enhanced	ON-SITE VP Creation	ON-SITE VP Preserved
1995-00589	SP - Authorized - Twelve Bridges - Ness	75.73	5.55		17.01		Originally 22.78 acre impacts (type?), 92.51 acres preserved on-site (type?), 34.17 created on-site (Types?). Changes from original are part of 1997-00375. Many modifications. 3.82 Impacts and credits data is poor. Assumption.														26.18		42.13		8.33	11.04
					0.226																0.34					
					0.02																0.02					
					3.82															3.82						
1996-00189	Verified	1			1		X																			
1996-00201	Verified	0.55	0.54		0.01		X				0.54					1.08	0.01									
1996-00328	Verified - Cat X	0.1			0.1		X										0.2									
1996-00329	Verified - Cat X	0.1			0.1		X										0.2									
1996-00495	SP - Authorized	0.413			0.413		Dredge 2000 cubic yards sediment from channel. Impacts assumed OAR. Delineated assumed.																			
1997-00315	Verified	2.56	0.04		2.52		About half of project is outside study area.								0.04	0.08	2.52									
1997-00375	SP - Auth	123.91	1.68		13.68		Includes portion of original 1995-00589, Incl all of 1992-00286, all but small parcel of 1990-00445					1.98				2	6.67				10.52		84.71	42	1.39	8.85
					14.99						0.29						23.9				21.1					
1997-00387	SP - Authorized	0.58	0.07		0.53		0.07 VP creation required by Corps was paid into FWS VP Conservation Fund…Where should we log data?								0.07	0.14			0.53							
1997-00391	Verified	3.81	0.69		1.91		X								0.69	1.38	1.91						1.21			

Number	Status Notes	Acres Waters Delineated	VP Impacts (Acres Permanent)	VP Impacts (Acres Temporary)	OAR Impacts (Acres Permanent)	OAR Impacts (Acres Temporary)	Mitigation/Impact Notes	Planting Ratios/Measures Associated with Aquatic Resource (Enhancement ?)	NFWF for impacts to (acres) VP	NFWF for impacts to (acres) OAR	Bank / Preserve VP Creation IN	Bank / Preserve VP Preservation IN	Bank / Preserve VP Creation OUT	Bank / Preserve VP Preservation OUT	Bank / Preserve VP Creation Unknown Location	Bank / Preserve VP Preservation Unknown Location	Bank / Preserve OAR Creation IN	Bank / Preserve OAR Preservation IN	Bank / Preserve OAR Creation OUT	Bank / Preserve OAR Creation Unknown Location	ON-SITE OAR Creation	ON-SITE OAR Restored	ON-SITE OAR Preserved	ON-SITE OAR Enhanced	ON-SITE VP Creation	ON-SITE VP Preserved
1997-00450	LOP - Authorized - Related to 1991-01022	0	0.02				0.303 Indirect VP via FWS. Supposedly, impacts were to be compensated for via off-site mit credits. No data on this. Comensation was recorded, but it is an assumption.								0.02											
1997-00508	RGP - Emergency	0			0		1.148 acre sediment removal from floods.																			
1997-00593	Verified	0.1	0.1				X								0.1	0.2										
1997-00605	Verified	0.82	0.29		0.23		FWS required on-site preserve, 0.25 OAR of which 0.22 is considered species habitat. Include? 0.02 VP impact is from 1995-00332								0.29	0.58	0.23									
			0.02								0.06					0.12										
1997-00632	SP - Authorized - D/I variable	20.61	4.98		0.688		Indirect VP 2.18, OAR 0.402.				4.98						0.697						9.487			5.52
			2.18		0.402							7.71														
												1.81														
1997-00695	LOP - Authorized - Cav - Loc UK	0.54	0.04		0.5		File loc UK. Realigned stream corridor is preserved (acres?) - Decision to place realignment in on-site OAR (C).								0.04	0.08					0.5					
1997-00767	Verified	0.49			0.49		X										0.49									
1998-00067	Verified	0.02			0.02		X										0.02									
1998-00081	Verified	5.99	0.53		1.04		Road Widening. NOTE: Entire linear projects line falls within study area.				0.53					0.53	0.4									
												1.06														
1998-00088	Verified	0.42			0.42												0.42									
1998-00117	Verified	0.29			0.29		X										0.29									

Number	Status Notes	Acres Waters Delineated	VP Impacts (Acres Permanent)	VP Impacts (Acres Temporary)	OAR Impacts (Acres Permanent)	OAR Impacts (Acres Temporary)	Mitigation/Impact Notes	Planting Ratios/Measures Associated with Aquatic Resource (Enhancement ?)	NFWF for impacts to (acres) VP	NFWF for impacts to (acres) OAR	Bank / Preserve VP Creation IN	Bank / Preserve VP Preservation IN	Bank / Preserve VP Creation OUT	Bank / Preserve VP Preservation OUT	Bank / Preserve VP Creation Unknown Location	Bank / Preserve VP Preservation Unknown Location	Bank / Preserve OAR Creation IN	Bank / Preserve OAR Preservation IN	Bank / Preserve OAR Creation OUT	Bank / Preserve OAR Creation Unknown Location	ON-SITE OAR Creation	ON-SITE OAR Restored	ON-SITE OAR Preserved	ON-SITE OAR Enhanced	ON-SITE VP Creation	ON-SITE VP Preserved
1998-00118	LOP - Authorized	0.56			0.56		X										0.49									
1998-00166	Verified	2.94	0.36		0.13		X				0.36						0.13						1.42			1.03
1998-00171	Verified	0.247			0.247		X																			
1998-00172	Verified	1.018	0.219		0.799		Delineated Assumed				0.219					0.438	0.799									
1998-00175	Verified	0			0		No Impacts. Where to put this one? Delineated assumed, no data.																			
1998-00184	Verified	0.09				0.06	X																			
1998-00208	Verified	1.77	1.42		0.1		1.436 VP C and 5.678 VP P required by FWS and referenced by Corps. Was to be purchased at Orchard Creek (in). Nancy feels Corps relied upon FWS mit to satisfy requirements - decision is to include those figures as Corps mitigation.				1.436	5.678					0.1									
1998-00263	Verified	0.28			0.28		X										0.28									
1998-00265	Verified	1.39	0.38		1.01		FWS mitigation (P) required by Corps				0.38					0.76	1.01									
1998-00371	Verified	0.004				0.004	Delineated Assumed																			
1998-00373	Verified	0.018			0.011	0.007	Delineated Assumed																			
1998-00377	Verified	0.03			0.03		X																			
1998-00379	Verified	0.14			0.14		X										0.14									
1998-00400	Verified	0.06			0.06		Delineated Assumed																			

Number	Status Notes	Acres Waters Delineated	VP Impacts (Acres Permanent)	VP Impacts (Acres Temporary)	OAR Impacts (Acres Permanent)	OAR Impacts (Acres Temporary)	Mitigation/Impact Notes	Planting Ratios/Measures Associated with Aquatic Resource (Enhancement ?)	NFWF for impacts to (acres) VP	NFWF for impacts to (acres) OAR	Bank / Preserve VP Creation IN	Bank / Preserve VP Preservation IN	Bank / Preserve VP Creation OUT	Bank / Preserve VP Preservation OUT	Bank / Preserve VP Creation Unknown Location	Bank / Preserve VP Preservation Unknown Location	Bank / Preserve OAR Creation IN	Bank / Preserve OAR Preservation IN	Bank / Preserve OAR Creation OUT	Bank / Preserve OAR Creation Unknown Location	ON-SITE OAR Creation	ON-SITE OAR Restored	ON-SITE OAR Preserved	ON-SITE OAR Enhanced	ON-SITE VP Creation	ON-SITE VP Preserved
1998-00481	Verified	2.08	1.04		0.56		Mitigation addressed Corps impacts, but was also used for FWS required mit. Sec 7 letter appended project to programmatic BO, this means we can assume 1:1C, 2:1 P						1.04			2.08			0.56							
1998-00538	Verified	6.45	0.31		2.69		X				2.51					5.02	0.49						3.45			
1998-00626	Verified	11.39	0.72		2.26		Best Available Info. This project is NWP 14 + NWP 26, so original delineated waters figure has not been modified.				2.14					4.28					2.87		8.36			
					0.05																					
1998-00668	Verified - SP - LOP - Modifications - Owner Grudzinski	9.6	0.41		2.09		Project has these authorizations and impacts, as well as a currently open incomplete SP.				0.41					0.82					2.72		7			
1998-00669	Verified	7.19	0.92		0.91		X			0.207					0.92	0.64					0.653		4.16			1.2
1998-00682	Verified	0.108	0.108				Delineated Assumed. FWS approved 0.108 constructed VP and FWS approved 0.216 preserved VP.								0.108	0.216										
1999-00051	LOP - Authorized - Permit Mod - Loc UK - Cav	0.25			0.25		Associated with 1992-00159. File loc UK.													0.25				0.6		
1999-00129	Verified	0.04			0.04		Small amt of fill from grading before delineation. Amt unknown. Assumed OAR.																			
1999-00252	Verified	1.39	0.05		1.34		Addl 0.34 VP (P) Purchased at Laguna Creek for FWS						0.17	0.34					1.22							
1999-00310	Verified	0.22			0.15		X												0.1		0.114					

Number	Status Notes	Acres Waters Delineated	VP Impacts (Acres Permanent)	VP Impacts (Acres Temporary)	OAR Impacts (Acres Permanent)	OAR Impacts (Acres Temporary)	Mitigation/Impact Notes	Planting Ratios/Measures Associated with Aquatic Resource (Enhancement ?)	NFWF for impacts to (acres) VP	NFWF for impacts to (acres) OAR	Bank / Preserve VP Creation IN	Bank / Preserve VP Preservation IN	Bank / Preserve VP Creation OUT	Bank / Preserve VP Preservation OUT	Bank / Preserve VP Creation Unknown Location	Bank / Preserve VP Preservation Unknown Location	Bank / Preserve OAR Creation IN	Bank / Preserve OAR Preservation IN	Bank / Preserve OAR Creation OUT	Bank / Preserve OAR Creation Unknown Location	ON-SITE OAR Creation	ON-SITE OAR Restored	ON-SITE OAR Preserved	ON-SITE OAR Enhanced	ON-SITE VP Creation	ON-SITE VP Preserved
1999-00322	LOP - Authorized - Part of Highland Reserve	0.44	0.29		0.15		RH 1037128. Impacts were previously authorized under 1989 Highland Reserve permit, but waters re-established. Mitigation for those impacts was also handled under original permit. Include any of this??																			
1999-00370	Verified	0.026				0.026	Delineated Assumed																			
1999-00383	Verified	0.25				0.25	Delineated Assumed																			
1999-00401	Verified	0.06				0.06	Delineated Assumed																			
1999-00662	Verified	0.01			0.01		Riparian replanting - not in Corps letter. NOTE: Entire utility line falls within study area. Waters delineated was actually 2.1 (NWP 12). Impact acreage used instead.																			
1999-00673	Verified	1.83	0.13		1.55		X								0.13	0.26			1.33							
1999-00680	Verified	0.577			0.577		X										0.577									
1999-00727	Verified - Addl Mod	2.629	0.357		0.126		Best Available Info, file incomplete. Preserve contains 2.146 acres, types uk. NOTE: Entire utility line falls within study area.								0.357	0.714				0.126			2.146			
1999-00728	Verified - D/I Variable	1.17	0.022		0.466		0.005 Indirect VP. 0.032 Indirect OAR.		0.022	0.466						0.044							0.711			
			0.005		0.032	0.005			0.005	0.032																
2000-00007	SP - Authorized - D/I Variable	2.89	0.2		1.98		0.15 Indirect VP.						0.7		1.4				2				0.56			
			0.15																							
2000-00054	Verified	1.03			0.289		X										0.29						0.75			
2000-00077	SP - Authorized	1.25	0.41		0.48		X								0.41	0.82	0.96									

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2000-00120	Verified	0.06			0.06		X													0.06						
2000-00127	Verified	1.12			0.13		X																			
2000-00140	Verified	0.03			0.03		Delineation Assumed.																			
2000-00300	Verified - Multiple	0.241	0.012				X		0.012							0.024										
2000-00330	Verified	0.32	0.21		0.11		X		0.21	0.11						0.42										
2000-00455	Verified	0.0112				0.0112	X																			
2000-00456	Verified	0.21		0.21			Impact greater than delineated acreage (0.1832). Impact used instead. FWS required mitigation.																			
2000-00513	Verified - Reverification	0.27	0.2		0.07		X				0.27					0.54										
2000-00668	Verified	0.0036			0.0036		Delineation Assumed.													0.0036						
2000-00671	Verified	0.07	0.04		0.03		Verification required 0.08 VP (P) at FWS bank. Corps required 0.04 VP C and 0.03 OAR C. Actual mitigation was 0.11 VP C In and 0.22 VP P In.				0.11	0.14															
												0.08														
2000-00702	Verified - D/I Variable	0.15			0.15		Delineation Assumed. Assoc w Highland Reserve. Indirect impacts (unspecified).										0.15									
2000-00730	Verified	0.01			0.01		Delineation Assumed.																			
2001-00011	Verified	0.05			0.05		X										0.05									
2001-00016	Verified - Multiple - Restoration	7.47			4.5	6.17	139.7 acres WOUS created via restoration (conservation area). NOTE: Be aware of any mitigation using Natomas HCP!!										139.7									
2001-00024	LOP and NWP - Verified/Authorized - D/I Variable	1			0.01		Indirect 0.176 (type uk, assumed OAR				0.379	0.758											0.58			0.02

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			0.379		0.031															0.21						
					0.176																					
2001-00050	Verified - D/I variable	0.17	0.06				0.11 Indirect OAR. FWS mit, 0.06 VP create, 0.120 vp preserve								0.06	0.12	0.06									
					0.11																					
2001-00096	Verified and/or SP - Originally Unauth	0.04	0.02		0.02		Impacts include VP, amt not specified in documents. (0.04 total) Assumption - impacts split evenly across types. FWS impacts much more. Significant FWS mitigation. Waters delineated was actually 1.441 (NWP 12). Impact acreage used instead.																			
2001-00136	Verified - D/I variable	0.64	0.003		0.24		X				0.003	0.67					0.24									
2001-00139	Verified	0.08				0.08	Credits required "riparian habitat" at Wildlands. Waters delineated was actually 0.29 (NWP 12). Impact acreage used instead.										0.08									
2001-00199	Verified	0.12			0.12		X										0.12									
2001-00216	Verified - utility line Orchard Creek	0.001				0.001	Waters delineated was actually 91.1 (NWP 12). Impact acreage used instead.	Plantings 3:1 (NMFS)																		
2001-00283	LOP - Authorized	0.7	0.08		0.61		X				0.18					0.36	1.68									
2001-00318	Verified	0.151	0.064		0.086		Applicant purchased 0.453 VP C (Sheridan) and 0.906 VP P (Orchard Creek) for FWS requirements.				0.453	0.906														
2001-00338	Verified	0.07			0.07		Delineation assumed. Expansion of 1901-08768.																			

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2001-00451	Verified	0.03				0.03	Waters delineated was actually 0.95 (NWP 12). Impact acreage used instead.												0.03							
2001-00536	Verified - D/I Variable	0.62	0.3		0.14		0.18 Indirect OAR.								0.3	0.6	0.23						0.18			
					0.18																					
2001-00568	Verified	0.006			0.006		Delineation assumed																			
2001-00569	Verified	0.06	0.06				X								0.06	0.12										
2001-00716	Verified	0.63	0.18		0.05		X								0.18	0.36				0.05						
2002-00017	SP - Authorized	4.072	0.617		2.639		X				2.849	5.69							0.581				0.59			
2002-00090	Verified	0.3			0.06	0.01	X										0.1									
2002-00101	Verified	0.43	0.12		0.31		X		0.12	0.31						0.24										
2002-00140	Verified	0.14			0.14		X										0.14									
2002-00183	Verified	0.006				0.006	X																			
2002-00357	Verified	0.089	0.045		0.04		X		0.045	0.04						0.09										
2002-00377	Verified	0.1			0.06		X																			
2002-00387	SP - Authorized	1.601	0.349		0.723		Review on-site preserve req - use this as acreage. on-site preserve acreage differs from permit requirement (more)				0.503					1.006			0.685				0.038			
2002-00396	SP - D/I variable - Authorized	2.155	0.623		0.25		1.102 Indirect types uk, ASSUMED OAR. 3.388 VP (P) at FWS bank (Mariner)				1.184	3.388					0.202						0.998			0.243
					1.102																					
2002-00442	Unauthorized	0.03	0.02				X																			
2002-00558	SP - Authorized - Ness - Loc UK	1.36	0.45		0.714		Loc UK, Best available info.		0.45							0.9				0.714			0.196			

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2002-00629	Verified	0.0003	0.0003				FWS mitigation: record of 0.0003 creation credits purchased (Sheridan)				0.0003					0.0006										
2002-00648	Verified - Multiple - D/I Variable - Unauth - Ness has	1.2532	0.001		0.063		Indirect 0.030 VP, 0.803 OAR. Significant mitigation req by other agencies.				0.03					0.06	0.97									
			0.03																							
			0.03		0.803																					
2002-00666	SP - Authorized - D/I variable	59.95	13.34		8.42		9.5 Indirect VP, 0.74 Indirect Vernal Swale. Preserve 210 acre portion of Reason Farms (wetland and waters acreage unknown). Irrevocable letters of credit $20m to secure 1000 acres of VP critical habitat ?? (Placer Land Trust).				43						8				7.07		13.35			24.84
					0.004						25.48							24			0.004					
					0.009	0.006						1.2						5.14								
					0.116							3														
					0.032	0.362						18.89														
2002-00752	SP - Authorized	5.326	0.177		2.351	0.096	FWS Mitigation	Shade Affected Reach 2:1							0.177	0.354					3.411		1.205			
2003-00040	Verified - D/I variable	0.556	0.094		0.277		0.185 Indirect Other WOUS. Delineated waters were unclear, multiple portions of multiple jds. Delineation assumed.		0.094							0.188	0.462									
					0.185																					
2003-00071	Verified - with Ness	0.654	0.37		0.094		X		0.37							0.74	0.094						0.19			
2003-00096	Verified	0.054	0.021		0.033		FWS mitigation								0.021	0.042										
2003-00127	Verified	0.32			0.32		X														1.3					
2003-00167	Verified	0.157			0.16		X										0.16									

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2003-00240	SP - Authorized - D/I variable	2.373	1.917		0.456		Indirect 0.038 impacts (type uk) ASSUMED OAR				2.128	4.256					0.283									
					0.038																					
2003-00297	Verified - restoration	0.76				0.76	X																			
2003-00496	Verified	0.133			0.133		X			0.133																
2003-00637	SP - Authorized - D/I variable - See 2005-00262	7.533	0.552		0.58		2.504 VP Indirect. 6.112 (P) and 1.298 (C) (types unspecified-assumed OAR) at Reason Farms. FWS (1.104) is an assumption based on known VP creation. 1.104 was subtracted from 6.112 (P) to generate assumed 5.008 OAR figure.				0.552	1.104					0.185	5.008								
			2.504														0.746									
2003-00650	Verified	2.931	0.251		0.226		0.702 VP Preservation at FWS approved bank was a condition		0.251							0.702	0.217						2.439			0.015
2003-00661	Verified	6.56			0.06		X																			
2003-00762	Verified	0.71			0.42	0.11	X													0.67						
					0.18																					
2003-00773	Verified	0.18			0.18		X			0.04							0.14									
2003-00797	Verified	0.24			0.24		X			0.13							0.21									
2004-00021	Verified	0.05			0.05		X										0.05									
2004-00136	Verified - D/I variable	0.05			0.03		Indirect 0.02 (types uk) ASSUMED OAR. Delineated was assumed.	Shade Affected Reach 3:1												0.1						
					0.02																					
2004-00213	SP - D/I variable - Authorized	2.015	1.036		0.546		Indirect 0.058 (types uk) ASSUMED OAR				1.347					2.694	0.575						0.433			
					0.058																					

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2004-00214	Verified	0.013			0.013		Waters delineated was actually 0.059 (NWP 14). Impact acreage used instead.													0.013						
2004-00394	Preserve (NWP) - Verified - Orchard Creek	3.18				0.01	VP creation required by permit, not included.																			
2004-00424	Preserve (NWP) - Verified - John D Vincent	54.85			0.003	0.02	13.469 created since initial permit. Creation and Restoration required by permit, not included.	Plantings: 1540 linear feet of ag ditch.																		
2004-00426	Verified	0.089			0.089		X			0.089																
2004-00447	Verified - see 2005-00349	0.152			0.15		X			0.15																
2004-00513	Verified	0.03				0.03	X	Plantings - Inch for inch (from PCN - incorporated by reference, not Corps letter)																		
2004-00770	Verified	0.98	0.2		0.15		X		0.2	0.15						0.4							0.63			
2004-00812	Verified - See 2000-00679	0.19	0.09		0.1		X		0.09	0.03						0.18			0.07							
2004-00843	Verified	0.38	0.27		0.11		X		0.27	0.11						0.54										
2004-00845	Verified - After the Fact and addl NWP	0.26			0.026		Waters delineated was actually 1.26 (NWP 14). Impact acreage used instead.	Shade Affected Reach 2:1		0.023																
2004-00867	Verified	2.156			0.352		X			0.352													1.793			
2004-00910	Verified	0.2			0.068		X			0.068																
2005-00017	Verified	0.05	0.028		0.015		X		0.028	0.015						0.056										
2005-00133	Unauth - Withdrawn for lack of staff resources	0.33			0.33		Delineated was assumed																			
2005-00254	Verified	0.392	0.063		0.192		X		0.063	0.192						0.126										

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2005-00259	SP - Verified - Outcard Channa - D/I variable	2.26	0.93		0.18		2.79 VP Indirect. (Total impact exceeds delineated, is this ok?) Mitigation an addl 1.42 on-site preserved (Resource Types unknown) - Assumed OAR. 1.86 VP (P) Service Approved bank.								0.93	1.86				0.18			1.42			
			2.79																							
2005-00307	SP - Authorized	2.038	0.708		1.33		X				0.708					1.416	1.33									
2005-00473	Verified	0.399			0.399		X			0.399																
2005-00493	Verified	0.98			0.07		X			0.07																
2005-00590	Verified - D/I variable	1.395	0.157		0.227		0.643 Indirect VP + 0.368 Indirect OAR. Off-site preservation was pulled from BO as a condition. NOTE: Entire Utility line falls within study area. Waters delineated was actually 21.197 (NWP 12). Impact acreage used instead.				0.868	4.74														
			0.643		0.368																					
2005-00595	Verified	0.11			0.11		X			0.11																
2005-00741	Verified - with Ness	0.806	0.38		0.06		Bank credits not yet purchased. 0.88 VP C IN, OR 1.32 VP C OUT. (ASSUMED 0.88 IN). Request by applicant to mitigate by resource at 1.5:1 instead of 2:1 all VP.				0.88					1.57							0.14			0.19
2005-00842	Verified	0.284	0.272		0.012		X		0.272	0.012						0.544										

Number	Status Notes	Acres Waters Delineated	VP Impacts (Acres Permanent)	VP Impacts (Acres Temporary)	OAR Impacts (Acres Permanent)	OAR Impacts (Acres Temporary)	Mitigation/Impact Notes	Planting Ratios/Measures Associated with Aquatic Resource (Enhancement ?)	NFWF for impacts to (acres) VP	NFWF for impacts to (acres) OAR	Bank / Preserve VP Creation IN	Bank / Preserve VP Preservation IN	Bank / Preserve VP Creation OUT	Bank / Preserve VP Preservation OUT	Bank / Preserve VP Creation Unknown Location	Bank / Preserve VP Preservation Unknown Location	Bank / Preserve OAR Creation IN	Bank / Preserve OAR Preservation IN	Bank / Preserve OAR Creation OUT	Bank / Preserve OAR Creation Unknown Location	ON-SITE OAR Creation	ON-SITE OAR Restored	ON-SITE OAR Preserved	ON-SITE OAR Enhanced	ON-SITE VP Creation	ON-SITE VP Preserved
2005-00936	SP - Authorized - outcard - Robb - Supposedly with Office of Council. See 1995-00018	0			0.432		Same site as 1995-00018. The required on-site preserve (6.862 OAR) is already included under 1995-00018, as is the delineated acreage.																			
2005-00955	LOP Authorized	0.53			0.53		X													0.53						
2005-01087	SP - Authorized	4.29	1.25		3.04		X				1.34		3.9				2.15		0.2							
																	0.8									
2006-00248	Verified	0.84			0.086		EIS includes on-site preserve w/riparian, amt unknown. Not specified in Corps letter.																			
2006-00282	Verified	0.37	0.04		0.33		Off-Site Preservation was for FWS, as a condition.		0.04	0.33	0.31	0.93														
2006-00327	Verified	0.08	0.005		0.075		Addl FWS VP Creation Credits 0.064		0.005	0.075					0.064	0.128										
2006-00509	Verified	0.15				0.15	X																			
2006-00536	Verified	0.01			0.003	0.007	Waters delineated was actually 0.055 (NWP 14). Impact acreage used instead.																			
2006-00791	Verified	0.046			0.046		Waters delineated was actually 0.425 (NWP 12). Impact acreage used instead.			0.046																

Number	Status Notes	Acres Waters Delineated	VP Impacts (Acres Permanent)	VP Impacts (Acres Temporary)	OAR Impacts (Acres Permanent)	OAR Impacts (Acres Temporary)	Mitigation/Impact Notes	Planting Ratios/Measures Associated with Aquatic Resource (Enhancement ?)	NFWF for impacts to (acres) VP	NFWF for impacts to (acres) OAR	Bank / Preserve VP Creation IN	Bank / Preserve VP Preservation IN	Bank / Preserve VP Creation OUT	Bank / Preserve VP Preservation OUT	Bank / Preserve VP Creation Unknown Location	Bank / Preserve VP Preservation Unknown Location	Bank / Preserve OAR Creation IN	Bank / Preserve OAR Preservation IN	Bank / Preserve OAR Creation OUT	Bank / Preserve OAR Creation Unknown Location	ON-SITE OAR Creation	ON-SITE OAR Restored	ON-SITE OAR Preserved	ON-SITE OAR Enhanced	ON-SITE VP Creation	ON-SITE VP Preserved
2006-00871	Verified - Multiple permits - Benn owner	0.269			0.269		LOP (0.269 impacts) used previous mititgation for Regional 65 Center (includes project area) for compensation. How to log? R 65 Center has no modern file # (1989). This old verification also includes VP impacts, on-site preserve, creation, etc.																			
					0.01	0.146				0.156																
						0.17																				
2006-01002	Verified	0.065			0.003	0.027	X														0.023					
2007-00053	Verified	0.061	0.061				X						0.061	0.122												
2007-00081	Verified	0.2273			0.0823	0.145	Waters delineated was actually 21.05 (NWP 12). Impact acreage used instead.			0.0823																
2007-00855	Dev Bank Incomplete + NWP Complete - Locust Road - See RAMS 2005-00937	2.57			0.91	0.01	Plan was to create 12.3 VP and 4.5 OAR. Corps letter also mandated this. 0.91 of the created OAR was to be used as compensation for impact. Although bank is still in review, created wetlands were constructed. As built acreages differ:11.52 VP and 2.53 OAR.																			
2007-00857	Dev Bank + NWP - Toad Hill - See RAMS 2005-00937	43.66			1.1																					
2007-01175	Verified	1.91				1.91	Waters delineated was actually 750.15 (NWP 12). Impact acreage used instead.																			
2008-00345	Verified	1.05			0.2		X			0.2																

Number	Status Notes	Acres Waters Delineated	VP Impacts (Acres Permanent)	VP Impacts (Acres Temporary)	OAR Impacts (Acres Permanent)	OAR Impacts (Acres Temporary)	Mitigation/Impact Notes	Planting Ratios/Measures Associated with Aquatic Resource (Enhancement ?)	NFWF for impacts to (acres) VP	NFWF for impacts to (acres) OAR	Bank / Preserve VP Creation IN	Bank / Preserve VP Preservation IN	Bank / Preserve VP Creation OUT	Bank / Preserve VP Preservation OUT	Bank / Preserve VP Creation Unknown Location	Bank / Preserve VP Preservation Unknown Location	Bank / Preserve OAR Creation IN	Bank / Preserve OAR Preservation IN	Bank / Preserve OAR Creation OUT	Bank / Preserve OAR Creation Unknown Location	ON-SITE OAR Creation	ON-SITE OAR Restored	ON-SITE OAR Preserved	ON-SITE OAR Enhanced	ON-SITE VP Creation	ON-SITE VP Preserved
2008-00762	Unauth - Complete. ATF NWP - Incomplete	0.013			0.013		Incomplete, but near final mitigation will make 0.013 impact temporary, and there will be 0.09 OAR on-site enhancement as well.																			
2008-01549	Verified - D/I variable	0.123			0.048		0.014 Indirect OAR. NFWF is 0.5:1 for indirect	Shade Affected Reach 1:1		0.055																
					0.014																					
2009-00424	Verified	0.015			0.015		X																			
2009-01096	Verified	0.2412	0.0004	0.2408			Waters delineated was actually 44.27 (NWP 12). Impact acreage used instead.								0.39	0.78										
2009-01537	Verified	0.0265			0.02	0.065	Delineated Assumed			0.2																
2010-00667	Verified	0.038			0.021	0.017	Waters delineated was actually 0.3 (NWP 14). Impact acreage used instead.														0.08					
2010-00735	SP - Authorized	1.5			0.437		X										0.48		0.14							
2010-01179	Verified	0.028			0.011	0.017	Waters delineated was actually 0.85 (NWP 14). Impact acreage used instead.																			
2011-00141	Verified	0.34			0.15	0.1	X																			
		1099.5133	147.5517	0.8708	291.3809	13.7892			2.547	4.3823	122.9255	135.5	5.871	0.462	10.162	48.2146	238.847	35.948	19.726	6.7266	180.304	11.9	297.457	44.05	71.329	77.648

TOTAL MIT 1314

APPENDIX 3.12

Traffic Noise Modeling

Westbrook Off-Site Alternative
Traffic Noise Levels

ROADWAY NAME Segment	Conditions	Number of Lanes in Each Direction	Median Width	ADT Volume	Design Speed (mph)	Distance From Edge of Pavemt	Alpha (1) Factor	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	dB(A) CNEL
Sunset west of Industrial	2025	1	15	22,600	35	50	0	0	1.3%	0.3%	66.4
Sunset west of Industrial	2025 + Project	3	0	32,400	35	50	0	0	1.3%	0.3%	67.3
Foothills south of Athens	2025	1	15	20,840	35	50	0	0	1.3%	0.3%	66.1
Foothills south of Athens	2025 + Project	2	0	22,110	35	50	0	0	1.3%	0.3%	66.1

Notes:
(1) Alpha Factor: Coefficient of absorption relating to the effects of the ground surface. An alpha factor of 0 indicates that the site is an acoustically "hard" site, such as aspalt. An alpha factor of 0.5 indicates that the site is an acoustically "soft" site such, as heavily vegetated ground cover.

Assumed 24-Hour Traffic Distribution

	Weighted Traffic Distribution (%)		
	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Impact Sciences, Inc.
Prepared by: Jennifer Millman
Date: November 1, 2012

APPENDIX 3.14

Westbrook EIS Transportation Analysis

DRAFT
Westbrook EIS
Transportation Analysis

Prepared for

Impact Sciences
USACE

Prepared by

DKS *Associates*

TRANSPORTATION SOLUTIONS

8950 Cal Center Drive, Suite 340
Sacramento, CA 95826

July 2012

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Transportation and Circulation

1. INTRODUCTION

This report evaluates the effects of the Westbrook Plan and several alternatives under "2025 CIP/build-out" conditions. This EIS analysis is based on the Sierra Vista EIS, which was approved and adopted by the City of Roseville in 2010, as well as the Westbrook Property Transportation Impact Study, prepared by Fehr and Peers in 2011.

An initial review of the project determined that implementation of the project would not affect air traffic patterns or result in inadequate parking capacity. Therefore, these issues are not addressed in this EIS.

The traffic impacts of the Westbrook project have been evaluated under a number of different scenarios of existing and future traffic conditions. **Figure 1** shows the location of the Proposed Project and alternatives in relation to the City of Roseville and other jurisdictions.

The following conditions and scenarios have been defined and evaluated in detail:

- **Existing Conditions**
  - No Project (reflects existing traffic counts conducted in late 2007/ early 2008)
- **2025 CIP Conditions**
  - 2025 CIP No Project
  - 2025 CIP plus Proposed Action ("The Project")
  - 2025 CIP plus Alternative #1 (Reduced Footprint, Increased Density)
  - 2025 CIP plus Alternative #2 (Reduced Footprint, Same Density)
  - 2025 CIP plus Alternative #2X (Central Preserve Alternative)
  - 2025 CIP plus Alternative #3 (Half Acre Wetland Impact Plan)
  - 2025 CIP plus Alternative #4 (One Acre Wetland Impact Plan)
  - 2025 CIP plus Alternative #5 (No Federal Action – No Corp of Engineers Permit)
  - 2025 CIP plus Alternative #6 (Off-Site – Placer Ranch site)

2. ENVIRONMENTAL SETTING

The evaluation of the operating characteristics of the existing circulation system in the City of Roseville is the initial task in defining impacts of the Westbrook project on the circulation system. In order to understand existing travel patterns and conditions, major aspects of transportation in Roseville were inventoried and analyzed.

The following sections briefly discuss roadway functions, traffic volumes, and traffic levels of service, as well as transit, truck and rail services, and bicycle routes.

Study Area Roadways and Intersections

The existing street network in the City of Roseville is a product both of roadways that have provided access to the older portions of the City for decades and of roadways that were designed to serve newer specific plan areas. In each of the City's specific plan areas and the North Industrial Plan Area, arterial and collector roadway classifications have been defined and most of these roadways have been constructed. In the older portions of the City, roadways were classified as arterial or collector roadways in the 1992 General Plan Update.

The primary function of arterial roadways is to move large volumes of traffic through the City to other sections and beyond. In the specific plan areas, the right-of-way for arterials varies from 76 feet to 100 feet and generally incorporates four to six travel lanes, bicycle lanes, and a landscaped median. On-street parking on existing arterials in the specific plan areas is prohibited, and access is limited to minimize cross traffic turning movements in order to improve traffic safety and allow more efficient traffic flow. Outside the specific plan areas, some roadways function as arterials due to the current high traffic volumes and their key linkages between one section of the City and another. For these roadways, current right-of-way widths vary, but most contain more than two traffic lanes.

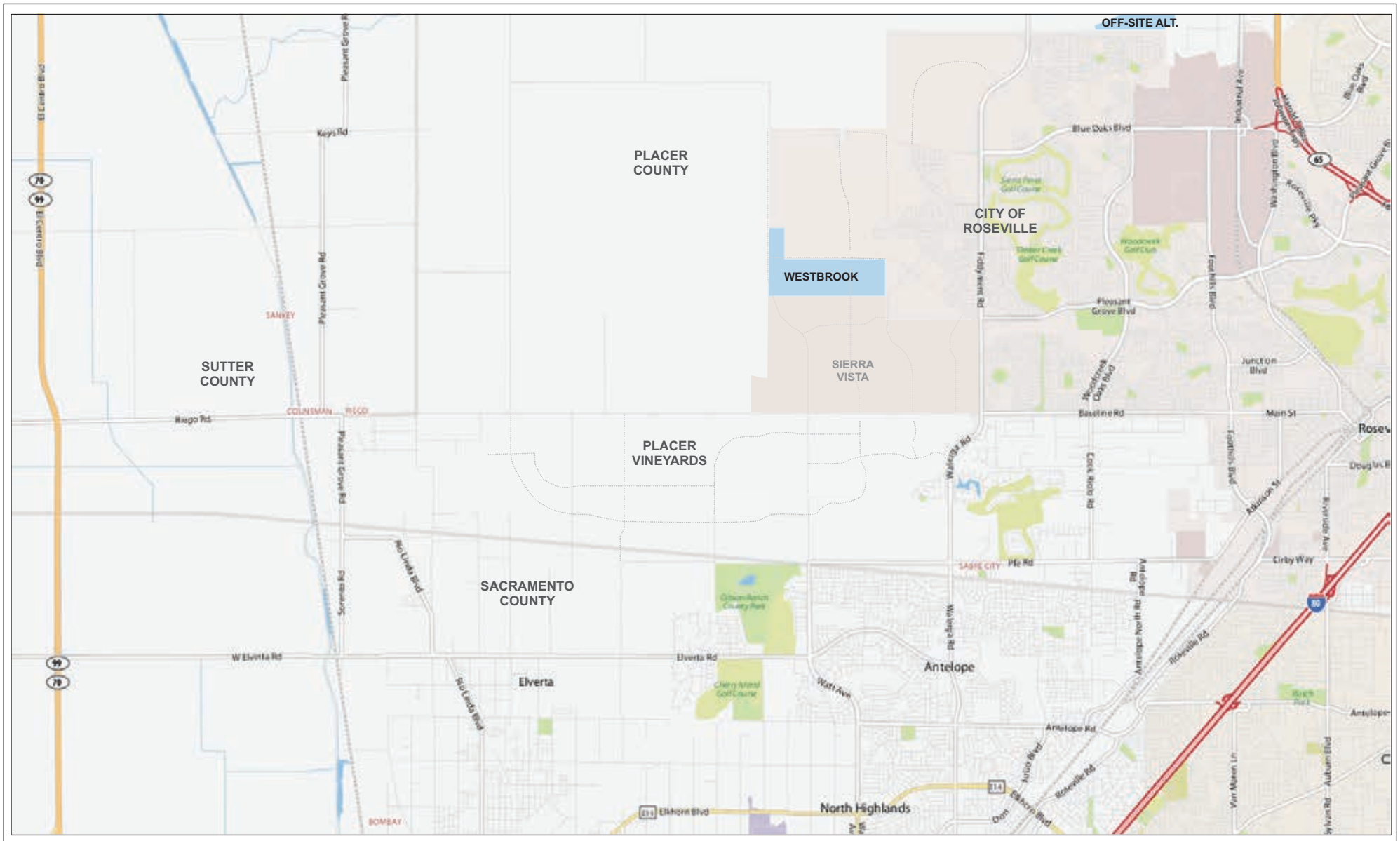

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FIGURE 1
Location of Proposed Project and Alternatives

Collector streets generally link local residential streets and the commercial and office parking areas to the arterials. In the specific plan areas, the right-of-way for these streets varies from 54 feet to 60 feet and contains two traffic lanes and bicycle lanes. Outside the specific plan areas, a number of roadways function as collector roadways due to moderate traffic volumes and their linkage to the arterial roadway system. The right-of-way widths for these roadways vary, but most contain two traffic lanes.

The existing state highway and arterial systems within the City of Roseville are described below.

State Highway System

Roseville is served by an interstate highway (I-80) and a state highway, State Route 65 (SR 65). I-80 is a transcontinental highway that links Roseville not only to Sacramento and the Bay Area, but to the rest of the United States via its crossing of the Sierra Nevada. It carries commute traffic between Placer and Sacramento counties, as well as interregional and interstate business, freight, tourist, and recreational travel. Roseville is connected to I-80 by five interchanges: Riverside Avenue, Douglas Boulevard, Eureka Road/Atlantic Street, Taylor Road, and SR 65. This freeway has eight lanes west of Riverside Avenue and six lanes through the remainder of Roseville. High Occupancy Vehicle (HOV) lanes currently exist on I-80 in Sacramento County but terminate at the Placer County line.

SR 65 is generally a north–south trending State Route that connects Roseville with the cities of Lincoln and Marysville (via Highway 70). In Roseville, this highway is a four-lane freeway with access provided by four interchanges: I-80, Galleria Boulevard/Stanford Ranch Road, Pleasant Grove Boulevard and Blue Oaks Boulevard.

Arterial Street System

The arterial network may be the most important system of roads within the overall street system. It links residential areas to both commercial and employment centers and links all of these uses to the regional freeway system. The existing arterial network in the western portion of the City of Roseville is described below.

Baseline Road is an east–west arterial that links Roseville with the Dry Creek Area and SR-70/99. From the city limits east, Baseline Road provides two westbound lanes and one eastbound lane until it becomes Main Street at Foothills Boulevard.

Blue Oaks Boulevard is an east–west arterial that links the cities of Roseville and Rocklin to each other and to SR 65. Between SR 65 and Crocker Ranch Road it has four lanes. From Crocker Ranch Road to west of Fiddyment Road it has six lanes. Blue Oaks Boulevard has recently been extended west of Fiddyment Road as part of the WRSP/ Fiddyment Ranch development.

Fiddyment Road is a north/ south arterial connecting western Roseville with Placer County and the City of Lincoln. Fiddyment Road has recently been widened and realigned as part of the West Roseville Specific Plan. It is currently 4 lanes between Pleasant Grove Boulevard and the north Roseville city limit.

Foothills Boulevard is the major north–south arterial in Roseville west of I-80. It extends as far south as Cirby Way, where it becomes Roseville Road and continues south into Sacramento. North of Cirby Way it traverses portions of the City's Infill Area, Northwest Specific Plan and North Industrial Plan Area and currently ends at Duluth Avenue at the northern city limits. This roadway (along with Washington Boulevard, Harding Boulevard and SR 65) provides one of only four grade-separated crossings of the Union Pacific railroad mainline.

Junction Boulevard is an east–west arterial in west Roseville that has four lanes from Washington Boulevard to Baseline Road.

Pleasant Grove Boulevard is an east/west arterial that extends from the West Roseville Specific Plan area to the City of Rocklin where it becomes Park Drive and connects the WRSP, the Del Webb Specific Plan, the Northwest Roseville Specific Plan, the North Central Roseville Specific Plan and the Highland Reserve Specific Plan to each other and to SR-65. It has four lanes from its current western terminus at Market Drive to west of Foothills Boulevard. It has six lanes from west of Foothills Boulevard to SR-65.

Riego Road is an east/west arterial roadway that extends from west of State Route 70/99 to the Sutter County/ Placer County line, where it becomes Baseline Road. Riego Road is a two-lane roadway and has an at-grade signalized intersection where it meets State Route 70/99.

Walerga Road is a north-south arterial that extends from Sacramento County to Baseline Road in Placer County. Walerga Road is currently a two-lane roadway from the county line to just south of Baseline Road, where it widens to four lanes. Walerga Road becomes Fiddyment Road north of Baseline Road.

Washington Boulevard is a major north–south arterial. It connects SR 65 and Blue Oaks Boulevard on the north to Oak Street in downtown Roseville. Most of Washington Boulevard has four lanes, except a two-lane segment north and south of where it crosses under the Union Pacific railroad north-south tracks.

Watt Avenue is a major north-south arterial that extends from Elk Grove in Sacramento County to its current terminus at Baseline Road in Placer County. In the vicinity of the proposed project, Watt Avenue is currently a two-lane roadway from the Sacramento County/ Placer County line to Baseline Road. Watt Avenue is proposed to be extended north as Santucci Boulevard as part of the SVSP.

Woodcreek Oaks Boulevard is a north–south arterial that extends from Baseline Road to Blue Oaks Boulevard. This arterial has four lanes from Baseline Road to north of Pleasant Grove Boulevard and two lanes north to Blue Oaks Boulevard.

Existing Traffic Levels of Service

The evaluation of traffic volumes on the roadway network provides an understanding of the general nature of travel conditions in the City of Roseville. However, traffic volumes do not indicate the quality of service provided by the street facilities or the ability of the street network to carry additional traffic. To accomplish this, the concept of "level of service" has been developed.

"Levels of service" describe roadway-operating conditions. Level of service is a qualitative measure of the effect of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs. Levels of service are designated "A" through "F" from best to worst, which cover the entire range of traffic operations that might occur. Level of service (LOS) A through E generally represent traffic volumes at less than roadway capacity, while LOS F represents over capacity and/or forced conditions.

The City revised its level of service policy with the update of the Capital Improvement Program (CIP), which was adopted in September 2002 and updated in 2006. The current level of service policy calls for the City to maintain a LOS C standard at a minimum of 70 percent of all signalized intersections in the City during the p.m. peak hour. The evaluation of this policy is based on buildout of currently entitled land within the City and 2020 market rate development outside of the City.

The traffic flow and capacity of Roseville's arterial/collector system is principally controlled by the capacity of its signalized intersections. Intersection operations were evaluated using a modified version of the Transportation Research Board Circular 212 (critical movement) method that was adopted for Roseville's CIP. **Table 1** presents the level of service categories for signalized intersections considered in this analysis and provides a definition of each category with the corresponding volume-to-capacity ratios. While the p.m. peak hour has typically been used in the operational analysis of the City's roadway system since it generally represents the highest hour for overall traffic volumes during the day, the City has decided that a.m. peak hour analysis should now be conducted as well. **Table 2** shows the intersection critical volume capacities used for the different jurisdictions in this analysis. While Placer County uses the published capacities, the City of Roseville uses capacities that are approximately 5% higher than the published capacities and Sacramento County uses capacities that are approximately 10% higher than the published capacities. **Table 3** shows the volume thresholds used to determine segment-based level of service on roadways in other jurisdictions. These thresholds are based on the Placer County General Plan.

Table 1
Level of Service Definitions at Signalized Intersections

Level of Service (LOS)	***Volume to Capacity Ratio[1]***	***Description***
A	0.00-0.60	Free Flow/Insignificant Delays: No approach phase is fully utilized by traffic and no vehicle waits longer than one red signal indication.
B	0.61-0.70	Stable Operation/Minimal Delays: An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles.
C[2]	0.71-0.81	Stable Operation/Acceptable Delays: Major approach phases fully utilized. Most drivers feel somewhat restricted.
D	0.82-0.90	Approaching Unstable/Tolerable Delays: Drivers may have to wait through more than one red signal indication. Queues may develop but dissipate rapidly, without excessive delays.
E	0.91-1.00	Unstable Operation/Significant Delays: Volumes at or near capacity. Vehicles may wait through several signal cycles. Long queues form upstream from intersection.
F	Greater than 1.00	Forced Flow/Excessive Delays: Represents jammed conditions. Intersection operates below capacity with low volumes. Queues may block upstream intersections.

Notes:

[1] The ratio of the traffic volume demand at an intersection to the capacity of the intersection.

[2] The City of Roseville has established a volume-to-capacity ratio of 0.81 as the LOS C threshold.

SOURCE: Transportation Research Board, 1985

Table 2
Circular 212 Critical Volume Capacities

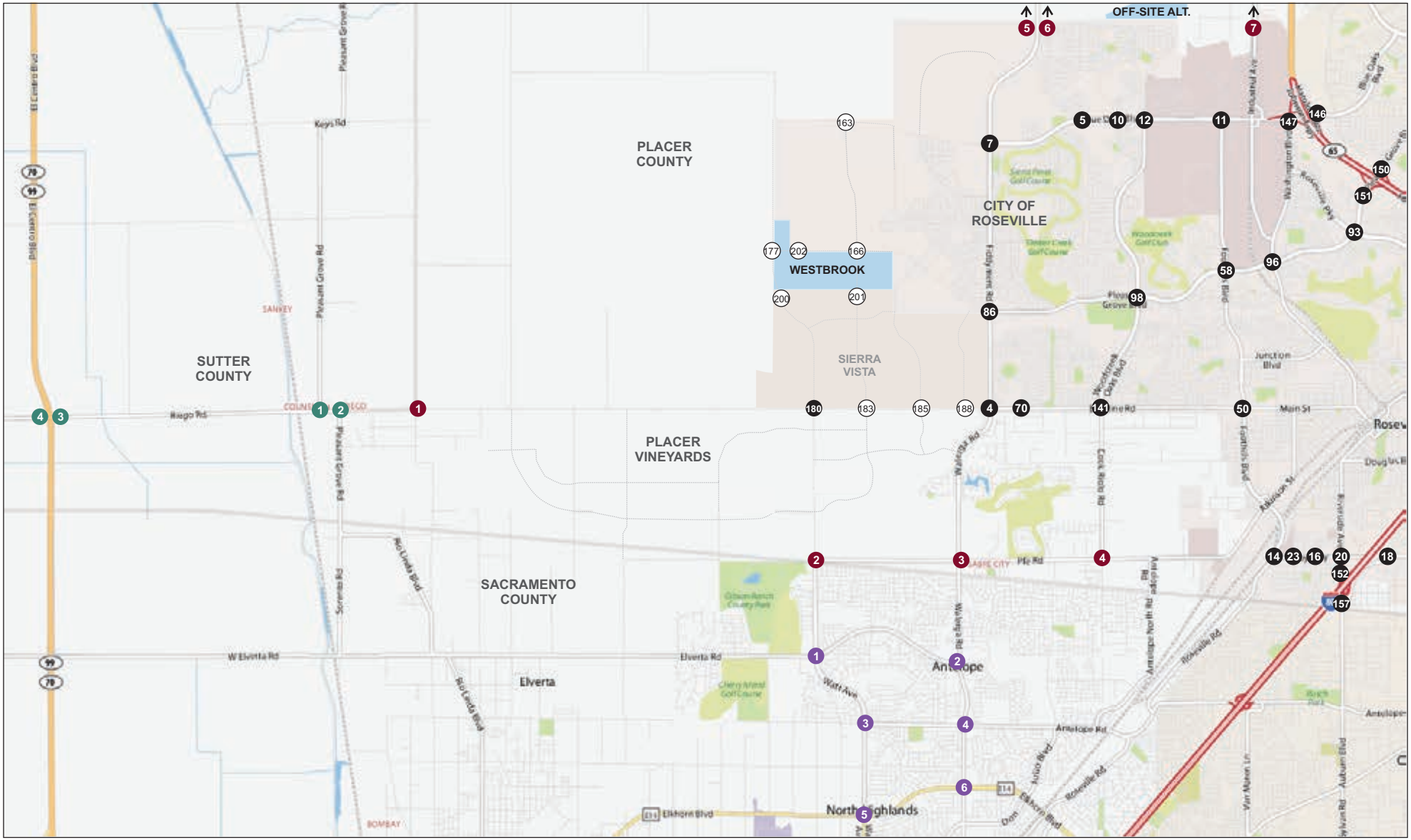
Jurisdiction	*Maximum Sum of Critical Volumes (vehicles per hour) by Number of Critical Phases*		
	Two Phases	*Three Phases*	*Four or More Phases*
Placer County, Sutter County (Published Circular 212)	1,500	1,425	1,375
City of Roseville	1,600	1,500	1,450
Sacramento County	1,650	1,550	1,500

Source: Transportation Research Board, 1985, DKS Associates, 2010

Table 3
Level of Service Definitions on Roadway Segments

Facility Type	*Average Daily Traffic Volume Threshold*				
	LOS A	*LOS B*	*LOS C*	*LOS D*	*LOS E*
Two-Lane Collector	9,000	10,700	12,000	13,500	15,000
Two-Lane Arterial	10,800	12,600	14,400	16,200	18,000
Four-Lane Arterial	21,600	25,200	28,800	32,400	36,000
Six-Lane Arterial	32,400	37,800	43,200	48,600	54,000
Four-Lane Freeway	37,600	52,800	68,000	76,000	80,000
Six-Lane Freeway	56,400	79,200	102,000	114,000	120,000
Eight-Lane Freeway	75,200	105,600	136,000	152,000	160,000

Source: DKS Associates, 2010



- # EXISTING ROSEVILLE INTERSECTIONS
- # FUTURE ROSEVILLE INTERSECTIONS
- # PLACER COUNTY INTERSECTIONS
- # SACRAMENTO COUNTY INTERSECTIONS
- # SUTTER COUNTY INTERSECTIONS

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FIGURE 2
Locations of Study Intersections

Figure 2 shows the intersections analyzed for existing and future conditions within the study area. The figure shows study intersections in the City of Roseville, Placer County, Sacramento County, and Sutter County. One intersection (Baseline Road & Watt Avenue) is currently within Placer County, but would be annexed to the City of Roseville with the development of the Sierra Vista Specific Plan. Therefore it is shown as both in the figure and shows up in both sets of LOS tables.

Table 4 shows the level of service at currently signalized intersections located in the western portion of the City of Roseville. These LOS calculations are based on turning movement counts conducted in late 2007 and early 2008. The table shows that all study intersections in the City of Roseville currently operate at LOS C or better during the a.m. peak hour and all but two intersections currently operate at LOS C or better during the p.m. peak hour.

Figure 3 shows existing daily two-way traffic volumes on major roadways throughout the City of Roseville.

Table 5 shows existing a.m. and p.m. peak hour levels of service at Placer County intersections. The table shows that one intersection (Locust and Baseline) operates unacceptably during the p.m. peak hour only. **Table 6** shows existing daily volumes and level of service at Placer County roadway segments. The table shows that one segment (Walerga Road south of Baseline Road) currently operates at LOS D, which now considered acceptable based on updated County standards.

Table 7 shows existing a.m. and p.m. peak hour levels of service at Sacramento County intersections. The table shows that all six Sacramento County intersections currently operate acceptably during the a.m. and p.m. peak hours. **Table 8** shows existing daily volumes and level of service at Sacramento County roadway segments. The table shows that all eight Sacramento County segments currently operate acceptably based on County standards.

Table 4
Level of Service at Roseville Signalized Intersections
Existing Conditions

	Intersection	Existing Conditions			
		AM Peak Hour		PM Peak Hour	
		LOS	V/C	LOS	V/C
	Existing Signalized Intersections				
4	Baseline Rd & Fiddyment Rd	B	0.67	C	0.80
5	Blue Oaks & Crocker Ranch	A	0.22	A	0.23
7	Blue Oaks & Fiddyment	A	0.20	A	0.18
10	Blue Oaks Bl & Diamond Creek Bl	A	0.36	A	0.30
11	Blue Oaks Bl & Foothills Bl	B	0.64	A	0.58
12	Blue Oaks Bl & Woodcreek Oaks Bl	A	0.55	A	0.41
14	Cirby Way & Foothills Blvd	B	0.67	B	0.68
16	Cirby Way & Northridge Dr	A	0.58	B	0.65
18	Cirby Way & Orlando Av	A	0.56	C	0.74
20	Cirby Way & Riverside Av	C	0.78	C	0.78
23	Cirby Way & Vernon St	C	0.71	**D**	**0.85**
50	Foothills & Baseline/Main	B	0.61	C	0.70
58	Foothills Bl & Pleasant Grove Bl	A	0.50	B	0.67
70	Junction Bl & Baseline Rd	A	0.31	A	0.46
86	Pleasant Grove & Fiddyment	A	0.34	A	0.27
93	Pleasant Grove & Roseville Pkwy	A	0.43	C	0.72
96	Pleasant Grove & Washington	A	0.56	B	0.69
98	Pleasant Grove Bl & Woodcreek Oaks Bl	A	0.45	A	0.54
141	Woodcreek Oaks & Baseline	B	0.60	B	0.65
146	SR 65 N/B Off & Blue Oaks Blvd	A	0.38	A	0.39
147	Washington Blvd & Blue Oaks Blvd	A	0.34	A	0.42
150	SR 65 N/B Off & Pleasant Grove Blvd	A	0.56	**D**	**0.85**
151	SR 65 S/B Off & Pleasant Grove Blvd	B	0.62	C	0.78
152	I-80 WB Off & Riverside Ave	A	0.55	B	0.69
157	I-80 EB Off/Orlando & Riverside Ave	A	0.54	B	0.69
180	Watt Ave & Baseline Rd	A	0.51	**D**	**0.86**

Note: **BOLD** Locations do not meet LOS Policy

Source: DKS Associates 2010

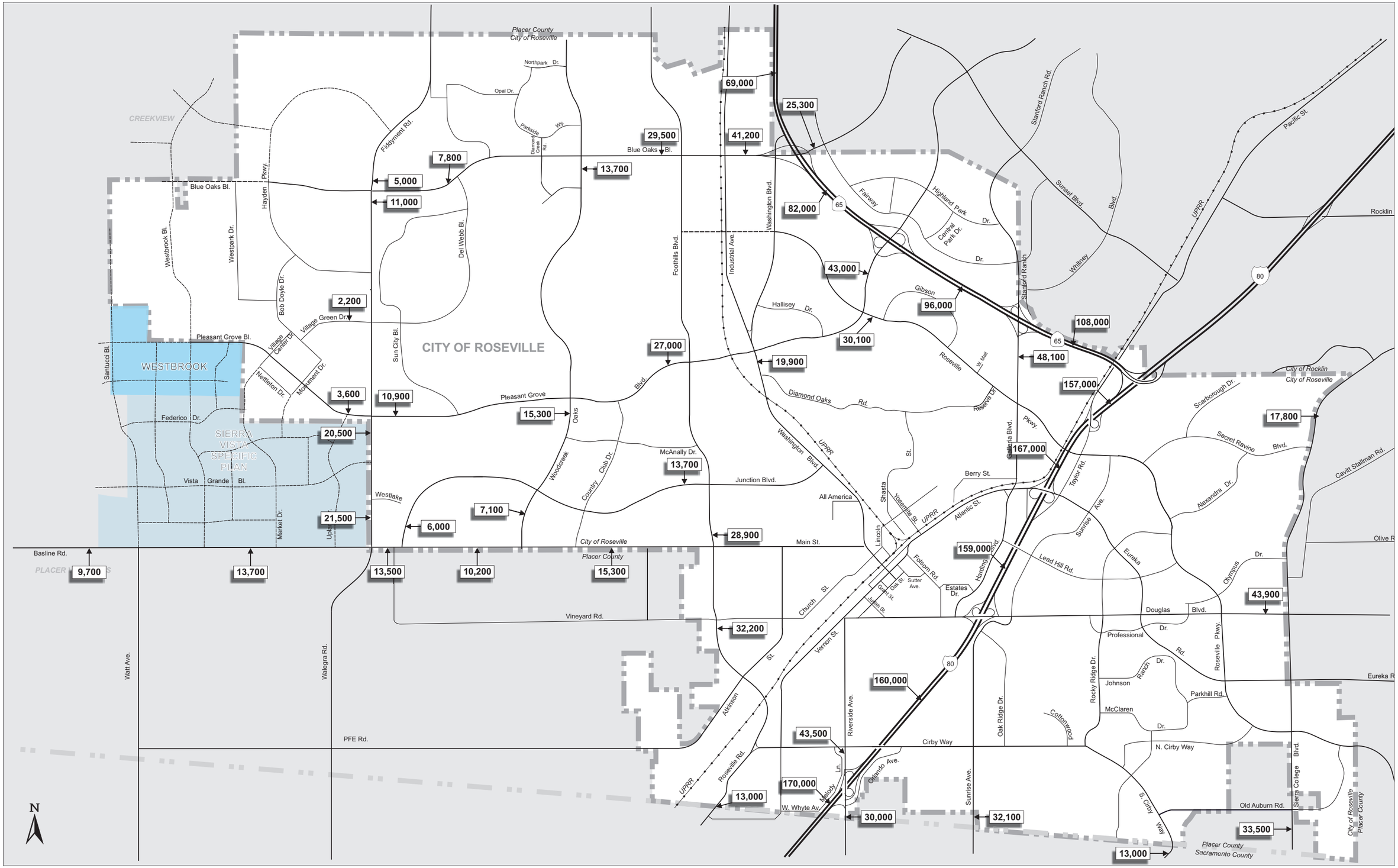

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FIGURE 3
Existing Daily Traffic Volumes

Table 5
Level of Service at Placer County Intersections
Existing Conditions

	Intersection	LOS Standard	Existing Conditions			
			AM Peak Hour		PM Peak Hour	
			LOS	V/C or Delay	LOS	V/C or Delay
1	Locust & Baseline	D	C	24.6 sec	**E**	47.2 sec
2	Watt Ave & PFE Rd	D	C	20.8 sec	C	16.5 sec
3	Walerga Rd & PFE Rd	F	E	0.98	D	0.84
4	Cook-Riolo & PFE Rd	F	B	11 sec	A	10 sec
5	W. Sunset & Fiddyment	C	A	2 sec	A	4 sec
6	Fiddyment & Athens	C	A	9 sec	B	11 sec
7	Athens & Industrial	C	A	0.27	A	0.42

Note: **BOLD** Locations do not meet LOS Policy
Source: DKS Associates 2010, Fehr and Peers, 2011

Table 6
Level of Service at Placer County Roadway Segments
Existing Conditions

Roadway Segment	LOS Standard	Lanes	Existing Conditions	
			ADT	LOS
Baseline Rd W/O Sierra Vista SP	D	2	9,700	A
Watt Ave S/O Baseline	F	2	5,700	A
Walerga Rd S/O Baseline	D	2	16,100	D
PFE Rd E/O Watt Ave	D	2	3,900	A
Fiddyment Rd S/O Athens	C	2	6,100	A
Sunset Blvd West W/O Fiddyment	C	2	1,000	A
Athens Ave E/O Fiddyment	C	2	3,700	A

Note: **BOLD** Locations do not meet LOS Policy
Source: DKS Associates 2010

Table 7
Level of Service at Sacramento County Intersections
Existing Conditions

	Intersection	LOS Standard	Existing Conditions			
			AM Peak Hour		PM Peak Hour	
			LOS	V/C	LOS	V/C
1	Watt Ave & Elverta Rd	E	A	0.47	B	0.62
2	Walerga Rd & Elverta Rd	E	C	0.76	C	0.70
3	Watt Ave & Antelope Rd	E	C	0.76	C	0.79
4	Walerga Rd & Antelope Rd	E	B	0.63	D	0.87
5	Watt Ave & Elkhorn	E	B	0.69	B	0.69
6	Walerga Rd & Elkhorn	E	B	0.62	C	0.80

Note: **BOLD** Locations do not meet LOS Policy
Source: DKS Associates 2010

Table 8
Level of Service at Sacramento County Roadway Segments
Existing Conditions

Roadway Segment	LOS Standard	Lanes	Existing Conditions	
			ADT	LOS
Watt Ave S/O PFE	E	2	16,300	E
Watt Ave S/O Elverta	E	4	25,700	C
Watt Ave S/O Antelope	E	4	28,400	C
Watt Ave S/O Elkhorn	E	4	32,600	E
Walerga Rd S/O PFE	E	4	23,300	B
Walerga Rd S/O Elverta	E	4	35,800	E
Walerga Rd S/O Antelope	E	4	31,800	D
Walerga Rd S/O Elkhorn	E	4	29,300	D

Note: **BOLD** Locations do not meet LOS Policy
Source: DKS Associates 2010

Table 9
Level of Service at Sutter County Intersections
Existing Conditions

	Intersection	LOS Standard	Existing Conditions			
			AM Peak Hour		PM Peak Hour	
			LOS	V/C	LOS	V/C
1	Pleasant Grove N & Riego	D	C	21.4 sec	D	27.7 sec
2	Pleasant Grove S & Riego	D	C	21.2 sec	**E**	**35.0 sec**
3	SR 70/99 & Riego Rd	D	**E**	**0.94**	D	0.85

Note: **BOLD** Locations do not meet LOS Policy
Source: DKS Associates 2010

Table 10
Level of Service at Sutter County Roadway Segments
Existing Conditions

Roadway Segment	LOS Standard	Lanes	Existing Conditions	
			ADT	LOS
Riego Rd E/O SR 70-99	D	2	8,100	C

Note: **BOLD** Locations do not meet LOS Policy
Source: DKS Associates 2010

Table 11
Average Daily Traffic Volumes and LOS on State Highways
Existing Conditions

Facility	*Segment*	*Lanes*	*Existing Conditions*	
			ADT	*LOS*
I-80	Sacramento County line to Riverside Ave	8	**170,000**	**F**
	Riverside Avenue to Douglas Blvd	6	**160,000**	**F**
	Douglas Blvd to Eureka Rd	6	**159,000**	**F**
	Eureka Rd to Taylor Rd	8	**167,000**	**F**
	Taylor Rd to SR 65	8	157,000	E
SR 65	I-80 to Galleria Blvd	4	**108,000**	**F**
	Galleria Blvd to Pleasant Grove Blvd	4	**96,000**	**F**
	Pleasant Grove Blvd to Blue Oaks Blvd	4	**82,000**	**F**
	Blue Oaks Blvd to Sunset Blvd	4	69,000	D
SR 70/99	Sankey Rd to Riego Rd	4	34,000	A
	Riego Rd to Elverta Rd	4	39,500	B
	Elverta Rd to Elkhorn Blvd	4	44,000	B

Notes:

Roadway segment levels of service (LOS) are based on roadway capacities and LOS criteria in Table 2

Highway segments operating at LOS F are **BOLD**.

Impacts are **Shaded**

Source: DKS Associates 2010

Table 12
Level of Service at Rocklin Roadway Segments
Existing Conditions

Roadway Segment	*LOS Standard*	*Lanes*	*Existing Conditions*	
			ADT	*LOS*
Blue Oaks Blvd west of Sunset	C	4	9,000	A
Sunset Blvd south of Blue Oaks Blvd	C	6	20,000	A
Blue Oaks Blvd east of Lonetree Blvd	C	4	10,600	A
Lonetree Blvd north of Blue Oaks Blvd	C	4	20,800	A
Lonetree Blvd south of West Oaks Blvd	C	4	11,700	A
West Oaks Blvd east of Lonetree Blvd	C	2	3,000	A
Sunset Blvd east of State Route 65	D*	4	13,800	A

Note: * Within ½ mile of freeway ramp
: **BOLD** Locations do not meet LOS Policy
Source: Fehr and Peers, 2011

Table 9 shows existing a.m. and p.m. peak hour levels of service at Sutter County intersections. The table shows that one intersection (SR 70/99 and Riego) operates unacceptably during the a.m. peak hour only and one intersection (Pleasant Grove South and Riego) operates unacceptably during the p.m. peak hour only. **Table 10** shows that Riego Road in Sutter County currently operates acceptably based on daily traffic volume.

Table 11 shows existing daily levels of service on area freeway mainlines. The table shows that the majority of segments on I-80 and SR 65 currently operate at LOS F, based on daily volumes. These segments do not meet Caltrans' level of service policies.

Table 12 shows existing daily levels of service on Rocklin roadways directly adjacent to the City of Roseville. The table shows that all study roadway segments currently operate acceptably.

Existing Transit Service

Transit service is currently provided to the residents of the City of Roseville by two transit providers: Roseville Transit Services, and Placer County Transit. Their current transit routes in the vicinity of the Proposed Project are shown on **Figure 4**. Other transit systems in Roseville include taxicab services, Greyhound Bus Lines, and Amtrak. These existing transit services are described below.

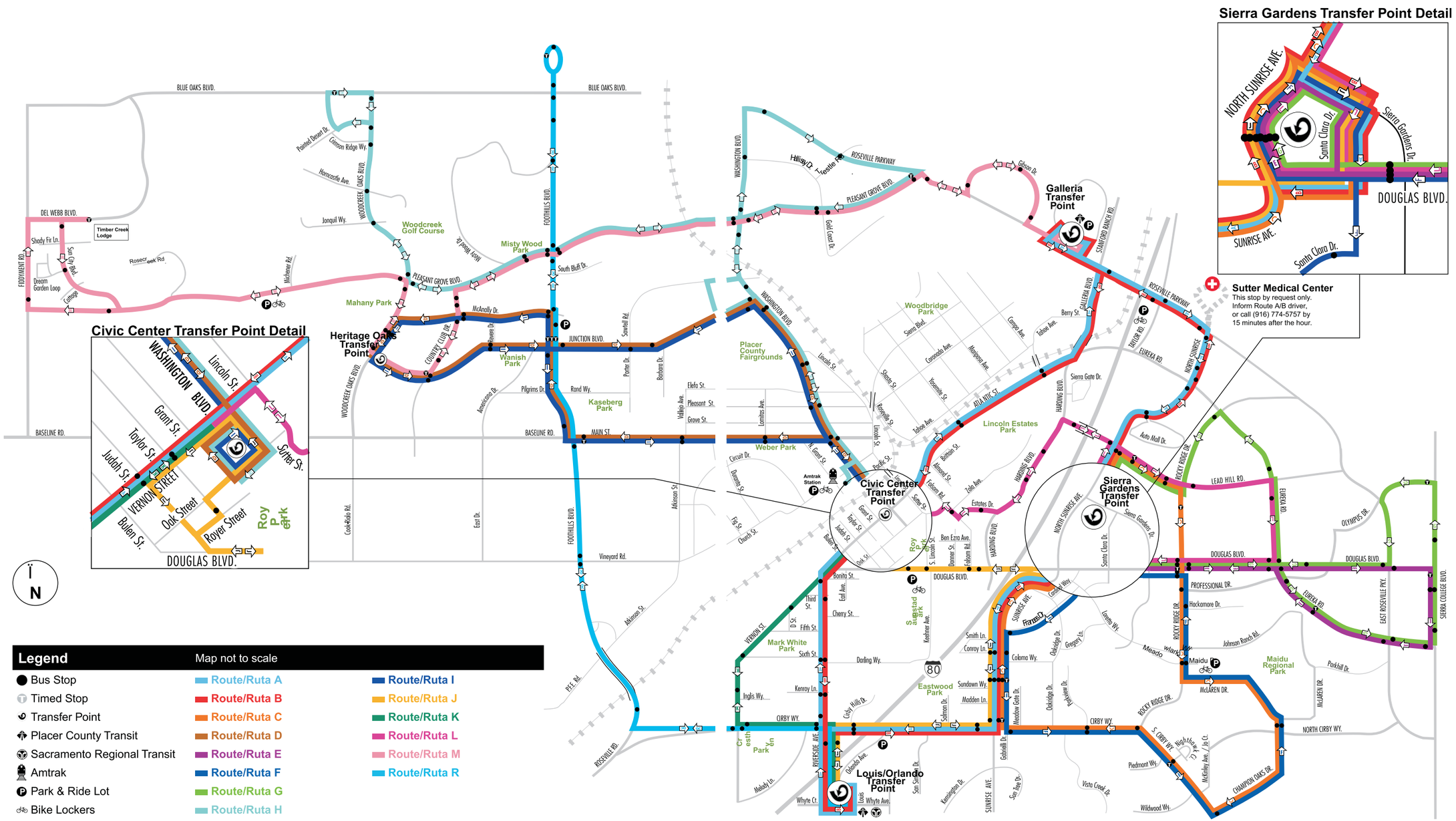
City of Roseville Transit Services

Roseville Commuter Service is a fixed-route scheduled transit system operated by the City of Roseville. It provides weekday commute period service between Roseville and downtown Sacramento.

Roseville Transit is a fixed-route scheduled transit system operated by the City of Roseville within the city limits. There are currently nine scheduled routes. There are five "transfer points": Sierra Gardens, Galleria Mall, City Hall, Auburn/Whyte, and Woodcreek Oaks/Junction. Many of the Roseville Transit riders are elderly and disabled. The Roseville Transit system connects to both Placer County Transit (at Galleria Mall and Auburn/Whyte) and Sacramento Regional Transit (at Auburn/Whyte).

There are currently no Roseville Transit routes directly serving the project site. The closest route is Route M. Route M currently travels close to the project site, with its closest access being at the intersection of Fiddyment Road and Pleasant Grove Boulevard. Route H currently travels within about two miles of the project site, with its closest access being at the intersection of Pleasant Grove Boulevard and Woodcreek Oaks Boulevard.

RADAR is a curb-to-curb system operated by the City of Roseville within its city limits, seven days a week. As a "dial-a-ride" service, it does not operate on fixed-route schedules; most of its ridership is elderly and disabled.



P10040-000 Fiddyment Ranch Ph2 & Ph3 Amendment SIER

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FIGURE 4
Existing Transit Facilities
City of Roseville

Placer County Transit Services

Placer County Transit is a fixed-route scheduled transit system operated by Placer County that principally serves the I-80, Highway 49 and SR 65 corridors. Some of the routes are "deviated." A "deviated route" means that the buses generally travel on a main route (i.e., I-80) but can deviate from that route up to a certain distance (three-quarter mile in the case of Placer County Transit) to serve the specific needs of transit patrons. Placer County Transit has an Auburn to Light Rail express route that stops at the Auburn/Whyte transfer point and connects to Sacramento Regional Transit there before proceeding to the Watt/I-80 light rail station. Placer County Transit also has a Lincoln to Galleria to Sierra College route.

Other Transit Services

Greyhound Bus Lines has a station at the intermodal facility (the Amtrak station) in Roseville. This station is a stop on the Sacramento to Auburn route and offers six to seven trips to Sacramento per day. From Sacramento, passengers can continue to destinations in any direction.

Amtrak provides intercity rail service to Placer County via stations in Roseville and Colfax. The "California Zephyr" provides east–west service between Chicago and Oakland with one Roseville stop in each direction daily. Placer County residents can also access the California Zephyr at Truckee in Nevada County. Other Amtrak trains can be accessed at Sacramento, or by using the Amtrak Thruway Bus Connections to Roseville.

Capital Corridor Intercity Rail links the Bay Area with the Sacramento area and Placer County. At present, one round trip train accesses Roseville daily. However, feeder bus service is provided to additional trains in Sacramento.

Taxi service is provided by several private companies.

Existing Pedestrian Facilities

The City of Roseville has an extensive network of pedestrian facilities. Most residential streets contain improved sidewalk facilities and crosswalks at intersections. Arterial roadways adjacent to existing residential development have wide sidewalks, often flanked by landscaping corridors.

Existing Bicycle Facilities

Bikeways are defined as specific routes and classes that meet minimum design standards. Roseville generally follows Caltrans' design standards for the following classes of bikeways:

- Class I bikeways, which provide a completely separated right-of-way designated for the exclusive use of bicycles and pedestrians with cross flows by motorists minimized. Class I bikeways are a minimum of 10 feet wide. A 2-foot graded area should parallel the bikeway on both sides, and the bikeway should be a minimum of 5 feet from an adjacent roadway.
- Class II bikeways are frequently referred to as on-street bike lanes. They provide a restricted right-of-way designated for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with cross-flows by pedestrians and motorists permitted. Class II bikeways range from 4 – 6 feet wide in Roseville and separated from vehicle traffic by a solid white stripe.
- Class III bikeways, which provide a right-of-way designated by signs or permanent markings, are shared with motorists.

In addition, Roseville has an additional classification for bikeways.

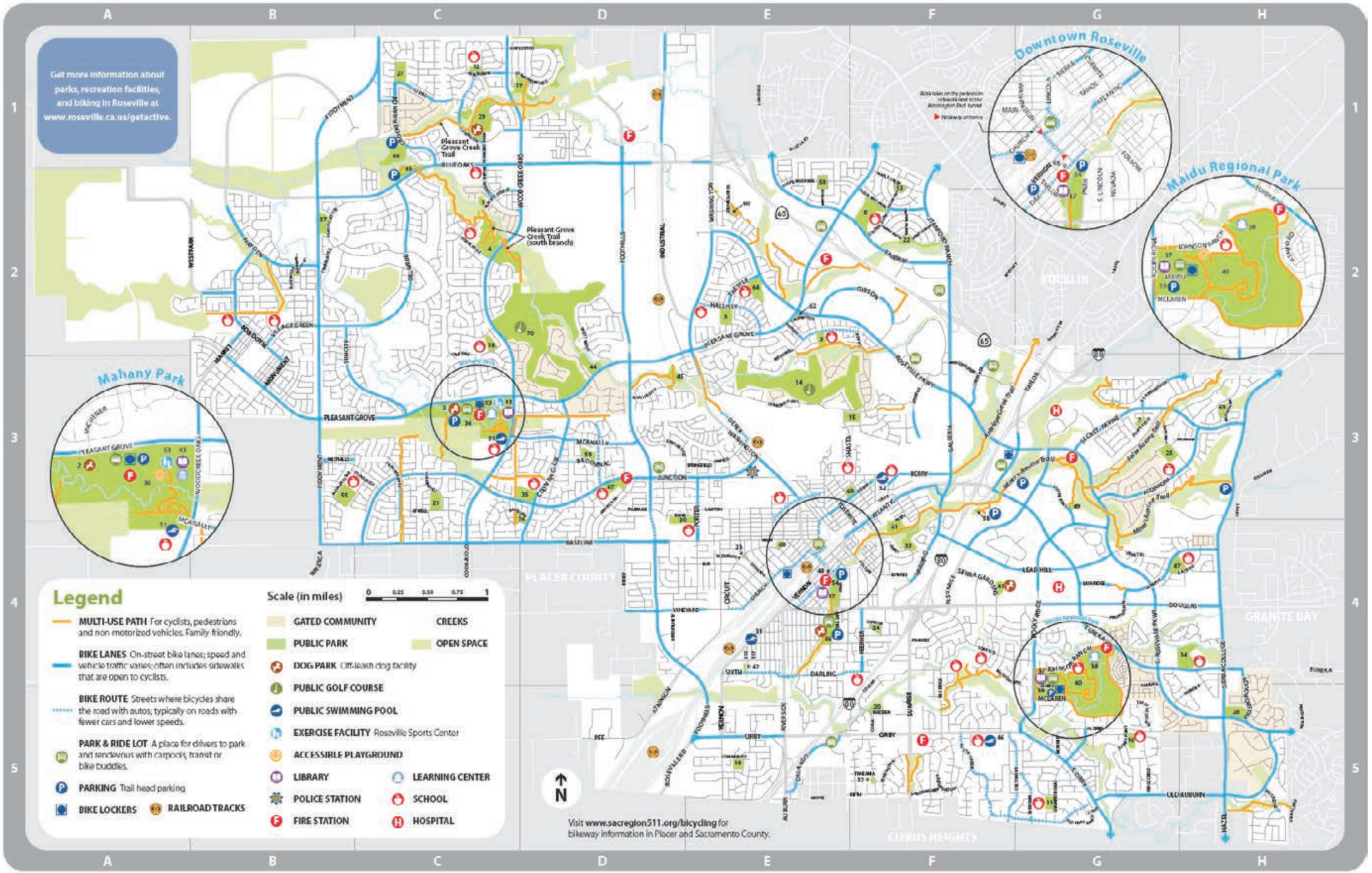
- Class IA facilities are shared pedestrian and bikeway paths within landscaped corridors along arterial and collector roadways and are separated from the roadway. Class IA bikeways are a minimum of 8 feet wide. Caltrans does not consider sidewalk facilities to be Class I facilities, and does not recommend that they be signed as bicycle routes.

However, Class IA facilities are still desirable for bicyclists of lower skill levels, such as children, as well as others who are hesitant to utilize on-street routes.

The City of Roseville has an adopted Bikeway Master Plan, which provides guidelines for the development of a city-wide network of Class I, II, and III bicycle facilities and design standards (based on Caltrans standards) for new bicycle facilities within Roseville.

Figure 5 shows the existing bikeways within Roseville city limits in the vicinity of the Proposed Project. Each of the specific plan areas contains significant bikeway elements within the plan areas.

The City's recommended bicycle network includes future Class II bike lanes on all arterial and collector roadways.



P10040-000 Fiddyment Ranch Ph2 & Ph3 Amendment SIER

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FIGURE 5
City of Roseville Existing Bicycle Facilities

3. REGULATORY SETTING

Local Regulations

City of Roseville General Plan Level of Service (LOS) Policy

The City of Roseville level of service policy calls for maintenance of a level of service (LOS) C standard at a minimum of 70 percent of all signalized intersections in the City during the p.m. peak hour. The determination of project consistency with this policy is based on build out of currently entitled land within the City and 2020 market rate development outside of the City. The City does not currently have a level of service policy for the a.m. peak hour.

City of Roseville Improvement Standards

Roadway improvements within the City of Roseville must conform to a set of standard plans that detail City standards for pavement width, lighting, drainage, sewer, and other roadside facilities. Roadway facilities associated with the Proposed Project must meet or exceed these standards.

Capital Improvement Program (CIP)

The CIP defines phasing of roadway improvements that are needed to meet the City's level of service standard. The existing CIP that was adopted in September 2002 is based on build out of currently entitled City land plus some potential redevelopment of properties within the City's Downtown area and 2020 market rate development outside of the City. The General Plan calls for the CIP to be updated a minimum of every 5 years or with the approval of a significant development. The CIP has been amended several times over the last 10 years as specific plans have been approved.

Long Range Transit Master Plan

The City has developed a plan to guide development of both inter- and intra-city transit services through year 2010.

Short Range Transit Plan

The SRTP is a state and federally mandated planning document that describes the plans, programs and goals of the transit operator. It has a 5-year planning horizon and is updated biennially. It focuses on the characteristics and capital needs of the existing system, and on committed (funded) expansion plans.

Bikeway Master Plan

The General Plan calls for the development of a comprehensive bikeway system that would provide connections between the City's major employment and housing areas and between existing and planned bikeways. The Bikeway Master Plan was updated in 2002. It provides guidelines for the development of a city-wide network of bicycle facilities and design standards for new bicycle facilities in Roseville.

Federal and State Regulations

There are no known federal or State standards that would directly affect the transportation and circulation aspects of the Proposed Project.

4. IMPACT ANALYSIS

Significance Criteria

For the purposes of this EIS, a significant impact would occur if development of the Proposed Project would:

City of Roseville

- Cause a signalized intersection previously identified in the CIP as functioning at LOS C or better to function at LOS D or worse during the p.m. peak hour;
- Cause a signalized intersection previously identified in the CIP as functioning at LOS D or E to degrade by one or more LOS category (i.e. from LOS D to LOS E) during the p.m. peak hour;
- Not meet the policies and guidelines of Roseville's Bikeway Master Plan;
- Have a negative impact on transit operations, travel times, and/or circulation;

Placer County

- Cause a signalized intersection previously identified as functioning at LOS C or better (D or better within or adjacent to the Dry Creek/ West Placer Community Plan) to function at LOS D or worse (E or worse within or adjacent to the Dry Creek/ West Placer Community Plan);
- Cause an intersection of segment already functioning at LOS D or worse (E or worse within or adjacent to the Dry Creek/ West Placer Community Plan) to experience a V/C increase of 0.05 or more;

Sacramento County

- Cause an intersection or roadway segment previously identified as functioning at LOS E or better to function at LOS F;
- Cause an intersection or roadway segment already functioning at LOS F to experience a V/C increase of 0.05 or more;

Sutter County

- Cause an intersection or roadway segment previously identified as functioning at LOS D or better to function at LOS E or worse;

City of Rocklin

- Cause in intersection or roadway segment previously identified as functioning at LOS C or better (D or better within ½ mile of a freeway ramp) to function at LOS D or worse (E or worse within ½ mile of a freeway ramp);
- Cause an intersection or roadway segment already functioning at LOS D or worse (LOS E or worse within ½ mile of a freeway ramp) to experience a V/C increase of 0.05 or more;

State Highway Facilities

- Increase congestion to the extent that operations on a state highway would deteriorate to levels below those identified in Caltrans' Transportation Concept Report (TCR). The TCRs for State Route 65, State Route 70/99 and I-80 indicate that these state highways have a LOS "E" standard;
- Cause a segment of Interstate 80 or State Route 65 to degrade to LOS F, based on daily volumes;
- Increase traffic on a segment of Interstate 80 or State Route 65 that already would operate at LOS F without the Project.

Methodology

The development of transportation system needs and impacts is based on the travel demand model which was originally developed by DKS Associates in 1992 for the City of Roseville and Placer County, and has since been updated and recalibrated multiple times, most recently in 2008. The model translates land uses into roadway volume projections. Its inputs are estimates of development (i.e., the number of single-family and multi-family dwelling units, and the amount of square footage of various categories of non-residential uses) and descriptions of the roadway and transit systems. The model covers not only the City of Roseville, but also the entire Sacramento region (including the portions of Placer County west of Colfax). The model

maintains a general consistency with the trip distribution and mode choice estimates from the regional model used by the Sacramento Area Council of Governments (SACOG).

The travel demand model was used to estimate future traffic volumes with and without the Proposed Project under various conditions. The outputs of the travel demand model include average daily, a.m., and p.m. peak hour traffic volume forecasts on roadway segments as well as for turning movements at intersections. The level of service of Roseville's arterial and collector roadway system is primarily dictated by the capacity and operations of its signalized intersections. For this Traffic Impact Analysis, levels of service were evaluated at existing and planned signalized intersections throughout the City of Roseville, as well as a number of intersections and roadway segments in other jurisdictions.

The City of Roseville's level of service policy is based solely on intersection operations during the p.m. peak hour, which is generally considered the busiest part of the day on local roadways. For the Sierra Vista EIR, the DEIR considered both the a.m. peak hour and p.m. peak hour volumes in evaluating traffic impacts within the plan area even though the City of Roseville level of service policy is based on the p.m. peak hour only

Analysis Scenarios

The traffic associated with development of the Proposed Project has been evaluated under existing and future conditions. The following conditions and scenarios have been defined and evaluated in detail:

- **Existing Conditions**
  - No Project (reflects existing traffic counts conducted in late 2007/ early 2008)
- **2025 CIP Conditions**
  - 2025 CIP No Project
  - 2025 CIP plus Proposed Action ("The Project")
  - 2025 CIP plus Alternative #1 (Reduced Footprint, Increased Density)
  - 2025 CIP plus Alternative #2 (Reduced Footprint, Same Density)

- 2025 CIP plus Alternative 2X (Central Preserve Alternative)
- 2025 CIP plus Alternative #3 (Half Acre Wetland Impact Plan)
- 2025 CIP plus Alternative #4 (One Acre Wetland Impact Plan)
- 2025 CIP plus Alternative #5 (No Federal Action – No Corp of Engineers Permit)
- 2025 CIP plus Alternative #6 (Off-Site – Placer Ranch site)

Development Assumptions for 2025 CIP Conditions

The City's adopted CIP Update and level of service standard considers traffic levels expected to occur under 2025 development levels, which was defined as build out of currently entitled City land plus some potential redevelopment of properties within the City's Downtown area and 2025 market rate development outside of the City. The build out development forecasts within Roseville are based on the forecasts developed for the City's adopted CIP update.

Development assumptions outside the City of Roseville, particularly in adjacent communities, also have an important impact on the forecasts of travel patterns within the City. The current CIP was based on 2025 development forecasts for each jurisdiction in Placer County. This forecast included build out of "Phase 1" of the proposed Placer Vineyards project in west Placer County. A portion of the City of Lincoln's recently approved sphere of influence (SOI) expansion was included as well. Outside of Placer County, the current CIP assumed 2025 land use and trip generation estimates prepared by the Sacramento Area Council of Governments (SACOG) for the most recent Metropolitan Transportation Plan (MTP), except in South Sutter County where build out of Phase 1 of the Sutter Pointe Specific Plan was assumed.

For the previously completed EIR, the City determined that 2025 be the forecast timeframe for the City's CIP analysis. The following land use assumptions are included in the 2025 CIP scenarios:

- Buildout of the City of Roseville (existing City)
- Buildout of Signature rezone (Fiddyment Ranch)

- Buildout of West Park rezone
- Buildout of Regional University (Placer County)
- Placer Vineyards Phase 1 (Placer County)
- City of Lincoln at 2025 market absorption
- Buildout of City of Rocklin residential and 2025 absorption of non-residential
- Forecast SACOG 2025 development outside of Placer County

The City also requested that a number of roadway improvements are included for the 2025 CIP scenarios, including:

- All roadway and intersection improvements included in Roseville's Capital Improvement Program (CIP)
- I-80 improvements, including HOV lanes and auxiliary lanes in Placer County
- SR 65 improvements, including widening to six lanes between I-80 and Blue Oaks Boulevard

Other regional roadway improvements have been assumed for the 2025 CIP scenarios, including:

- Widening of Baseline Road to six lanes from Fiddyment Road to the Sutter County line (consistent with the Placer Vineyards Specific Plan and current City or Roseville and Placer County Fee programs for Baseline Road)
- Widening of Baseline Road to six lanes from Sutter County Line SR 70/99 (consistent with MTP and South Sutter Specific Plan)
- Widening of Watt Avenue to six lanes between Baseline Road and the Sacramento County line (consistent with the Placer Vineyards Specific Plan)
- Widening of Walerga Road to four lanes between Baseline Road and the Sacramento County line (consistent with Placer County CIP)
- Construction of an interchange at SR 70/99 and Riego Road

- Construction of Watt Avenue from Baseline Road to south of Blue Oaks Boulevard (consistent with Regional University Specific Plan)

Trip Generation of Proposed Project and Alternatives

Table 13 and **Table 14** provide a summary of the proposed land use and trip generation and summarize the additional trip ends associated with the Proposed Project under each of the alternatives. The table shows that the Proposed Project would increase trip generation by approximately 34,300 daily trip ends. Daily trip ends include both trips originating in and terminating in the Proposed Project. The table also shows the estimated trip ends associated with each of the project alternatives. The trip generation of the project alternatives range from 51% to 87% of the Proposed Project.

It should be noted that since the Proposed Project and all project alternatives contain both residential and non-residential uses, some internalization of trips can be expected. For example, some residents living within the Proposed Project could do their shopping or work within the project site, and thus their shopping or work trips might remain within the project site. A "select zone" assignment was performed with the travel demand model to estimate the internalization of trips. The model predicted that approximately 18% of the daily trips generated by the proposed project would remain on roadways within the Proposed Project and approximately 82% of the daily trips would exit the project area and use other local and regional roadways.

Trip Distribution of Proposed Project

The travel demand model was used to isolate vehicular trips beginning and/ or ending within the Proposed Project. This data was used in turn to estimate the distribution of project-related vehicle trips. As stated in the Trip Generation discussion, approximately 82% of the daily trips would exit the project area and use other local and regional roadways. **Figure 6** shows the trip distribution estimated using the travel demand model. The figure shows that a high percentage of project-related non internal trips use roadways in western Roseville. Approximately 23% of the vehicles use Blue Oaks Boulevard east of the Proposed Project. Approximately 37% of the

vehicles are estimated to travel south into the Sierra Vista Specific Plan. Approximately 14% travel north on Westbrook Boulevard. Approximately 8% of the vehicles are estimated to travel west on Blue Oaks Boulevard. As is expected, a very small number of vehicles travel on I-80 through Roseville, as this is not a convenient way to access the project site.

Table 13
Project Alternatives Land Use

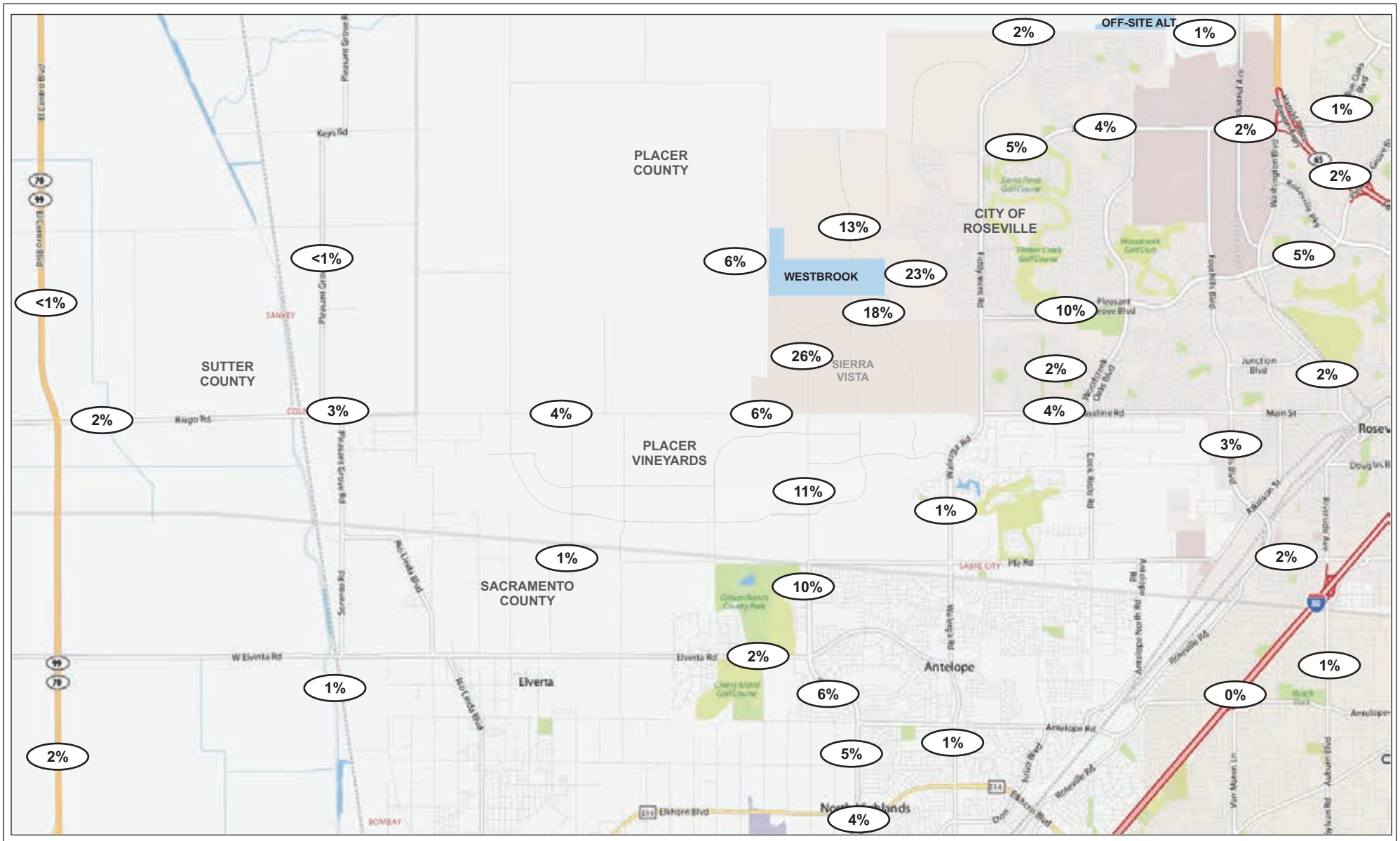
Land Use	*Units*	*Land Use Assumptions*							
			Alternatives						
		Proposed Action "The Project"	*Alt #1 Reduced Footprint Increased Density*	*Alt #2 Reduced Footprint Same Density*	*Alt #2X Central Preserve Alt*	*Alt #3 Half Acre Wetland Impact Plan*	*Alt #4 One Acre Wetland Impact Plan*	*Alt #5 No Federal Action*	*Alt #6 Off-Site Alt*
Single Family	DU's	1,340	695	811	895	638	667	950	885
Multi-Family		689	1,195	594	600	616	672	555	465
Total Residential		**2,029**	**1,890**	**1,405**	**1,495**	**1,254**	**1,339**	**1,505**	**1,350**
Commercial	KSF	457.8	434.5	434.5	434.5	203.6	248.3	324.5	220.0
Office		54.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Industrial		0.0	0.0	0.0	0.0	0.0	0.0	0.0	154.6
School	Students	750	700	520	550	460	500	550	500
Park	Acres	15.5	15.7	11.2	11.5	12.4	12.8	13.5	14.2

Source: DKS Associates 2012

Table 14
Project Alternatives Trip Generation

Land Use	Daily Trip Ends Per Unit	Daily Trip Ends							
			Alternatives						
		Proposed Action "The Project"	Alt #1 Reduced Footprint Increased Density	Alt #2 Reduced Footprint Same Density	Alt #2X Central Preserve Alt	Alt #3 Half Acre Wetland Impact Plan	Alt #4 One Acre Wetland Impact Plan	Alt #5 No Federal Action	Alt #6 Off-Site Alt
Single Family (DU's)	9.0	12,060	6,255	7,299	8,055	5,742	6,003	8,550	7,965
Multi-Family (DU's)	6.5	4,479	7,768	3,861	3,900	4,004	4,368	3,608	3,023
Commercial (KSF)	35.0	16,023	15,208	15,208	15,208	7,128	8,690	11,358	7,700
Office (KSF)	17.7	972	0	0	0	0	0	0	0
Industrial (KSF)	7.6	0	0	0	0	0	0	0	1,175
School (Students)	1.0	750	700	520	550	460	500	550	500
Park (Acres)	2.2	34.1	34.54	24.64	25.3	27	28	30	31
Total Daily Trip Ends		**34,318**	**29,965**	**26,913**	**27,738**	**17,361**	**19,589**	**24,095**	**20,394**
as Percentage of Proposed Project			87%	78%	81%	51%	57%	70%	59%

Source: DKS Associates 2012



DKS Associates
TRANSPORTATION SOLUTIONS

FIGURE 6
Estimated Project Trip Distribution

PROJECT IMPACTS

2025 CIP Plus Project Conditions – Roseville

This section discusses traffic-related impacts on the City's roadway system under the 2025 CIP Plus Proposed Project scenario and each of the identified alternatives. The City's travel demand model has been used to estimate the change in daily, a.m. and p.m. peak hour traffic volumes on City of Roseville roadways due to development of the Proposed Project and each alternative under 2025 CIP conditions.

Traffic volume forecasts are not based on a simple layering/ adding of assumed project-generated traffic volumes onto the No Project traffic volumes. Rather, the City's travel demand model is used to predict how travel patterns would change if the Proposed Project is added to buildout land uses within the City. The travel model redistributes trips and can cause traffic on some roadways to increase or decrease and cause changes in "critical" traffic movements at intersections. Due to this re-distribution process, changes in level of service at intersections some distance from the Proposed Project can take place.

Roseville: AM Peak Hour Impacts

Table 15 identifies the a.m. peak hour levels of service at current and future signalized intersections under 2025 CIP conditions without and with buildout of the Westbrook development and each project alternative. The table shows that two signalized Roseville intersections would be impacted during the a.m. peak hour with the addition of the proposed project or project alternatives.

Table 15
Level of Service at Roseville Signalized Intersections
2025 CIP Plus Project Alternative Conditions – AM Peak Hour

Intersection		Scenario																	
				2025 CIP Plus Project															
		No Project		Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alternative		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
ID	Intersection Name	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
Existing Signalized Intersections																			
4	Baseline Rd & Fiddyment Rd	**D**	**0.85**	**D**	**0.88**	**D**	**0.89**	**D**	**0.89**	**D**	**0.88**	**D**	**0.90**	**D**	**0.90**	**D**	**0.89**	**D**	**0.86**
5	Blue Oaks & Crocker Ranch	C	0.80	C	0.79	C	0.80	C	0.80	C	0.80	C	0.80	C	0.80	C	0.80	**D**	**0.82**
7	Blue Oaks & Fiddyment	C	0.78	C	0.80	C	0.80	C	0.79	C	0.80	C	0.80	C	0.80	C	0.80	C	0.75
10	Blue Oaks Bl & Diamond Creek Bl	C	0.77	C	0.78	C	0.78	C	0.78	C	0.78	C	0.77	C	0.78	C	0.77	C	0.76
11	Blue Oaks Bl & Foothills Bl	**E**	**0.97**	**E**	**0.97**	**E**	**0.97**	**E**	**0.97**	**E**	**0.97**	**E**	**0.97**	**E**	**0.97**	**E**	**0.97**	**F**	**1.04**
12	Blue Oaks Bl & Woodcreek Oaks	**E**	**0.94**	**E**	**0.95**	**E**	**0.95**	**E**	**0.95**	**E**	**0.95**	**E**	**0.95**	**E**	**0.95**	**E**	**0.95**	**E**	**0.93**
14	Cirby Wy & Foothills Bl	**E**	**0.99**	**E**	**1.00**	**E**	**1.00**	**E**	**1.00**	**E**	**1.00**	**E**	**0.99**	**E**	**1.00**	**E**	**1.00**	**E**	**0.99**
16	Cirby Wy & Northridge Dr	C	0.76	C	0.77	C	0.77	C	0.77	C	0.77	C	0.77	C	0.77	C	0.77	C	0.77
18	Cirby Wy & Orlando Av	**E**	**0.92**	**E**	**0.91**	**E**	**0.91**	**E**	**0.91**	**E**	**0.91**	**E**	**0.91**	**E**	**0.91**	**E**	**0.91**	**E**	**0.91**
20	Cirby Wy & Riverside Av	**F**	**1.03**	**F**	**1.03**	**F**	**1.03**	**F**	**1.03**	**F**	**1.03**	**F**	**1.03**	**F**	**1.03**	**F**	**1.02**	**F**	**1.03**
23	Cirby Wy & Vernon St	**E**	**0.99**	**E**	**0.98**	**E**	**0.98**	**E**	**0.98**	**E**	**0.98**	**E**	**0.98**	**E**	**0.98**	**E**	**0.98**	**E**	**0.98**
50	Foothills & Baseline/Main	**E**	**0.96**	**E**	**0.97**	**E**	**0.97**	**E**	**0.97**	**E**	**0.96**	**E**	**0.97**	**E**	**0.97**	**E**	**0.97**	**E**	**0.97**
58	Foothills Bl & Pleasant Grove Bl	**D**	**0.87**	**D**	**0.88**	**D**	**0.88**	**D**	**0.88**	**D**	**0.88**	**D**	**0.88**	**D**	**0.88**	**D**	**0.88**	**D**	**0.86**
70	Junction Bl & Baseline Rd	B	0.69	B	0.68	B	0.68	B	0.69	B	0.68	B	0.68	B	0.68	B	0.69	B	0.70
86	Pleasant Grove & Fiddyment	C	0.77	**D**	**0.82**	C	0.81	C	0.81	C	0.81	C	0.80	C	0.81	C	0.81	C	0.76
93	Pleasant Grove & Roseville Pkwy	**F**	**1.01**	**E**	**1.00**	**E**	**1.00**	**E**	**1.00**	**E**	**1.00**	**E**	**1.00**	**E**	**1.00**	**E**	**1.00**	**E**	**1.00**

Table 15
Level of Service at Roseville Signalized Intersections
2025 CIP Plus Project Alternative Conditions – AM Peak Hour

Intersection		Scenario																	
				2025 CIP Plus Project															
		No Project		Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alternative		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
ID	Intersection Name	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
96	Pleasant Grove & Washington	**D**	**0.84**	**D**	**0.85**	**D**	**0.85**	**D**	**0.85**	**D**	**0.85**	**D**	**0.84**	**D**	**0.85**	**D**	**0.85**	**D**	**0.83**
98	Pleasant Grove & Woodcreek Oaks	B	0.66	B	0.69	B	0.68	B	0.68	B	0.68	B	0.67	B	0.68	B	0.68	B	0.67
141	Woodcreek Oaks & Baseline	**D**	**0.89**	**D**	**0.90**	**D**	**0.90**	**D**	**0.89**	**D**	**0.90**	**D**	**0.90**	**D**	**0.90**	**D**	**0.90**	**D**	**0.88**
146	SR 65 N/B Off & Blue Oaks Bl	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55
147	Washington Bl & Blue Oaks Bl	A	0.50	A	0.50	A	0.50	A	0.50	A	0.50	A	0.50	A	0.50	A	0.50	A	0.48
150	SR 65 N/B Off & Pleasant Grove Bl	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A	0.54
151	SR 65 S/B Off & Pleasant Grove Bl	A	0.43	A	0.42	A	0.42	A	0.43	A	0.43	A	0.42	A	0.42	A	0.42	A	0.44
152	I-80 WB Off & Riverside Ave	C	0.72	C	0.72	C	0.72	C	0.72	C	0.72	C	0.72	C	0.72	C	0.72	C	0.72
157	I-80 EB Off/Orlando & Riverside	C	0.76	C	0.75	C	0.76	C	0.76	C	0.76	C	0.76	C	0.76	C	0.76	C	0.75
180	Watt Ave & Baseline Rd	B	0.63	B	0.66	B	0.66	B	0.66	B	0.65	B	0.64	B	0.65	B	0.66	B	0.64
Future Signals in CIP																			
163	Blue Oaks Bl & Westbrook Bl	A	0.44	A	0.46	A	0.46	A	0.46	A	0.46	A	0.46	A	0.46	A	0.46	A	0.44
166	Pleasant Grove Bl & Westbrook Bl	A	0.44	A	0.58	A	0.56	A	0.55	A	0.55	A	0.54	A	0.55	A	0.54	A	0.46
Signalized Intersections Added with Sierra Vista																			
177	Santucci Bl & Pleasant Grove	A	0.26	A	0.53	A	0.51	A	0.50	A	0.50	A	0.51	A	0.52	A	0.50	A	0.26
183	Westbrook Bl & Baseline Rd	C	0.76	C	0.77	C	0.78	C	0.78	C	0.79	C	0.77	C	0.77	C	0.78	C	0.76
185	Market St & Baseline Rd	B	0.64	B	0.63	B	0.63	B	0.63	B	0.63	B	0.63	B	0.63	B	0.63	B	0.63
188	Upland Dr & Baseline Rd	A	0.53	A	0.53	A	0.53	A	0.52	A	0.53	A	0.52	A	0.53	A	0.53	A	0.52

Table 15
Level of Service at Roseville Signalized Intersections
2025 CIP Plus Project Alternative Conditions – AM Peak Hour

Intersection		Scenario																	
				2025 CIP Plus Project															
		No Project		Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alternative		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
ID	Intersection Name	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
Signalized Intersections Added with Westbrook																			
200	Santucci Bl & Road E	n/a		A	0.32	A	0.34	A	0.29	A	0.29	A	0.31	A	0.30	A	0.30	n/a	
201	Westbrook Bl & Road E	n/a		A	0.25	A	0.24	A	0.23	A	0.24	A	0.21	A	0.21	A	0.24	n/a	
202	Pleasant Grove Bl & Road 1	n/a		A	0.41	A	0.41	A	0.38	A	0.38	A	0.37	A	0.39	A	0.37	n/a	

Note: **BOLD** Locations do not meet LOS Policy, **Shaded** Locations indicate LOS Impacts

Source: DKS Associates 2012

Table 16
Level of Service at Roseville Signalized Intersections
2025 CIP Plus Project Alternative Conditions – PM Peak Hour

Intersection		Scenario																	
				2025 CIP Plus Project															
		No Project		Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alternative		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
ID	Intersection Name	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
Existing Signalized Intersections																			
4	Baseline Rd & Fiddyment Rd	**F**	**1.01**	**E**	**0.99**	**E**	**0.99**	**E**	**0.99**	**E**	**0.99**	**E**	**0.99**	**E**	**0.99**	**E**	**1.00**	**E**	**1.00**
5	Blue Oaks & Crocker Ranch	C	0.77	C	0.78	C	0.77	C	0.77	C	0.77	C	0.77	C	0.77	C	0.77	C	0.76
7	Blue Oaks & Fiddyment	**C**	**0.77**	C	0.79	C	0.77	C	0.77	C	0.78	C	0.77	C	0.78	C	0.77	C	0.78
10	Blue Oaks Bl & Diamond Creek Bl	**E**	**1.00**	**F**	**1.01**	**F**	**1.01**	**E**	**1.00**	**F**	**1.01**	**F**	**1.01**	**F**	**1.01**	**F**	**1.01**	**F**	**1.09**
11	Blue Oaks Bl & Foothills Bl	**F**	**1.34**	**F**	**1.35**	**F**	**1.35**	**F**	**1.35**	**F**	**1.35**	**F**	**1.35**	**F**	**1.35**	**F**	**1.35**	**E**	**0.99**
12	Blue Oaks Bl & Woodcreek Oaks	B	0.69	B	0.69	B	0.70	B	0.69	B	0.69	B	0.70	B	0.69	B	0.70	B	0.70
14	Cirby Wy & Foothills Bl	**F**	**1.11**	**F**	**1.11**	**F**	**1.11**	**F**	**1.11**	**F**	**1.11**	**F**	**1.11**	**F**	**1.11**	**F**	**1.11**	**F**	**1.12**
16	Cirby Wy & Northridge Dr	**E**	**0.92**	**E**	**0.93**	**E**	**0.93**	**E**	**0.93**	**E**	**0.93**	**E**	**0.93**	**E**	**0.93**	**E**	**0.93**	**E**	**0.92**
18	Cirby Wy & Orlando Av	**D**	**0.89**	**D**	**0.89**	**D**	**0.89**	**D**	**0.89**	**D**	**0.89**	**D**	**0.89**	**D**	**0.89**	**D**	**0.89**	**D**	**0.89**
20	Cirby Wy & Riverside Av	**F**	**1.14**	**F**	**1.15**	**F**	**1.15**	**F**	**1.15**	**F**	**1.15**	**F**	**1.15**	**F**	**1.15**	**F**	**1.15**	**F**	**1.14**
23	Cirby Wy & Vernon St	**F**	**1.28**	**F**	**1.29**	**F**	**1.29**	**F**	**1.28**	**F**	**1.28**	**F**	**1.28**	**F**	**1.28**	**F**	**1.28**	**F**	**1.28**
50	Foothills & Baseline/Main	**D**	**0.86**	**D**	**0.86**	**D**	**0.86**	**D**	**0.85**	**D**	**0.86**	**D**	**0.86**	**D**	**0.86**	**D**	**0.86**	**D**	**0.86**
58	Foothills Bl & Pleasant Grove Bl	**E**	**0.99**	**E**	**1.00**	**E**	**1.00**	**E**	**0.99**	**E**	**1.00**	**E**	**1.00**	**E**	**1.00**	**E**	**0.99**	**E**	**0.98**
70	Junction Bl & Baseline Rd	D	0.86	**D**	**0.86**	D	0.87	D	0.86	D	0.87	D	0.87	D	0.86	D	0.86	D	0.86
86	Pleasant Grove & Fiddyment	**E**	**0.94**	**F**	**1.05**	**F**	**1.04**	**F**	**1.03**	**F**	**1.03**	**F**	**1.02**	**F**	**1.02**	**F**	**1.03**	**E**	**0.93**
93	Pleasant Grove & Roseville Pkwy	**F**	**1.20**	**F**	**1.20**	**F**	**1.20**	**F**	**1.20**	**F**	**1.20**	**F**	**1.20**	**F**	**1.20**	**F**	**1.20**	**F**	**1.22**
96	Pleasant Grove & Washington	**E**	**0.91**	**E**	**0.92**	**E**	**0.91**	**E**	**0.92**	**E**	**0.91**	**E**	**0.91**	**E**	**0.91**	**E**	**0.91**	**D**	**0.89**

Table 16
Level of Service at Roseville Signalized Intersections
2025 CIP Plus Project Alternative Conditions – PM Peak Hour

Intersection		Scenario																	
				2025 CIP Plus Project															
		No Project		Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alternative		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
ID	***Intersection Name***	***LOS***	***V/C***	***LOS***	***V/C***	***LOS***	***V/C***	***LOS***	***V/C***	***LOS***	***V/C***	***LOS***	***V/C***	***LOS***	***V/C***	***LOS***	***V/C***	***LOS***	***V/C***
98	Pleasant Grove & Woodcreek Oaks	**D**	**0.85**	**D**	**0.86**	**D**	**0.87**	**D**	**0.87**	**D**	**0.86**	**D**	**0.86**	**D**	**0.87**	**D**	**0.86**	**D**	**0.87**
141	Woodcreek Oaks & Baseline	**D**	**0.88**	**D**	**0.88**	**D**	**0.87**	**D**	**0.87**	**D**	**0.87**	**D**	**0.88**	**D**	**0.87**	**D**	**0.88**	**D**	**0.88**
146	SR 65 N/B Off & Blue Oaks Bl	B	0.66	B	0.66	B	0.66	B	0.66	B	0.66	B	0.66	B	0.66	B	0.66	B	0.65
147	Washington Bl & Blue Oaks Bl	B	0.68	B	0.68	B	0.68	B	0.68	B	0.68	B	0.68	B	0.68	B	0.68	B	0.67
150	SR 65 N/B Off & Pleasant Grove Bl	C	0.76	C	0.76	C	0.76	C	0.76	C	0.76	C	0.76	C	0.76	C	0.76	C	0.76
151	SR 65 S/B Off & Pleasant Grove Bl	C	0.71	C	0.71	C	0.71	C	0.71	C	0.71	C	0.71	C	0.71	C	0.71	C	0.71
152	I-80 WB Off & Riverside Ave	B	0.63	B	0.63	B	0.63	B	0.63	B	0.63	B	0.63	B	0.63	B	0.63	B	0.63
157	I-80 EB Off/Orlando & Riverside	**D**	**0.84**	**D**	**0.84**	**D**	**0.84**	**D**	**0.84**	**D**	**0.84**	**D**	**0.84**	**D**	**0.84**	**D**	**0.84**	**D**	**0.84**
180	Watt Ave & Baseline Rd	C	0.75	C	0.78	C	0.77	C	0.76	C	0.76	C	0.74	C	0.75	C	0.75	C	0.75
Future Signals in CIP																			
163	Blue Oaks Bl & Westbrook Bl	A	0.57	A	0.60	A	0.60	A	0.59	A	0.59	A	0.59	A	0.60	A	0.59	A	0.59
166	Pleasant Grove Bl & Westbrook Bl	A	0.57	B	0.69	B	0.67	B	0.66	B	0.66	B	0.66	B	0.67	B	0.64	A	0.57
Signalized Intersections Added with Sierra Vista																			
177	Santucci Bl & Pleasant Grove	A	0.50	A	0.58	A	0.56	A	0.56	A	0.56	A	0.55	A	0.75	A	0.56	A	0.50
183	Westbrook Bl & Baseline Rd	C	0.78	C	0.76	C	0.76	C	0.76	C	0.76	C	0.77	C	0.76	C	0.77	C	0.80
185	Market St & Baseline Rd	B	0.63	B	0.62	B	0.62	B	0.62	B	0.62	B	0.62	B	0.62	B	0.62	B	0.63
188	Upland Dr & Baseline Rd	A	0.59	A	0.57	A	0.58	A	0.57	A	0.58	A	0.58	A	0.58	A	0.58	A	0.58
Signalized Intersections Added with Westbrook																			

Table 16
Level of Service at Roseville Signalized Intersections
2025 CIP Plus Project Alternative Conditions – PM Peak Hour

Intersection		Scenario																	
				2025 CIP Plus Project															
		No Project		Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alternative		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
ID	Intersection Name	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
200	Santucci Bl & Road E	n/a		A	0.41	A	0.39	A	0.37	A	0.37	A	0.35	A	0.36	A	0.34	n/a	
201	Westbrook Bl & Road E	n/a		A	0.25	A	0.24	A	0.24	A	0.24	A	0.23	A	0.24	A	0.28	n/a	
202	Pleasant Grove Bl & Road 1	n/a		A	0.39	A	0.37	A	0.36	A	0.36	A	0.38	A	0.40	A	0.35	n/a	

Note: **BOLD** Locations do not meet LOS Policy, **Shaded** Locations indicate LOS Impacts

Source: DKS Associates 2012

Table 17
Level of Service Impacts at Roseville Signalized Intersections
2025 CIP Plus Project Alternative Conditions

Intersection		Scenario																	
				2025 CIP Plus Project															
		No Project		Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alternative		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
ID	***Intersection Name***	***LOS***	***V/C***	***LOS***	***V/C***	***LOS***	***V/C***	***LOS***	***V/C***	***LOS***	***V/C***	***LOS***	***V/C***	***LOS***	***V/C***	***LOS***	***V/C***	***LOS***	***V/C***
AM Peak Hour																			
5	Blue Oaks & Crocker Ranch	C	0.80	C	0.79	C	0.80	C	0.80	C	0.80	C	0.80	C	0.80	C	0.80	**D**	**0.82**
86	Pleasant Grove & Fiddyment	C	0.77	**D**	**0.82**	C	0.81	C	0.81	C	0.81	C	0.80	C	0.81	C	0.81	C	0.76
PM Peak Hour																			
10	Blue Oaks Bl & Diamond Creek Bl	**E**	**1.00**	**F**	**1.01**	**F**	**1.01**	**E**	**1.00**	**F**	**1.01**	**F**	**1.01**	**F**	**1.01**	**F**	**1.01**	**F**	**1.09**
86	Pleasant Grove & Fiddyment	**E**	**0.94**	**F**	**1.05**	**F**	**1.04**	**F**	**1.03**	**F**	**1.03**	**F**	**1.02**	**F**	**1.02**	**F**	**1.03**	**E**	**0.93**

Note: **BOLD** Locations do not meet LOS Policy, **Shaded** Locations indicate LOS Impacts

Source: DKS Associates 2012

Table 17 identifies the two intersections that would be significantly impacted during the a.m. peak hour.

- Pleasant Grove Boulevard and Fiddyment Road – (LOS C to LOS D)
    - 2025 CIP plus Proposed Action ("The Project")
- Blue Oaks Boulevard and Crocker Ranch Rd – (LOS C to LOS D)
    - 2025 CIP plus Off-Site Alternative

Pleasant Grove Boulevard and Fiddyment Road – Under the 2025 CIP plus project scenario only, this intersection would degrade from LOS C to LOS D. A potential mitigation would be to modify this intersection to include three east bound through lanes, two westbound to southbound left turn lanes, and two westbound through lanes, which would improve the operation of the intersection under the 2025 CIP plus project scenario to LOS C (V/C 0.81). However, the City of Roseville may not consider this improvement to be feasible. As such, this impact is considered **significant**.

Blue Oaks Boulevard and Crocker Ranch Road – Under the 2025 CIP plus Off-Site Alternative scenario only, this intersection would degrade from LOS C to LOS D. The intersection could be re-striped to include two southbound to eastbound left turn lanes and a separate right turn lane which would improve the intersection to LOS B. This improvement would be added to the City's capital improvement program and development within the Westbrook plan would be required to pay fair share costs for this improvement. As such, this impact is considered **significant**.

Roseville: PM Peak Hour Impacts

Table 16 identifies the p.m. peak hour levels of service at current and future signalized intersections under 2025 CIP conditions without and with buildout of the Westbrook development and each project alternative. The table shows that two signalized Roseville intersections would be impacted during the p.m. peak hour with the addition of the proposed

project or project alternatives. **Table 17** identifies those intersections that would be significantly impacted during the p.m. peak hour. Those intersections are:

- Blue Oaks Boulevard and Diamond Creek Boulevard – (LOS E to LOS F)
    - 2025 CIP plus Proposed Action ("The Project")
    - 2025 CIP plus Alternative #1 (Reduced Footprint, Increased Density)
    - 2025 CIP plus Alternative #2X (Central Preserve Alternative)
    - 2025 CIP plus Alternative #3 (Half Acre Wetland Impact Plan)
    - 2025 CIP plus Alternative #4 (One Acre Wetland Impact Plan)
    - 2025 CIP plus Alternative #5 (No Federal Action – No Corp of Engineers Permit)
    - 2025 CIP plus Alternative #6 (Off-Site – Placer Ranch Site)

- Pleasant Grove Boulevard and Fiddyment Road – (LOS E to LOS F)
    - 2025 CIP plus Proposed Action ("The Project")
    - 2025 CIP plus Alternative #1 (Reduced Footprint, Increased Density)
    - 2025 CIP plus Alternative #2 (Reduced Footprint, Same Density)
    - 2025 CIP plus Alternative #2X (Central Preserve Alternative)
    - 2025 CIP plus Alternative #3 (Half Acre Wetland Impact Plan)
    - 2025 CIP plus Alternative #4 (One Acre Wetland Impact Plan)
    - 2025 CIP plus Alternative #5 (No Federal Action – No Corp of Engineers Permit)

Blue Oaks Boulevard and Diamond Creek Boulevard – Under the 2025 CIP plus project scenario and five of the six alternatives, this intersection would degrade from LOS E (V/C 1.00) to LOS F (V/C 1.01). A potential mitigation would be to modify this intersection to include a separate southbound right turn lane, which would improve the operation of the intersection to LOS E (V/C 0.97) with the proposed project and all on-site alternatives. However, the City of Roseville may not consider this improvement to be feasible due to adjacent sidewalks and landscaping. As such, this impact is considered **significant**.

Pleasant Grove Boulevard and Fiddyment Road – Under the 2025 CIP plus project scenario and all on-site alternatives, this intersection would degrade from LOS E to LOS F. A potential mitigation would be to modify this intersection to include three east bound through lanes, two westbound to southbound left turn lanes, and two westbound through lanes, which would improve the operation of the intersection under the 2025 CIP plus project scenario to LOS E (V/C 0.97). However, the City of Roseville may not consider this improvement to be feasible. As such, this impact is considered **significant**.

2025 CIP Plus Project Conditions – Placer County

The Proposed Project would result in traffic volume increases on a number of roadways in Placer County under 2025 CIP conditions.

Placer County: AM Peak Hour Impacts

Table 18 identifies the a.m. peak hour levels of service at current and future signalized intersections under 2025 CIP conditions without and with buildout of the Westbrook development and each project alternative. The table shows that no Placer County intersections would be significantly impacted with the addition of the Westbrook development of any of the alternatives.

The intersection of Walerga Road and PFE Road would operate at LOS E under all cases; however Placer County has recently adopted their updated Dry Creek/ West Placer County Community plan, which identifies LOS F as the policy for this intersection. The intersection of West Sunset Boulevard and Fiddyment Road would exceed the LOS C policy under all cases; however none of the V/C increases would be 0.05 or greater. The intersection of Fiddyment Road and Athens Avenue would exceed the LOS C policy under all cases; however none of the V/C increases would be 0.05 or greater. The intersection of Athens Avenue and Industrial Avenue would exceed the LOS C policy under all cases; however none of the V/C increases would be 0.05 or greater. As such, this impact is considered **less than significant**.

Placer County: PM Peak Hour Impacts

Table 18 identifies the p.m. peak hour levels of service at current and future signalized intersections under 2025 CIP conditions without and with buildout of the Westbrook development and each project alternative. The table shows that no Placer County intersections would be significantly impacted with the addition of the Westbrook development of any of the alternatives.

The intersection of Walerga Road and PFE Road would operate at LOS E under all cases; however Placer County has recently adopted their updated Dry Creek/ West Placer County Community plan which identifies LOS F as the policy for this intersection. The intersection of West Sunset Boulevard and Fiddyment Road would exceed the LOS C policy under all cases, however none of the V/C increases would be 0.05 or greater. The intersection of Fiddyment Road and Athens Avenue would exceed the LOS C policy under all cases; however none of the V/C increases would be 0.05 or greater. The intersection of Athens Avenue and Industrial Avenue would exceed the LOS C policy under all cases; however none of the V/C increases would be 0.05 or greater. As such, this impact is considered **less than significant**.

Placer County: Daily Impacts

Table 19 shows the changes in daily traffic volume on Placer County roadways under 2025 CIP conditions without and with buildout of the Westbrook development and each on-site project alternative, as well as the off-site alternative. The table shows that no Placer County roadway segments would be significantly impacted with the addition of the Westbrook development of any of the on-site alternatives.

The segment of Walerga Road south of Baseline Road would exceed the LOS D policy under all cases; however none of the V/C increases would be 0.05 or greater. The segment of Athens

Avenue east of Fiddyment Road would exceed the LOS C policy under all cases; however none of the V/C increases would be 0.05 or greater.

The segment of Sunset Boulevard west of Industrial Avenue would operate at LOS B under no project and all on-site alternatives; however it would degrade to LOS E with the addition of the off-site alternative on the Placer Ranch site. This increase of over 10,000 daily vehicles on this segment is based on the fact that the off-site alternative would provide a new connection between Sunset Boulevard and Woodcreek Oaks Boulevard. This new connection would also cause significant volume decreases on Blue Oaks Boulevard between Woodcreek Oaks and Foothills, and on Foothills Boulevard between Blue Oaks and Sunset. Large amounts of development on the Placer Ranch site would require Sunset Boulevard to be widened to six lanes between Industrial Avenue and Foothills Boulevard. Because the City of Roseville does not have jurisdiction over Placer County roadways, this represents a **significant and unavoidable** impact for the off-site alternative.

Table 18
Level of Service at Placer County Intersections
2025 CIP Plus Project Alternative Conditions

	Intersection	LOS Standard	Scenario																	
					2025 CIP Plus Project															
			No Project		Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alternative		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
AM Peak Hour																				
1	Locust & Baseline	D	A	0.29	A	0.30	A	0.30	A	0.30	A	0.30	A	0.30	A	0.30	A	0.30	A	0.29
2	Watt & PFE	D	A	0.53	A	0.55	A	0.55	A	0.54	A	0.55	A	0.54	A	0.54	A	0.54	A	0.53
3	Walerga & PFE	F	E	0.93	E	0.91	E	0.91	E	0.91	E	0.91	E	0.92	E	0.92	E	0.92	E	0.93
4	Cook Riolo & PFE	F	F	1.12	F	1.14	F	1.13	F	1.13	F	1.14	F	1.14	F	1.14	F	1.13	F	1.11
5	W Sunset & Fiddyment	C	D	0.82	D	0.83	D	0.83	D	0.83	D	0.83	D	0.83	D	0.83	D	0.83	C	0.80
6	Fiddyment & Athens	C	F	1.01	F	1.01	F	1.01	F	1.01	F	1.01	F	1.01	F	1.01	F	1.01	E	0.98
7	Athens & Industrial	C	F	1.08	F	1.08	F	1.08	F	1.08	F	1.08	F	1.08	F	1.08	F	1.08	F	1.10
PM Peak Hour																				
1	Locust & Baseline	D	A	0.52	A	0.54	A	0.54	A	0.53	A	0.53	A	0.53	A	0.53	A	0.54	A	0.53
2	Watt & PFE	D	A	0.60	B	0.61	B	0.61	B	0.61	B	0.61	B	0.61	B	0.61	B	0.61	A	0.60
3	Walerga & PFE	F	E	0.92	E	0.94	E	0.94	E	0.93	E	0.94	E	0.93	E	0.94	E	0.94	E	0.91
4	Cook Riolo & PFE	F	F	1.21	F	1.21	F	1.20	F	1.20	F	1.20	F	1.21	F	1.20	F	1.21	F	1.21
5	W Sunset & Fiddyment	C	E	0.97	E	0.98	E	0.98	E	0.98	E	0.98	E	0.98	E	0.98	E	0.98	E	0.95
6	Fiddyment & Athens	C	F	1.14	F	1.15	F	1.15	F	1.15	F	1.15	F	1.15	F	1.15	F	1.15	F	1.17
7	Athens & Industrial	C	F	1.38	F	1.38	F	1.38	F	1.38	F	1.38	F	1.38	F	1.38	F	1.38	F	1.37

Note: **BOLD** Locations do not meet LOS Policy, **Shaded** Locations indicate LOS Impacts

Source: DKS Associates 2012

Table 19

Level of Service at Placer County Roadway Segments
2025 CIP Plus Project Alternative Conditions

Roadway Segment	LOS Standard	Lanes	Scenario																	
					2025 CIP Plus Project															
			No Action		Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alternative		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
			ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS
Baseline Rd w/o Watt Ave	D	6	43,500	D	44,360	D	44,250	D	44,180	D	44,160	D	43,920	D	43,920	D	44,030	D	44,480	D
Watt Ave s/o Baseline Rd	F	5	22,620	A	26,300	A	25,960	A	25,550	A	25,540	A	24,160	A	24,480	A	24,720	A	26,410	A
Walerga Rd s/o Baseline	D	4	**36,520**	**F**	**35,960**	**E**	**35,950**	**E**	**35,970**	**E**	**36,020**	**F**	**36,060**	**F**	**36,050**	**F**	**36,080**	**F**	**36,140**	**F**
PFE Rd e/o Watt Ave	C	4	6,280	A	7,070	A	7,040	A	6,820	A	6,850	A	6,670	A	6,770	A	6,810	A	7,080	A
Fiddyment s/o Athens	C	4	25,870	C	26,150	C	26,130	C	26,100	C	26,090	C	26,080	C	26,060	C	26,100	C	25,680	C
Sunset w/o Fiddyment	C	2	1,330	A	1,350	A	1,350	A	1,360	A	1,350	A	1,340	A	1,350	A	1,350	A	1,420	A
Athens e/o Fiddyment	C	2	**20,670**	**F**	**20,610**	**F**	**20,620**	**F**	**20,630**	**F**	**20,620**	**F**	**20,650**	**F**	**20,630**	**F**	**20,630**	**F**	**20,390**	**F**
Sunset w/o Industrial	C	4	22,600	B	22,860	B	22,850	B	22,730	B	22,740	B	22,730	B	22,800	B	22,810	B	**32,400**	**E**
Foothills s/o Athens	C	4	20,840	A	20,950	A	20,920	A	20,920	A	20,940	A	20,920	A	20,900	A	20,930	A	22,110	B

Note: **BOLD** Locations do not meet LOS Policy, **Shaded** Locations indicate LOS Impacts

Source: DKS Associates 2012

2025 CIP Plus Project Conditions – Sacramento County

The Proposed Project would result in traffic volume increases on a number of roadways in Sacramento County under 2025 CIP conditions.

Sacramento County: AM Peak Hour Impacts

Table 20 identifies the a.m. peak hour levels of service at current and future signalized intersections under 2025 CIP conditions without and with buildout of the Westbrook development and each project alternative. The table shows that no Sacramento County intersections would be significantly impacted with the addition of the Westbrook development of any of the alternatives.

The intersection of Walerga Road and Elverta Road would operate at LOS F under all cases; however none of the V/C increases would be 0.05 or greater. The intersection of Watt Avenue and Antelope Road would exceed the LOS E policy under all cases; however none of the V/C increases would be 0.05 or greater. As such, this impact is considered **less than significant**.

Placer County: PM Peak Hour Impacts

Table 20 identifies the p.m. peak hour levels of service at current and future signalized intersections under 2025 CIP conditions without and with buildout of the Westbrook development and each project alternative. The table shows that no Sacramento County intersections would be significantly impacted with the addition of the Westbrook development of any of the alternatives.

The intersection of Walerga Road and Elverta Road would operate at LOS F under all cases; however none of the V/C increases would be 0.05 or greater. The intersection of Watt Avenue and Antelope Road would exceed the LOS E policy under all cases; however none of the V/C increases would be 0.05 or greater. The intersection of Watt Avenue and Elkhorn Boulevard

would exceed the LOS E policy under all cases; however none of the V/C increases would be 0.05 or greater. As such, this impact is considered **less than significant**.

Sacramento County: Daily Impacts

Table 21 shows the changes in daily traffic volume on Sacramento County roadways under 2025 CIP conditions without and with buildout of the Westbrook development and each project alternative. The table shows that no Sacramento County roadway segments would be significantly impacted with the addition of the Westbrook development of any of the alternatives.

The segment of Walerga Road south of PFE Road would exceed the LOS E policy under all cases; however none of the V/C increases would be 0.05 or greater. As such, this impact is considered **less than significant**.

Table 20
Level of Service at Sacramento County Intersections
2025 CIP Plus Project Alternative Conditions

	Intersection	LOS Standard	Scenario																	
					2025 CIP Plus Project															
			No Project		Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alternative		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
AM Peak Hour																				
1	Watt Ave & Elverta Rd	E	D	0.88	D	0.88	D	0.88	D	0.88	D	0.88	D	0.88	D	0.88	D	0.88	D	0.88
2	Walerga Rd & Elverta Rd	E	**F**	**1.22**	**F**	**1.22**	**F**	**1.22**	**F**	**1.22**	**F**	**1.22**	**F**	**1.22**	**F**	**1.22**	**F**	**1.22**	**F**	**1.22**
3	Watt Ave & Antelope Rd	E	**F**	**1.19**	**F**	**1.20**	**F**	**1.19**	**F**	**1.19**	**F**	**1.19**	**F**	**1.20**	**F**	**1.19**	**F**	**1.20**	**F**	**1.19**
4	Walerga Rd & Antelope Rd	E	B	0.62	B	0.62	B	0.62	B	0.62	B	0.62	B	0.62	B	0.62	B	0.62	B	0.62
5	Watt Ave & Elkhorn Bl	E	D	0.87	D	0.87	D	0.87	D	0.87	D	0.87	D	0.87	D	0.87	D	0.87	D	0.87
6	Walerga Rd & Elkhorn Bl	E	B	0.65	B	0.64	B	0.64	B	0.65	B	0.65	B	0.64	B	0.65	B	0.65	B	0.64
PM Peak Hour																				
1	Watt Ave & Elverta Rd	E	E	0.98	E	1.00	E	1.00	E	0.99	E	0.99	E	0.99	E	0.99	E	0.99	E	0.98
2	Walerga Rd & Elverta Rd	E	**F**	**1.29**	**F**	**1.30**	**F**	**1.29**	**F**	**1.29**	**F**	**1.29**	**F**	**1.29**	**F**	**1.29**	**F**	**1.29**	**F**	**1.29**
3	Watt Ave & Antelope Rd	E	**F**	**1.17**	**F**	**1.19**	**F**	**1.19**	**F**	**1.18**	**F**	**1.18**	**F**	**1.17**	**F**	**1.17**	**F**	**1.17**	**F**	**1.16**
4	Walerga Rd & Antelope Rd	E	D	0.85	D	0.86	D	0.85	D	0.86	D	0.86	D	0.85	D	0.86	D	0.86	D	0.85
5	Watt Ave & Elkhorn Bl	E	**F**	**1.04**	**F**	**1.04**	**F**	**1.04**	**F**	**1.03**	**F**	**1.04**	**F**	**1.03**	**F**	**1.04**	**F**	**1.03**	**F**	**1.04**
6	Walerga Rd & Elkhorn Bl	E	D	0.87	D	0.89	D	0.90	D	0.88	D	0.88	D	0.89	D	0.88	D	0.88	D	0.86

Note: **BOLD** Locations do not meet LOS Policy, **Shaded** Locations indicate LOS Impacts

Source: DKS Associates 2012

Table 21

Level of Service at Sacramento County Roadway Segments
2025 CIP Plus Project Alternative Conditions

Roadway Segment	LOS Standard	Lanes	Scenario																	
					2025 CIP Plus Project															
			No Action		Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alt		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
			ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS
Watt Ave s/o PFE	E	6	50,480	E	50,920	E	50,880	E	50,830	E	50,860	E	50,700	E	50,750	E	50,740	E	51,040	E
Watt Ave s/o Elverta	E	6	37,820	C	38,000	C	37,920	C	37,990	C	38,010	C	37,940	C	37,930	C	37,880	C	38,050	C
Watt Ave s/o Antelope	E	6	37,420	B	37,580	B	37,600	B	37,460	B	37,570	B	37,390	B	37,440	B	37,490	B	37,360	B
Watt Ave s/o Elkhorn	E	6	44,890	D	45,160	D	45,100	D	45,010	D	45,070	D	45,040	D	45,010	D	45,030	D	45,190	D
Walerga Rd s/o PFE	E	4	**48,550**	**F**	**48,910**	**F**	**48,860**	**F**	**48,840**	**F**	**48,860**	**F**	**48,670**	**F**	**48,670**	**F**	**48,770**	**F**	**49,060**	**F**
Walerga Rd s/o Elverta	E	4	35,800	E	35,800	E	35,780	E	35,740	E	35,770	E	35,730	E	35,780	E	35,790	E	35,880	E
Walerga Rd s/o Antelope	E	4	31,800	D	31,800	D	31,590	D	31,670	D	31,550	D	31,770	D	31,720	D	31,680	D	31,970	D
Walerga Rd s/o Elkhorn	E	4	30,540	D	30,490	D	30,480	D	30,460	D	30,450	D	30,520	D	30,520	D	30,490	D	30,640	D

Note: **BOLD** Locations do not meet LOS Policy, **Shaded** Locations indicate LOS Impacts

Source: DKS Associates 2012

2025 CIP Plus Project Conditions – Sutter County

The Proposed Project would result in traffic volume increases on some Sutter County roadways. **Table 22** shows the projected a.m. and p.m. peak hour levels of service at Sutter County intersections in the vicinity of the Proposed Project under 2025 CIP Plus Project conditions, as well as the project alternatives.

Sutter County: AM Peak Hour Impacts

Table 22 shows that all study area intersections in Sutter County are projected to operate at acceptable levels with or without the proposed project or any of the project alternatives. As such, this impact is considered **less than significant**.

Sutter County: PM Peak Hour Impacts

Table 23 shows that all study area intersections in Sutter County are projected to operate at acceptable levels with or without the proposed project or any of the project alternatives. As such, this impact is considered **less than significant**.

Sutter County: Daily Impacts

Table 23 shows the changes in daily traffic volume on Sutter County roadways under 2025 CIP conditions without and with buildout of the Westbrook development and each project alternative. The segment of Riego Road east of SR 70/99 would exceed the LOS D policy under all cases; however none of the V/C increases would be 0.05 or greater. As such, this impact is considered **less than significant**.

Table 22
Level of Service at Sutter County Intersections
2025 CIP Plus Project Alternative Conditions

	Intersection	LOS Standard	Scenario																	
					2025 CIP Plus Project															
			No Project		Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alternative		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
AM Peak Hour																				
1	Pleasant Grove N & Riego	D	B	0.63	B	0.65	B	0.65	B	0.65	B	0.65	B	0.64	B	0.65	B	0.65	B	0.64
2	Pleasant Grove S & Riego	D	A	0.53	A	0.54	A	0.54	A	0.53	A	0.53	A	0.53	A	0.53	A	0.54	A	0.53
3	SR 99 NB Off & Riego	D	A	0.53	A	0.55	A	0.54	A	0.54	A	0.54	A	0.54	A	0.54	A	0.54	A	0.54
4	SR 99 SB Off & Riego	D	B	0.63	B	0.66	B	0.66	B	0.65	B	0.65	B	0.65	B	0.65	B	0.66	B	0.63
PM Peak Hour																				
1	Pleasant Grove N & Riego	D	B	0.65	B	0.67	B	0.67	B	0.66	B	0.66	B	0.66	B	0.66	B	0.66	B	0.65
2	Pleasant Grove S & Riego	D	D	0.82	D	0.82	D	0.83	D	0.83	D	0.82	D	0.83	D	0.82	D	0.82	D	0.82
3	SR 99 NB Off & Riego	D	B	0.67	B	0.68	B	0.68	B	0.68	B	0.68	B	0.67	B	0.68	B	0.68	B	0.68
4	SR 99 SB Off & Riego	D	A	0.51	A	0.51	A	0.51	A	0.51	A	0.51	A	0.51	A	0.51	A	0.51	A	0.51

Note: **BOLD** Locations do not meet LOS Policy, **Shaded** Locations indicate LOS Impacts

Source: DKS Associates 2012

Table 23

Level of Service at Sutter County Roadway Segments
2025 CIP Plus Project Alternative Conditions

Roadway Segment	LOS Standard	Lanes	Scenario																	
					2025 CIP Plus Project															
			No Action		Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alt		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
			ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS
Riego Rd e/o SR 70-99	D	4	**33,900**	**F**	**34,320**	**F**	**34,280**	**F**	**34,220**	**F**	**34,220**	**F**	**34,120**	**F**	**34,140**	**F**	**34,180**	**F**	**34,010**	**F**

Note: **BOLD** Locations do not meet LOS Policy, **Shaded** Locations indicate LOS Impacts

Source: DKS Associates 2012

Table 24
Level of Service at Rocklin Roadway Segments
2025 CIP Plus Project Alternative Conditions

Roadway Segment	LOS Standard	Lanes	Scenario																	
					2025 CIP Plus Project															
			No Action		Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alt		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
			ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS
Blue Oaks w/o Sunset	C	4	14,300	A	14,400	A	14,400	A	14,400	A	14,400	A	14,500	A	14,500	A	14,400	A	14,070	A
Sunset s/o Blue Oaks	C	6	40,100	C	40,000	C	40,100	C	40,100	C	40,100	C	40,000	C	40,000	C	40,100	C	40,100	C
Blue Oaks e/o Lonetree	C	4	14,700	A	14,800	A	14,800	A	14,800	A	14,900	A	14,900	A	14,900	A	14,800	A	14,450	A
Lonetree n/o Blue Oaks	C	4	**34,100**	**E**	**34,200**	**E**	**34,200**	**E**	**34,200**	**E**	**34,200**	**E**	**34,200**	**E**	**34,200**	**E**	**34,100**	**E**	**33,530**	**E**
Lonetree s/o West Oaks	C	4	25,900	C	26,100	C	26,100	C	26,100	C	26,100	C	26,000	C	26,000	C	25,900	C	25,330	C
West Oaks e/o Lonetree	C	2	3,900	A	3,900	A	3,900	A	3,900	A	3,900	A	3,900	A	3,900	A	3,900	A	3,860	A
Sunset e/o SR 65	C	6	38,600	C	38,600	C	38,600	C	35,500	C	35,500	C	38,500	C	38,600	C	38,600	A	42,200	C
Blue Oaks w/o Sunset	C	4	14,300	A	14,400	A	14,400	A	14,400	A	14,400	A	14,500	A	14,500	A	14,400	A	14,070	A

Note: **BOLD** Locations do not meet LOS Policy, **Shaded** Locations indicate LOS Impacts

Source: DKS Associates 2012

2025 CIP Plus Project Conditions – Rocklin

The Proposed Project would result in traffic volume increases on some Rocklin roadways. **Table 25** shows that the addition of the Proposed Project is projected to increase daily traffic on three of the four study segments; however these increases would not result in a significant change in level of service. No level of service changes are projected at these Rocklin locations with the addition of the Proposed Project under 2025 CIP conditions. As such, this impact is considered to be **less than significant**.

2025 CIP Plus Project Conditions – State Facilities

State Facilities: Peak Hour Intersection Impacts

The addition of the Proposed Project to 2025 CIP conditions would cause minor changes in traffic volumes at State highway interchanges providing access to the site. It should be noted that the project site is a number of miles from any State highway, so impacts to State highway facilities are minimal. **Table 25** shows the levels of service at area State highway interchange intersections with and without the proposed project and each alternative. The table shows that none of the intersections are projected to operate at worse than LOS E.

State Facilities: Daily Mainline Segment Impacts

Portions of I-80, SR 65, and SR 70/99 are projected to operate at LOS F and the addition of the Proposed Project and on-site alternatives would add some volume (less than one percent) to these already deficient facilities. **Table 26** shows the segments on the state highway system that would be significantly impacted with the addition of the Proposed Project and its alternatives. The table shows that the impacts of the on-site alternatives are all similar to or less than the impacts of the Proposed Project.

Because Caltrans considers any increase in volume on an already deficient facility an in impact, this represents a **significant** impact.

No specific improvements have been identified to mitigate project impacts on I-80 and SR 65; however, the City is willing to work with Caltrans & the Placer County Transportation Planning Agency (PCTPA) to establish a regional approach to institute a fee program for the purpose of funding improvements on these facilities. If and when Caltrans and the City enter into an enforceable agreement, the Project shall pay impact fees to the City of Roseville in amounts that constitute the Project's fair share contributions to the construction of transportation facilities and/or improvements, consistent with the Mitigation Fee Act (Gov. Code, § 66000 et seq.).

The City recognizes the magnitude of the projected growth in Placer County, its resulting increase in travel demand, and the need for a cooperative approach to plan, fund and implement transportation improvements to accommodate that growth, including improvements to the State Highway System in Placer County.

The City is working with the Placer County Transportation Planning Agency (PCTPA), the South Placer Regional Transportation Authority (SPRTA) and their member jurisdictions to develop a strategic "Transportation Expenditure Plan" that includes funding for improvements for State highways in Placer County. The Expenditure Plan includes a number of critical transportation projects and programs including construction of the Placer Parkway, improvements to I-80 and SR 65, and construction of SR 65 Lincoln Bypass.

The proposed funding components for the Expenditure Plan are as follows:

- Additional development fees
  - Tier 2 Fee for construction of Placer Parkway
  - Transportation Uniform Mitigation Fee
- Transportation sales tax
- Existing and future State and Federal funds

The Tier 2 fees for Placer Parkway have been adopted in Roseville, Rocklin, Lincoln and Placer County and will be applied to all new growth areas. The Sierra Vista Specific Plan will be required to participate in this fee program. In addition, the Sierra Vista Plan area will be required to participate in the South Placer Regional Transportation Authority Fee Program (SPRTA) and the Highway 65 Joint Powers Authority to fund improvements along Highway 65. The additional development fees will need to be adopted by each of the jurisdictions in South Placer County. The City supports implementation of the Transportation Expenditure Plan to fund regional improvements in South Placer County. The City will support Caltrans and regional agencies in efforts to:

- Secure as much Federal and State funding for improvements to the State Highway System as possible, including funds for the transportation bond measure approved by the voters in 2006.

- Establish impact fees so that development throughout South Placer County pays their fair share of the unfunded cost of regional improvements, including improvements to SR 65

Funding currently exists for the construction of interchanges on SR 70/99 at Riego Road and Elverta Road. Caltrans has identified funding for the entire Elverta Road interchange and for the first phase of the Riego Road interchange. Funding also has been identified for the reconstruction of the Feather River crossing, well to the north of the proposed project on State Route 99. Funding has not been identified for any mainline improvements or additional auxiliary lanes on State Route 99 in the vicinity of the Proposed Project north and south of Riego Road. As with Interstate 80 and State Route 99, the Proposed Project would be required to participate in any fee program developed to provide mainline improvements in the State Route 99 corridor in the vicinity of Riego Road.

Because the City of Roseville does not have jurisdiction over State Highway facilities, this impact is considered **significant and unavoidable**.

Table 25

Level of Service at State Highway Ramp Intersections
2025 CIP Plus Project Alternative Conditions

Intersection	LOS Standard	Scenario																	
		No Project		2025 CIP Plus Project															
				Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alternative		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
		LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
AM Peak Hour																			
SR 65 N/B Off & Blue Oaks	E	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55
Washington Blvd & Blue Oaks	E	A	0.50	A	0.50	A	0.50	A	0.50	A	0.50	A	0.50	A	0.50	A	0.50	A	0.48
I-80 WB Off & Douglas Blvd	E	B	0.69	B	0.69	B	0.69	B	0.69	B	0.69	B	0.69	B	0.69	B	0.69	B	0.69
I-80 WB On & Atlantic St	E	A	0.42	A	0.42	A	0.42	A	0.42	A	0.42	A	0.42	A	0.42	A	0.42	A	0.43
SR 65 N/B Off & Pleasant Grove	E	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A	0.55	A	0.54
SR 65 S/B Off & Pleasant Grove	E	A	0.43	A	0.42	A	0.42	A	0.43	A	0.43	A	0.42	A	0.42	A	0.42	A	0.44
I-80 WB Off & Riverside Ave	E	C	0.72	C	0.72	C	0.72	C	0.72	C	0.72	C	0.72	C	0.72	C	0.72	C	0.72
Stanford Ranch & Sr-65 N/B On	E	A	0.52	A	0.52	A	0.52	A	0.53	A	0.52	A	0.53	A	0.52	A	0.53	A	0.51
Stanford Ranch/Galleria & Sr-65 S/B On	E	A	0.43	A	0.43	A	0.43	A	0.44	A	0.44	A	0.44	A	0.43	A	0.44	A	0.42

Table 25

Level of Service at State Highway Ramp Intersections
2025 CIP Plus Project Alternative Conditions

Intersection	LOS Standard	Scenario																	
		No Project		2025 CIP Plus Project															
				Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alternative		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
		LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
Taylor & Eureka I-80 EB Off	E	D	0.83	D	0.83	D	0.83	D	0.83	D	0.83	D	0.83	D	0.82	D	0.83	D	0.84
I-80 EB Off/Orlando & Riverside Ave	E	C	0.76	C	0.75	C	0.76	C	0.76	C	0.76	C	0.76	C	0.76	C	0.76	C	0.75
SR 99 NB Off Ramp & Riego Rd	E	A	0.53	A	0.55	A	0.54	A	0.54	A	0.54	A	0.54	A	0.54	A	0.54	A	0.54
SR 99 SB Off Ramp & Riego Rd	E	B	0.63	B	0.66	B	0.66	B	0.65	B	0.65	B	0.65	B	0.65	B	0.66	B	0.63
PM Peak Hour																			
SR 65 N/B Off & Blue Oaks Blvd	E	B	0.66	B	0.66	B	0.66	B	0.66	B	0.66	B	0.66	B	0.66	B	0.66	B	0.65
Washington Blvd & Blue Oaks Blvd	E	B	0.68	B	0.68	B	0.68	B	0.68	B	0.68	B	0.68	B	0.68	B	0.68	B	0.67
I-80 WB Off & Douglas Blvd	E	C	0.79	C	0.79	C	0.79	C	0.79	C	0.79	C	0.79	C	0.79	C	0.79	C	0.79
I-80 WB On & Atlantic St	E	A	0.56	A	0.55	A	0.56	A	0.56	A	0.56	A	0.56	A	0.56	A	0.56	A	0.56
SR 65 N/B Off & Pleasant Grove Blvd	E	C	0.76	C	0.76	C	0.76	C	0.76	C	0.76	C	0.76	C	0.76	C	0.76	C	0.76
SR 65 S/B Off & Pleasant Grove Blvd	E	C	0.71	C	0.71	C	0.71	C	0.71	C	0.71	C	0.71	C	0.71	C	0.71	C	0.71
I-80 WB Off & Riverside Ave	E	B	0.63	B	0.63	B	0.63	B	0.63	B	0.63	B	0.63	B	0.63	B	0.63	B	0.63
Stanford Ranch & Sr-65 N/B On	E	D	0.86	D	0.86	D	0.86	D	0.86	D	0.86	D	0.86	D	0.86	D	0.86	D	0.85
Stanford Ranch/Galleria & Sr-65 S/B On	E	D	0.82	D	0.83	D	0.82	D	0.82	D	0.82	D	0.82	D	0.82	D	0.82	D	0.82
Taylor & Eureka I-80 EB Off	E	E	0.97	E	0.96	E	0.96	E	0.96	E	0.96	E	0.95	E	0.96	E	0.95	E	0.96
I-80 EB Off/Orlando & Riverside Ave	E	D	0.84	D	0.84	D	0.84	D	0.84	D	0.84	D	0.84	D	0.84	D	0.84	D	0.84

Table 25

Level of Service at State Highway Ramp Intersections
2025 CIP Plus Project Alternative Conditions

Intersection	LOS Standard	Scenario																	
		No Project		2025 CIP Plus Project															
				Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alternative		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
		LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
SR 99 NB Off Ramp & Riego Rd	E	B	0.67	B	0.68	B	0.68	B	0.68	B	0.68	B	0.67	B	0.68	B	0.68	B	0.68
SR 99 SB Off Ramp & Riego Rd	E	A	0.51	A	0.51	A	0.51	A	0.51	A	0.51	A	0.51	A	0.51	A	0.51	A	0.51

Note: **BOLD** Locations do not meet LOS Policy, **Shaded** Locations indicate LOS Impacts

Source: DKS Associates, 2012

Table 26
Average Daily Traffic Volumes and LOS on State Highways
2025 CIP Plus Project Alternatives

Facility	Segment	Lanes	No Build		2025 CIP Plus Project: Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alternative		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
			ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS
I-80	Sacramento Co. to Riverside Ave	8	**230,300**	**F**	**230,400** +0.04%	**F**	**230,300** 0%	**F**	**230,300** 0%	**F**	**230,300** 0%	**F**	**230,200** -0.04%	**F**	**230,200** -0.04%	**F**	**230,300** 0%	**F**	**230,000** -0.13%	**F**
	Riverside Avenue to Douglas Blvd	6	**227,100**	**F**	**227,200** +0.04%	**F**	**227,100** 0%	**F**	**227,100** 0%	**F**	**227,100** 0%	**F**	**227,100** 0%	**F**	**227,000** -0.04%	**F**	**227,100** 0%	**F**	**226,400** -0.32%	**F**
	Douglas Blvd to Eureka Rd	6	**221,100**	**F**	**221,200** +0.05%	**F**	**221,100** 0%	**F**	**221,000** -0.05%	**F**	**221,100** 0%	**F**	**220,900** -0.09%	**F**	**221,000** -0.05%	**F**	**221,100** 0%	**F**	**220,300** -0.36%	**F**
	Eureka Rd to Taylor Rd	8	**238,500**	**F**	**238,600** +0.04%	**F**	**238,600** +0.04%	**F**	**238,600** +0.04%	**F**	**238,500** 0%	**F**	**238,400** -0.04%	**F**	**238,600** +0.04%	**F**	**238,500** 0%	**F**	**237,600** -0.37%	**F**
	Taylor Rd to SR 65	8	**223,100**	**F**	**223,300** +0.09%	**F**	**223,100** 0%	**F**	**223,100** 0%	**F**	**223,100** 0%	**F**	**223,100** 0%	**F**	**223,100** 0%	**F**	**223,100** 0%	**F**	**222,300** -0.36%	**F**
SR 65	I-80 to Galleria Blvd	6	**136,400**	**F**	**136,400** +0.00%	**F**	**136,300** -0.07%	**F**	**136,300** -0.07%	**F**	**136,300** -0.07%	**F**	**136,300** -0.07%	**F**	**136,300** -0.07%	**F**	**136,300** -0.07%	**F**	**136,300** -0.04%	**F**
	Galleria Bl. to Pleasant Grove Bl	6	**138,900**	**F**	**138,900** +0.00%	**F**	**138,800** -0.07%	**F**	**138,700** -0.14%	**F**	**138,700** -0.14%	**F**	**138,800** -0.07%	**F**	**138,800** -0.07%	**F**	**138,800** -0.07%	**F**	**138,900** **+0.04%**	**F**
	Pleasant Grove Bl to Blue Oaks Bl	6	**128,300**	**F**	**128,300** 0%	**F**	**128,300** 0%	**F**	**128,200** -0.08%	**F**	**128,200** -0.08%	**F**	**128,300** 0%	**F**	**128,300** 0%	**F**	**128,300** 0%	**F**	**127,900** -0.31%	**F**
	Blue Oaks Blvd to Sunset Blvd	4	**123,000**	**F**	**123,000** 0%	**F**	**123,100** +0.08%	**F**	**123,100** +0.08%	**F**	**123,000** 0%	**F**	**123,000** +0.00%	**F**	**123,100** +0.08%	**F**	**123,100** +0.08%	**F**	**121,900** -0.91%	**F**

Table 26
Average Daily Traffic Volumes and LOS on State Highways
2025 CIP Plus Project Alternatives

Facility	Segment	Lanes	No Build		2025 CIP Plus Project: Proposed Action "The Project"		Alternative #1 Reduced Footprint Increased Density		Alternative #2 Reduced Footprint Same Density		Alternative #2X Central Preserve Alternative		Alternative #3 Half Acre Wetland Impact Plan		Alternative #4 One Acre Wetland Impact Plan		Alternative #5 No Federal Action		Alternative #6 Off-Site Alternative	
			ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS
SR 70/99	Sankey Rd to Riego Rd	4	57,300	C	57,300 0%	C	57,300 0%	C	57,300 0%	C	57,300 0%	C	57,300 0%	C	57,300 0%	C	57,300 0%	C	57,300 +0.03%	C
	Riego Rd to Elverta Rd	4	**77,200**	**E**	**77,600** +0.52%	**E**	**77,100** -0.13%	**E**	**77,000** -0.26%	**E**	**77,100** -0.13%	**E**	**77,000** -0.26%	**E**	**77,000** -0.26%	**E**	**77,100** -0.13%	**E**	**77,300** **+0.16%**	**E**
	Elverta Rd to Elkhorn Blvd	4	**79,700**	**E**	**80,100** +0.50%	**F**	**79,700** 0%	**E**	**79,600** -0.13%	**E**	**79,500** **-0.3%**	**E**	**79,600** -0.13%	**E**	**79,600** -0.13%	**E**	**79,600** -0.13%	**E**	**79,900** **+0.20%**	**E**

Notes:

Roadway segment levels of service (LOS) are based on roadway capacities and LOS criteria in Table x

Highway segments operating at LOS F are **BOLD**.

Impacts are **Shaded**

Source: DKS Associates, 2012

Transit Impacts

With its additional residential and non-residential land uses, the proposed project and alternatives would increase demand for transit within the City of Roseville and neighboring jurisdictions. Traditionally, Roseville Transit has been funded primarily by local Transportation Development Act (TDA) funding sources, which are derived from a statewide one-quarter cent sales tax. Secondary and tertiary historical funding sources have been Federal Transit Administration (FTA) funds and local transit fares. General funds have not historically been used to support Roseville Transit and would not be expected to be used to support transit services for the CSP. As TDA revenues rise or fall during various economic conditions, transit services are expected to reflect the amount of funding available versus the unmet needs which are evaluated annually by the Placer County Transportation Planning Agency (PCTPA). Currently, Roseville Transit is facing reduced revenues and is making adjustments to reduce its services to align itself with increased costs and reduced revenues. Accordingly, if TDA revenues increase in the years ahead, Roseville Transit will have an opportunity to expand its services to best meet the unmet transit needs within the City of Roseville, which may include the new Creekview Specific Plan area. At a minimum, the current policy is to provide DAR services citywide. Thus, DAR services would provide a minimum level of transit services to the CSP upon development under the City's current policies."

The addition of residential units and commercial square footage would increase the demand for transit within the City of Roseville. There are currently no Roseville Transit routes directly serving the project site. Transit needs within the Proposed Project would not be met by current transit lines. This would result in a potentially significant impact on transit demand.

As mitigation, the project would be required to develop transit stops at key arterial intersections and at other locations as determined by the Public Works Director, in accordance with the City's Improvement Standards. Roseville Transit shall provide transit services in accordance with the SRTP and LRTP as funding allows. Although the Roseville Transit System is currently facing funding problems, the requirement that the Project develop transit stops at key arterial

intersections and other locations determined by Public Works will be sufficient to allow service to be extended to the Project area. Notably, nothing about the inclusion of such transit stops will worsen the current funding problems of the Roseville Transit system, which should improve as the national and regional economies recover from the recent recession. Because development in the Project area is not expected to occur to any significant degree until economic conditions improve, the City expects system revenues to increase as demand for transit service in the Project area arises. For these reasons, the proposed mitigation would reduce impacts to a **less than significant** level.

Bicycle System Impacts

With its additional residential and non-residential land uses, the proposed project and alternatives would increase demand for bicycle facilities within the City of Roseville and neighboring jurisdictions. The Proposed Project would result in demand for safe and convenient pedestrian/bicycle facilities by residents and employees of the site for primarily transportation-related purposes. The SVSP project proposal includes Class I trails, Class II bike lanes and the Class IA facilities (paseos, etc.). These are connected within the project and to the existing City bikeway system. The Class II bike lanes for collectors have been modified to accommodate slower vehicular speeds and narrower street sections; this is a deviation from current City of Roseville Design/Construction Standards. However, they do comply with the minimum requirements of the Highway Design Manual. Thus, this impact is considered to be **less than significant**.