Capital SouthEast Connector Project Volume 3 of the Final Program Environmental Impact Report – Appendices

Prepared by:

Capital SouthEast Connector Joint Powers Authority

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

State Clearinghouse #2010012066

February 2012

CAPITAL SOUTHEAST CONNECTOR PROJECT
VOLUME 3 OF THE FINAL PROGRAM ENVIRONMENTAL IMPACT REPORT – APPENDICES

CAPITAL | SOUTHEAST
CONNECTOR JPA
Connecting Communities

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IN ASSOCIATION WITH:

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Volume 3 of 3

Appendix A

Notice of Preparation, Scoping Report, and Comment Letters

NOTICE OF PREPARATION OF A PROGRAM ENVIRONMENTAL IMPACT REPORT FOR THE CAPITAL SOUTHEAST CONNECTOR PROJECT

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FEBRUARY 2010

ICF International. 2010. *Notice of Preparation of Program Environmental Impact Report for the SouthEast Connector Project*. February. (ICF J&S 00907.08) Sacramento, CA. Prepared for: Capital SouthEast Connector Joint Powers Authority, Mather, CA.

General Information About This Document

What's in this document?

The Capital SouthEast Connector Joint Powers Authority (JPA) has prepared this notice of preparation (NOP) for an upcoming program environmental impact report (EIR). The NOP identifies the potential environmental impacts of the proposed Capital SouthEast Connector project (proposed project) located in the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom, California. The document describes why the project is being proposed, alternatives considered for the project, and the probable environmental impacts.

What should you do?

The NOP is available for a 45-day public review as part of the scoping process for the program EIR.

- Please read this NOP. Additional copies of this document are available on the project website at http://connectorjpa.net or at the following locations:
  - JPA office, located at 10640 Mather Blvd, Suite 120, Mather, CA95655
  - City of Elk Grove Planning Counter, located at City Hall, 8401 Laguna Palms Way, Elk Grove, CA 95758
  - City of Rancho Cordova Planning Department, located at City Hall, 2729 Prospect Park Drive, Rancho Cordova, CA 95670
  - City of Folsom Planning Counter, located at City Hall, 50 Natoma Street, 2nd Floor, Folsom, CA 95630
  - County of Sacramento Public Information Counter, located at 827 7th Street, Room 101, Sacramento, CA 95814
  - County of El Dorado Planning Department, located at 2850 Fairlane Court, Building "C", Placerville, CA 95667

- Attend any one of the public scoping meetings to be held for the project:
  - Tuesday, February 23 , 2010, from 6:00 p.m. to 8:00 p.m., at the El Dorado Hills Library, 7455 Silva Valley Parkway, El Dorado Hills
  - Wednesday, February 24, 2010, from 6:00 p.m. to 8:00 p.m., at the Rancho Cordova City Hall, American River Room, 2729 Prospect Park Drive, Rancho Cordova
  - Monday, March 1 , 2010, from 6:00 p.m. to 8:00 p.m., at the Sacramento County Agricultural Extension Auditorium, 4145 Branch Center Road, Sacramento
  - Wednesday, March 3 , 2010, from 6:00 p.m. to 8:00 p.m., at the Elk Grove City Hall, Council Chambers, 8400 Laguna Palms Way, Elk Grove
  - Monday, March 8, 2010, from 6:00 p.m. to 8:00 p.m., at the Folsom Community Center, 52 Natoma Street, Folsom

- We welcome your comments. If you have any concerns regarding the proposed project, please attend the public scoping meetings or send your written comments to the JPA by the deadline. Submit comments via U.S. mail to the JPA at the following address:

  Tom Zlotkowski, Executive Director
  10640 Mather Blvd, Suite 120
  Mather, CA 95655
  916/876-9094

- Submit comments via email to: info@ConnectorJPA.net
- Submit comments by the deadline: March 17, 2010.

What happens next?

After comments are received from the public and reviewing agencies, the JPA will consider all relevant comments on the scope of the program EIR, including alternatives to consider, methods for analysis, and potential mitigation. The JPA will circulate a draft program EIR and consider comments on the draft EIR prior to adopting a final EIR and making a decision on the project.

Purpose and Organization of this Notice of Preparation

The JPA will prepare a program-level environmental impact report (EIR). Unlike a project EIR that examines the impacts that would result from development of a specific project (CEQA Guidelines Section 15161), a program EIR is prepared on a series of actions that can be characterized as one large project. The proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years. Therefore, the JPA determined that a program EIR was the appropriate document to comply with CEQA for the overall project. The program EIR for the proposed project will establish the framework for later tiered or project-level environmental documents that will be prepared for specific Connector segments in accordance with the overall program (CEQA Guidelines Section 15168(a)).

This NOP has been prepared pursuant to the California Environmental Quality Act (CEQA) (14 California Code of Regulations [CCR]) and State CEQA Guidelines Sections 15082(a), 15103, and 15375 to inform agencies and the public that the EIR is being prepared and to invite comments and input on the scope and content of the EIR.

This NOP presents general background information on the preliminary alternatives, scoping process, the environmental issues to be addressed in the EIR, and the anticipated uses of the EIR. It also describes the proposed project as currently envisioned, the project location, and the project's probable environmental impacts.

The Capital SouthEast Connector JPA, as the lead agency under CEQA, must evaluate the environmental impacts of the project prior to considering whether to approve the project. If the lead agency finds substantial evidence that any aspect of the project, either individually or cumulatively, may have a significant impact on the environment—regardless of whether the overall effect of the project is adverse or beneficial—the lead agency is required to prepare an EIR.

In reviewing the preliminary information provided for the proposed project, the Capital SouthEast Connector JPA has analyzed the potential environmental impacts of the proposed project in this NOP and has determined that preparation of an EIR is required.

Purpose and Scope of Program EIR

Purpose of the Program EIR

The State CEQA Guidelines encourage agencies to use a program EIR in certain circumstances involving the implementation of a series of related projects (in this case, the multiple sections of the Connector to be developed over time). Use of such a document allows the lead agency to characterize the overall program as the project being approved at the time. A program EIR can act as the first-tier analysis for subsequent, more detailed project-specific environmental review.

Design information for the Corridor is at a conceptual level and therefore the environmental analysis for the project will be at a program level. Previous studies and analyses indicate that there are resources in the Connector corridor that are protected under federal and state law and that could be affected by the project, including wetlands, endangered species, and cultural resources. In addition, the project could result in conversion of farmland and effects on the floodplain as well as direct and indirect impacts on residences and businesses along the project corridor. The analysis that will be conducted for the program EIR will not result in the submittal of permit applications to regulatory agencies, although is anticipated that the program EIR will eventually result in a project that will require regulatory agency approval. The program EIR will be prepared consistent with CEQA Guidelines Section 15168, which states:

<u>Program EIR</u>

(a) General. A program EIR is an EIR which may be prepared on a series of actions that can be characterized as one large project and are related either:

(1) Geographically,
(2) A logical parts in the chain of contemplated actions,
(3) In connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program, or
(4) As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways.

(b) Advantages. Use of a program EIR can provide the following advantages. The program EIR can:

(1) Provide an occasion for a more exhaustive consideration of effects and alternatives than would be practical in an EIR on an individual action,
(2) Ensure consideration of cumulative impacts that might be slighted in a case-by-case analysis,
(3) Avoid duplicative reconsideration of basic policy considerations,

(4) Allow the Lead Agency to consider broad policy alternatives and program-wide mitigation measures at an early time when the agency has greater flexibility to deal with basic problems or cumulative impacts, and
(5) Allow reduction in paperwork.

(c) Use with Later Activities. Subsequent activities in the program must be examined in the light of the program EIR to determine whether an additional environmental document must be prepared.

(1) If a later activity would have effects that were not examined in the program EIR, a new Initial Study would need to be prepared leading to either an EIR or a Negative Declaration.
(2) If the agency finds that pursuant to Section 15162, no new effects could occur or no new mitigation measures would be required, the agency can approve the activity as being within the scope of the project covered by the program EIR, and no new environmental document would be required.
(3) An agency shall incorporate feasible mitigation measures and alternatives developed in the program EIR into subsequent actions in the program.
(4) Where the subsequent activities involve site specific operations, the agency should use a written checklist or similar device to document the evaluation of the site and the activity to determine whether the environmental effects of the operation were covered in the program EIR.
(5) A program EIR will be most helpful in dealing with subsequent activities if it deals with the effects of the program as specifically and comprehensively as possible. With a good and detailed analysis of the program, many subsequent activities could be found to be within the scope of the project described in the program EIR, and no further environmental documents would be required.

(d) Use with Subsequent EIRs and Negative Declarations. A program EIR can be used to simplify the task of preparing environmental documents on later parts of the program. The program EIR can:

(1) Provide the basis in an Initial Study for determining whether the later activity may have any significant effects.
(2) Be incorporated by reference to deal with regional influences, secondary effects, cumulative impacts, broad alternatives, and other factors that apply to the program as a whole.
(3) Focus an EIR on a subsequent project to permit discussion solely of new effects which had not been considered before.

(e) Notice with Later Activities. When a law other than CEQA requires public notice when the agency later proposes to carry out or approve an activity within the program and to rely on the program EIR for CEQA compliance, the notice for the activity shall include a statement that:

(1) This activity is within the scope of the program approved earlier, and
(2) The program EIR adequately describes the activity for the purposes of CEQA.

The program EIR will provide the JPA with a base reference of facts and analyses that will avoid unnecessary repetition for project-specific assessments by individual jurisdictions on Connector segments, and will preclude redundant or contradictory approaches to the consideration of regional and cumulative impacts.

Phasing and Schedule of the Program EIR

The program EIR will be prepared in three phases. Phase I is the scoping phase, which involves formulating and evaluating preliminary alternatives, distributing the NOP for the draft program EIR, and conducting public meetings to obtain input on the project. Phase II, which will begin in Spring 2010, consists of preparation and distribution of the draft program EIR, which is anticipated to begin public review in late summer 2010. Phase III includes preparation and distribution of the final program EIR, which will occur in late fall, 2010.

Scope of the Program EIR

The following topics will be covered in the program EIR:

- Aesthetics
- Agricultural Resources
- Air Quality/Climate Change
- Biological Resources
- Cultural Resources
- Geology/Soils
- Hazards and Hazardous Materials
- Hydrology/Water Quality
- Land Use/Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation/Traffic
- Utilities and Service Systems
- Cumulative and Growth-Inducing Impacts

The probable environmental impacts of the proposed project will be described in the program EIR and are listed under "Environmental Issues to be Addressed in the Program EIR". Subsequent environmental documents will incorporate by reference materials from the program EIR, as appropriate, regarding secondary effects, cumulative impacts, broad alternatives, and other factors. Subsequent environmental documents will focus solely on site-specific issues that were not considered previously.

Public Involvement Program for the Program EIR

CEQA outlines a scoping process as part of the environmental review of a proposed project or action. Section 15083 of the State CEQA Guidelines defines early consultation, also called scoping, as the opportunity to identify the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in the EIR. The opportunity to provide input on the issues and alternatives to be evaluated during the environmental process is to be afforded to all affected federal, state, and local agencies, any affected Indian tribes, the proponent of the action, and other interested persons or organizations that may be concerned with the environmental effects of the project.

During the course of the previously conducted Connector Study (as described below, under "Previous Studies and Analysis"), SACOG invited the extensive participation of each local government agency, community residents, and other stakeholders affected by the project.

During the conceptual planning phase of the project, a Stakeholder Advisory Committee and Technical Advisory Committee met regularly to develop the elements of the project's objectives and purpose and need, which were presented to a Policy Advisory Committee that included representatives from each of the five affected jurisdictions. During this pre-environmental studies phase, these committees continued to meet regularly. Community residents and other members of the public attended these meetings as well as the six public information sessions held during the course of the study. Oral and written comments were received from committee members, local residents, community representatives, and other interested parties. The JPA has held additional public workshops in communities along the Connector to solicit comments. These comments were being used as preliminary scoping input to the JPA for the formal environmental process, and will be incorporated during the scoping phase.

CEQA provides for several key points in time during preparation of the program EIR at which agencies and the public will have the further opportunity to comment on the environmental review process. These key points include the following:

- Scoping comment period: As part of the NOP comment period, the JPA will hold scoping meetings to solicit comments, identify issues of concern regarding the proposed project, and incorporate comments into the program EIR analysis.
- Draft EIR comment period: The JPA will conduct informational meetings to present the results of and solicit comments on the draft EIR. The meetings will provide agencies and the public with opportunities to clarify any questions or concerns on the draft EIR before a public hearing is held.
- Final EIR review period: The JPA will hold a public hearing before certifying the final EIR to consider comments on the draft EIR, during which agencies and the public can provide additional comments.
- In addition to holding meetings, the JPA will prepare and distribute to agencies and interested individuals newsletters providing updates of ongoing activities associated with the proposed project and announcing upcoming meetings and public comment periods.

Background

Project Location

The approximate 35-mile-long project is located in the Sacramento region (Figure 1). The project study area is generally bounded by I-5 and Bradshaw Road on the west, the Cosumnes River on the south, Grant Line and White Rock Roads on the east, and U.S. 50 on the north. Within

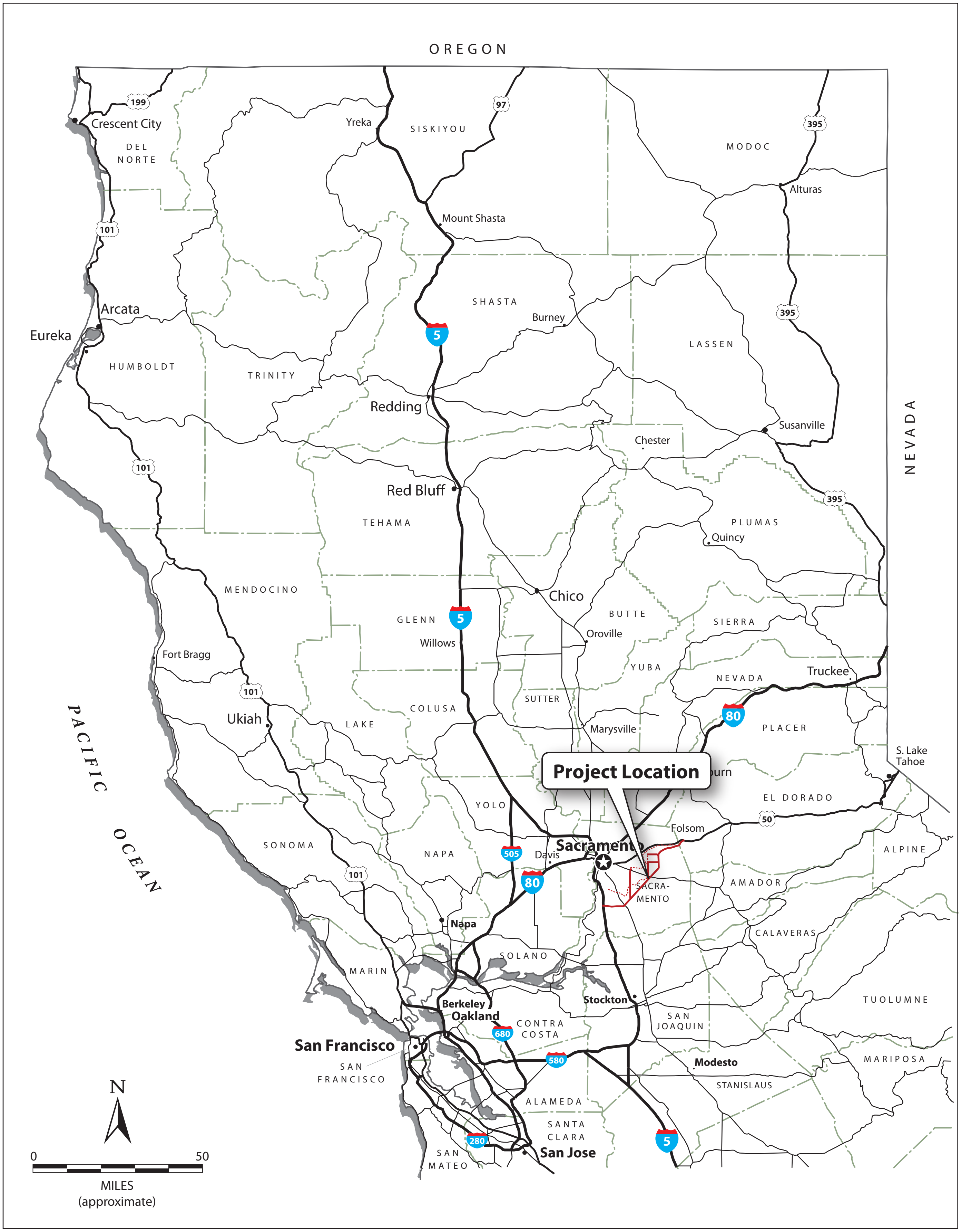

Figure 1
Project Vicinity

unincorporated Sacramento County, the corridor passes through the Franklin-Laguna, Vineyard, and Cosumnes communities and within unincorporated El Dorado County, the corridor is located in the El Dorado Hills community (Figure2).

Previous Studies and Analysis

In response to increasing development, population, and transportation demand, planning for a regional transportation facility to serve the project corridor has been ongoing for two decades. Sacramento County conducted the East Area Transportation Study in 1984, which identified a need for a circumferential "beltway." This became the focus of a feasibility study conducted by the Sacramento Area Council of Governments (SACOG) in 1985. In 1986, the California Department of Transportation (Caltrans) prepared a Route Concept Report for two proposed highways in southern Placer County and eastern Sacramento County, State Routes 65 and 148. The "beltway" and the proposed alignments of the highways were located within the corridor between Elk Grove in the south and southern Placer County in the north.

During the late 1980s, SACOG conducted a study of transportation system improvements for the year 2010 (the Metro Study). The study identified the need for a multi-modal corridor between Interstate 80 near Roseville in Placer County, connecting to U.S. 50 in eastern Sacramento County, and SR 99 and I-5 near Elk Grove in southern Sacramento County. This study specifically analyzed a Route 65/148 freeway. The recommended alternative included this new roadway, along with other transit and bicycle improvements in the corridor.

In the early 1990s, Caltrans undertook the SouthEast Area Transportation Study (SATS) to identify transportation alternatives for meeting future travel demand in the same general corridor that had been identified in the Metro Study. The SATS study was intended to be a feasibility study for a broader area that included the corridor, but with a greater emphasis on multi-modal transportation options.

During preparation of the Metropolitan Transportation Plan (MTP) 2025 by SACOG in 2002, a project in the corridor area was designated as the Elk Grove–Rancho Cordova–El Dorado Connector. Immediately following adoption of MTP 2025, SACOG undertook a project planning process (the Elk Grove-Rancho Cordova-El Dorado Connector Study) to generate input from a wide range of stakeholders on project purpose and need for the Connector corridor, and to define a set of conceptually-defined project alternatives to be considered in a future environmental review process. As a result of this process four conceptual alternatives along with a no-project alternative were developed, which generally follow Hood-Franklin, Kammerer, Grant Line, and White Rock Roads, and include segments using either Bradshaw Road or Sunrise Boulevard.

In May 2005, the SACOG Board of Directors approved a Final Concept Plan report. Detailed descriptions of the conceptual alternatives developed during the Connector study were outlined in the report, along with initial Elements of Purpose and Need. The project was also included in MTP 2035, adopted by the SACOG Board in 2008.

Measure A

In 1988, the voters of Sacramento County passed Measure A, a countywide one-half percent sales tax to be levied over a 20-year period (1989-2009). The proceeds of the tax were specified to be used to fund a comprehensive program of roadway and transit improvements. In 2004, the voters extended

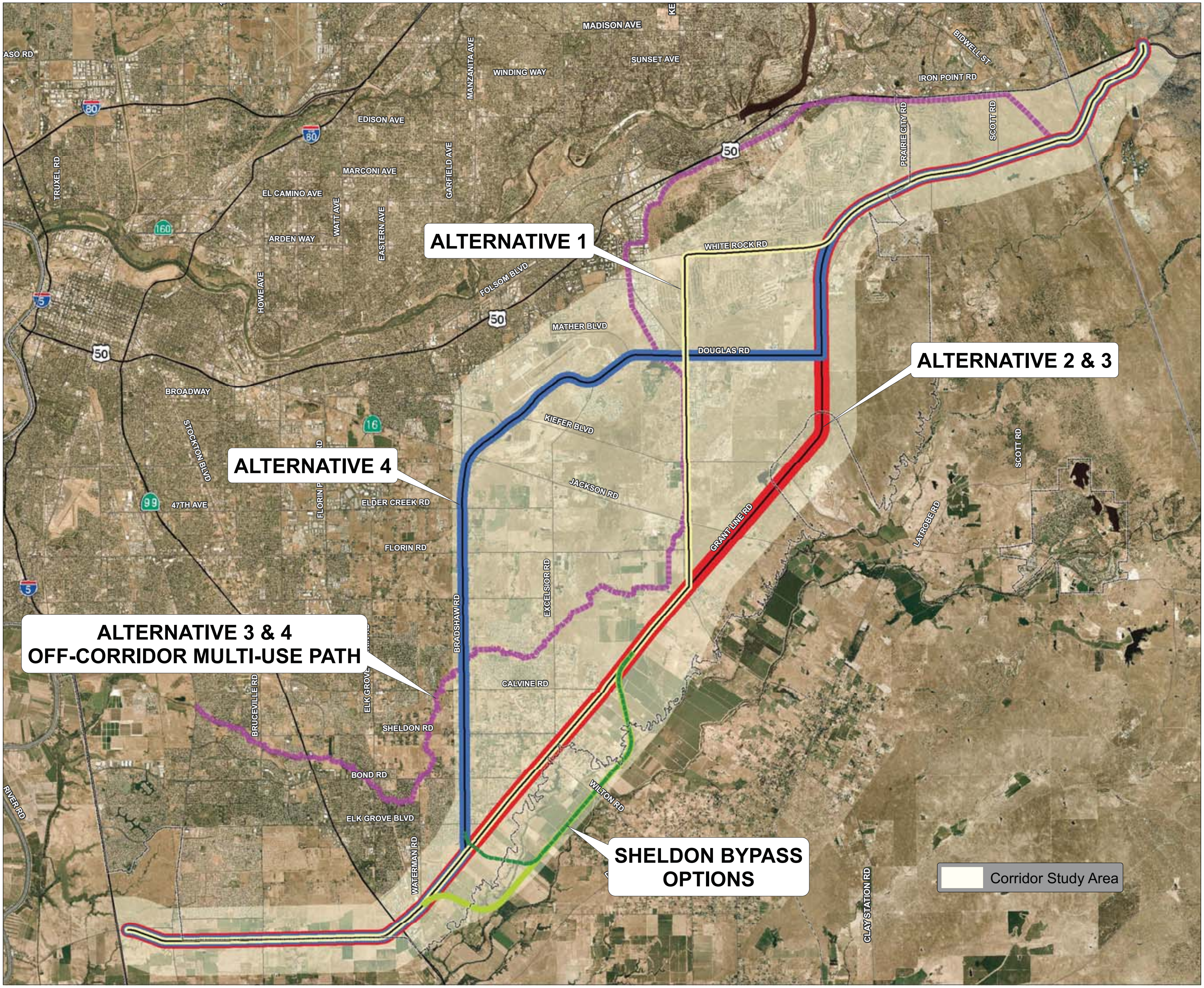

FIGURE 2. PROJECT ALTERNATIVES

0 1 2 4 Miles

the tax an additional 30 years. The ballot text of the Measure A extension, as approved by the voters, identifies the proposed project as the "I-5/SR99/US50 Connector" and specifies that receipt of funding for construction is contingent on the establishment, approval, and adoption of a habitat conservation approach by the local recipient of funds.

Joint Powers Authority

In December 2006, the Cities of Elk Grove, Folsom and Rancho Cordova, as well as El Dorado and Sacramento Counties, collaborated to form a Joint Powers Authority (JPA) to proceed with planning, environmental review, engineering design and development of the Capital SouthEast Connector project. The JPA currently is funded by Regional Surface Transportation Program (RSTP) funds, JPA member contributions, and Measure A funds.

Regional Planning

The proposed project would support numerous past and ongoing regional planning efforts. The following adopted documents were used as a basis to help develop the initial population projections and traffic volume forecasts for the project through 2035:

- MTP 2035, adopted by SACOG on March 20, 2008
- Folsom General Plan, adopted 1988
- Rancho Cordova General Plan, adopted July 26, 2006
- Elk Grove General Plan 2003, as amended May 1, 2007
- County of El Dorado General Plan, as amended July 1, 2008
- County of Sacramento General Plan, adopted December 15, 1993

In addition, more current information from the draft Sacramento County General Plan update, Folsom General Plan update, and the Folsom South of U.S. Highway 50 draft Specific Plan was used to better reflect current conditions in the County and Folsom since adoption of the 1993 and 1998 general plans, respectively.

Lead and Responsible Agencies

The JPA will serve as the lead agency under CEQA for the program EIR. Responsible agencies for the program EIR include the member agencies of the JPA (Sacramento County, El Dorado County, and the cities of Elk Grove, Rancho Cordova, and Folsom), each of which is expected to certify the program EIR. Because this is a program EIR, and no project-level approvals are likely at this point, no other permits or approvals (and hence, no other responsible agency actions) are anticipated for the program EIR.

Project Objectives

Introduction

A statement of a project's objectives provides a basis for defining the range of alternatives to be evaluated in an environmental review process in accordance with the CEQA and the State CEQA Guidelines. CEQA also requires the analysis of a range of reasonable alternatives to a proposed project, which would ". . . feasibly attain most of the basic objectives of the project, but would avoid or substantially lessen any of the significant effects" (State CEQA Guidelines). Based on these requirements, the JPA has developed project objectives intended to address deficiencies in the project area, which are described below.

Background

There are numerous regional and local deficiencies not currently met by existing facilities in the corridor, which cause a variety of underlying transportation problems in the project corridor. These deficiencies include:

- Insufficient transportation options for personal and goods/freight movement to, from, and within the corridor.
- Local streets are increasingly subject to congestion and use by non-local traffic.
- The project study area is susceptible to flooding and needs an all-weather transportation facility to enable normal mobility, as well as emergency vehicle access, in the event of a catastrophic flood or other emergency.
- Increasing vehicle traffic is degrading the safety of existing facilities; improvements are needed to ensure the safety and security of travel by all modes in the corridor (automobile, transit, bicycle, and pedestrian).
- Increasing development encroaches upon open space and wildlife habitat; planning is needed to preserve these resources and ensure access to open space.

In addition, well-planned transportation improvements need to accompany and support housing and job growth to ensure that growth proceeds along planned patterns.

Project Objectives

The overall objectives for the project is to improve mobility, access, and connections between residential and nonresidential land uses, which have been compromised by increasing congestion, and to assist in preservation of open space and threatened habitats. The project would link employment centers and residential areas in the corridor and contribute to the remedy for current and future deficiencies in transportation capacity, safety, and land use compatibility. The project would serve both regional and local travel needs, and would relieve congestion on heavily used local roadways that currently serve the corridor.

During Phase 1, extensive comments by project sponsors and other stakeholders identified the following four purposes of the proposed project:

• Enhance mobility options within the project corridor (and the greater Sacramento region) to serve and support sustainable planned growth and development patterns and principles from the approved General Plans and MTP, while minimizing impacts to the livability of residences and communities along the Project corridor.

The communities in the Project corridor reflect a range of development types, established attributes, and local activities. The Project should not detract from the quality of life established by these communities and expected by their residents. Several defined communities exist along the corridor, including the small unincorporated community of Franklin, the Sheldon area of Elk Grove, the former military housing community on the Mather Air Force Base site, and the El Dorado Hills area of unincorporated El Dorado County.

- Franklin. The unincorporated community of Franklin is located approximately two miles south of Elk Grove and is centered on Franklin Boulevard. The community consists of several stores, a few scattered residences, and a California Historical Landmark cemetery.
- Sheldon. The Sheldon community is a largely "exurban," rural area within the city of Elk Grove that straddles Grant Line Road, with mostly large lot residential uses and a small cluster of commercial uses centered near the intersection of Grant Line and Wilton Roads. The historical two-lane configuration of Grant Line and the relative isolation of the area have fostered a sense of community that long-time residents passionately embrace.
- Mather. The site of the former Mather Air Force Base includes approximately 1,300 single family housing units in the central portion of the base. When the base was active, this housing supported a community of approximately 4,000 people, including military personnel and their families. The units were vacated in 1993 when the base closed. The on-base housing area has been redeveloped. The residential subdivision "Independence at Mather" opened in 1999 and has been well received by the community. The area accommodates new homes, schools, several parks, mature vegetation, and open space on all four sides. Mature vegetation is embedded within the development. Mather Commerce Center, a 250-acre commercial office complex, is located in close proximity to the residential housing site and provides opportunities for employment within a short distance from the homes.
- El Dorado Hills. The community of El Dorado Hills is located in the lower Sierra Nevada foothills in western El Dorado County, about 25 miles east of Sacramento. US-50 is the primary route through the community. The community, which sits immediately inside the El Dorado County line, has developed steadily over the past three decades. In the last few years, it has seen tremendous growth in both facilities and activities available to residents and businesses in the area. Most recently, development has focused south of US-50 on both the two-and four-lane segments of the White Rock Road alignment, with residential development (e.g., Four Seasons, Stonebriar, Cresleigh, A Fuller Sunset, and Valley View), and commercial development (Town Center) directly abutting the roadway.

In addition to the incorporated areas and established communities present in the Project corridor, several single residences and residential communities are located in the project corridor. The main residential communities include:

- **The Sunridge Specific Plan area of Rancho Cordova**, which includes the existing Anatolia development as well as other approved residential projects.
- **The Vineyard Area**, which includes the Vineyard Specific Plan Area and the North Vineyard Station Specific Plan Area
- **Elk Grove residential developments along Bradshaw Road**, which include the following subdivisions:
  - Fieldstone Subdivision
  - Clarke Farms Subdivision
  - Tributary Pointe Subdivision
  - Remington Estates Subdivision
  - Bishop Ranch Subdivision
  - Char-Lyn Acres Subdivision
  - Meadowlark Ranch Subdivision
  - Bradshaw Ranch Estates Subdivision

Under certain circumstances, improvements in mobility can result in making land more attractive for development. In such cases, transportation projects can contribute to inducement of growth which fosters "economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment." (State CEQA Guidelines, 14 Cal. Code Regs. § 15126.2, subdivision (d).) This issue is of particular relevance in areas where local plans do not call for urban development, as is the case in several sections of the alternative corridors under consideration.

While implementation of the Project would not involve any changes in land use plans, it could make some areas more attractive for development by improving access to those areas. Recognizing this effect, strategically applied access control and capacity characteristics would preserve the regional functionality of the Project and, in part, relieve direct growth pressure on adjacent properties not designated for growth. In addition, the project includes $15 million in funds to serve as seed money for a larger program to preserve open space and critical wildlife habitat. Strategically programmed, these funds could effectively inhibit development in areas that are not planned for urban growth.

• Aid economic vitality by improving accessibility to existing and planned job centers and commercial areas, facilitating goods movement, and enhancing the attractiveness of existing and planned employment and commercial areas.

Rancho Cordova is the largest employment center in the corridor, with about 77,000 jobs in 2007. By 2045, employment in Rancho Cordova is expected to more than double, when its job total will be more than the current employment in the Sacramento Central City. The El Dorado Hills Business Park will also become a major employment center, growing from 9,000 jobs in 2007 to more than 33,000 jobs in 2045. Additionally, Elk Grove is expected to grow as an employment center in the region, with an estimated increase in jobs from 25,000 in 2007 to more than 84,000 jobs in 2045.

The Project is a part of the overall regional transportation system, and its ability to improve access and provide connectivity among these communities and throughout the region complements other new and/or improved roadways identified in MTP 2035 as strategies to serve this focused residential and employment growth. The project would facilitate diversified employment opportunities for residents of the region and provide a larger reservoir of skilled workers to businesses in the corridor by creating a more direct connection between residential areas and employment centers.

• Provide a multi-modal facility that limits access to the extent possible to afford efficient transportation options within the corridor that balance transportation needs between local access and shorter trips and regional needs for longer trips; enable flexibility among automobile, transit service, bicycle, and pedestrian uses, while incorporating ITS elements where possible.

The Project is being proposed to achieve the following improvements in transportation operations:

- Reduced total vehicle-hours traveled (VHT) during morning and evening peak commute periods on Corridor roadways, especially time spent in congested conditions;
- Reduced travel times between key origins and destinations (e.g., between the Elk Grove and Rancho Cordova, Elk Grove and El Dorado County, and Rancho Cordova and El Dorado County);
- Evidence of fewer short trips on I-5, SR-99, and US-50, and fewer long trips on local/residential streets; and
- Reduced transit travel times and improved service frequencies in the corridor – evidence of viable options to automobile travel.

To achieve these improvements in transportation operations, the project will need to be designed for higher travel speeds, have a higher capacity, and have less delay at intersections than a typical arterial or thoroughfare facility. The Project will need to be designed primarily to an expressway standard, which will have more limited access than a thoroughfare and will include grade-separated interchanges instead of at-grade intersections at locations where level of service C or better conditions cannot be provided. To achieve the desired transportation operations, the portions of the Project with intersection spacing of less than ½ mile will be greatly minimized.

• Preserve open space, wildlife habitat, and productive agricultural uses in the corridor and minimize growth inducement via sound transportation facility improvements and implementation.

Among the key features of the Project is a $15 million (minimum) allocation to preserve open space, wildlife habitat, and valuable agricultural lands in the project corridor. The preservation could be supported by an active, funded program for open space protection in conjunction with the transportation improvements. Such a program could strategically target those areas that are most susceptible to growth-inducement pressures associated with enhanced access. The manner in which such a program would be administered is dependent on the adoption of JPA policies and procedures that will accompany the development of the overall administration of the Project.

In addition to open space preservation, the Project will include design features that are intended to relieve potential impacts on sensitive natural resources. This will include access management techniques to minimize direct exposure of natural resources to increased activity. It will also include a commitment to alternative modes of transportation, including enhanced transit services and non-motorized facilities. In addition to preserving open space and habitat, the corridor should continue to accommodate agricultural uses through the consideration of the regional need to transport agricultural products to market and to move agricultural equipment. In general, the project should support the overall region's growth and sustainability objectives (including economic and environmental) from a rural perspective.

Sustainable "green highways" design principles also will be incorporated into the project design. These may include preservation strategies for wetlands, farmland, and other ecologically sensitive areas affected by the alignment of the corridor; recycling and reuse of construction materials to reduce energy consumption and construction costs; source controls and other best management practices to decrease the rate of discharge caused by any increase in impervious surfaces, and to capture and reduce pollutant loads generated primarily from roadway usage; and innovative design to reduce noise pollution and light pollution.

Proposed Project

The project limits extend from the Interstate 5 (I-5)/Hood-Franklin Road interchange in southwest Sacramento County east and north approximately 35 miles, terminating at U.S. Highway 50 (U.S. 50) in the vicinity of Silva Valley Parkway approximately 3 miles past the El Dorado County line. The JPA has developed a set of preliminary alternatives that would generally meet the overall project objectives. It is anticipated that these alternatives will be further refined by the JPA and some alternatives could be eliminated from further consideration after input from agencies and the public is received. The draft program EIR will provide a detailed overview of the alternatives screening process as well as a description of any alternatives eliminated to allow the project to move forward with right-of-way acquisition and preservation.

The Connector is expected to provide 4 to 6 traffic lanes to accommodate the projected volume of vehicles in the MTP and general plans, and will provide new multi-modal options. Portions of the Kammerer Road/Grant Line Road near SR99 are currently in the General Plans as 8-lanes although through 2035 the traffic volume for the Connector only requires a 6-lane section. Existing roadways would be utilized to the extent possible. Depending on the alternative selected, some new segments of roadway could be constructed.

Each of the preliminary alternatives includes the following common segments along the approximately 35-mile corridor:

- Expressway segment from I-5/Hood-Franklin Road Interchange to Kammerer Road/Bruceville Road with at-grade signalized intersections spaced at a minimum of 1 mile apart
- Thoroughfare segment on Kammerer Road from Bruceville Road to Lotz Parkway with at-grade signalized intersections spaced at a minimum of 1 mile apart.
- Thoroughfare segment from Kammerer Road/Lotz Parkway to Grant Line Road/Bradshaw Road
- Expressway segment from White Rock Road/Grant Line Road to White Rock Road at the Sacramento/El Dorado County line with grade-separated interchanges at most major cross streets when warranted by LOS conditions
- Thoroughfare segment on White Rock Road from the Sacramento/El Dorado County line to U.S. 50/Silva Valley Parkway interchange
- Non-motorized multi-modal options

Roadway Types

Thoroughfare Segments

The thoroughfare portion of the Connector is similar to an urban arterial, with 4 to 6 traffic lanes. The left turns are limited to at-grade signalized intersection. These intersections are to be spaced a minimum of ½ mile, with one mile spacing preferred and ¼ mile spacing allowed only in locations where consolidation of existing and approved intersections is not feasible. Direct access will also be minimized, with planned and existing driveways to be consolidated or eliminated where feasible. These thoroughfare segments typically include a landscaped median, Class II bike lanes and sidewalks and/or multi-use paths. (See Figure 3 – typical thoroughfare segment.)

Expressway Segments

The expressway portion of the Connector is a 4- to 6-lane divided, high speed facility with grade-separated interchanges where a LOS C cannot be maintained with an at-grade intersection. Access is restricted to the interchanges or intersections where feasible. These expressway segments require a typical 200' right of way, which would accommodate future widening to 6 lanes for exclusive HOV/transit lanes and a separated on-corridor multi-use path. (See Figure 3 – typical expressway segment.)

Rural Roadway Segments

Rural roads are typically 2-lane roadways lacking curbs or raised medians. Rural roads serve primarily to provide access to adjacent land and provide service to travel over relatively short distances as compared to collectors or other higher systems. The City of Elk Grove adopted guidelines for adjustments in roadway capacity within the City's defined rural residential areas, which includes the Sheldon area[1]. The policy establishes an approach to road improvements based on the need to solve specific traffic issues identified through periodic evaluations of traffic conditions with commensurate improvements and provides design standards with the intent of preserving and enhancing existing rural character.

The rural roadway segments for the project are 2-4 lanes with paved shoulders and open ditches for drainage. Access is limited where feasible on these segments, with left turns allowed only at the intersections. (See Figure 3 – typical rural roadway segment.)

Sheldon Bypass Segment

The Sheldon Bypass is a mostly elevated, divided 2-lane facility built on concrete piers and bridge slabs, with extended sections of an alternate direction passing lane to facilitate slower traffic, and continuous shoulders on both sides. Emergency pull outs will be provided at approximate ¼ mile spacing. No additional access points are proposed for the entire length of the bypass including Wilton Road. Bicyclists and pedestrians will be prohibited. (See Figure 4-Sheldon Bypass typical section.)

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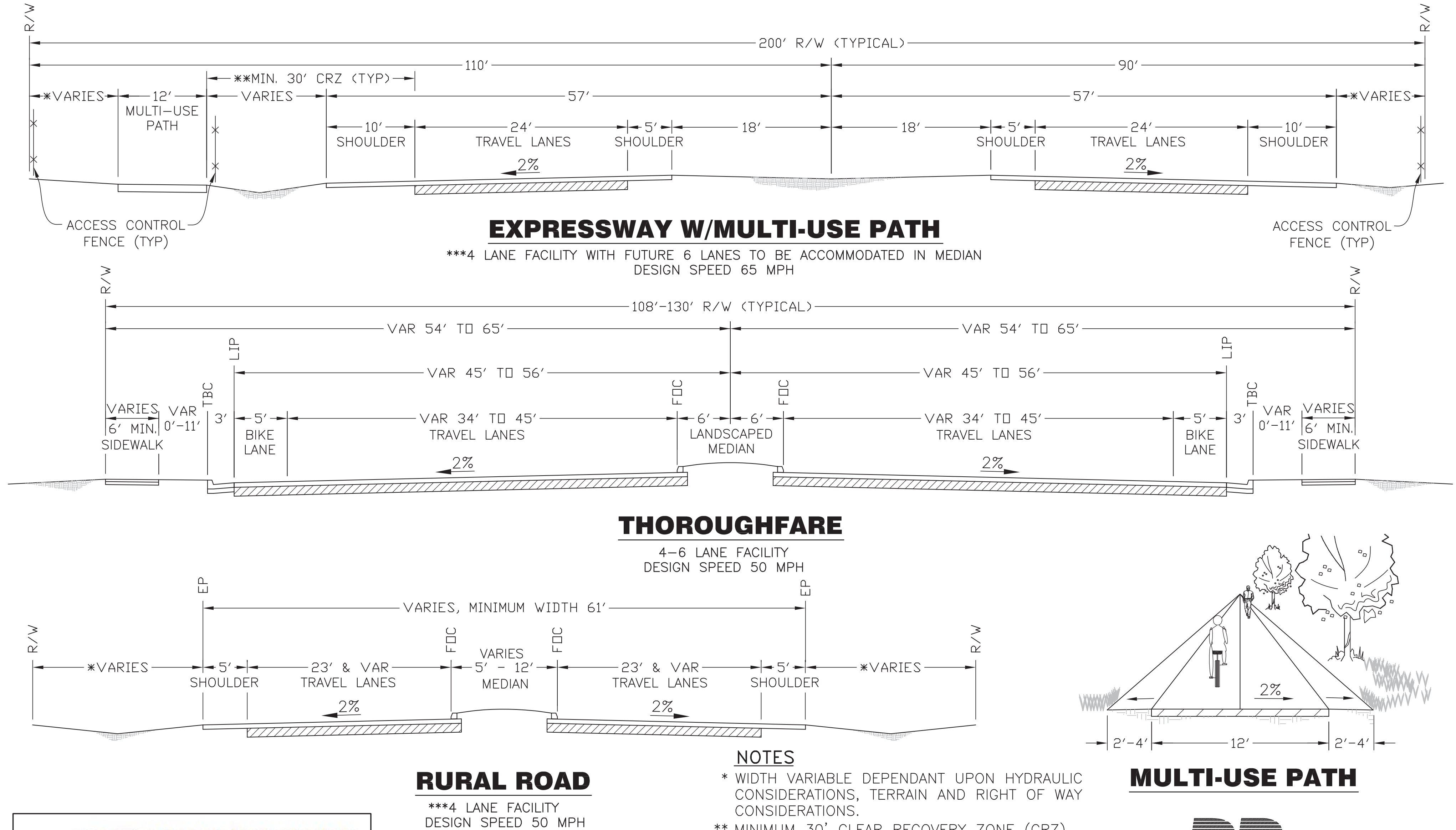
[1] City of Elk Grove. Planning Department. 2007. Rural Road Improvement Policy. Elk Grove, CA. Adopted November 17, 2007. Access date: December 14, 2009. Available: http://www.egplanning.org/rural_roads/files/adopted_documents/Rural%20Road%20Improvement%20Policy_11.20.07.pdf Note: Grant Line Road is excluded from this policy as indicated.



NOTES

* WIDTH VARIABLE DEPENDANT UPON HYDRAULIC CONSIDERATIONS, TERRAIN AND RIGHT OF WAY CONSIDERATIONS.

** MINIMUM 30' CLEAR RECOVERY ZONE (CRZ) IS PREFERRED FROM EDGE OF TRAVEL WAY

*** OFF-CORRIDOR MULTI-USE PATH WILL BE CONSIDERED WHEN APPLICABLE

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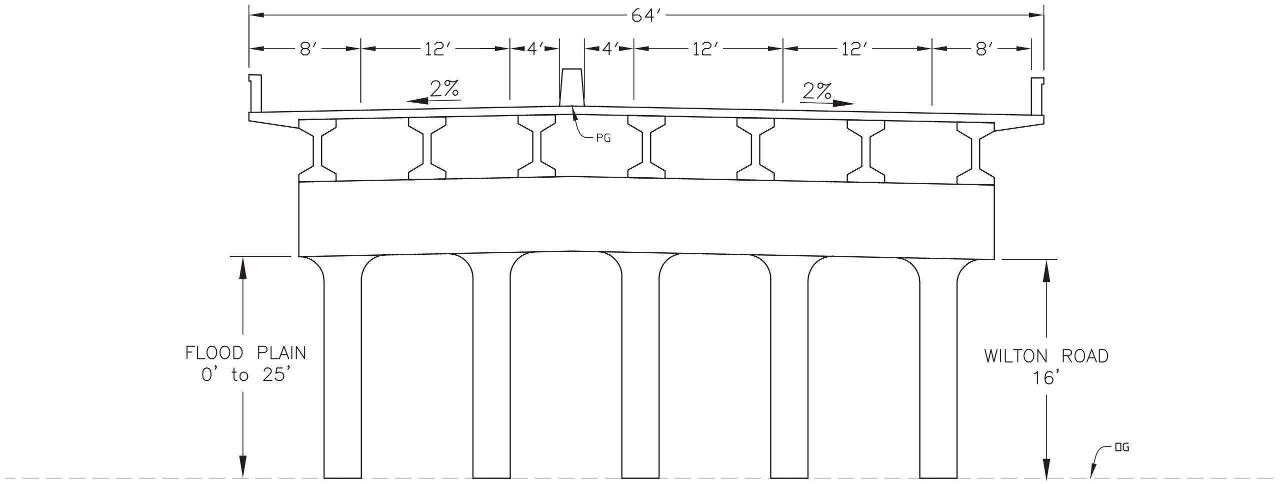
PB 100 YEARS
PB Americas, Inc.
3840 ROSIN COURT, SUITE 200
SACRAMENTO, CALIFORNIA 95834
Tele: 916-567-2500
Fax 916-925-3517

FIGURE 3. TYPICAL SECTIONS



SHELDON BYPASS

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FIGURE 4. BYPASS TYPICAL SECTION

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3840 ROSIN COURT, SUITE 200
SACRAMENTO, CALIFORNIA 95834
Tele: 916-567-2500
Fax 916-925-3517

Interchanges and Intersections

An interchange is typically a junction of two or more travel ways that uses ramps or grade separations to permit traffic to pass through the junction without directly crossing any other traffic stream. It differs from a standard intersection, at which roads cross at grade. Interchanges are almost always used when at least one of the roads is a limited-access divided highway (expressway or freeway), though they may occasionally be used at junctions between two surface streets.

Grade separated interchanges are proposed along the expressway portions of the Connector at most major cross streets except at locations where LOS C conditions can be maintained with an at-grade intersection.

Non-Motorized Facilities

Each of the preliminary alternatives includes the use of a dedicated pedestrian/bike (non-motorized) facility. The type of facility will vary by alternative and by roadway type.

As described above, in thoroughfare segments both sidewalks and Class II bike lanes are proposed to be incorporated into the right of way. The sidewalks are proposed to be 6' to 12' wide and may be separated from the back of the curb, depending on the right of way width and proximity to intersections.

No sidewalks or striped Class II bike lanes are proposed for the rural roadway segments through the Sheldon area. A minimum 5' wide paved shoulder in this area would accommodate bicyclists, or parallel and connecting local roads could accommodate both bicyclists and pedestrians. An off-corridor multi-use path will also be considered in the area where applicable.

In the expressway segments, a 12' Class I non-motorized paved multi-use path with graded shoulders is proposed within the corridor. The path would be separated from the roadway by use of landscaping and/or barriers where necessary. Interim crossings for bike and pedestrian access may be needed as interchanges are phased in over time and to ensure adequate access is maintained to the multi-use path.

Non-motorized facilities vary by alternative. For Alternatives 1 and 2 (described below), additional options will be considered to minimize at-grade crossings of the multi-use path with the roadway and ramps. Also, improved access to local streets and additional features to enhance the functionality of the path will be considered as the design of the facility evolves.

An additional non-motorized alignment for Alternatives 3 and 4 (described below) would be located almost entirely off of the Connector and utilizes existing trail facilities developed by the various jurisdictions where possible. Originating in Elk Grove the trail for these alternatives would optimize the use of existing facilities, constructed and planned along Laguna Creek, the Folsom South Canal, Alder Creek, and other areas along the corridor. A new 12' wide paved multi-use path with graded shoulders is proposed to connect to the existing facilities, linking the entire system together. The final segment of the trail would be aligned and adjacent to the road facility in El Dorado County along White Rock Road. (See Figure 2 – project alternatives and Figure 3 - multi-use path typical section).

Transit Services and Facilities

Transit is an integral component of the Connector project. The transit services operating on the Connector route and on parallel routes will be operated by Regional Transit and/or other transit providers in the study area. The Connector JPA is developing a transit policy to support the transit needs in the Corridor, which will be coordinated with local jurisdictions and providers.

For all alternatives, transit facilities would be provided along the Connector facility and on other yet-to-be determined major arterials within the Connector corridor. Facilities will include exclusive HOV/transit lanes on expressway segments that exceed 4 lanes as well as intersection signal priority, "queue jumps", transit centers and park-and-ride lots, which will be defined and implemented in a phased manner, consistent with development and ridership growth trends. These facilities will be constructed in coordination with expansion of local fixed route, express bus, and bus rapid transit (BRT) services, the latter of which will be implemented as densities increase along the corridor.

Open Space Acquisition and Preservation

Within the Sacramento County Measure A sales tax, the project is allocated $15 million for open space acquisition and habitat preservation. The manner in which the funds for open space acquisition would be applied is subject to further discussion. The program could include a variety of strategies designed to fund acquisition, operation, and management of open space resources.

No-Project Alternative

The No-Project Alternative represents the transportation system in SACOG's adopted 2035 MTP, with widening of the existing roadways along the Connector alignments to 4 or 6 lanes. Access along the roadways within the study area under the No-Project Alternative represents "business as usual," with only minor limitations on new driveways. The No-Project Alternative is also assumed to have numerous at-grade intersections with their locations based on adopted and proposed General Plans and Specific Plans. For the Sheldon Area, the Elk Grove Rural Roadway Standards would apply with improvements made as traffic volume thresholds warrant.

Proposed Preliminary Alternatives

Four preliminary build alternatives are proposed, in addition to a no-build (no project) alternative. The build alternatives contain four elements—roadway, non-motorized trails; transit services and facilities; and open space acquisition—and each have a mix of transit services and facilities both along and off the alignment based on the transit policy. The no-build and build alternatives are described below and illustrated in Figure 2 and Figure 5-typical section segments.

Alternative 1. Sunrise Alignment

The Alternative 1 concept utilizes existing Sunrise Boulevard for a portion of the alignment. This alternative, originating at the I-5/Hood-Franklin Road interchange, follows the common Connector alignment to SR99 along Kammerer Road. From the Grant Line/SR99 interchange, the alignment would proceed along Grant Line Road to Calvine Road, continuing as a thoroughfare except in the Sheldon area which has several options that are defined below for the Sheldon Community Options for Alternatives 1, 2, and 3. The Connector then continues from Calvine Road to Sunrise Boulevard as an expressway.

From there, the alignment follows Sunrise Boulevard north as an expressway from Grant Line Road to just north of State Route 16 (Jackson Highway) and then a thoroughfare segment north of State Road 16 (Jackson Highway) to Douglas Road. North of Douglas Road, the alignment would be east of and parallel to Sunrise Boulevard, requiring an undefined new thoroughfare segment to provide a connection to White Rock Road. Alternative 1 continues east as a thoroughfare, utilizing the White Rock Road alignment through Rancho Cordova. East of Grant Line Road, the Connector then follows the common Connector alignment along White Rock Road and the southern boundary of the Folsom sphere of influence to the El Dorado County with an expressway. In El Dorado County, the Connector is proposed to be a thoroughfare segment along White Rock Road to the terminus at U.S. 50. (See Figure 2 and Figure 5)

Alternative 2. Grant Line Alignment

The Alternative 2 alignment follows Kammerer Road, Grant Line Road, and White Rock Road. The non-motorized facilities follow the main alignment. This concept is located primarily on Grant Line Road. Similar to the Alternative 1, the alignment would proceed from I-5 to SR99 along Kammerer Road . From the Grant Line/SR99 interchange, the Connector would remain on Grant Line Road through Elk Grove and Sacramento County to White Rock Road in Rancho Cordova. On Grant Line Road, from Bradshaw Road to Calvine Road, several options are being considered for the Sheldon Community under Alternatives 1, 2, and 3 . From Calvine Road to White Rock Road, the Connector is proposed to be an expressway. This expressway continues on White Rock Road following the common alignment to the El Dorado County line. In El Dorado County, the Connector is proposed to be a thoroughfare segment along White Rock Road to the terminus at U.S. 50. (See Figure 2 and Figure 5)

Alternative 3. Grant Line Alignment with Off-Corridor Multi-Use Trail

The Alternative 3 alignment is the same as under Alternative 2 except in the design of the non-motorized facilities. The on-corridor bike/pedestrian component under this alternative would be restricted to one side of the roadway and would have limited connections to local streets and few enhancements to intersection and interchange access. However, this alternative would include an additional multi-use trail component aligned off the Connector route. This multi-use path would be constructed along Laguna Creek, the Folsom South Canal, Folsom Boulevard, Alder Creek, and Union Pacific Railroad right-of-way to White Rock Road. The multi-use trail location is consistent with the bicycle master plans of the local jurisdictions, and portions of a trail system is already in existence along Laguna Creek and the Folsom South Canal and would be utilized for this alternative. (See Figure 2)

Sheldon Community Options for Alternatives 1, 2, and 3

Several options are being evaluated for the portion of the Connector alignment through the Sheldon community as part of Alternatives 1, 2, and 3. These options include various alignments for a bypass that would take the Connector route off of the Grant Line Road alignment or that would realignment local street and access points.

Sheldon Bypass Option

This option would construct a bypass of Grant Line Road south of the central part of the Sheldon community. The bypass would be constructed above grade through the Cosumnes River floodplain, just east of Grant Line Road, from Waterman Road or Bradshaw Road to Sloughhouse Road. No access would be provided along the bypass through the floodplain, including at Wilton Road. Under this option, bicycle and pedestrians access would not be accommodated along the bypass because of

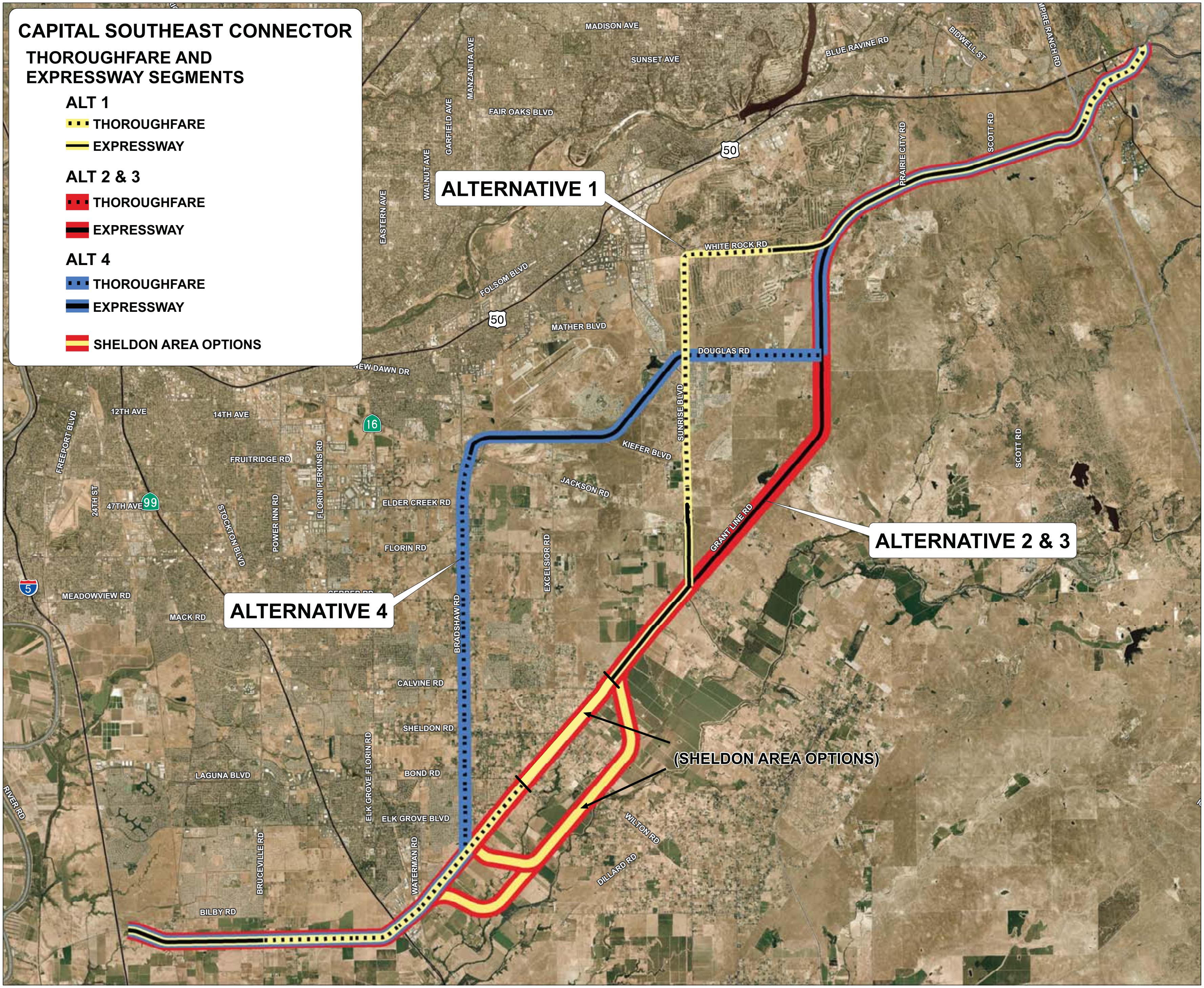

FIGURE 5. TYPICAL SECTION SEGMENTS

0 0.5 1 2 3 4 Miles

the need to limit project footprint and alignment widths within the floodplain. Instead, bicycle and pedestrians would be accommodated along Grant Line Road. (See Figure 2 and Figure 4)

Under this option, the segment of Grant Line Road running through the Sheldon area would not be incorporated into the Project but would remain a rural roadway under the jurisdiction of the City of Elk Grove. This road would be managed in accordance with the Rural Road Guidelines adopted by the City, which anticipate adjustments in capacity as warranted by traffic demand.

Sheldon Limited Access Roadway (LAR) Option

This option proposes to construct a rural road segment, with a raised center median along Grant Line Road thorough the Sheldon Area. This option would eliminate direct driveway access, increasing the capacity of the road while minimizing the right of way impact as much as possible. Controlled spacing of signalized intersections and frontage roads would need to be developed to access businesses and residences at selected locations. An effort will be undertaken to investigate the feasibility of this option and provide sufficient detail for analysis in the EIR. (See Figure 3)

Sheldon No-Build Option

This option proposes the segment of Grant Line Road running through the Sheldon area would not be incorporated into the Project but would remain a rural roadway under the jurisdiction of the City of Elk Grove. This road would be managed in accordance with the Rural Road Guidelines adopted by the City, which anticipate adjustments in capacity as warranted by traffic demand.

Alternative 4. Bradshaw Alignment

The Alternative 4 concept utilizes existing Bradshaw Road for a segment of the Connector. As with all other alternatives, this concept originates at I-5/Hood-Franklin Road interchange, and the first segment, up to Bradshaw Road, matches that of the previously described Alternatives 1 and 2.

At Grant Line Road and Bradshaw Road, the Connector would be aligned to the north along a widened Bradshaw Road up to State Route 16 (Jackson Highway) as a thoroughfare, with access limited and consolidated where feasible. Signalized intersection spacing of ½ mile may not be feasible in this area due to the existing and approved development, therefore minimal ¼ mile spacing may be allowed for this stretch. From Jackson Highway, a new expressway would be constructed in a predominantly easterly direction, along the southern boundary of Mather Airport, to the intersection of Sunrise Boulevard and Douglas Road. The alignment would then follow Douglas Road, as a thoroughfare segment to Grant Line Road where it then follows Grant Line Road as an expressway. East of Grant Line Road, the Connector continues as an expressway and follows the common Connector alignment along White Rock Road to El Dorado County. In El Dorado County the Connector is proposed to be a thoroughfare along White Rock Road to the terminus at U.S. 50. The additional non-motorized trail alignment is the same as in Alternative 3. (See Figure 2 and Figure 5)

Environmental Issues to be Addressed in the Program EIR

Introduction

This section presents a preliminary listing of the probable environmental effects that will be analyzed in the program EIR. The issues to be addressed and the methodologies used will be finalized after comments on the NOP are received. The discussion below summarizes possible impacts for each issue area. The draft program EIR will determine whether these impacts could actually occur, determine their level of significance, and propose feasible mitigation measures to reduce significant impacts. Thresholds for determining significant impacts will be based on applicable sections of the State CEQA Guidelines and regulatory agency standards.

Aesthetics

Impacts could occur both during construction and after facilities are built and in operation. Likely issues associated with aesthetics in relation to the proposed project include:

- Obstructing high-quality or important views of the landscape
- Constructing facilities in the landscape that are visible from important viewing areas or visually incongruous with their surroundings
- Constructing elements that increase to a noticeable level the amount of new light and glare visible from important viewing areas
- Constructing elements in the landscape that are visible from and are incongruous with recreation facilities or open space areas that may be accessible to the public presently or in the foreseeable future

Agricultural Resources

Likely impacts associated with agricultural resources resulting from the project include the following:

- Temporary and permanent removal of land from agricultural production
- Conflict with existing zoning for agricultural uses
- Temporary and permanent removal of land under Williamson Act contract and land considered 'prime farmland' by the State of California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP)
- Changes from the project in the existing environment that could result in the conversion of farmland to non-agricultural use

- Conversion of farmland to urban uses
- Effects of proposed urban uses on any nearby agricultural operations
- Effects of the proposed project on lands under Williamson Act contract and farmland preserves
- Consistency of the project with City farmland preservation policies

Air Quality

Air quality issues associated with the proposed project involve both construction and operational air emissions and conformity with air quality management plans. The issues include:

- potential air emissions from construction equipment fuel combustion and ground disturbance during construction
- potential operational emissions of criteria pollutants (ozone precursors, PM10, PM2.5 and carbon monoxide)

Climate Change

The proposed project's effects on climate change will also be assessed. Specifically, both construction and operations-related greenhouse gas (GHG) emissions will be estimated from increased traffic, electricity, or water use resulting from the proposed project.

Biological Resources

Botanical Resources

Issues associated with botanical resources primarily involve construction-related impacts. The proposed project's elements that could affect botanical resources include the development footprint and other disturbance areas. Construction of the proposed project would involve vegetation removal and ground-breaking activities that could affect:

- Federally listed or state-listed threatened or endangered plant species
- Other special-status plant species
- Wetland and riparian habitats
- Rare native plant communities
- Land under conservation easement

Wildlife Resources

Issues associated with wildlife and fishery resources primarily involve impacts related to construction of the proposed project, which would require vegetation removal and groundbreaking or other construction-related disturbances. These actions could result in any of the following:

- Change of wildlife habitat, disruption of natural movement corridors, or fragmentation or isolation of wildlife habitats
- Disturbance or displacement of wildlife during construction
- Effects on federally listed or state-listed threatened or endangered wildlife species or critical habitat
- Effects on other special-status wildlife species, including state species of special concern and candidate species for federal listing as threatened or endangered
- Effects on wetland and riparian wildlife habitats, or other wildlife habitats that have declined regionally

Cultural Resources

Possible disturbances to cultural resources could result from groundbreaking activities related to construction or alteration of structures with historical significance. Construction of new facilities could lead to:

- Disturbance of known or unknown archeological sites where groundbreaking activities occur, including the Mormon Hill Historic District and the American River Mining District
- Disturbance or alteration of structures with historical importance

Geology/Soils

Issues associated with geologic and seismic hazards and soils constraints involve mostly construction-related impacts. Construction of new facilities could affect:

- Soil stability conditions
- Soil erosion rates
- Topography

Operational issues include:

- Exposure of people or property to geologic hazards
- Possible location of facilities in substrate that contains material subject to liquefaction or other secondary seismic hazards from ground shaking
- Possible location of facilities within a known active fault zone or an area characterized by surface rupture that might be related to a fault

Hazards and Hazardous Materials

Impacts associated with hazards and hazardous materials primarily involve construction-related activities, including the following possible impacts:

- Routine transport, use, or disposal of hazardous materials associated with project construction
- Construction of portions of the proposed projects on a site that is included on a list of hazardous material sites
- Potential interference with an adopted emergency response plan or emergency evacuation plan during construction

Hydrology/Water Quality

Issues associated with hydrology and water quality are primarily related to the construction of new facilities, including:

- Alteration of surface water flow
- Changes in groundwater flow and recharge
- Construction of facilities within a floodplain
- Surface water quality impacts associated with project construction and run-off from the new facilities due to increased impervious surfaces in the project area
- National Pollutant Discharge Elimination System (NPDES) permit compliance

Land Use/Planning

Most land use impacts could result from construction of new facilities, including:

- Compatibility with adjacent land uses or zoning designations
- Consistency with local land use policies
- Division or disruption of existing communities, including Sheldon, Mather Housing, and El Dorado Hills

Mineral Resources

Impacts associated with mineral resources involve the possibility the construction of the proposed project will result in the loss of availability of a known mineral resource that would be of value to local or regional jurisdictions or the state

Noise

Issues associated with noise involve both construction and operational activities. Construction activities that can be a significant source of noise include trucking operations, use of heavy construction equipment (e.g. graders, cranes, and front-end loaders), pile-driving activities, and blasting. The extent to which these activities will occur or be of concern will depend on the requirements of construction sites. Sources of operational noise include traffic associated with use of the proposed project.

Population and Housing

Issues associated with population and housing primarily involve construction of the proposed facilities. Construction of new facilities could lead to displacement of residences or interruption of the operation of businesses during construction.

The following operational issues will also be reviewed:

- Additional population growth due to construction of the proposed project
- Additional residential housing units built in the project vicinity due to the proposed project
- Shifts in jobs/housing balance due to the proposed project
- Additional jobs created by construction of the proposed project

Public Services

The major effects on public services and facilities include increased demand and potential disruption of services. Construction-related effects on public services and facilities include increases in police, fire and emergency medical response times.

Depending on the potential of the project to induce growth, the need for other public services and facilities could result from operation of the proposed project.

Recreation

The proposed project has the potential to displace or degrade recreational facilities and opportunities in the project area. In addition, depending on the growth-inducing potential of the proposed project, the resulting increased use could further degrade existing recreational facilities.

Transportation/Traffic

Issues associated with transportation and traffic related to construction and alteration of existing roadways and facilities involve both construction-related and operation impacts. The construction-related issues include:

- Additional trips occurring during transportation of the construction crew and materials
- Increase in traffic volume on the adjacent roadways resulting from road closures and detours
- Alteration of circulation patterns and interruption of traffic flow during construction resulting from road closures and detours
- Disruption of bicycle, pedestrian or transit access
- Increase in traffic hazards resulting from construction activities

Operational issues could include:

- Alteration of traffic due to the proposed project
- Changes in access for pedestrians, bicyclists and transit
- Increased use of associated roadways to access the proposed project, resulting in traffic and potential level of service violations

Utilities and Service Systems

Issues associated with utilities and service systems include the following:

- Disruption of utility service during project construction
- Relocation of existing facilities in the project area for construction
- Increased demand for utilities due to operation of proposed project, including increased electricity for operation of associated facilities (e.g. streetlights)

Cumulative and Growth-inducing Impacts

Indirect effects, or cumulative and growth-inducing impacts, associated with the project will also be discussed in the program EIR. As described above under "Purpose of the Program EIR", use of a program EIR ensures the consideration of cumulative impacts. A cumulative impact consists of significant effects that are the result of the combined effects of individual past, present, and probable future projects. A project's individual effect may be considered less than significant while still making a considerable contribution to a significant cumulative effect. A background of the cumulative impact analysis will be developed by the JPA and will include build out of the general plans for the cities and the counties within the project area.

Issues associated with utilities and service systems include the following:

- The potential capacity addition to roadway segments and their potential influence on growth
- The specific relationship between the project's capacity to projected and planned growth
- The consistency of the project with projected growth

- The development policies of the counties' and cities' general plans and whether the implementation of the project would eliminate a significant obstacle to growth in an area that would otherwise not be affected

Scoping Report

Capital SouthEast Connector
Environmental Impact Report
Scoping Report
March 9, 2010

After the February 1, 2010 release of the Notice of Preparation for the Program Environmental Impact Report for the Capital SouthEast Connector five scoping meetings were conducted. The meetings were conducted the on the following dates and at the following locations:

El Dorado Hills Library	Tuesday, February 23, 2010
Rancho Cordova City Hall	Wednesday, February 24, 2010
Sacramento County Ag Extension Auditorium	Monday, March 1, 2010
Elk Grove City Hall, Council Chambers	Wednesday, March 3, 2010
Folsom Community Center	Monday, March 8, 2010

Overall, seventy-eight people attended the scoping meetings, with the largest attendance at the Elk Grove meeting. A copy of the sign in sheet from each meeting is attached to the report.

Advertisements for the meetings were placed in the following publications prior to the meetings:

Sacramento Bee
Folsom Telegraph
Village Life
Elk Grove Citizen
Grapevine Independent

Additionally, the Connector office mailed postcards to more than two thousand area residents.
The meeting formats were identical at each meeting. There were display exhibits that provided information about the following topic areas:

Travel Demand and Transportation

Environmental

Public Outreach

Engineering/Design

Connector staff and consultants staffed each exhibit area to answer any questions that meeting attendees had about the specific topic areas covered. A separate station was set up for public comments. Comment cards were available for meeting attendees to fill out at the meeting or take home and mail/email/fax to the Connector office. A copy of the comment card is attached to the report.

Comments received at the scoping meetings are summarized below:

El Dorado Hill Scoping Meeting
February 23, 2009
Comment Card Summary

Senior citizens from El Dorado Hills

- Feel that the highway will diminish housing prices in the area
- The dust and exhaust will cause health problems among children and seniors
- Suggest connecting at Prairie City Road because there is no housing around that area
- Feel that scoping meetings are a "formality" and the road plan will not change regardless of public opinion
- Feel that there is no reason for the road to connect so high along 50 because there has been no growth above El Dorado Hills (Cameron Park and Placerville) in the last five years

El Dorado Hills Business Park Representative

- Feels that there needs to be a full study of the impacts to the area and planned growth to predict what traffic will be in 2025
- Adding traffic from outside El Dorado County onto an infrastructure that was designed only to accommodate internal growth must be mitigated or avoided
- It is geometrically impossible to accommodate all of the traffic that will exist by 2025 at the intersection of White Rock and Latrobe Road and adding the connector will make this worse
- Connector should attach to Highway 50 before El Dorado Hills

Four Seasons Resident

- Connector will increase traffic to area near White Rock Rd.
- Alternatives all increase traffic in town center
- Makes more sense to route traffic to Highway 50 before town center to cut back traffic

Four Seasons Resident

- Feels that connector section at White Rock Rd should be re-routed through the business park and Prairie City road
- White Rock will create a bottleneck
- White Rock section will pass through Four Season Community

Rancho Cordova Scoping Meeting
February 24, 2010
No scoping comments received

Sacramento County Scoping Meeting
March 1, 2010
No scoping comments received

Elk Grove Scoping Meeting
March 3, 2010
Comment Card Summary

Elk Grove Resident:

How long will the LAR take?
How long after the LAR is complete will it be available to review?
JPA should consider connecting the bypass with Hwy 50 between Prairie City and Scott Road because there is nothing built there right now rather than connecting it all the way up White Rock Road because there is so much development in El Dorado County.

Elk Grove Resident who commutes to Ranch Cordova:

This person supports this project that will provide an alternative to I-5 and 99. They think it is a great asset to Elk Grove citizens and a much needed improvement.

Elk Grove Resident:

Thinks Sheldon should be left as it is. At a maximum – 4 lanes with turnabouts and without closing private driveways and building new side access roads. Cites Bradshaw as an example that works.

WAG member from Wilton:

The most immediate solution to the Sheldon issue is community preservation with limited access roadway. This is the least disruptive and most options for improved success of the rural community. The bypass is wrong in the following ways: floodplain intrusion by infrastructure, habitat detriment, cost, the actual bypassing of Sheldon

Elk Grove Resident:

Excellent Outreach

Folsom Scoping Meeting
March 8, 2010
Comment Card Summary

Environmental concern from Granite Bay Resident

The NOP for the Program EIR on page 21 under the title “Cultural Resources” specifies disturbance to “archaeological sites” and “structures with historical importance” but does not mention paleontological resources as included as Cultural Resources under CEQA. Ground disturbance around the connector could impact paleo resources and the Program EIR needs to address these potential impacts.

The complete version of each comment card received at the meeting is attached to the report.

CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

SIGN-IN SHEET

El Dorado Hills Public Scoping Meeting
El Dorado Hills Library

Tuesday, February 23, 2010
6:00 p.m. – 8:00 p.m.

	Name	Organization	Address & Phone Number	Email Address
1	JOHN THOMSON	BASS LAKE ACTION COMM.	501 KIRKWOOD CT EDH CA 95762	doctorjo8@AOL.com
2	Jon Jakowatz	Four Seasons Connector Workgroup	6031 Creekberry Way EDH	on file.
3	ART MARINACCIO	EDH BUSINESS PARK ASSN	4024 JACKPINE RD SHINGLE SPRINGS 530-957-9276	ARTMARINACCIO@HOTMAIL.COM
4	JOHN RASLEAR	FOUR SEASONS CIVIC LEAGUE	3124 FOUR SEASONS DR EL DORADO HILLS CA 95762	4SCIVICLEAGUE@SBCGLOBAL.NET
5	Ray Nutting	County Supervisor El Dorado		RayNutting@Hughes.net
6	David Robinson	Fehr & Peers	1728 Timberline Ridge Drive El Dorado Hills, CA 95762	D.Robinson@fehrandpeers.com
7				
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CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

SIGN-IN SHEET

El Dorado Hills Public Scoping Meeting
El Dorado Hills Library

Tuesday, February 23, 2010
6:00 p.m. – 8:00 p.m.

	Name	Organization	Address & Phone Number	Email Address
1	Jim + Judi Rusha		4016 Treeline Wy EDH, Ca 95762	
2	Joanne Cisneros	4Seasons Civic League	7523 Doe Springs Way EDH Ca 95762	jlc2009@comcast.net
3	Carolyn Grace Ralph Morgan		1001 Autumn Trail Way, EDH 933-3688	busigrace@comcast.net
4	Paul Raveling		2737 Carnelian Circle, EDH 95762 933-5826	Paul.Raveling@sierrafoot.org
5	NOAH BRIEL		2021 OLD BASS LAKE RD. EDH 95762 530 672-2074	SIERRAMIRAGE@MSN.com
6	Bill Kennedy	4 Seasons Civic League	3072 Four Seasons Dr. EDH 916-358-5267	wmkennedy07@yahoo.com
7	Matt Keasling	Taylor & Wiley		mkeasling@taylor-wiley.com
8				

CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

SIGN-IN SHEET

El Dorado Hills Public Scoping Meeting
El Dorado Hills Library

Tuesday, February 23, 2010
6:00 p.m. – 8:00 p.m.

	Name	Organization	Address & Phone Number	Email Address
1	Don Gibson	Four Seasons' Civic League	8714 Snow Fall Way El Dorado Hills Ca. 95762 (916) 933-4872	nanapmagibson 6 comcast.net
2	Mark Hanson	Cordova Hills	5241 Arnold Ave McClellan, CA 95652 916-565-3667	mhanson@sbmcorp.com
3				
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El Dorado Hill Scoping Meeting
February 23, 2009
Comment Card Feedback

Senior citizens from El Dorado Hills

- Feel that the highway will diminish housing prices in the area
- The dust and exhaust will cause health problems among children and seniors
- Suggest connecting at Prairie City Road because there is no housing around that area
- Feel that scoping meetings are a “formality” and the road plan will not change regardless of public opinion
- Feel that there is no reason for the road to connect so high along 50 because there has been no growth above El Dorado Hills (Cameron Park and Placerville) in the last five years

El Dorado Hills Business Park Representative

- Feels that there needs to be a full study of the impacts to the area and planned growth to predict what traffic will be in 2025
- Adding traffic from outside El Dorado County onto an infrastructure that was designed only to accommodate internal growth must be mitigated or avoided
- It is geometrically impossible to accommodate all of the traffic that will exist by 2025 at the intersection of White Rock and Latrobe Road and adding the connector will make this worse
- Connector should attach to Highway 50 before El Dorado Hills

Four Seasons Resident

- Connector will increase traffic to area near White Rock Rd.
- Alternatives all increase traffic in town center
- Makes more sense to route traffic to Highway 50 before town center to cut back traffic

Four Seasons Resident

- Feels that connector section at White Rock Rd should be re-routed through the business park and Prairie City road
- White Rock will create a bottleneck
- White Rock section will pass through Four Season Community

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Public Scoping Comments
For the Capital SouthEast Connector
Program Environmental Impact Report

Please circle topic your comment relates to:

- Environmental
- Traffic/ Transportation
- Project Alternatives
- Other

Name Carolyn Grace

Organization and Address
1001 Autumn Trail Way
El Dorado Hills

Phone (916) 933-3688

Fax ( )

E-mail busigrace@comcast.net

Comment here: 2-23-10
Date

Living in Four Seasons which is adjacent to White Rock, I am very concerned about the increased traffic the Connector will bring to our area. Currently the proposed alternatives all terminate in the vicinity of Town Center which would greatly increase traffic in this area. Residents in EDH make many local trips to this area and this scenario will only increase as retail increases. Having commuter traffic accessing Highway 50 in this locale will create huge traffic issues. It seems to make more sense to route traffic to Highway 50 prior to traveling through this area (Sacramento Co. Line and east to La Trobe), I think other freeway entrances would better serve commuter traffic and allow for smoother flow of traffic.

Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.

Thank you

(Please print clearly)

CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

Public Scoping Comments
For the Capital SouthEast Connector
Program Environmental Impact Report

Name Jim & Judi Riska
Organization and Address 4016 Treeline Wy
EDH, Ca 95762

Phone ( ) ______
Fax ( ) ______ E-mail ______

Please circle topic your comment relates to:

Environmental
Traffic/ Transportation
Project Alternatives
Other

Comment here: ______
Date

I submitted a letter but had also thought that EDH County is extremely high in all their fees! So unless someone needs their name & pats on backs, its all political! There has been "NO" growth for 5 years above EDH!

Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.
Thank you
(Please print clearly)

CAPITAL | SOUTHEAST
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Connecting Communities

Public Scoping Comments For the Capital SouthEast Connector Program Environmental Impact Report

Name Ralph Morgan
Organization and Address 1001 Autumn Trail Way
El Dorado Hills, CA
95762
Phone (916) 933-3688
Fax ( ) ______ E-mail ______

Please circle topic your comment relates to:

- Environmental
- Traffic/ Transportation
- Project Alternatives
- Other

Comment here: 2-23-2010
Date

Please look carefully at the proposed connector section of White Rock Road East of the SAC-El Dorado County line. We believe that this section which passes through residential neighborhoods (including Four Seasons age restricted community) should be re-routed through the business park and Prairie City road. High volumne thourofare traffic along this section of White Rock will be a nightmare, not only for local residents, but also for commuters who will inevitably be slowed through this area. The intersection of White Rock and Latrobe roads will be an unacceptable bottleneck. Please reconsider!

Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.
Thank you
(Please print clearly)

Thanks,
Ralph Morgan

Art Marinaccio
4024 Jackpine Rd.
Shingle Springs CA 95682

RE: Sacramento SouthEast Connector EIR scoping
February 23, 2010

There are a few major issues that of necessity must be discussed both within the project description and EIR.

The El Dorado County General Plan and Transportation capital improvement program identify transportation improvements that will be needed within the approximate 20 year time frame to marginally deal with the traffic generated by growth within El Dorado County. El Dorado County will continue to grow past the 2025 approximate time line of the General Plan. El Dorado Hills will likely incorporate within the time frame of the EIR for this proposed project.

The addition of additional traffic from outside El Dorado County onto infrastructure that was designed only to accommodate internal growth must be fully mitigated or avoided. The most critical intersection identified in the El Dorado County General Plan is at White Rock and Latrobe Road. There has been identified no possible geometry for this intersection that can accommodate all the local traffic that will exist by 20025 no less the traffic that would be added by making this intersection part of a regional connector.

Possible mitigations that must be studied completely include a fully functional alternative route to highway 50 to accommodate both residential and commercial traffic from the south end of Latrobe Road back to highway 50 in Sacramento County. The route constructed must accommodate the actual traffic not just the additional traffic to be generated by future development in Sacramento County and Folsom. This study must be based on reasonable growth assumptions. Assuming no growth in El Dorado County past 2025 is neither reasonable nor acceptable.

One of the alternatives studied needs to identify a route for the connector that enters Highway 50 prior to entering El Dorado County.

To the extent that this proposed project proposes to add additional traffic to a local road system that is already over capacity with no identified mechanism to alleviate the additional traffic this is clearly a CEQA issue requiring both study and appropriate mitigation. No statement of overriding consideration will be acceptable to the people or business community of El Dorado County.

I am representing the El Dorado Hills Business Park Association in this matter and wish to be kept informed of progress.

Thank you,
Art Marinaccio

Feb. 23, 2010

Connector Road:

Housing prices are low as it is, therefore why even bring the connector road so high up to even mess with homes and people! To help California would be to help the people that have property and to keep their homes without diminishing their value. Even if we could sell at a lower price, our homes will drop more with a highway so close. Now if it were further from us our prices could rise because it would be a benefit. But right in our backyard it is a deterrent!

No one bought homes here to have a huge road put in, to have noise, dust and exhaust invading their homes and outdoor life style. The health problems will certainly take it's toll on Seniors and children that live in the area.

Some cannot move, whether it be because of health, finances or just the stress of moving. All of us are not deaf or blind and we can smell exhaust and dust! We gave to society, worked and brought up our families, now is our time for rest and relaxation! It's not a time to wonder how bad the air is before we go swimming, playing tennis, working in the garden or running, biking or walking in our area.

I realize most progressives believe Seniors are disposable and might as well kill them off as quickly as possible! I realize you want to be progressive and this is progress! But it isn't for those living next to a highway! You want our taxes, our vote and our organs, but you don't believe we are good for anything else.

One question, do you live next to a freeway or huge highway? Would you want your parents or children, grandchildren to live next to one? Why not? Why even bring that road so high up! You could cut it off and connect it at Prairie Road and use that corridor, that has no housing around it! You wouldn't be dropping our housing prices, you wouldn't have people upset, and you would be saving the government millions of dollars!

I'm sure you already have your backing, finances, plans and these meetings are just a formality and nothing is going to stop where you put this road, unless it's an endangered species!

The years that it takes you to build this road will leave a carbon footprint longer and more than everyone in Four Seasons! I understand the way the government and big business works. If we had a drought in California and we couldn't water our lawns they would die, even though we spent money to put it in, it wouldn't matter....but if you were putting in the road, and the drought hit, you would still be able to get your water to spray on dirt to keep the dust down! Water for dust, not for growth of plants!

I don't know how many people this road will help. Building is at a standstill starting 5 years ago in Placerville and Cameron Park. Eskaton in Placerville is the only housing that actually got completed! And I doubt if too many of them drive constantly to warrant a road!

I know too that you will justify everything in your favor. Everyone can justify what they do and why to their own benefit! But I again, urge you to change plans and put the connector road further down from this area in order to save the negative economic impact of California for Seniors and those that have homes in this area.

Thank you,
Judi & Jim Resha
4016 Treeeline Way
EDH, Ca 95762

Comment Summary
Elk Grove
March 3, 2010

Elk Grove Resident:

How long will the LAR take?
How long after the LAR is complete will it be available to review?
JPA should consider connecting the bypass with Hwy 50 between Prairie City and Scott Road because there is nothing built there right now rather than connecting it all the way up White Rock Road because there is so much development in El Dorado County.

Elk Grove Resident who commutes to Ranch Cordova:

This person supports this project that will provide an alternative to I-5 and 99. They think it is a great asset to Elk Grove citizens and a much needed improvement.

Elk Grove Resident:

Thinks Sheldon should be left as it is. At a maximum – 4 lanes with turnabouts and without closing private driveways and building new side access roads. Cites Bradshaw as an example that works.

WAG member from Wilton:

The most immediate solution to the Sheldon issue is community preservation with limited access roadway. This is the least disruptive and most options for improved success of the rural community. The bypass is wrong in the following ways: floodplain intrusion by infrastructure, habitat detriment, cost, the actual bypassing of Sheldon

Elk Grove Resident:

Excellent Outreach

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Connecting Communities

SIGN-IN SHEET

Elk Grove Public Scoping Meeting
Elk Grove City Hall – Council Chambers

Wednesday, March 3, 2010
6:00 p.m. – 8:00 p.m.

	Name	Organization	Address & Phone Number	Email Address
1	Lorraine Croup		2932 Robinson Creek Ln. Elk Grove 95758	
2	Suzanne Pecci		10212 Equestrian Dr. Elk Grove	SLpecci@aol.com
3	Nikki Carpenter		8700 Mecca Rd Elk Grove.	
4	William Myers	SCA	10300 Sheldon Rd., E.G.	wemyers@cal.net
5	Barbara Washburn	WAG	8541 Dillard Rd Wilton	washburn[illegible]@frontier[illegible].net
6	Rita Velasquez	EG CHAMBER	9370 Studio Court, Ste 110 EG	ritav@elkgroveca.com ~~ritav~~
7	Patricia Mahon		9951 Grant Line Road Elk Grove	mahonpl@aol.com
8	Homer [illegible]		10595 Franklin Blvd Elk Grove	Hkhapp@aol.com

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SIGN-IN SHEET

Elk Grove Public Scoping Meeting
Elk Grove City Hall – Council Chambers

Wednesday, March 3, 2010
6:00 p.m. – 8:00 p.m.

	Name	Organization	Address & Phone Number	Email Address
1	Matt Satow		8654 Bradshaw Rd.	MSatow@Markthomas.com
2	Domenic Spinelli		10656 Sheldon Woods Way EG	domenic@olsonlaw.com
3	Kristy Day	HDR/THE HOYT COMPANY	1325 J ST, STE 1300 SACRAMENTO CA 95814	KRISTY.DAY@HDRINC.COM
4	Harold Overmier		~~[illegible]~~ 10780 CHAMBEAU WAY, ELK GROVE	
5	Tom Shine	GSREHA/SCA	8758 Rubia DR. Elk Grove, CA 95624	shine8758@frontiernet.net
6	max Karl		8330 Chester Dr Sac 95830 916 698 1189	maxKarl@frontiernet.net
7				
8				

CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

SIGN-IN SHEET

Elk Grove Public Scoping Meeting
Elk Grove City Hall – Council Chambers

Wednesday, March 3, 2010
6:00 p.m. – 8:00 p.m.

	Name	Organization	Address & Phone Number	Email Address
1	CORRIGAN ROBERT		9255 GRANT LINE RD 916-686-6456	BOJEACOR@ ~~[illegible]~~ GMAIL .COM
2	EVERSDEN RON		10280 - EQUESTRIAN DR 916 - 686-5722	
3	Tim Washburn		8541 Dillard RD Wilton CA 95693	
4	Ron & Sandy HAMPTON		10592 FRANKLIN BLVD (916) 684-2513 ELK GROVE, CA 95757	
5	LORI CANDELARIA		10343 LINSCOTT CT 510-205-6588 ELK GROVE, CA 95624	lori_can@yahoo.com.
6	Richard Shepard	City of EG		
7				
8				

CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

SIGN-IN SHEET

Elk Grove Public Scoping Meeting
Elk Grove City Hall – Council Chambers

Wednesday, March 3, 2010
6:00 p.m. – 8:00 p.m.

	Name	Organization	Address & Phone Number	Email Address
1	Ruth Drescher-Brown	WAG	10300 Colony Rd. Wilton, CA 687-8604	ruthandvern@citlink.net
2	Dave & Karon Youns	Property Owner	~~8824~~ 8824 Grantline Road Elk Grove 6824226	
3	Vic Russo	property owner	8829 Burnt Spur Ct 689-6961	
4	Rock Carlson	property owner	8810 Burnt Spur CT 688-3238	
5	Kandus Ford		10595 Franklin Blvd 205 7836	Kandus64@yahoo.com
6	Barbane Lemar	SCA	9831 Edeva Way EG 95624 714-0284	
7	Brent Lemon	Citizen ElkGrove	5801 Laguna Vale Way, EG 95758 683-2292	brentlemon@gmail.com
8	Lori Candelaria	Resident	510-205-6588	lori_can@yahoo.com.

CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

SIGN-IN SHEET

Elk Grove Public Scoping Meeting
Elk Grove City Hall – Council Chambers

Wednesday, March 3, 2010
6:00 p.m. – 8:00 p.m.

	Name	Organization	Address & Phone Number	Email Address
1	Lucille Christensen		4220 Hood Franklin Rd Elk Grove Ca 95757	
2	DAVE SIMAS		10860 BeitzEL ROAD ELK GRAVE CA. 95624	
3	GARY GRUNWALD	CITY OF E.G.		
4	Sharon Lynes	SCA	8976 Mackey Rd. EG 95624	sgelkgrove@yahoo.com
5	STEVE LEE		9120 QUAIL TERRACE WY EG 95624	
6	Connie Conley	E&CC	8854 St. Anthony Cut EG 95624	connieteg@frontiernet.net
7	Joe Dachling		10045 Grant Line Elk Grove 95624	dachlingranch@hotmail.com
8	Dan Gougherty			ElkgroveNews@yahoo.com

CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

Public Scoping Comments
For the Capital SouthEast Connector
Program Environmental Impact Report

Name Tom Shine

Organization and Address
8758 Rubia Dr.
Elk Grove 95624

Phone (916) 681-9534

Fax ( ) E-mail

Please circle topic your comment relates to:

- Environmental
- Traffic/ Transportation
- Project Alternatives
- Other

Comment here: 3/3/10
Date

Excellent outreach

Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.

Thank you

(Please print clearly)

CAPITAL | SOUTHEAST
CONNECTOR JPA
Connecting Communities

Public Scoping Comments For the Capital SouthEast Connector Program Environmental Impact Report

Name Nikki Carpenter

Organization and Address 8200 Mecca Rd
Elk Grove, CA 95624

Phone 916 682-8783

Fax ( ) ——

E-mail weeteepee@frontiernet.net

Please circle topic your comment relates to:

- Environmental
- Traffic/ Transportation
- Project Alternatives
- Other

Comment here: 3/3/10
Date

(1) How long will the LAR take? (2) How long after the LAR is completed will it be available to review?
(3) Why has the JPA not considered running the by pass up White Rock & connect with Hwy 50 between Prairie City & Scott Road rather than all the way up White Rock with all the development that exists in El Dorado County. There is so much open space available between Prairie City & Scott Road, no homes, nothing there right now.

Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.
Thank you
(Please print clearly)

CAPITAL | SOUTHEAST
CONNECTOR JPA
Connecting Communities

Public Scoping Comments
For the Capital SouthEast Connector
Program Environmental Impact Report

Please circle topic your comment relates to:

- Environmental
- Traffic/ Transportation
- Project Alternatives
- Other

Name Ruth Dresher-Brown

Organization and Address WAG
10300 Colony Rd
Wilton, CA 95693

Phone (916) 687-8604

Fax ( ) " "

E-mail ruthandvern@citlink.net

Comment here: 3/3/10
Date

Community Preservation with limited access roadway is the most immediate solution to the Sheldon issue, least disruption - most options for improved success of the rural community in Big City Elk Grove.

The Bypass is wrong in so many ways - Floodplain intrusion by infrastructure, Habitat detriment, cost, the actual Bypassing of Sheldon.

Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.
Thank you
(Please print clearly)

CAPITAL | SOUTHEAST
CONNECTOR JPA
Connecting Communities

Public Scoping Comments
For the Capital SouthEast Connector
Program Environmental Impact Report

Please circle topic your comment relates to:

Environmental
Traffic/ Transportation
Project Alternatives
Other

Name Domenic Spinelli

Organization and Address
10656 Sheldon Woods
Elk Grove, CA

Phone 916 448-7888

Fax ( ) ________ E-mail domenic@dkdaw.com

Comment here: 3-3-10
Date

Leave Sheldon as is, at a maximum - 4 lanes with turnabouts and without closing private driveways and building new side access roads. See Bradshaw as example. Bradshaw works!

Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.

Thank you

(Please print clearly)

CAPITAL | SOUTHEAST
CONNECTOR JPA
Connecting Communities

Public Scoping Comments
For the Capital SouthEast Connector
Program Environmental Impact Report

Name Brent Lemon

Organization and Address Citizen
5801 Laguna Vale Way
Elk Grove, CA 95758

Phone 916 683-2292

Fax ( ) ________ E-mail brentlemon@gmail.com

Please circle topic your comment relates to:

Environmental
Traffic/ Transportation
Project Alternatives
Other

Comment here: 3/3/10
Date

As a citizen of our community that commutes to work in the Rancho Cordova area - I completely support a transportation solution, which provides an alternative to I-5 and Route 99. This project is a much needed improvement and will be a great ~~asset~~ to us in Elk Grove.

Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.

Thank you

(Please print clearly)

CAPITAL | SOUTHEAST
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Connecting Communities

Public Scoping Comments
For the Capital SouthEast Connector
Program Environmental Impact Report

Please circle topic your comment relates to:

- Environmental
- Traffic/ Transportation
- Project Alternatives
- Other

Name D.J. Smith

Organization and Address

Phone ( )

Fax ( ) E-mail

Comment here: March 3, 2010
Date

Build it, damn it!

Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.
Thank you
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CAPITAL | SOUTHEAST
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Public Scoping Comments
For the Capital SouthEast Connector
Program Environmental Impact Report

Please circle topic your comment relates to:

- Environmental
- Traffic/ Transportation
- Project Alternatives
- Other

Name Lanny H. Fisk
Organization and Address
9274 Auburn Folsom Road
Granite Bay, CA 95746
Phone (916) 947-9594
Fax ( )
E-mail Lanny@PaleoResource.com

Comment here: Folsom 08 March 2010
Date

The NOP for the Program EIR on page 21 under the title Cultural Resources specifies disturbance to "archeological sites" and "structures with historical importance" but does NOT mention paleontological resources which are also included as Cultural Resources under CEQA. Ground disturbane in the vicinity of the Connector would have the potential to adversely impact paleo resouces. Therefore, the program EIR needs to address potential impacts to paleo resources.

Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.
Thank you
(Please print clearly)

Folsom Scoping Meeting
March 8, 2010
Comment Card Summary

Environmental concern from Granite Bay Resident

The NOP for the Program EIR on page 21 under the title “Cultural Resources” specifies disturbance to “archaeological sites” and “structures with historical importance” but does not mention paleontological resources as included as Cultural Resources under CEQA. Ground disturbance around the connector could impact paleo resources and the Program EIR needs to address these potential impacts.

CAPITAL SOUTHEAST
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SIGN-IN SHEET

Folsom Public Scoping Meeting
Folsom Community Center

Monday, March 8, 2010
6:00 p.m. – 8:00 p.m.

	Name	Organization	Address & Phone Number	Email Address
1	John Hettinger		113 Puffer Way, Folsom, CA 916-990-0719	john@shaunv.com
2	HOWARD WHITVER		8178 LAKE FOREST DR 916 383-9266	
3	MIKE KOZLOWSKI		1528 HAMMOND CT FOLSOM CA 916-984-4605	HAMDAD@YAHOO.COM
4				
5				
6				
7				
8				

CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

SIGN-IN SHEET

Folsom Public Scoping Meeting
Folsom Community Center

Monday, March 8, 2010
6:00 p.m. – 8:00 p.m.

	Name	Organization	Address & Phone Number	Email Address
1	Philip Rose	FEDSHRA SMS HPC	482 South Lexington Drive Folsom.	psrose@att.net
2	Jerry Cookson		9766 Elk Grove Blvd, Elk Grove 685-5468	JCookson@FrontierNet.Net
3	Kurt Steinert		138 Witmer Dr. Folsom, CA 95636	KPSteinert@earthlink.net
4	Matt Keasling			mkeasling@taylor-wiley.com
5	Lanny H. Fisk		9274 Auburn Folsom Road Granite Bay, CA 95746	Lanny@PaleoResource.com
6	Schaelene Rollins	Lucy CO Resident Communications	115 Hollyann DR Folsom CA 95630	Schaelene@gmail.com
7	Lucy Eidam	〃	1614-19th St. Sac 95811	lucy@lucyco.com
8	Craig Drake		10337 Equestrian Dr. Elk Grove, CA 95624	cdrake@drakehaglan.com

CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

SIGN-IN SHEET

Folsom Public Scoping Meeting
Folsom Community Center

Monday, March 8, 2010
6:00 p.m. – 8:00 p.m.

	Name	Organization	Address & Phone Number	Email Address
1	Dennis Haglan	Folsom Resident	106 Thomas Court Folsom, CA	dhaglen@drakehaglen.com
2	Eric Olds	Folsom Resident FEDSHRA	705 Sibley St. Folsom, CA	e_olds@hotmail.com
3	Eli Aramouni	Folsom Resident	2089 Tarbolton Circle Folsom, CA	earamouni @drakehaglan.com
4	Pat McAchren	Folsom		
5	Michelle Amira			
6	Roberta Long	MT Democrat	226 Moon Circle Folsom 530.305.0720	
7				
8				

CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

SIGN-IN SHEET

Rancho Cordova Public Scoping Meeting
Rancho Cordova City Hall – American River Room

Wednesday, February 24, 2010
6:00 p.m. – 8:00 p.m.

	Name	Organization	Address & Phone Number	Email Address
1	ED Condon		4537 Rosecliff Circle 612-6274	econdon7@yahoo.com
2	Linda Budge			
3	Dennis Scovill		3517 Debina Way 635-5847	dascovill@gmail.com
4	Wrenn Braxton-Miller	Cordova Hills	5241 Arnold Ave. McClellan, Ca 95652	WBRAXTON@SBMCORP.COM
5				
6				
7				
8				

CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

SIGN-IN SHEET

Rancho Cordova Public Scoping Meeting
Rancho Cordova City Hall – American River Room

Wednesday, February 24, 2010
6:00 p.m. – 8:00 p.m.

	Name	Organization	Address & Phone Number	Email Address
1	Mark Hanson	Cordova Hills	5241 Arnold Ave McClellan, CA 95652	mhanson@sbmcorp.com
2	Matt Keasling	Taylor & Wiley		mkeasling@taylor-wiley.com
3				
4				
5				
6				
7				
8				

CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

SIGN-IN SHEET

Sacramento County Public Scoping Meeting
Ag Extension Auditorium, Room 34

Monday, March 1, 2010
6:00 p.m. – 8:00 p.m.

	Name	Organization	Address & Phone Number	Email Address
1	Nicole Leddy		2612 G St. #9 Sacramento, CA 95816	nmleddy@gmail.com
2	Alan Glen		9761 Saddlebred Ct Wilton, CA 95693	alang@quincyeng.com
3	BRITT FUGITT			
4	Matt Keasling			
5	Michele Simra	MM Strategies		
6				
7				
8				

CAPITAL | SOUTHEAST
CONNECTOR JPA
Connecting Communities

Public Scoping Comments
For the Capital SouthEast Connector
Program Environmental Impact Report

Please circle topic your comment relates to:

Environmental
Traffic/ Transportation
Project Alternatives
Other

Name____

Organization and Address__________________________________

____

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Phone (   ) _______________

Fax (   ) ________________   E-mail___________________________

Comment here: ____________________________________
Date

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Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.

Thank you

(Please print clearly)

CAPITAL | SOUTHEAST
CONNECTOR JPA
Connecting Communities

10640 Mather Boulevard, Suite 120
Mather, CA 95655

Place
Stamp
Here

Capital SouthEast Connector
10640 Mather Boulevard, Suite 120
Mather, CA 95655

Attn: Mr. Tom Zlotkowski

Please fold, tape, stamp and mail

Comments

www.ecosacramento.net

www.Habitat2020.org

March 17, 2010

Tom Zlotkowski,
Executive Director, Capital Connector, JPA
10640 Mather Blvd., Suite 120
Mather CA 95655
info@ConnectorJPA.net

Dear Mr. Zlotkowski,

Habitat 2020 is a coalition of environmental organizations collaborating on common issues in, and affecting, the Sacramento region, and acts as the Habitat Conservation Committee of the Environmental Council of Sacramento (ECOS) – working to protect the lands and waters where our wildlife and native plants live in the Sacramento region. Members of Habitat 2020 include the Sacramento Audubon Society, California Native Plant Society, Friends of the Swainson's Hawk, Save the American River Association, Save Our Sandhill Cranes, the Sacramento Group of the Sierra Club, Stone Lakes National Wildlife Refuge Association, and the Sacramento Area Creeks Council.

We are very concerned about the Capitol Southeast Connector being a Trojan horse for future urban development. The NOP acknowledges this possibility with statements such as this from page 11:

> Under certain circumstances, improvements in mobility can result in making land more attractive for development. In such cases, transportation projects can contribute to inducement of growth which fosters "economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment." (State CEQA guidelines, 14 Cal. Code Regs. 15126.2, subdivision (d).) This issue is of particular relevance in areas where local plans do not call for urban development…

The NOP's in response to this prospect is evidenced in the very next paragraph on page 11:

> While implementation of the project would not involve any changes in land use plans, it could make some areas more attractive for development by improving access to those areas. Recognizing this effect, strategically applied access control, and capacity characteristics would preserve the regional functionality of the Project and, in part, relieve direct growth pressure on adjacent properties not designated for growth. In addition, the project includes $15 million in funds to serve as seed money for a larger program to preserve open space and critical wildlife habitat. Strategically programmed these funds could effectively inhibit development in areas that are not planned for urban growth.

We agree with the first sentence with the caveat that it is quite certain that the project "WILL" most definitely "make some areas more attractive for development.." Addressing this inevitability with "strategically applied access control, and capacity characteristics" lacks any sort of long term assurance that physical and structural changes will not be made to the roadway to accommodate access to what is being presented as unanticipated growth – unanticipated because the Project expects no growth to occur because of its physical properties. The increased desirability of developing along the roadway will create future pressure to allow access to it. We feel the EIR should realistically examine the prospect that access control will be relaxed in the future, and what that will portend for future loss of habitat and for other additional environmental impacts.

This leaves the "$15 million in funds to serve as seed money for a larger program to preserve open space and critical wildlife habitat." First, it is not clear whether any of these funds could or would be used to mitigate for loss of habitat associated with the construction of the project. If the $15 million is used for mitigation of direct impacts, then it will have no value as seed money. This should be clarified in the project description. If this is the seed money, where are the rest of the funds expected to grow from. State and Federal funds are extremely tight and the competition for them is great. The Project would be competing for funds with large scale conservation efforts in the region such as the South Sacramento Habitat Conservation Plan. And though the Project, if approved, would be covered by the SSHCP, it cannot assume that any of the mitigation required for the Project would result in a buffer around the roadway. The SSHCP is designed to create landscape sized preserves that will conserve entire ecosystems and because of their size, reduce edge effects. The creation of a preserve next to a roadway would increase edge effects and would not be recommended.

Buffering the roadway with conserved lands might work strategically to limit or stop growth in open space areas, but the project would be left with only $15 million to accomplish this, with very limited prospects of additional funding from State and Federal sources, and very little and maybe no overlap with preserve creation from the SSHCP. The roadway will make the lands that need to be conserved more "attractive for development" and this immediately translates into more expensive land prices with speculation as a driver – the prospect and not the reality or inevitability of development in the future. This means that acquisition costs will skyrocket and that $15 million will have very little purchasing power.

The effect of land price increases will also further complicate other conservation efforts in the area such as the SSHCP which has targeted acreages for acquisition in the zones where the roadway would be created. When the specter of the Elk Grove Sphere of Influence expansion is factored in, the SSHCP is further compromised because the limited inventory on the “receiving” side of the Plan, particularly in zones 8 and 9, will make meeting target preserve acres very difficult or even impossible to acquire.

In addition to an examination of these economic factors and the effect of the Project on the SSHCP, we believe the EIR should:

1. Look at the relative potential of the different options to induce growth pressure beyond the current USB/Folsom SOI boundaries

2. Evaluate how the alternatives will influence growth within the USB/Folsom SOI. Identify the most likely locations for future intersections based on existing and proposed developments/plans and compare the impact of development on habitat values within the immediate vicinity of those interchanges.

3. Based on the analysis above, identify specific areas where limitations on access (via land acquisition or deed restrictions on access associated with right of way acquisition) can be most effective in reducing the impact on sensitive habitat. Develop mitigation measures to incorporate them. We believe the second technique can be a more cost-effective method of limiting access.

4. Include an analysis of potential impacts of the freeway on land values and the secondary impacts that increases in those values will have on the ability to implement conservation programs targeted at threatened species. We realize that this goes beyond the normal scope of an EIR, but feel that we have made a case for a more thorough look at the economics.

Thank for your consideration of these concerns and suggestions.

Sincerely,

Sean Wirth
Chair, Habitat 2020
Executive Committee, Sacramento Group of the Mother Lode Chapter, Sierra Club

Richard Seyman
Co-chair, Transportation, Air Quality, Climate Change Committee
Environmental Counsel of Sacramento

Bass Lake Action Committee
501 Kirkwood Court
El Dorado Hills, CA 65762
www.basslakeaction.org
530-677-3039

March 11, 2010

Tom Zlotkowski, Executive Director
Capital SouthEast Corridor Joint Powers Authority
10640 Mather Boulevard, Suite 120
Mather, CA 95655

Subject: Scoping Comments on Notice of Preparation of Environmental Impact Report for the Capital SouthEast Connector Project, SCH Number 2010012066

Dear Mr. Zlotkowski:

The Capital SouthEast Corridor Joint Powers Authority (JPA) solicited comments from interested persons with their Notice of Preparation dated February 2010 (NOP) with respect to the Environmental Impact Report (EIR) for the proposed Capital SouthEast Connector Project (Connector).

These comments are being submitted by the Bass Lake Action Committee (BLAC), a grassroots nonprofit community organization whose goal is keeping residents of the unincorporated communities of Bass Lake and El Dorado Hills in El Dorado County informed as to the proposed actions of governmental agencies, as a public service on behalf of those communities.

BLAC is an interested party to the Connector because the Project's eastern terminus as currently proposed is El Dorado Hills, and will adversely impact that community, including the Bass Lake area.

PROJECT DESCRIPTION

The overall objectives for the project are to improve mobility, access, and connections between residential and nonresidential land uses, which have been compromised by increasing congestion, and to assist in preservation of open space and threatened habitats. The project would link employment centers and residential areas in the corridor and contribute to the remedy for current and future deficiencies in transportation capacity, safety, and land use compatibility. The project would serve both regional and local travel needs, and would relieve congestion on heavily used local roadways that currently serve the corridor.

The 35-mile-long project is located in the Sacramento region in an area generally bounded by I-5 and Bradshaw Road on the west, the Cosumnes River on the south, Grant Line and White Rock Roads on the east, and U.S. 50 on the north. Within unincorporated Sacramento County, the corridor passes through the Franklin-Laguna, Vineyard, and Cosumnes communities. Within unincorporated El Dorado County, the corridor is located in, and terminates in, the El Dorado Hills community.

The project limits extend from the Interstate 5 - Hood-Franklin Road interchange in southwest Sacramento County east and north approximately 35 miles, terminating in the community of El Dorado Hills at U.S. Highway 50 (U.S. 50) where U.S. 50 crosses what we will call for purposes of this letter White Rock Road approximately 3 miles past the El Dorado County line (eastbound White Rock Road becomes Silva Valley Parkway approximately 500 feet south of U.S. 50).

The JPA has developed a set of preliminary alternatives that would generally meet the overall project objectives. It is anticipated that these alternatives will be further refined by the JPA and some alternatives could be eliminated from further consideration after input from agencies and the public is received. Regardless of the final route chosen, all Project route alternatives designate the eastern terminus to be in El Dorado Hills.

The Connector is expected to provide 4 to 6 traffic lanes to accommodate the projected volume of vehicles in the MTP and general plans. The Project is a limited access roadway becoming a thoroughfare segment on White Rock Road from the Sacramento/El Dorado County line to U.S. 50/Silva Valley Parkway interchange.

BASS LAKE ACTION COMMITTEE

The mission of the Bass Lake Action Committee (BLAC) is to provide a voice for Bass Lake residents in dealing with El Dorado County and other public agencies, and specifically to ensure that homeowners' concerns regarding the Project are addressed and the JPA's actions with regard to the Project meet the homeowners' needs.

Accordingly, this letter has been prepared by the Bass Lake Action Committee as a response to the NOP on behalf of the residents of the community of Bass Lake because those residents live within the area affected by the proposed Project, an area which, with the current Project plans, will incur substantial adverse impacts as a result of the completion of that Project. The community of Bass Lake is made up of residents of the villages of Bridlewood, The Hills of El Dorado, Woodridge at Bass Lake, and those residents of El Dorado Hills whose homes lie along Bass Lake Road.

MAJOR ENVIRONMENTAL ISSUES AND CONCERNS

BLAC is concerned about certain traffic and traffic-related environmental aspects of the Project. Specifically, we are concerned about the adverse environmental impact that will be generated by the increased level of traffic flow (1) traversing El Dorado Hills in and around what will be the junction of White Rock Road (the Project route) and U.S. 50 at what will be the interchange at White Rock Road, and (2) using the adjacent U.S. 50 interchanges at El Dorado Hills Boulevard (Latrobe Road) and Bass Lake Road. We are also concerned that the JPA does not understand the extent of road network development needed in the El Dorado Hills area in order to support the Project. Our concern is that a Draft EIR will be prepared before adequate planning is in place for the El Dorado Hills area.

White Rock Road in El Dorado Hills

White Rock Road is not viable as the only designated route to carry Connector through traffic across El Dorado Hills. The routing of the connector via surface streets through El Dorado Hills will result in high traffic congestion that would approach level of service (LOS) F. Consequently, we recommend that the connector route be modified at its eastern end to branch into a system of several alternative routes so as to diffuse the traffic flow into and through the city of Folsom and the community of El Dorado Hills.

The Connector is planned to traverse El Dorado Hills in the Town Center area, of which the most traffic-critical intersection is Latrobe Road and White Rock Road. The El Dorado Hills road network carries not only local traffic but substantially all through traffic between Sacramento County and El Dorado County.

The routing of through traffic and distribution of Connector access from El Dorado Hills through multiple major feeders is essential if LOS F is to be avoided. Routing of through traffic and distribution of Connector access from EDH through multiple major feeders is essential.

White Rock Road can be one of the feeders between the Connector and El Dorado Hills, provided that it serves, in conjunction with other viable roadways, to distribute local traffic and not to concentrate it in El Dorado Hills along White Rock Road.

Southern Route Alternative

One or more additional feeders need to be routed to the southern portion of El Dorado Hills. This particular area is in an early phase of very substantial housing build out, and continued development in the 885-acre El Dorado Hills Business Park will exacerbate peak period congestion. Some form of such a roadway will be necessary in the more distant future, but to our knowledge neither El Dorado County, Sacramento County, nor the City of Folsom has considered this alternative.

A north-south arterial west of the Business Park and the residential areas bordering it is essential to provide interconnection between the separate east-west roadways, including the Connector, in order to distribute traffic generated by the Business Park and by the new residential developments. The most natural routing would connect with the Empire Ranch Road interchange with U.S. 50.

Terminus Interchanges

The Connector plans assume that there will be interchanges to easily accept the vehicle traffic at each end of the Connector. As examination of the western end of the proposed Connector route reveals that there is an existing Connector interchange at both Highway 99 and Interstate 5.

The western terminus of the Connector is assumed to be an interchange at White Rock Road and U.S. 50 in El Dorado Hills. However, at that point there is now only a bridge that takes U.S. 50 over White Rock Road at what is known as the Clarksville bridge, which was built in the 1960s. There was to be a new interchange built east of the Clarksville bridge, but plans for that interchange have been postponed indefinitely and BLAC understands that the Clarksville bridge will remain the undercrossing for White Rock Road in the foreseeable future.

Possible Mitigation Strategies

Planning for the Connector terminus at El Dorado Hills is critical. The general route planned, White Rock Road to U.S. 50 at the Silva Valley Interchange, is appropriate, but its unacceptable LOS levels need relief by distributing the Connector's eastern terminus among different routes. There are several possible ways to terminate the Connector in El Dorado Hills, therefore mitigating the low levels of service. Many of these alternatives can be coordinated, and they need not be mutually exclusive.

For example, a northern El Dorado Hills and eastern Folsom end point could include a connection from White Rock Road to the north via an extension of Empire Ranch Road, providing access to U.S. 50 and crossing U.S.50 to connect with Iron Point and Saratoga.

Also, a connection eastward on Saratoga to El Dorado Hills Boulevard on the north side of U.S. 50, would bypass the congested area at the El Dorado Hills Boulevard (Latrobe Road) freeway interchange.

In addition, an El Dorado Hills bypass could join the Connector to U.S. 50 without use of El Dorado Hills surface streets or U.S. 50 within El Dorado Hills. The main components for such a bypass would be peripheral connections to U.S. 50.

Summary

White Rock Road is not viable as the only designated route to carry Connector through traffic across El Dorado Hills. The routing of the connector via surface streets through El Dorado Hills will result in high traffic congestion that would approach level of service (LOS) F. Consequently, BLAC recommends that the connector route be modified at its eastern end to branch into a system of several alternative routes so as to diffuse the traffic flow into and through the city of Folsom and the community of El Dorado Hills.

Thank you for the opportunity to comment on the Notice of Preparation dated February, 2010. Please contact the undersigned if you have any further questions.

Sincerely,

John E. Thomson, Ph.D.
President

COUNTY OF SACRAMENTO

Inter-Department Correspondence

March 16, 2010

TO: Mary Anne Dann

MSA Environmental Clearinghouse

FROM: Rich Blackmarr

MSA Infrastructure Finance Section

SUBJECT: Capital SouthEast Connector Project - Notice of Preparation

The MSA Infrastructure Finance Section (IFS) has prepared a few comments in response to the Notice of Preparation (NOP) of a Program Environmental Impact Report for the Capital SouthEast Connector Project dated February 2010. These comments are ancillary to any concerns about the potential environmental impacts of the Connector Project itself, but are oriented to the scope of the Program EIR's analysis of the potential impacts in the subject areas of Transportation/Traffic as well as Land Use/Planning.

IFS is not an operating department with a direct responsibility for installation of infrastructure or delivery of urban services and for mitigation of impacts associated with such infrastructure/services. Instead IFS administers some funding programs related to the provision of infrastructure/services within urban growth areas. A major share of the IFS work effort, however, is directed toward the funding for mitigation of traffic impacts associated the urban growth areas in unincorporated Sacramento County. With that preface, IFS suggests that the scope of the Program EIR for the Connector Project consider:

1. The Connector Project has potential effects on the scope, design, cost, and timing requirements for various roadway improvement projects included within the County approved Public Facilities Financing Plans (PFFPs) for several urban growth areas that are under development or have pending or approved land use entitlements. These include the PFFPs for Vineyard/Vineyard Springs Comprehensive Plan, North Vineyard Station Specific Plan, Florin Vineyard Community Plan (in hearings), Mather Field Specific Plan, and the Glenborough at Easton/Easton Place Special Planning Area (SPA).
2. Connector Alternative Alignment 1 has potential impacts on PFFP funded intersection improvements at the Sunrise Blvd/Florin Road intersection.
3. Connector Alternative Alignments 1, 2, and 3 have potential impacts on PFFP funded intersection improvements at the Grant Line Road/White Rock Road and Grant Line Road/Calvine Road intersections.
4. Connector Alternative Alignment 4 has potential impacts on PFFP funded improvements to various thoroughfare intersections along Bradshaw Road from Calvine Road north to

Jackson Road and to Douglas Road improvements through the Mather Field Specific Plan.

5. The Connector Program EIR should contain information about how the Connector Project is expected to be funded (financing strategy including preliminary cost estimates) and, in the event that the designs for intersection and segment improvements within Sacramento County's PFFP roadway CIPs are projected to be impacted, if additional funds are intended to be made available to pay for any necessary upgrades.

Thank you for the opportunity to provide comments on the Capital Southeast Connector Project - Notice of Preparation.

Municipal Services Agency

Department of Transportation
Michael J. Penrose, Director

Steven C. Szalay, Interim County Executive
Paul J. Hahn, Agency Administrator

County of Sacramento

March 12, 2010

Mr. Tom Zlotkowski
Capitol Southeast Connector JPA
10640 Mather Blvd, Suite 120
Mather, CA 95655

SUBJECT: COMMENTS ON THE NOTICE OF PREPARATION (NOP) OF A PROGRAM ENVIRONMENTAL IMPACT REPORT (PEIR) FOR THE CAPITAL SOUTHEAST CONNECTOR PROJECT.

Dear Mr. Zlotkowski:

The Sacramento County Department of Transportation has reviewed the NOP for the subject project. We appreciate the opportunity to review this document and have the following comments to offer:

1. Please coordinate with SACDOT staff the scope of work for the traffic impact analysis of this project.

2. The cumulative land use assumptions for this project should include Easton, Cordova Hills, East County Mining projects, Folsom SOI, Growth Area east of Grant Line Road, Jackson Growth Area and growth in the Cities of Rancho Cordova and Elk Grove. Please coordinate with the Planning department and verify details of the land use assumptions for these foreseeable projects.

3. Please use the SACOG MTP roadway projects as a basis for the cumulative roadway network.

4. Please evaluate the impacts due to the access control to the adjacent properties for each of the alternatives. How will access to these properties be provided?

5. Will there be auxiliary lanes at the intersections to address slow moving gravel trucks? Most likely auxiliary lanes would be necessary to provide smooth operations in clearing queues during a signal cycle at the intersections.

Should you have any questions, please feel free to contact Kamal Atwal at (916) 875-2844 or me at (916) 874-6121.

Sincerely,

Dean Blank, P.E.
Principal Civil Engineer
Department of Transportation

DAB:ka

c: Dan Shoeman, DOT
Matt Darrow, DOT
Kamal Atwal, DOT

Department of Waste Management & Recycling

County of Sacramento
9850 Goethe Road
Sacramento, CA 95827-3561

Municipal Services Agency
Mail Code: 61-001
Phone: (916) 875-6789
Fax: (916) 875-6767

MEMORANDUM

Date: March 8, 2010

To: Mary Anne Dann, MSA Department of Administration

From: Dave Ghirardelli, Sacramento County Waste Management and Recycling

Subject: **Capitol SouthEast Connector** program EIR Notice of Preparation

Sacramento County Waste Management and Recycling Department staff have reviewed the Public Notice for this project and have the following comments:

1. The Department is owner of the 243-acre Kiefer Landfill Wetland Preserve located along the southeast side of Grant Line Road, on a portion of Capitol Southeast Connector alternatives 2 and 3. This preserve is established in perpetuity. At such time as Grant Line Road is widened and the intersection of Grant Line Road and Kiefer Blvd is improved, ***all right-of-way expansion must occur outside the existing Kiefer Wetland Preserve***. These constraints should be taken into account when studying possible alignments and the potential biological resource impacts, and any other impacts that would occur under Capitol SouthEast Connector alternatives 2 and 3.

2. The baseline condition existing trips associated with the Kiefer Landfill and Recycling Facility should be taken into account in all project scenarios developed as part of the Program Environmental Impact Report.

Please contact me at 875-4557 if you need additional information.

March 15, 2010

To: Tom Zlotkowski
Capital/Southeast Connector JPA

From: Dale W. Mahon
9951 Grant Line Road
Elk Grove, CA 95624-1411
Phone: 916-686-6575 Fax: 916-686-8278

RE: Environmental/Project Alternatives

As a long time resident landowner south of Grant Line Road, I strongly oppose the elevated bypass alterative that has been proposed for the Capital Southeast Connector route. My reasons are set forth below. Should the bypass route be considered, the below listed concerns should be fully addressed in the environmental impact study.

1. The south bypass alternative for the Capital Southeast Connector would be constructed along the west edge of the Cosumnes River bottomland. This specific area is very sensitive for Pleistocene paleontological resources, including, but not limited to large vertebrate fossils. The same area is also very sensitive for prehistoric and historic Native American archaeological resources. Large, ancient village mounds are located along Deer Creek, as well as along the Cosumnes River. More important, archaeologists have found highly mineralized (ancient) human skeletal remains in the calichified clay terraces along the several channels of Deer Creek.

2. The California Environmental Quality Act (CEQA) statutes, guidelines and advisories stipulate that avoiding such resources is preferred to any other mitigation. Considering that there are other alternatives such as widening Grant Line Road, which lies in an area unlikely to yield archaeological or paleontological resources, it seems inconceivable that the alternative that takes a course through the Cosumnes River bottom land would be even considered.

3. In addition to CEQA, the project applicant will undoubtedly need to apply for a Clean Water Act, Section 404 permit from the U.S. Army Corps of Engineers and perhaps other federal permits. Application for a Section 404 permit will trigger the need for a National Historic Preservation Act, Section 106 consultation. This will require detailed study of the Cosumnes bottomland alternative. From a cultural resources perspective, and perhaps also from the perspective of biological resources, the bottomland alternative will be problematic, to say the least, when compared to a mere widening Grant Line Road.

4. Also, much of the land bisected by the bypass route is under contract for agriculture use pursuant to the Williamson Act. There is a policy in the Williamson Act that directs public entities, when practicable, to avoid locating public improvements (and condemnation of land for the improvements) in agricultural preserves. [Govt. Code §51290]

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

REPLY TO
ATTENTION OF

February 22, 2010

Regulatory Division SPK-2010-00216

Tom Zlotkowski
Capital SouthEast Connector Joint Powers Authority
10640 Mather Blvd Ste 120
Mather, California 95655

Dear Mr. Zlotkowski:

We are responding to your February 11, 2010 request for scoping comments for the Programmatic Environmental Impact Report to be prepared for the Capital SouthEast Connector Project. The approximately 35-mile-long project is located in the Sacramento region, with a project study area generally bounded by I-5 and Bradshaw Road on the west, the Cosumnes River on the south, Grant Line and White Rock Roads on the east, and U.S. 50 on the north. Your identification number is SPK-2010-00216.

The Corps of Engineers' jurisdiction within the study area is under the authority of Section 404 of the Clean Water Act for the discharge of dredged or fill material into waters of the United States. Waters of the United States include, but are not limited to, rivers, perennial or intermittent streams, lakes, ponds, wetlands, vernal pools, and marshes. Project features that result in the discharge of dredged or fill material into waters of the United States will require Department of the Army authorization prior to starting work.

To ascertain the extent of waters on the present site, you should prepare wetland delineations, covering each of the proposed alternatives and combinations, in accordance with the "Minimum Standards for Acceptance of Preliminary Wetland Delineations", under "Jurisdiction" on our website at the address below. You should include the results of the delineations in the EIR for the project, and quantify the expected impacts to waters of the United States associated with each of the project alternatives.

Please note that the EIR should also address the expected effects of each of the alternatives on the implementation of the South Sacramento Habitat Conservation Plan ("SSHCP"). Although we understand that the proposed Capital SouthEast Connector may not be a covered activity under the SSHCP, much of the project study area is within the SSHCP plan area. As such, the proposed Capital SouthEast Connector has the potential to influence the future of the SSHCP. Moreover, note that the Corps considers the Capital SouthEast Connector a single and complete project, requiring a single permit application.

Please refer to identification number SPK-2010-00216 in any correspondence concerning this project. If you have any questions, please contact me by email *Kathleen.A.Dadey@usace.army.mil*, or by telephone at 916-557-7253. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/regulatory.html*.

Sincerely,

Kathleen A. Dadey, PhD
California Delta Branch

Copy Furnished:

City of Elk Grove, Planning Division, 8401 Laguna Palms Way, Elk Grove, California 95758

City of Rancho Cordova, Planning Department, 2729 Prospect Park Drive, Rancho Cordova, California 95670

Sacramento County Department of Planning and Economic Development, 827 7th St, Sacramento, California 95814

U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, Habitat Conservation Division, 2800 Cottage Way, Room W-2605, Sacramento, California 95825

DEPARTMENT OF TRANSPORTATION
DISTRICT 3 – SACRAMENTO AREA OFFICE
Office of Transportation Planning
2800 Gateway Oaks Drive, MS 19
SACRAMENTO, CA 95833
PHONE (916) 274-0627
FAX (916) 263-1796
TTY 711

Flex your power!
Be energy efficient!

February 23, 2010

Mr. Tom Zlotkowski
Capital SouthEast Connector
Joint Powers Authority
10640 Mather Blvd., Suite 120
Mather, CA 95655

Dear Mr. Zlotkowski:

Thank you for the opportunity to review and comment on the Capital SouthEast Connector, Notice of Preparation (NOP). The project limits extend from Interstate 5/Hood-Franklin interchange in southwest Sacramento County east and north approximately 35 miles, terminating at US 50 in the vicinity of Silva Valley parkway three miles past El Dorado County line.

Our Comments are as follows:

- A Traffic Study will be necessary to identify any impacts and proposed associated mitigations to the State Highway System. The "Guide for Preparation of Traffic Impact Studies" can be found on our website at: http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/. We would appreciate the opportunity to review the scope of the TIS before it commences.

- The Capital South East Connector has the potential to significantly alter traffic circulation patterns. The traffic analysis for the project needs to consider how the changes in circulation could impact State Highways and interchanges. Specifically, the analysis should include analysis of intersections and interchanges at Interstate 5, SR 99, SR 16, and US 50. Caltrans should be consulted and provided the opportunity to review traffic forecasts generated for each of the project alternatives prior to their use for operational analysis.

If you have any questions about these comments please contact Larry Brohman at (916) 274-0627.

Sincerely,

ALYSSA BEGLEY, Chief
Office of Transportation Planning—South

bc: Jim Calkins, Office of Traffic Operations – Sacramento TMC
Christine Zdunkiewicz, Office of Traffic Operations
Jeff Pulverman, Office of Transportation Planning
Bruce De Terra, Office of Transportation Planning
Bill Davis, Office of Travel Forecasting and Modeling
Gary Arnold, HQ Division of Transportation Planning
Dawn Cheser, Local Assistance

From:	Keen. Pamela (MSA)
To:	Wickam, Kathryn
Subject:	FW: Comment submission to Connector JPA for Connector Notice of Preparation
Date:	Wednesday, March 10, 2010 11:39:24 AM

Pamela Keen
Executive Assistant to
Tom Zlotkowski
Executive Director
Capital SouthEast Connector JPA
www.connectorjpa.net
916-876-9094 direct line
916-876-9097 fax

From: InfoConnectorJPA
Sent: Wednesday, March 10, 2010 11:31 AM
To: Keen. Pamela (MSA)
Subject: FW: Comment submission to Connector JPA for Connector Notice of Preparation

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From: Paul Raveling[SMTP:PAUL.RAVELING@SIERRAFOOT.ORG]
Sent: Wednesday, March 10, 2010 11:29:56 AM
To: InfoConnectorJPA
Cc: Zlotkowski. Tom (MSA); John Knight; Paul Raveling
Subject: Comment submission to Connector JPA for Connector Notice of Preparation
Auto forwarded by a Rule

Comments in response to Notice of Preparation of a Program Environmental Impact Report for the Capital Southeast Connector Project

Submitted by Paul Raveling,
2737 Carnelian Circle
El Dorado Hills, CA 95762
(916) 933-5826
Paul.Raveling@sierrafoot.org

February 10, 2010

Summary

From an El Dorado Hills perspective the most important part of CEQA review should be to first conduct and complete requirements analysis and preliminary conceptual project design for the eastern end of the Connector. This would identify and study alternative route

alignments to serve the needs of both regional through traffic and El Dorado Hills local traffic.

However, the Notice of Preparation cited only the originally proposed route using White Rock Road. Consequently, CEQA law dictates that this environmental review process can consider only that single route. If the CEQA study concludes that this route is not viable, as I suggest is the case, CEQA law requires issuance of a new NOP and restarting environmental review for the significant new information, beginning with the public outreach process for the new NOP.

The White Rock Road alignment has serious problems as a regional through route. It traverses the El Dorado Hills areas of Town Center, skirts the west edge of the 885-acre El Dorado Hills Business Park, and is used by local traffic to serve at least four major residential areas. It intersects with Latrobe Road, the only north-south arterial in El Dorado Hills, in the area of maximum traffic load. Traffic on Latrobe Road between White Rock Road and US 50 is expected to reach a level in the range of 60,000 to 70,000 average daily trips after buildout of the Business Park and new residential developments in the Valley View and Carson Creek Specific Plan areas. Potential for further growth exists, with one of the Sacramento region's major developers owning approximately 10,000 acres. That land is generally south and southeast of El Dorado Hills, and partially abuts the southern portion of El Dorado Hills..

SACOG recognized the need for alternate route studies in the El Dorado Hills area no later than 2005, but deferred action pending formation of the JPA. Since then the Connector JPA board has failed to take action and has repeatedly insisted that the needed study would occur in the environmental review process. That position ignores both the real functional requirements for managing engineering projects in their initial definition and design phases, as well as restrictions in CEQA law. CEQA restrictions require public publication of the proposed project definition at the time the Notice Of Preparation is issued, and choice of alternative route alignments is a major part of the definition of this specific project.

My first recommendation is to (1) terminate the CEQA process for which this NOP was issued; (2) perform the needed requirements analysis and conceptual project planning for the El Dorado Hills area, with appropriate public input to that process; (3) initiate environmental review only when a set of viable candidate route alignments in the El Dorado Hills area has been identified.

If the JPA board commissions those studies in parallel with the CEQA process for the White Rock Road alignment, the current CEQA process could continue at the risk of being invalidated by need for different route choices in El Dorado Hills and in eastern Sacramento County. Any such parallel studies should produce at least two major documents for public review:

- A formal requirements analysis report for El Dorado Hills requirements. This is a prerequisite to conceptual design.

- A conceptual design study identifying an appropriate number of alternative alignments in the El Dorado Hills area. This study needs to involve functional considerations which are not always relevant to environmental review. Based on past study by the El

Dorado Hills Citizens Alliance and the Four Seasons Civic League it appears that 3 to 4 major alternative alignments are appropriate for study.

If the JPA does not terminate the current CEQA process it can amend it as required by Public Resources Code §21092.1, beginning with issuance of a new NOP for the additional information from the non-CEQA planning study.

It is very disturbing that a public process can run for 8 years without the overseeing body recognizing the need for the most important phases of the planning process. To be fair, SACOG staff recognized the El Dorado Hills issues at least 5 years ago but postponed studying them as the project was being prepared for handoff to the Connector JPA.

To date El Dorado Hills has gained attention from the JPA mainly through JPA staff, and the board has been the dominant obstacle to planning for El Dorado Hills. Some form of remedial action for the board's failure to recognize this set of needs is appropriate. At this time my personal thoughts are about whether staff should have ultimate authority and the board of elected officials should act as an advisory body rather than an oversight body.

CEQA law: Need for additional environmental review public process

The JPA's intention to conduct requirements analysis and initial project planning for the El Dorado Hills area will require an additional public review cycle.

A case law finding applying to analysis of cumulative impacts, in *Gray v. County of Madera* (2008) 167 Cal.App.4th 1099, found that the date of release of the Notice of Preparation is the cutoff date for search for probable new projects. The court's rationale applies to addition of any substantial new information for a single project. Since the Connector NOP specifies only the White Rock Road alignment through El Dorado Hills, one of these two cases applies:

- This environmental review process can consider only White Rock Road as the sole possible Connector alignment in El Dorado Hills.

- If alternatives are defined during preparation of the EIR the Notice of Preparation must be reissued in accordance with Public Resources Code §21092.1 and EIR preparation must provide an additional cycle of consultation.

Here is the directly relevant statutory requirement:

> § 21092.1. ADDITION OF NEW INFORMATION; NOTICE AND CONSULTATION
> When significant new information is added to an environmental impact report after notice has been
> given pursuant to Section 21092 and consultation has occurred pursuant to Sections 21104 and
> 21153, but prior to certification, the public agency shall give notice again pursuant to Section
> 21092, and consult again pursuant to Sections 21104 and 21153 before certifying the environmental
> impact report.

In accordance with PRC §21104(a) I request to be included for consultation as an interested member of the public.

One point in CEQA law is not explicitly clear. PRC §21092.1 appears to permit the possibility of adding new information following issuance of a Draft EIR for public comment. In my opinion a incorporation of significant new information should occur *prior* to issuance of the Draft EIR to assure that all DEIR reviewers understand the overall Connector project, including traffic and land use implications of alternate alignments in El Dorado Hills and eastern Sacramento County.

Therefore, I recommend that no Draft EIR be circulated until information for alternate alignments in the El Dorado Hills area will have been incorporated.

Relation of stated plan for White Rock Road alignment to Project Objectives and Project Purposes

The two tables below separately summarize Connector Project Objectives and Project Purposes, as identified directly in the Notice Of Preparation and by NOP reference to the SACOG Environmental Phase 1 Studies Final Technical Report. These comments apply only to the El Dorado Hills area, they do not address portions of the Connector to the west of that portion of Sacramento County immediately west of El Dorado Hills. Comments are explicitly applicable only to the single Connector route alignment identified in the NOP, White Rock Road from eastern Sacramento County to the future Silva Valley interchange on US 50. See text below the tables for additional notes.

Stated Project Objective	Reasonably predictable results of White Rock Road Connector alignment through El Dorado Hills	Importance to EDH for environmental review and project design
Improve mobility, access, and connections between residential and nonresidential land uses.	Mobility in the Town Center/Business Park area would be impaired by additional traffic levels on White Rock Road in El Dorado Hills. This section of White Rock Road currently has four traffic signals in 2 miles, and current plans will result in about 8 traffic signals in this area. Increased traffic on White Rock Road will place Latrobe Road at risk of increased delays, with the Latrobe Rd/US 50 link most recently forecast to reach about 60,000 to 70,000 ADT before mid-century. While most of the Connector is planned as an expressway in Sacramento County, in El Dorado Hills it would be a slow thoroughfare, limited to 2 lanes in each direction between traffic signals. Consequently, the Connector would improve mobility in Sacramento County but it would be expected to impair mobility in El Dorado Hills due to increasing the Volume to Capacity ratio	Very High

	Mobility between El Dorado Hills and Sacramento County locations on the Connector route would be improved, but only within Sacramento County. Mobility for El Dorado Hills traffic would be impaired by the traffic load from use of the Connector as a regional through route, as well as by the uncity's local traffic.	
Assist in preservation of open space and threatened habitats.	There is no remaining open space in El Dorado Hills in the area of White Rock Road. However, the immediately adjoining area of Sacramento County is mainly occupied by a ranch and by open space. The portion north of White Rock Road is in the City of Folsom's Sphere of Influence. A Connector alignment on White Rock Road would need to address these preservation issues in Sacramento County and in the Folsom SOI.	Low
Link employment centers and residential areas in the corridor.	Alternate route access from El Dorado Hills to Sacramento County employment centers would be improved. Sacramento County access to the EDH Business Park and Town Center would be improved. Increased commute traffic between employment centers and residential areas in each county could produced consequential congestion impacts in the EDH Town Center and Business Park areas.	High
Contribute to the remedy for current and future deficiencies in transportation capacity, safety, and land use compatibility.	Under current planning a Connector route on White Rock Road would be important to provide additional east/west capacity to mitigate any future increases in congestion on US 50. The only other east/west arterial reliever in this role will be the future extension of Saratoga Way to connect with Iron Point Road in Folsom.	High
Serve both regional and local travel needs.	The level of congestion expected in the southern part of El Dorado Hills tends produce competition for limited future capacity on White Rock Road, from the Sacramento/El Dorado County line to the future Silva Valley interchange with US 50	High
Relieve congestion on heavily used local roadways that currently serve the corridor.	At this time there are no other local roadways in El Dorado Hills to serve this corridor. The future extension of Saratoga Way to Folsom, on the opposite side of US 50, is the only additional local roadway planned at this time. Folsom's future extension of Empire Ranch Road to connect Iron Point Road, US 50, and White Rock Road will serve in part to provide north/south road network connectivity for El Dorado Hills local traffic.	Moderate

Stated Project Purposes from Phase 1 Study	Reasonably predictable results of White Rock Road Connector alignment through El Dorado Hills	Importance to EDH for environmental review and project design
Enhance mobility options within the project corridor and the greater Sacramento region.	The White Rock alignment will not create new mobility options in El Dorado Hills as it does in Sacramento County. Combination of Connector through trafficwith local traffic will increase V/C and consequent traffic delay times on White Rock Road through the Town Center area.	Very High
Serve and support sustainable planned growth and development patterns and principles.	Most EDH near-future growth and development is south of White Rock Road. New arterial connections between White Rock Road and that area probably will be necessary to mitigate traffic growth on Latrobe Road.	Very High
Minimize impacts to the livability of residences and communities along the Project corridor.	Traffic growth on White Rock will have negative impact on the communities of Four Seasons, Carson Creek, and Stonebriar.	Moderate
Aid economic vitality by improving accessibility to job centers and commercial areas.	Connector access on any alignment will improve accessibility to job and commercial centers with El Dorado Hills as either a destination or a source of traffic. Connector use of the White Rock Road alignment risks harming such access by increasing traffic delays between the county line and Silva Valley Road. In later decades the added traffic load probably will be similar to the 18,000 average daily trips that were added to Folsom city streets by closure of Folsom Dam Road. The EIR should note that the Folsom example required design and construction of a new bridge and regional connecting road on a near-emergency basis due to economic impacts of increased traffic. The EIR should study both similarities and differences in these two situations.	High
Provide efficient transportation options within the corridor that balance	The EIR should note El Dorado Hills issues in sparseness of its arterial network for local traffic to serve a community currently planned to grow to an actual population of about 70,000. It should additionally	

transportation needs between local access and shorter trips and regional needs for longer trips.	note that only two east/west routes cross through El Dorado Hills: US 50 and Green Valley Road. Use of only the White Rock Road alignment for regional through on the Connector traffic requires that traffic analysis be scoped to include both local and regional traffic.	Very High
Enable flexibility among automobile, transit service, bicycle, and pedestrian uses, while incorporating ITS elements where possible.	Choice of White Rock Road limits service to automobiles, bus transit, and possibly bicycles in Class 2 bikeways due to restricted right of way width. A separated bicycle path would be preferable but probably is not appear feasible. Among ITS elements, traffic light synchronization is imperative: Expect 8 traffic signals in 2 miles in El Dorado Hills.	Moderate
Preserve open space, wildlife habitat, and productive agricultural uses in the corridor.	The El Dorado Hills portion of White Rock Road is almost entirely urbanized. Limited open space is still present at the west and east ends of the EDH segment of White Rock Road.	Low (mainly not feasible)
Minimize growth inducement via sound transportation facility improvements and implementation.	This probably is not feasible due to existing development and additional planned future development. In earlier years a multimodal transportation facility had been planned in the area of White Rock and Latrobe Road, but the plan was changed to eliminate this facility.	Low (mainly not feasible)

The notes above are partially based on actual history of chronic LOS F conditions on El Dorado Hills Boulevard and the western end of Serrano Parkway in morning peak period, resolved only by opening the east end of Serrano Parkway to Bass Lake Road in 2005. At the time of that change El Dorado Hills Blvd between Serrano Parkway and US 50 showed traffic counts of about 36,000 Average Daily Trips. Comparison of traffic counts on Bass Lake Road between Serrano Parkway and US 50 suggest that the EDH Blvd gridlock was relieved by initial diversion of as little as 3,000 ADT to Bass Lake Road for access to US 50.

During the chronic LOS F morning peak delay time was consistently in the range of 35 to 45 minutes on both El Dorado Hills Blvd and the western part of Serrano Parkway. After Serrano Parkway was opened to Bass Lake Road delay time in this area dropped into the range of 1 to 5 minutes, depending on timing of the 3 traffic signals within ½ mile of US 50 on EDH Blvd.

Numerous locations in the El Dorado Hills road network experience episodic traffic levels of LOS E and F. The road network topology is very sparse, it is a minimally updated rural network in an actual city with a current population estimated at about 43,000 and land use planning already in place to reach at least 60,000, more likely 70,000.

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Paul Raveling
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(916) 933-5826 Home
(916) 849-5826 Cell phone

Judith A. Murphy
8562 Grant Line Road
Elk Grove, CA 95624
(916) 682-7475
December 7, 2009

Capital South East Board of Directors;

I have received information on the proposed widening of Grant Line Road and using it to connect Highway 5 to Highway 99 to Highway 50. I am totally opposed to this idea. I have not gotten enough information on how you propose to let me exit my property. Until all aspects of this project are on the board and maps are provided to all that will be affected I do not see how you can possibly consider it further. Get all the facts to the people that this project will have the greatest impact on and not just the information that makes it seem good. I live on a private road that has three houses on it. We have a very rural atmosphere and I do not want to see that change. I also do not want to be stranded on my property without an acceptable means of exiting onto Grant Line Road.

There has got to be an acceptable way to make this connector freeway with out a negative impact on so many people. Those of us that moved into the country with acreage around us did it for a reason. We want peace and quiet. If I had wanted to live with business and lots of people in my back yard I would have bought a house in town with my neighbors house ten feet away from mine.

Please reconsider your present proposal for a more acceptable one.

Sincerely,

Judith A. Murphy

SAVE the SHELDON COMMUNITY!

CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

Public Scoping Comments
For the Capital SouthEast Connector
Program Environmental Impact Report

Name: Sharon Lynes
Organization and Address: Sheldon Com. Assoc.
8976 Mackey Rd.
Elk Grove, CA 95624
Phone ( ) ___
Fax ( ) ___ E-mail ___

Please circle topic your comment relates to:

- Environmental
- Traffic/ Transportation
- Project Alternatives
- Other

All

Comment here: March 17, 2010
Date

① (top of pg 7 in NOP) – the Sheldon community IS NOT MENTIONED! in the list of areas the connector passes thru, but Vineyard and Cosumnes are – why?

② (pg 9 "Background") – the ⑤ deficiences mentioned all are incorrect (not true) for Elk Grove and won't be true for some time considering the economic conditions of our city, county, state and nation. The 5th deficiency is the most "glaring" – it's all about future development. This connector is to NOT TO BE GROWTH INDUCING according to the original purposes and needs from SACOG and yet this whole NOP "screams" out DEVELOPMENT! (check the original documents)

Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.
Thank you
(Please print clearly)

SAVE the SHELDON COMMUNITY!

Page 2

CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

**Public Scoping Comments
For the Capital SouthEast Connector
Program Environmental Impact Report**

Please circle topic your comment relates to:
Environmental
Traffic/ Transportation
Project Alternatives
Other (All)

Name Sharon Lynes
Organization and Address Sheldon Comm. Assoc
8976 Mackey Rd.
Elk Grove, CA 95624
Phone ( ) ——
Fax ( ) —— E-mail ——

Comment here: March 17, 2010
Date

③ (pg 10 - 1st objective) - "to support planned growth... minimizing impacts to the livability of residences and communities along the... corridor." "the project should not detract from the quality of life established by these communities". That is the goal so why is the JPA looking at an LIAR for the Sheldon segment?

④ (pg 10 - "Sheldon") What does "exurban" refer to? The Sheldon community is rural and not urban.

⑤ (pg 11 - middle, 2nd full paragraph) - So SHELDON will become the "sacrifical lamb" for the connector project and limit access to our driveways, roads and lanes (LIAR) so that others who live outside of our area can get to work faster, Tahoe faster, etc.

**Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.
Thank you
*(Please print clearly)***

SAVE the SHELDON COMMUNITY!

CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

Public Scoping Comments
For the Capital SouthEast Connector
Program Environmental Impact Report

Please circle topic your comment relates to:

- Environmental
- Traffic/ Transportation
- Project Alternatives
- Other (All)

Name Sharon Lynes
Organization and Address Sheldon Comm. Assoc.
8976 Mackey Rd.
Elk Grove, CA 95624
Phone ( ) —
Fax ( ) — E-mail —

Comment here: March 17, 2010
Date

⑥ (pg 13 - 3rd bullet pt.) — Between the 3rd and 4th segments mentioned, Bradshaw to White Rock are not included. I know that the alternatives are different but they should have been included in the report in this section.

⑦ (pg 18 - Sheldon RAR paragraph) — this RAR option would totally "up-end" our town of Sheldon and the Sheldon rural community. This RAR option would be totally contrary to the purpose & needs statements.

⑧ (pg 18 - Sheldon No-Build paragraph) — Grant Line Road thru Sheldon would remain a rural road except a "turn lane" between the 2 lanes could be added to allow turns into homes and businesses. Sure, the traffic would have to slow down — but SO WHAT!

Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.

Thank you (Please print clearly)

Why destroy our rural life style for the sake of a "speed way" (did I suggest "free way")!

December 5, 2009

SACOG/Joint Powers Authority (JPA)

RE: Grantline Road Widening Project

To Whom It May Concern:

As I am unable to attend the meeting on December 11, 2009, I am writing this letter so that I can go on record that I am HUGELY opposed to the Grantline Road Widening Project.

My residence at 8581 Graybill Lane is located on a privately owned road which can only be accessed from Grantline Road. I have lived at the end of Graybill Lane for 10 years and enjoy the safe and tranquil quality of life that this private road has offered my family. Not only would the widening project take away access to my street, it would ultimately strip me and my family of a safe and tranquil environment and dramatically reduce the value of my home leaving my family with no future financial security.

I can't fathom why anyone would wish to pursue the widening project when so many families and business owners would suffer such a negative impact to their current quality of life and right to financial security. With so many families and businesses already suffering from the current economy, this project only adds insult to injury. I believe Grantline Road currently offers an acceptable means for commuting and the State should focus on other roadway projects that would utilize our Taxpayers dollars more efficiently.

Please do not take away the peaceful quality of life and financial security my residence on Graybill Lane offers my family.

Thank you for your time.

Stacey Nappen
8581 Graybill Lane
Elk Grove, CA 95624
(916) 688-5942

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

MAR 17 2010

Tom Zlotkowski
Executive Director
Capital SouthEast Connector JPA
10640 Mather Blvd, Suite 120
Mather, CA 95655

Subject: Notice of Preparation of a Program Environmental Impact Report for the Capital SouthEast Connector Project, Sacramento and El Dorado Counties, California

Dear Mr. Zlotkowski:

The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced document received on February 11, 2010 for the Capital Southeast Connector project in Sacramento and El Dorado counties, California. The proposed 35-mile-long transportation corridor is located in the southeast Sacramento region and is generally bounded by Interstate 5 (I-5) on the west, the Cosumnes River on the south, Grant Line and White Rock Roads on the east, and the U.S. 50 on the north. EPA has also reviewed the Environmental Phase 1 Studies Final Technical Report for this project (November 16, 2006; http://www.connectorjpa.net/Documents/Connector-FinalPhase1Report_11-16-06.pdf). We note that the purpose of initiating the Phase 1 Environmental Study process was to prepare for a subsequent project-level EIS/EIR for the Connector project (page ES-1).

EPA commends the project proponents for integrating into the alternatives opportunities for 1) motorized travel, 2) non-motorized trails, 3) transit, and 4) open-space preservation. Integrating these elements is a great advancement towards achieving solutions that meet accessibility and mobility needs while creating sustainable places, so long as measures to reduce environmental impacts to the greatest extent possible are also included as project commitments. EPA provides the following comments to assist with the environmental review process for the proposed project.

National Environmental Policy Act Considerations

The Notice of Preparation (NOP) indicates that the Capital SouthEast Connector Joint Powers Authority (JPA) will be the Lead Agency under the California Environmental Quality

Act (CEQA) and will prepare the program Environmental Impact Report (EIR) for the Project. No mention is made, however, in the NOP of the National Environmental Policy Act (NEPA) or preparation of a programmatic Environmental Impact Statement (EIS). It is unclear why the CEQA process is moving forward without associated programmatic-level NEPA review given that future project-level components of the Connector may be constructed with federal funds (as noted in Section 8.3.1 of the Final Technical Report).

- NEPA-level consideration may be warranted at this stage if the purpose of the environmental review process is to establish right-of-way for future project-level components of the Connector project where federal funding or approval applies. EPA is available to further discuss this issue and proposes a meeting in the near future to discuss NEPA-related analysis for this project.

The NOP states that the proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years and that project-level environmental documents will be prepared for specific Connector segments. However, it is not clear from the maps provided how individual potential project segments have independent utility and logical termini.

- EPA recommends that the JPA clearly indicate how the future phasing of project segments will occur. If future phased project segments do not have logical termini and independent utility, NEPA-level consideration at the programmatic level is warranted to insure that a range of reasonable alternatives is not precluded from consideration at the project level. If elements of the Connector project have already completed environmental review, the JPA should clearly identify how those project segments relate to the decisions to be made at the programmatic level.

Aquatic Resources

Aquatic resources located within the Capital SouthEast Connector project study area include areas of forested and emergent wetland, as well as the Cosumnes River floodplain and vernal pool complexes. These resources provide fish and wildlife habitat, natural sediment management, flood attenuation, natural pollution filtering, and water supply for agricultural uses. EPA is concerned with the direct, indirect and cumulative impacts to these sensitive resources, including those associated with construction and operation of the proposed project. Although no permit applications will be submitted to regulatory agencies as part of the programmatic environmental process, EPA recommends regular coordination with the Army Corps of Engineers and EPA to ensure that the analysis of alternatives adequately addresses concerns that are likely to be raised during project-level coordination.

We note that Table 6.2 of the Environmental Phase I Studies Final Technical Report indicated a range of 25 to 42 acres of impact to wetlands and between 16 and 104 acres of impact to 100-year floodplain. We understand that this report was completed four years ago and estimated impacts may no longer be as extensive. However, based on this preliminary data, the project would likely require an individual Clean Water Act permit from the Army Corps of Engineers and integration of NEPA and CWA permitting through the *April 2006 National*

Environmental Policy Act and Clean Water Action Section 404 Integration Process for Federal Aid Surface Transportation Projects in California Memorandum of Understanding (NEPA/404 MOU) process, which has been modified to apply to programmatic projects in Caltrans District 3, and elsewhere in the state. As modified for programmatic review, the NEPA/404 MOU includes specific agreement points to assist in developing the EIS and involves active participation in meetings and document reviews. We request that Caltrans and the JPA contact EPA to discuss coordination through the modified programmatic process once more information about the potential impact to waters of the United States is available so that the agreement points can be addressed as early as possible in the EIS process, if applicable.

Recommendations for the program environmental document:

- Disclose potential direct, indirect and cumulative impacts to waters of the U.S. that may occur during construction and operation of the proposed project alternatives.
- Disclose the approximate acreage and function of waters that occur within the study area, including permanent, intermittent and ephemeral streams, wetlands, and other waterways, including floodplains.
- Include wildlife species affected that could reasonably be expected to use waters or associated riparian habitat and sensitive plant taxa that are associated with waters or associated riparian habitat.
- Address the potential for soil erosion and stormwater runoff during construction and operation.
- Analyze the potential water quality impact and potential effects to designated uses.
- Address techniques proposed for minimizing surface water contamination due to increased runoff from additional impervious surfaces.
- Analyze the potential flood flow alteration.
- Identify potential compensatory mitigation measures to offset impacts where avoidance or minimization of impacts to waters of the U.S. is not feasible.

Indirect and Induced Growth Impacts

EPA is concerned about the potential indirect impacts of this project, particularly impacts associated with induced growth. The proposed Capital SouthEast Connector is a major new expressway in a developing rural area with large areas of undisturbed habitat and abundant biological resources, including endangered species, wetlands, and the adjacent Cosumnes River. The NOP recognizes that the proposed project will not only have potential direct impacts on these resources, but also that the project is likely to have adverse effects due to growth-inducement in southeastern Sacramento County.

The growth-inducing impacts of the proposed alternatives could vary significantly, depending on the location of the corridor, the interchanges, and their proximity to existing development. The southernmost alternatives (alternatives 1, 2 and 3) provide access to many undeveloped areas facing intense development pressures, including areas around Sheldon and Wilton. The northerly route (alternative 4) provides access closer to areas of existing urban development. Corridor alternatives and interchange locations that direct growth to northern rather than southern areas of Southeastern Sacramento County would likely have fewer growth-related impacts to environmental resources and result in less habitat fragmentation. EPA recommends that the environmental document contain an estimate, by alternative, of indirect impacts to sensitive environmental resources, as well as a commitment to measures that avoid and minimize growth-inducing impacts.

We commend JPA for the recognition of potential indirect impacts in the NOP, particularly growth inducement, as a major issue for the project, and for JPA's objective to avoid unplanned growth in environmentally sensitive areas. The NOP specifically refers to strategically applied access control and capacity characteristics that will be incorporated into the project as a way to relieve direct growth pressure on adjacent properties. The NOP further states that the preservation of open space, wildlife habitat, and productive agricultural uses will be incorporated into the project design. The environmental document should discuss the mechanisms that will be used to accomplish these goals, and discuss the feasibility, extent and expected duration of these potential protections.

Recommendations for the program environmental document:

- Prepare a robust qualitative and quantitative analysis appropriate to the programmatic level of indirect impacts -- including habitat fragmentation and growth-related impacts to environmental resources -- for each alternative, and provide supporting data.
- Use the Caltrans' Growth Related Indirect Impacts Guidance to analyze the potential growth-inducing impacts of the project and to compare alternatives. It is available at http://www.dot.ca.gov/ser/Growth-related_IndirectImpactAnalysis/gri_guidance.htm.
- Discuss how the proposed project may affect the location, pattern, and pace of residential, commercial, and industrial development. Also include a discussion of how and where the project could stimulate development.
- Analyze the potential indirect impacts of the project to resources of concern, including waters of the U.S., threatened and endangered species and their critical habitat, air quality, and water quality. Discuss the mitigation responsibilities of JPA and of other entities for these impacts.
- Present a quantitative estimate of indirect impacts for each alternative and provide a map overlaying aquatic and terrestrial resources and habitat boundaries with areas of existing and anticipated (planned and reasonably-foreseeable) growth.
- Describe in detail the mechanisms listed in the NOP to avoid and minimize impacts associated with induced growth, including restricting access along the Corridor. Discuss the commitments required from JPA or other entities to accomplish this goal.
- Describe in detail the mechanisms referred to in the NOP to preserve open space, wildlife habitat, and productive agricultural uses along the Corridor. Discuss the commitments required from JPA or other entities to accomplish this goal.
- Identify how conservation efforts led by JPA as part of the Capital SouthEast Connector project relate to conservation strategies being developed as part of the South Sacramento Habitat Conservation Plan.

Cumulative Impacts

Cumulative impacts refer to impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such actions. These actions include both transportation and non-transportation activities. The cumulative impact analysis should consider all nearby projects such as adjacent roadway improvements, proposed commercial and residential development, and other projects that are reasonably foreseeable and are identified in the surrounding area. These types of projects, identified within and around the proposed project, should be included in the cumulative impacts analysis. Where adverse cumulative impacts are identified, the environmental document should identify appropriate mitigation measures, even if the mitigation is the responsibility of other entities. Disclose the parties that would be responsible for avoiding, minimizing, and mitigating those adverse impacts.

Recommendations for the program environmental document:

- Use the Caltrans' Guidance for Preparers of Cumulative Impacts Analysis to analyze the cumulative impacts of the project and to compare alternatives. It is available at http://www.dot.ca.gov/ser/cumulative_guidance/purpose.htm
- Identify cumulative impacts in the study area relative to resources of concern at an appropriate level for a programmatic review.
- Disclose the past, present, and reasonably foreseeable impacts on resources of concern from transportation and non-transportation activities. The analysis should identify a baseline from which these impacts are measured, and analyze the rate of loss and magnitude (size and relative importance) of impacts to these resources.
- Provide a summary (quantitative and qualitative) of cumulative impacts to resources of concern.

Air Quality

The proposed project is located in an area that is designated as non-attainment for the NAAQS for particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), moderate non-attainment for particulate matter less than 10 microns in diameter (PM_{10}), and serious non-attainment for 8-hour Ozone. Because of the area's non-attainment status, it is important to reduce emissions of ozone precursors and particulate matter from this project to the maximum extent.

Recommendations for the program environmental document:

- <u>Ambient Conditions</u>: Include a detailed discussion of ambient air conditions (i.e., baseline or existing conditions), the area's attainment or nonattainment status for all NAAQS, and potential air quality impacts (including cumulative and indirect impacts) from the construction and operation of the project for each fully evaluated alternative. The environmental document should include estimates of all criteria pollutant emissions and diesel particulate matter (DPM). EPA also recommends that the environmental document disclose the available information about the health risks associated with vehicle emissions and how the proposed project will affect current emission levels.

- Conformity: Ensure that the emissions from both the construction and the operational phases of the project will conform to the approved State Implementation Plan and do not cause or contribute to violations of the NAAQS. To meet the transportation conformity requirements, the environmental document should demonstrate that the project is included in a conforming transportation plan and transportation improvement program.
- Traffic: Describe how any traffic estimates were developed and how these traffic estimates relate to regional transportation estimates included in the regional transportation plan developed by the Sacramento Area Council of Governments. Any supporting documents on which the conclusions of the project's impacts to air quality are based, such as traffic data and other air analyses, should be included in the environmental document.

Greenhouse Gas Emissions and Sustainable Communities Strategies

The State of California has increased its focus on potential climate change and impacts of increasing greenhouse gas emissions. Specifically, the Global Warming Solutions Act of 2006 and Executive Order S-3-05 recognize the impact that climate change can have within California and provide direction for future reductions of greenhouse gases. Additionally, Senate Bill 375 (SB 375) is aimed at curbing sprawl and reducing vehicle miles traveled in an effort to cut greenhouse gas emissions. SB 375 requires Metropolitan Planning Organizations (MPOs) to develop a "sustainable communities strategy" (SCS), which demonstrates how the region will meet greenhouse gas emissions reduction targets set by the California Air Resources Board.

The State of California is also a 2009 recipient of EPA's Smart Growth Implementation Assistance (SGIA). The State of California requested assistance in developing a local government sustainable community framework to provide guidance to local jurisdictions in determining which combination of greenhouse gas emission reduction strategies, smart growth practices, and sustainability policies are best for their communities. At the Federal level under the Partnership for Sustainable Communities, EPA, the U.S. Department of Housing and Urban Development (HUD), and the U.S. Department of Transportation (DOT) are working together to help improve access to affordable housing, more transportation options, and lower transportation costs while protecting the environment in communities nationwide. HUD and DOT will assist EPA in implementing the SGIA for the State of California.

Recommendations for the program environmental document:

- Identify the cumulative contributions to greenhouse gas emissions that will result from implementation of the project, including construction and operations-related greenhouse gas emissions.
- Discuss the potential impacts of climate change on the project, and identify if there are specific mitigation measures needed to protect the project from the effects of climate change.
- Describe how the project meets the intent of statewide and national sustainability initiatives and goals to develop sustainable communities.

Cultural and Historic Resources

The environmental document should identify the potential for adverse impacts to any cultural and historic resources located in the study area, including the Mormon Hill Historic District and the American River Mining District. The environmental document should also describe what steps are proposed to ensure compliance with national, state, and local cultural resource protection laws, as well as what mitigation techniques will be taken should sensitive resources be discovered, including avoidance measures and/or changes in project design.

We appreciate the opportunity to provide early comments on the preparation of the program environmental document for the Capital Southeast Connector project, and look forward to further coordination with JPA. Please feel free to direct any questions you may have concerning our comments to me at (415) 972-3370 or meek.clifton@epa.gov. Thank you in advance for your interest and cooperation.

Sincerely,

Clifton Meek
Environmental Review Office

CC: John Webb, Caltrans
Cindy Adams, Caltrans
Jay Norvell, Caltrans
Nancy Haley, U.S. Army Corps of Engineers
Ken Sanchez, U.S. Fish and Wildlife Service
Jeff Finn, California Department of Fish and Game
Mike McKeever, Sacramento Area Council of Governments

Four Seasons Civic League

c/o The Lodge at Four Seasons
3186 Four Seasons Drive
El Dorado Hills CA 95762
4scivicleague@sbcglobal.net

Directors: John Raslear, Don Gibson, Jon Jakowatz, Jerry Kallan, Bill Knox

March 1, 2010

Capital SouthEast Connector Joint Powers Authority
Attention: Tom Zlotkowski, Executive Director
10640 Mather Blvd, Suite 120
Mather, CA 95655

The Four Seasons Civic League thanks the Capital SouthEast Connector JPA (JPA) for the opportunity to provide its scoping comments in response to the Notice of Preparation document issued by the JPA on February 1, 2010. These comments should also be considered applicable to the forthcoming Draft Environmental Impact Report (DEIR) for the proposed Capital Southeast Connector Project (Connector or Project).

The goal of the Four Seasons Civic League is "To contribute to the planning that helps make El Dorado Hills a leading California community where growth and the quality of life of its residents are mutually supportive." In adhering to its stated goal, the Four Seasons Civic League believes that it is essential that the Environmental Impact Review process for the Connector rigorously examine the following issues:

1) General
   a) While the Four Seasons Civic League has attempted to identify as many items as possible during this limited 45 day period that require evaluation during the Environmental Impact Review process, it expects that the process will thoroughly assess and identify further issues as required by applicable laws and standards of review. Accordingly, these comments should not be construed as exhaustive, but only illustrative.
   b) To insure the adequacy of the DEIR, the document should include:
      i) Clearly written project objectives which will enable the lead agency to develop reasonable alternatives and aid decision makers in preparing findings or a statement of overriding considerations, if necessary. These objectives should be publicly discussed and agreed-upon.
      ii) An analysis of the policy and planning context in which the Connector is proposed, including a discussion of the inconsistencies between the Connector and regional and local jurisdiction general and specific plans.
      iii) The DEIR must discuss the cumulative effects of all proposed or planned projects for programs adjacent to or near the Connector.
      iv) Clearly written documentation that is understandable by the general public.

v) Full disclosure of any assumptions, estimates, and assertions used preparing this document.
vi) Clear identification of the dates and times of any surveys or fieldwork completed and identification of any outside consultants doing said surveys or fieldwork.
vii) Full disclosure of the proposed construction process(es) including the types and numbers of different machines to be used, the likelihood that blasting or explosives may be used as part of the process, and whether there will be an import or export of soil, vegetation, or other features to/from the Connector area.

c) To further insure adequacy, the EIR process should include:
   i) Ample opportunity for public review and comment of the DEIR. A public comment period of the DEIR of ninety days and notice of the DEIR's release date no less than sixty days before the proposed release date.
   ii) At least thirty days be given before future public meetings such as the DEIR and Final EIR comment meetings.
   iii) Public meetings held to educate residents and other concerned parties about the EIR process.

d) Connector route alternatives
   i) During the past year, in public and workgroup meetings, alternative routes to those originally identified by SACOG and furthered by the Connector JPA, have been proposed and summarily dismissed by the Connector JPA staff and consultants. Consequently and specifically, no alternate routes have been identified nor formally studied for the eastern portion of the Connector unlike the western portion of the Connector for which the JPA has allocated up to $120,000 before NOP comments were due. The EIR needs to incorporate a thorough discussion of previously suggested and dismissed alternatives as well as other alternatives that may come to light during the EIR process. As held by the California Supreme Court, one of the major functions of an EIR is to ensure that public agencies thoroughly assess all reasonable alternatives to proposed projects. Laurel Heights Improvement Assn. v. Regents of the University of California, 47 Cal. 3d 376, 400 (1988). The alternatives section of the DEIR must focus on alternatives that are capable of avoiding or substantially lessening the project's significant effects, even if the alternatives would impede attainment of the project objectives or be more costly. 14 Ca. Code Reg. Section 15126.6(b).
   ii) The alternatives section of the DEIR must identify all selected alternatives and identify all rejected alternatives together with the reason for their rejection. 14 Ca. Code Reg. 15126.6(c) and (f). The conclusion that an alternative is infeasible must be supported by substantial, articulated, evidence. City of Fremont v. San Francisco BART, 34 Cal. App. 4th 1780, 1788 (1995). In determining feasibility, the following must be considered:
      (1) Site suitability;
      (2) Economic viability;
      (3) Availability of infrastructure;
      (4) General plan consistency,
      (5) Jurisdictional boundaries, and
      (6) Whether the proponent can acquire control, or otherwise access and alternative site.

e) Mitigation - The EIR process and DEIR document should consider and include the following:

i) Proposed mitigations be feasible, effective, and rigorously enforced.
ii) Mitigations for all impacts be required as a condition of developing the Connector.
iii) A realistic plan for monitoring compliance be in place when the Final EIR is certified.
iv) Continued compliance with all applicable mitigations be demonstrated throughout construction of the Connector.
v) Periodic (monthly or quarterly) mitigation compliance reports be provided to all impacted and interested parties.

2) Air Quality
   a) Exhaustive study of the impacts of the massively increased carbon-based emissions resulting from a 450% increase in daily trips on White Rock Road at the County line
      i) Current - 7,600
      ii) 2035 - 34,200
   b) Thorough study of the impacts on human and wildlife health and well-being resulting from the increased daily trips including, but not limited to, the occurrence of illnesses and disorders such as cancer, emphysema, asthma, COPD, melanomas, birth defects, etc. Specially consideration should be made of the active and outdoor lifestyle envisioned for the current as well as projected future residents and business patrons and employees in the eastern portion of the Connector.
   c) Complete assessment of the impact of the loss of vegetation and trees resulting from the permanent destruction of flora in the construction of the Connector thoroughfare.
   d) Thoroughly study, identify, and quantify additional air quality impacts caused by induced growth resulting from the Connector
   e) Quantify and assess air quality degradation impacts on residents, businesses and community/religious facilities resulting from construction phase(s) of Connector and Access Road project(s).
3) Noise Pollution - Residents of the Four Seasons and other El Dorado Hills communities enjoy a degree of quiet that approaches total silence at times, excepting the occasional interruption from a frog's croak or a bird's song. The potential for loss of this natural "amenity" demands that the EIR include the following:
   a) Exhaustive study of the impacts of the massive increase in noise pollution resulting from a 450% increase in daily trips on White Rock Road at County line
      i) Current - 7,600
      ii) 2035 - 34,200
   b) Thorough evaluation of the effect of rubberized pavement on the increased noise pollution
   c) Complete assessment of the loss of quality of life experienced by current residents as a result of increased noise pollution and compensatory damages of same, including its emotional and physiological toll.
   d) Thoroughly study and identify additional noise pollution impacts caused by the induced growth resulting from the Connector
   e) Quantify and assess noise pollution impacts on residents, businesses, community facilities, and wildlife resulting from construction phase(s) of Connector and Access Road project(s).
   f) Evaluation and consideration of lowering the roadbed to reduce noise.

4) Environmental - The EIR should include quantitative and qualitative assessments of the biological resources and habitat types that will be impacted by the proposed projects and its alternatives. These assessments should include, but not be limited to, the following:
   a) A list of Federal or State candidate, proposed, or listed species and locally sensitive species that are on or near the project site, including a detailed discussion of these species and information pertaining to their local status and distribution.
   b) Thorough identification, study, and evaluation of the environmental impacts to areas nearby or within the Connector route including but not limited to the following:
      i) White Rock Springs - natural spring s/o White Rock Road, East of Placerville Road (ref, Sacramento Bee, 8/20/2009, Pg D2).
      ii) White Rock outcropping (bull quartz) n/o White Rock Road, East of Placerville Road (ref, Sacramento Bee, 8/20/2009, Pg D2).
      iii) Identify and evaluate status of owl roosting in box culvert s/o White Rock Road, East of Placerville Road.
      iv) Free ranging falcons, hawks and other indigenous birds nesting and foraging nearby or within the area of the Connector route.
      v) Impact on pastoral grazing of horses, cattle, other husbandry in and along the Connector route.
   c) Evaluate, qualify, and quantify impacts of increased polluted runoff from expanded roadway to local waterways and wetlands. White Rock Road increases in width at County line from 25 feet to 89 feet (ref, Page 11 of Jacobs Carter Burgess Connector Project Bus Tour and Board Workshop document dated May 16, 2008)
      i) 450% increase in daily trips on White Rock Road at County line
         (1) Current - 7,600
         (2) 2035 - 34,200
      ii) Petroleum product combustion by-products
      iii) Brake dust
      iv) Tire dust
      v) Evaluate, quantify, and document changes to 100 year flood event for local streams and wetlands
   d) Thoroughly identify, study, and discuss wildlife corridors and how the Connector will impact the regional ecosystem.
   e) Conduct wildlife surveys at the appropriate time of year when plant and animal species would be found rather than at times that would not be likely to find these plants and animals.
   f) Thoroughly study and identify additional environmental impacts caused by the induced growth resulting from the Connector
   g) Identify, quantify, and assess environmental impacts resulting from construction phase(s) of Connector and Access Road project(s).
5) Historical/Archeological/Paleontological
   a) Thorough identification, study, and evaluation of the impacts to historical, archeological, and paleontological sites and artifacts nearby or within the area of the Connector route including but not limited to the following:

i) Sacramento Valley Railroad historical right-of-way and tracks running parallel to Placerville Road and Payen Road
ii) White Rock outcropping (bull quartz) n/o White Rock Road, East of Placerville Road (ref, Sacramento Bee, 8/20/2009, Pg D2)
iii) Site of White Rock Springs Ranch Hotel (1850-1871) s/w corner of White Rock Road and Placerville Road (ref, Sacramento Bee, 8/20/2009, Pg D2)
iv) Historical building ruins located adjacent to south side of White Rock Road west of intersection with Scott Road (north).
v) Native American sites, ruins, or artifacts.

6) Traffic
   a) Assess impacts on residents, businesses and community facilities resulting from 450% increase in daily trips on White Rock Road at County line.
      i) Current - 7,600
      ii) 2035 - 34,200
   b) Quantify and assess impacts on residents, businesses and community/religious facilities resulting from ground vibrations caused by increased heavy vehicle traffic.
   c) Quantify and assess impact to LOS for current and projected signaled intersections on White Rock Road at Four Seasons Drive, Carson Crossing Road, Windfield Way, Latrobe Road, Post Street, and Valley View Parkway.
      i) Increased daily trips on White Rock Road at County line
         (1) Current - 7,600
         (2) 2035 - 34,200
      ii) Effects of projected over-utilization of Latrobe Road/White Rock Road intersection on development of El Dorado Hills Business Park and Town Center
   d) Identify, quantify and assess traffic impacts on White Rock Road and other existing roads in El Dorado Hills resulting from the non-build of proposed Connector local access roads. JPA estimates of Traffic Volumes on White Rock Road at the County line assume that other access roads (e.g., Empire Ranch Road extension and "Back Door" route to EDH Business Park) will be available to relieve volumes on White Rock Road while the JPA has no control over the planning, funding, design, scheduling, or construction of these access roads. The JPA needs plenary planning and financing capabilities to bring such routes into early fruition.
   e) Assess pedestrian mobility parallel to and crossing White Rock Road through El Dorado Hills.
   f) Assess alternate mobility forms (bicycles, scooters, etc.) parallel to and crossing White Rock Road through El Dorado Hills.
   g) Thoroughly identify and study additional traffic congestion impacts caused by the induced growth resulting from the Connector
   h) Identify and evaluate mass transit alternatives to the proposed Connector route through El Dorado Hills
   i) Quantify and assess traffic impacts on residents, businesses and community/religious facilities resulting from construction phase(s) of Connector and attendant Access Road project(s).

   j) JPA assumption and inclusion in its Program of ancillary and access routes located in the City of Folsom and its Sphere of Influence south of Highway 50 as part of its jurisdiction and administration.

7) Public Health
   a) Identify, qualify, and quantify any potential sensitive receptors who might be disproportionately affected by noise, construction dust, earth shaking, or any other environmental disturbances during construction of the project.
   b) Identify, qualify, and quantify any potential sensitive receptors who might be disproportionately affected by noise, construction dust, earth shaking, or any other environmental disturbances throughout the ongoing operation of the completed project.
8) Public Safety
   a) Assess, qualify, and quantify public safety impacts of the 450% increase in traffic on White Rock Road at County line. This study should include, but not be limited to, ingress and egress of traffic and pedestrians to/from residential, commercial, business and community/religious areas.
   b) Assess, qualify, and quantify public safety impacts resulting from construction phase(s) of Connector and attendant Access Road project(s).
9) Visual
   a) Residents of the Four Seasons and other El Dorado Hills communities can actually view and enjoy stars and planets in the night sky. The EIR must identify, qualify, and quantify the impacts of the light produced by added street lighting, traffic signals, vehicle head and tail lights on the night sky resulting from the 450% increase in traffic on the White Rock Road portion of the connector. El Dorado County Code section 17.14.170 states, "It is the policy of the County that the creation of artificial light and glare be controlled to the extent that unnecessary and unwarranted illumination of an adjacent property be prohibited."
   b) Most El Dorado Hills residents will rank highly the rural beauty of the area as a reason for locating there. The EIR must identify, qualify, and quantify the visual impacts of the major rearrangement of the landscape resulting from the construction of the Connector that will significantly and permanently scar the visual aspects of the existing pastoral landscape. The current 25 foot wide White Rock Road will be replaced by an 89 foot wide thoroughfare requiring major cuts and fills as the road crosses the hills and canyons entering El Dorado County.
10) Cost/Benefit
   a) Identify, assess, and quantify who benefits, and how, from the Connector including, but not limited to the following:
      i) Residents - including special consideration for the elderly as well as the youth attending schools and youth oriented activities in the El Dorado Business Park, the Town Center, and other business and community areas along or near White Rock Road and its intersecting roads in El Dorado Hills.
      ii) Employees, visitors, tourists,
      iii) Businesses and trades people,
      iv) Community/religious organizations,
      v) Land developers,

vi) Home builders,
vii) Commercial builders,
viii) Public/Private Partnerships,

b) Identify, assess, and quantify funding sources for the construction of the Connector including, but not limited to the following:
   i) Local assessments
   ii) Special District assessments
   iii) County assessments
   iv) State
   v) Federal
   vi) Residents
   vii) Businesses
   viii) Community/religious organizations
   ix) Land developers
   x) Home builders
   xi) Commercial builders
   xii) Public/Private Partnerships

c) Identify, assess, and quantify the compensatory damages resulting from the loss of visual, auditory, psychological and physical quality of life experienced by residents of the Four Seasons and other communities in El Dorado Hills impacted by the Connector.

d) Thoroughly identify, assess, and quantify future maintenance of the Connector roadway and its appurtenant structures
   i) Responsible jurisdictions
   ii) Funding sources
   iii) Roadway and signage maintenance
   iv) Street and path sweeping
   v) Trash removal
   vi) Blight
   vii) Law enforcement and public safety

e) Thoroughly identify, assess, quantify future Connector needs for emergency services
   i) Responsible jurisdictions
   ii) Funding sources
   iii) Access to the Connector
   iv) Level of Service at all points along the Connector

f) Thorough identification and analysis of costs and risks of build/no build of Connector access roads that do not currently exist. The Connector JPA estimates of Traffic Volumes on White Rock Road at the County line assume that other access roads (e.g., Empire Ranch Road extension and "Back Door" route to EDH Business Park) will be available to relieve volumes on White Rock Road while the JPA has no control over the planning, funding, design, scheduling, or construction of these access roads.

g) Identify, assess, and quantify potential Inverse Condemnation claims resulting from the construction and maintenance of the Connector.
h) Identify and assess litigation costs resulting from "public taking" issues including without limitation loss of the aforementioned lifestyle amenities sold to Four Seasons residents as part of the inducement to purchase homes in that community.
i) Identify, assess, and quantify purchase cost of properties found condemned in residential areas.

The Four Seasons Civic League appreciates this opportunity to provide input to the environmental review process for the Connector. It looks forward to a continued constructive and mutually respectful relationship with the Connector JPA staff and its consultants. Please refer any questions regarding this NOP comment document to Jon Jakowatz at (916) 941-6792 or via email at jakcomj1@jakowatz.net.

Sincerely,

John Raslear

John Raslear, Chair
Four Seasons Civic League

Jon Jakowatz

Jon Jakowatz, Chair
Four Seasons Civic League Connector Workgroup Committee

cc: El Dorado County Board of Supervisors
El Dorado County Department of Transportation
Four Seasons Home Owners Association
Bass Lake Action Committee
El Dorado Hills Community Council
Clarksville Regional Historical Society
Folsom, El Dorado & Sacramento Historical Railroad Association
Rolling Hills Community Services District
Environmental Council of Sacramento

CAPITAL | SOUTHEAST
CONNECTOR JPA
Connecting Communities

Public Scoping Comments
For the Capital SouthEast Connector
Program Environmental Impact Report

Please circle topic your comment relates to:

Environmental
Traffic/ Transportation
Project Alternatives
Other

Name Bill Kennedy
Organization and Address Civic League
Four Seasons, El Dorado Hills

Phone ( )
Fax ( ) E-mail wmkennedy07@yahoo.com

Comment here: 2/22/10
Date

this presentation failed to clearly present the options to traffic flow on White Rock Road thru EDH. These have been discussed with you over the past year. You presented ancient history.

Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.
Thank you
(Please print clearly)

CAPITAL | SOUTHEAST
CONNECTOR JPA
Connecting Communities

Public Scoping Comments
For the Capital SouthEast Connector
Program Environmental Impact Report

Name Bill Kennedy

Organization and Address Civic League
Four Seasons, El Dorado Hills

Phone ( ) ___________

Fax ( ) ___________ E-mail wmkennedy07@yahoo.com

Please circle topic your comment relates to:

- Environmental
- Traffic/ Transportation
- Project Alternatives
- Other

Comment here: 2/22/10
Date

this presentation failed to clearly present the options to traffic flow on White Rock Road thru EDH. These have been discussed with you over the past year. You presented ancient history.

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Thank you
(Please print clearly)

To JPA,

Just to be sure that there is no misunderstanding, I am opposed to any Connector alternative that includes Grant Line Road.

First of all, I find it unfair that we are 'fighting' with consultants that you all hired, and that we will ultimately pay.

Why is cost the only/primary criteria? How can we put a cost on the disruption that will occur if you cut a swath thru our homes?

Let the property owners that will potentially be impacted vote on the alternatives.

David O'Farrell
9806 Grant Line Road

From: s c <bsskcrab@yahoo.com>
To: sheldonroads@aol.com
Subject: Grant Line Road and Sheldon area
Date: Thu, Dec 10, 2009 11:15 am

Hey Karen. These are some of my thoughts. We were so excited to move into our country home 11 years ago after living in town for 26 years. The excitement has turned into stress. We invite each of you to come and stay at our home for 1 day and one night to see the issues we face daily. THEN consider the CHANGES you want to enforce for GRANT LINE ROAD . Just put yourselves in our homes. WOULD YOU WANT THESE CHANGES INFRINGING ON YOUR LIVES? THERE IS A BETTER SOLUTION IF YOU WOULD LISTEN TO THE PEOPLE. Susan Crabtree

CAPITAL SOUTHEAST
CONNECTOR JPA
Connecting Communities

Public Scoping Comments
For the Capital SouthEast Connector
Program Environmental Impact Report

Please circle topic your comment relates to:

- Environmental
- Traffic/ Transportation
- Project Alternatives
- Other

Name Grant Lynes

Organization and Address 8976 Mackey Rd, Elk Grove, CA 95624

Phone (916) 685-5920

Fax ( ) ——— E-mail ———

Comment here: 11 Mar 10
Date

Congratulations! You have the opportunity to have a world-class elevated 4-lane roadway similar to the Yolo Bypass, bypass Grant Line Rd. around Elk Grove and Sheldon by going elevated at tree-top level thru the floodplain area around Deer Creek and the Cosumnes River. Advantages: Wetlands are not disturbed, farmland is conserved, the floodplain is minimally affected, noise is diverted away from residences, endangered species, wildlife, and cultural resources are minimally affected, AND MOST OF ALL, existing residences, businesses, roads, and lifestyle along Grant Line Rd, including Sheldon, will not be affected. In fact, with a bypass, the thru-town/cross town traffic should be minimized, thereby IMPROVING our RURAL LIFESTYLE. It is a win-win situation where commute traffic is expedited and local traffic is reduced! Think outside the box.

Grant Lynes

Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.

Thank you

(Please print clearly)

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March 16, 2010

<u>VIA U.S. MAIL AND ELECTRONIC MAIL</u>

Tom Zlotkowski
Executive Director
Capital SouthEast Connector JPA
10640 Mather Boulevard, Suite 120
Mather, CA 95655

Re: <u>Capital SouthEast Connector JPA / Notice of Preparation Comments</u>

Dear Tom:

As you may recall, this office represents the Cordova Hills project located in the southeast portion of Sacramento County. We write in follow up to our client's letter to you dated January 14, 2010 regarding the impacts of the Cordova Hills project to the Capital SouthEast Connector project (the "Connector"). As we explain below, the Connector Environmental Impact Report ("EIR") should analyze the traffic impacts associated with the Cordova Hills project.

It is critical that the Connector EIR analyze impacts associated with "foreseeable" projects. In this regard, the Cordova Hills project application was accepted by the County Board of Supervisors in May of 2008 and has been actively processed since that time. In addition to being included in the County Planning Commission's final recommendations to the Board of Supervisors on the General Plan Update, the Cordova Hills project is nearly ready to commence with environmental review. Consequently, the Cordova Hills project is a "foreseeable" project and its impacts to the Connector should be analyzed in the EIR. (See, *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 270 Cal.Rptr. 650; *San Franciscans for Reasonable Growth v. City and County of San Francisco* (1984) 151 Cal.App.3d 61, 198 Cal.Rptr 634).

In order to ensure public safety, acceptable Levels of Service, and viable commercial opportunities, the Cordova Hills project was strategically planned to include three points of access along Grant Line Road with one half (½) mile spacing. While the Cordova Hills EIR will ultimately provide the necessary analysis regarding these access points, preliminary traffic modeling has suggested that all three planned access points along Grant Line Road are necessary. Accordingly, it is likely that these three access points will be included in the final approvals for the Cordova Hills project. Thus, we strongly recommend that the Connector EIR analyze the impacts associated with these three Cordova Hills access points along Grant Line Road.

We appreciate your continued cooperation on this matter. Should you have any questions or comments, please do not hesitate to contact our office.

Very truly yours,

GREGORY D. THATCH

GDT/rh
H0275.ltr

cc: Ron Alvarado, Cordova Hills
Mark Hanson, Cordova Hills

STATE OF CALIFORNIA

Arnold Schwarzenegger, *Governor*

PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

March 1, 2010

Tom Zlotkowski
Capital SouthEast Connector Joint Powers Authority
10640 Mather Boulevard, Suite 120
Mather, CA 95655

Re: Notice of Preparation, Draft Environmental Impact Report (DEIR)
Capital SouthEast Connector
SCH# 2010012066

Dear Mr. Zlotkowski:

As the state agency responsible for rail safety within California, the California Public Utilities Commission (CPUC or Commission) recommends that development projects proposed near rail corridors be planned with the safety of these corridors in mind. New developments and improvements to existing facilities may increase vehicular traffic volumes, not only on streets and at intersections, but also at at-grade highway-rail crossings. In addition, projects may increase pedestrian traffic at crossings, and elsewhere along rail corridor rights-of-way. Working with CPUC staff early in project planning will help project proponents, agency staff, and other reviewers to identify potential project impacts and appropriate mitigation measures, and thereby improve the safety of motorists, pedestrians, railroad personnel, and railroad passengers.

The traffic/circulation section of the DEIR needs to specifically consider safety issues with the proposed new multi-modal options presuming that rail is an option. In addition to the potential impacts of the proposed project itself, the DEIR needs to consider cumulative rail safety-related impacts created by other projects.

In general, the major types of impacts to consider are collisions between trains and vehicles, and between trains and pedestrians. The proposed project has the potential to increase vehicular and pedestrian traffic in the vicinity.

Measures to reduce adverse impacts to rail safety need to be considered in the DEIR. General categories of such measures include:

- Installation of grade separations at crossings, i.e., physically separating roads and railroad track by constructing overpasses or underpasses
- Improvements to warning devices at existing highway-rail crossings
- Installation of additional warning signage
- Improvements to traffic signaling at intersections adjacent to crossings, e.g., traffic preemption

- Installation of median separation to prevent vehicles from driving around railroad crossing gates
- Prohibition of parking within 100 feet of crossings to improve the visibility of warning devices and approaching trains
- Installation of pedestrian-specific warning devices and channelization and sidewalks
- Construction of pull out lanes for buses and vehicles transporting hazardous materials
- Installation of vandal-resistant fencing or walls to limit the access of pedestrians onto the railroad right-of-way
- Elimination of driveways near crossings
- Increased enforcement of traffic laws at crossings
- Rail safety awareness programs to educate the public about the hazards of highway-rail grade crossings

Commission approval is required to modify an existing highway-rail crossing or to construct a new crossing.

Thank you for your consideration of these comments. We look forward to working with the JPA on this project. If you have any questions in this matter, please contact me at (415) 713-0092 or email at ms2@cpuc.ca.gov.

Sincerely,

Moses Stites

Moses Stites
Rail Corridor Safety Specialist
Consumer Protection and Safety Division
Rail Transit and Crossings Branch
515 L Street, Suite 1119
Sacramento, CA 95814

From:	Keen. Pamela (MSA)
To:	Abhar, Cyrus (MSA); Blank. Dean (MSA); Cermak, Robert; Holt, Cynthia; Diane Nguyen; Don Smith; Jeff Pulverman; Jim Ware; John Long; Wickam, Kathryn; Laura Walsh - CalTrans ; Maggie Townsley; Mark Thomas; Penrose. Michael (MSA); Rich Lorenz; Ryans. Deborah (MSA); Samson Okhade; Steve Propst; Vicki Axiaq; Rupa L Somavarapu/PV/EDC; Korinne J Thomsen/PV/EDC; MHeiman@sacog.org; Yee. Heather (MSA); djsmith@smithwattsco.com; Carin Martin; dawn.cheser@dot.ca.gov; Richard Shepard - City of Elk Gove; Craig.Mckibbin@edcgov.us; dave.spiegelberg@edcgov.us; Laura Walsh/D03/Caltrans/CAGov; John Long
Subject:	Resident NOP Comment - Susan Williams
Date:	Thursday, March 18, 2010 11:03:14 AM

I am commenting on the Notice of Preparation for the Capital Southeast Connector due today March 17, 2010.

I own a home near the southern border of Elk Grove and will be negatively impacted by increased traffic congestion and noise brought to the area by the proposed Capital Southeast Connector. I purchased this home to be near south county's rural farm communities and the Consumnes River Wildlife Preserve. Both the proposed high-speed connector and the proposed expansion of the City of Elk Grove south of Kammer and east of Grant Line breeches the urban services boundary established by Sacramento County in 1993. The connector and city's expansion will invite additional development and destroy the seasonal wetlands and flood plain habitat near the river. A concrete freeway and more homes and shoping malls in the landscape south of town will transform the river into an urban drainage ditch and destroy the wildlife that depends upon it for survival.

In addition, the proposed alternative to build an elevated freeway east of Wilton will cut off this historic town from the farm community it supports and destroy the adjacent wetland habitat. Option No. 4, by-passing Wilton on existing surface streets up Bradshaw is the best alternative and will preserve the town's small businesses and rural setting. The open-space adjacent to the river and the rural life-style of Wilton should not be destroyed to benefit uncontrolled residential development in El Dorado County.

Preserve Sacramento County's 1993 urban services boundary and the town of Wilton.

Thank you for the opportunity to comment.

Susan Williams
9621 Oakham Way
Elk Grove
(916) 897-2003

From: Keen. Pamela (MSA) <keenp@ConnectorJPA.Net>
To: susanewilliams1@sbcglobal.net
Sent: Wed, March 17, 2010 4:55:37 PM
Subject: test

test

Pamela Keen

Executive Assistant to
Tom Zlotkowski
Executive Director
Capital SouthEast Connector JPA
www.connectorjpa.net
916-876-9094 direct line
916-876-9097 fax

CAPITAL | SOUTHEAST
CONNECTOR JPA
Connecting Communities

Public Scoping Comments
For the Capital SouthEast Connector
Program Environmental Impact Report

Please circle topic your comment relates to:

- Environmental
- Traffic/ Transportation
- Project Alternatives
- Other

Name Roberta Long
Organization and Address Editor/Writer
226 Moon Cir
Folsom CA 95630
Phone (916 293 8253
Fax ( ) N/A E-mail rjklong@comcast.net

Comment here: Prefer Alt. 3 3-15-10

Date

ALTERNATE 3 IS THE MOST DIRECT, MOST EFFICIENT, LEAST INTRUSIVE ALTERNATIVE. IT ALSO INCLUDES AN OFF ROAD BICYCLE MULTI-USE PATH SO BICYCLISTS AND HIKERS ARE NOT EXPOSED TO VEHICLE EXHAUST.

Written comments can be submitted at the scoping meetings, mailed to the Capital SouthEast Connector office (mailing address is on the back of this card), faxed to 916-876-9097, emailed to Tom Zlotkowski at zlotkowskit@ConnectorJPA.Net or provided online at www.connectorjpa.net by close of business, Wednesday, March 17, 2010. Please call 916-876-9094 for more information.

Thank you

(Please print clearly)

Department of Water Resources
Keith DeVore, Director

SACRAMENTO COUNTY
WATER AGENCY

Including service to the cities of
Elk Grove and Rancho Cordova

February 16, 2010

Tom Zlotkowski, Executive Director
Capital SouthEast Connector Joint Powers Authority
10640 Mather Blvd., Suite 120
Mather, CA 95655

Re: Comments on the Notice of Preparation of a Program Environmental Impact Report for the Capital SouthEast Connector Project

Dear Mr. Zlotkowski:

The Sacramento County Water Agency (SCWA) appreciates the opportunity to comment on the Notice of Preparation of a Program Environmental Impact Report for the Capital SouthEast Connector Project (Connector NOP). SCWA was formed in 1952 by a special legislative act of the State of California to, in part, make water available for any beneficial use of lands and inhabitants within Sacramento County and to produce, store, transmit, and distribute surface water and groundwater. As a water purveyor, SCWA provides domestic water service to approximately 50,000 customers within Sacramento County.

The alignments identified in the Connector NOP are largely within the SCWA service area; therefore, it is likely that the final alignment selected will be in the vicinity of existing and/or proposed SCWA facilities. SCWA requests that you coordinate with staff to ensure that any conflicts are resolved early in the process. In addition, if the ultimate alignment is common with future SCWA pipeline facilities, we request early notification to coordinate construction of those facilities, if appropriate. For your reference I have attached a copy of the Zone 40 system map at buildout showing anticipated major transmission facilities. It is likely that this map will be revised over the next few years, and we will provide you with the update as it becomes available.

If you have any questions, please do not hesitate to contact me at (916) 874-4681. Thank you for your consideration.

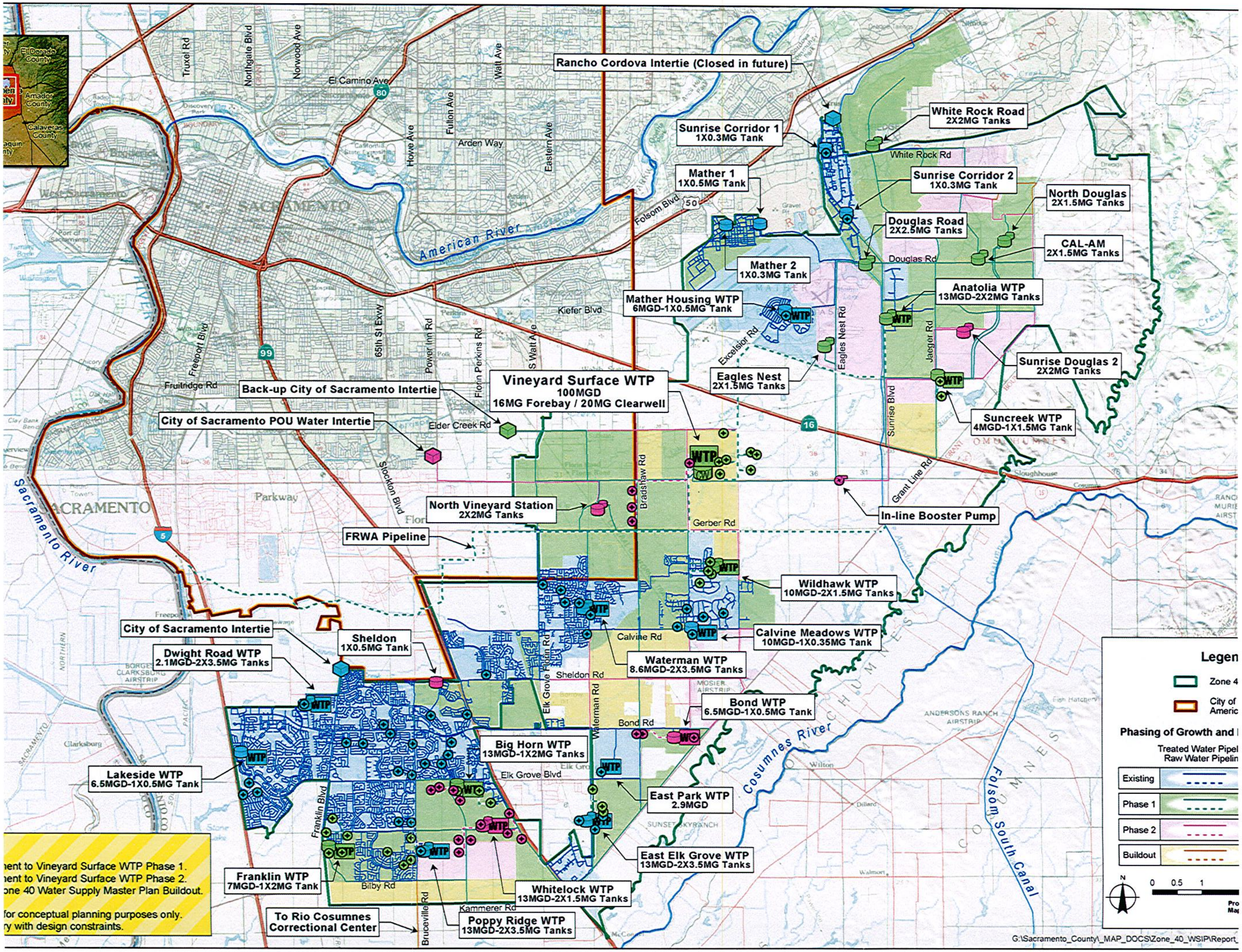
Sincerely,

Kerry Schmitz, P.E.
Principal Civil Engineer

Attachment

"Managing Tomorrow's Water Today"

Main: 827 7th St., Rm. 301, Sacramento, CA 95814 • (916) 874-6851 • fax (916) 874-8693 • www.scwa.net
Facilities Operations & Admin.: 3847 Branch Center Rd. #1 & #5 Sacramento, CA 95827 • (916) 875-RAIN • fax (916) 875-6884
Water Supply Design: 9700 Goethe Road, Suite A, Sacramento, CA 95827 • (916) 875-RAIN • fax (916) 875-4046


Rancho Cordova Intertie (Closed in future)
White Rock Road
2X2MG Tanks
Sunrise Corridor 1
1X0.3MG Tank
Sunrise Corridor 2
1X0.3MG Tank
Mather 1
1X0.5MG Tank
North Douglas
2X1.5MG Tanks
Douglas Road
2X2.5MG Tanks
CAL-AM
2X1.5MG Tanks
Mather 2
1X0.3MG Tank
Anatolia WTP
13MGD-2X2MG Tanks
Mather Housing WTP
6MGD-1X0.5MG Tank
Sunrise Douglas 2
2X2MG Tanks
Eagles Nest
2X1.5MG Tanks
Vineyard Surface WTP
100MGD
16MG Forebay / 20MG Clearwell
Back-up City of Sacramento Intertie
City of Sacramento POU Water Intertie
Suncreek WTP
4MGD-1X1.5MG Tank
North Vineyard Station
2X2MG Tanks
In-line Booster Pump
FRWA Pipeline
Wildhawk WTP
10MGD-2X1.5MG Tanks
Calvine Meadows WTP
10MGD-1X0.35MG Tank
City of Sacramento Intertie
Sheldon
1X0.5MG Tank
Dwight Road WTP
2.1MGD-2X3.5MG Tanks
Waterman WTP
8.6MGD-2X3.5MG Tanks
Bond WTP
6.5MGD-1X0.5MG Tank
Big Horn WTP
13MGD-1X2MG Tanks
Lakeside WTP
6.5MGD-1X0.5MG Tank
East Park WTP
2.9MGD
East Elk Grove WTP
13MGD-2X3.5MG Tanks
Franklin WTP
7MGD-1X2MG Tank
Whitelock WTP
13MGD-2X1.5MG Tanks
To Rio Cosumnes
Correctional Center
Poppy Ridge WTP
13MGD-2X3.5MG Tanks
American River
Sacramento River
Cosumnes River
Folsom South Canal
ment to Vineyard Surface WTP Phase 1.
ment to Vineyard Surface WTP Phase 2.
one 40 Water Supply Master Plan Buildout.
for conceptual planning purposes only.
ry with design constraints.
Legen
Zone 4
City of
Americ
Phasing of Growth and
Treated Water Pipel
Raw Water Pipelin
Existing
Phase 1
Phase 2
Buildout
G:\Sacramento_County_MAP_DOCS\Zone_40_WSIP\Report_

From:	Keen. Pamela (MSA)
To:	Wickam, Kathryn
Subject:	FW: COMMENT for NOTICE OF PREPARATION OF - CAPITAL SOUTHEAST CONNECTOR PROJECT
Date:	Friday, March 12, 2010 7:54:23 AM

Pamela Keen
Executive Assistant to
Tom Zlotkowski
Executive Director
Capital SouthEast Connector JPA
www.connectorjpa.net
916-876-9094 direct line
916-876-9097 fax

From: InfoConnectorJPA
Sent: Thursday, March 11, 2010 10:08 PM
To: Keen. Pamela (MSA)
Subject: FW: COMMENT for NOTICE OF PREPARATION OF - CAPITAL SOUTHEAST CONNECTOR PROJECT

From: Ng Rob[SMTP:RNGUYEN22@YAHOO.COM]
Sent: Thursday, March 11, 2010 10:08:04 PM
To: InfoConnectorJPA
Subject: Fw: COMMENT for NOTICE OF PREPARATION OF - CAPITAL SOUTHEAST CONNECTOR PROJECT
Auto forwarded by a Rule

I have one more comment,

Have you consider Park and Ride lots? I highly recommended.

Thanks

----- Forwarded Message ----
From: Ng Rob <rnguyen22@yahoo.com>
To: info@ConnectorJPA.net
Sent: Tue, March 9, 2010 10:02:22 PM
Subject: COMMENT for NOTICE OF PREPARATION OF - CAPITAL SOUTHEAST CONNECTOR PROJECT

Hi, I live about a mile N/E corner of Bradshaw Rd and Calvine Rd intersection. I would like to support this project. However, I have the following questions/comments.

1. I prefer Alt. 3 over with the Expressway with Multi-use path option
2. what is the cost for each alt.

3. what other type of funds are paying for this project beside Measure A
4. what is the target date for construction and duration
5. is Public to Private Partnership option considered
6. the Multi-use path must continue all the way through the project limits with on and off access to local streets.
7. what is the Sheldon Bypass for
8. with option 3, are you including any landscape features and where
9. is the design going to be based on State Hwy Standards.
10. is SACOG and Caltrans involved in this project
11. is FHWA involved in this project in any way, are there Federal $
12. will this project reduce traffic volume along hwy 5,99 and 50 by what percentage, during peak hour.
13. overall will this project improved air emissions for the region
14. what are the benefit to cost ratio for each of the alt.
15. was transit options or elements considered/proposed
16. will this be a State or Local facility

Thanks,

Rob Nguyen

From: jenov@saclink.csus.edu
To: sheldonroads@aol.com
Sent: 12/11/2009 12:47:04 A.M. Pacific Standard Time
Subj: FW: Grant line Connector project

From: 1christine@frontiernet.net [1christine@frontiernet.net]
Sent: Thursday, December 10, 2009 11:59 PM
To: Jenovino, Jeanine D
Subject: Grant line Connector project

Grant line connector project
Thank you for letting me know about the meeting tomorrow morning concerning Grant Line Road and the Sheldon Area. I have prior appointments so I am not able to attend.

First I wish to express my concern on the date of this meeting. It seems it was planned during the busiest time of the year, just before Christmas when people are busy with family and celebrations. Less people at this meeting means less influence on the project from the public.

I am concern about the traffic this project will attract. The Area from Elk Grove Blvd to Calvine Road is already developed. I can see more strip mall shopping and industry along the road. We already have a shopping center incomplete due to the economy, poor planning, and now you want to encourage more. The city needs to finish what it has started. Grant Line Road will not be an expressway to Folsom when it is developed with business and homes and lights. Yes more signals. I also understand you want to take as many roads leading onto Grant Line off. This area needs to stay rural as it has been designed for.

How about putting an expressway down the Cosumnes River area designed similar to the Yolo bypass? This has been brought up many times before but always put on the back burner. You may say it will cost too much but just think of the land you will need to purchase along Grant Line and all those stop lights, changing how people come and go from their homes because you now want to re-route their streets. I am off Jetmar and I have heard you will not allow us to turn left from our street when this project goes through.

I have been against this route from day one. Have attended meetings before and it seems the public's voice is not heard. If it as if goes in one ear and out the other because you have already made up your minds where this road is going.

By the way we have lived here since 1981 when there was one stop sign and one stop light. Look where we are now! Too much growth and the city can't afford and it's needs. Growth is fine. It just needs to be planned in an organized manner.

Sincerely
Christine Padilla
9435 Butterfly Lane
Elk Grove, Ca 95624

Keen. Pamela (MSA)

From: InfoConnectorJPA
Sent: Wednesday, March 03, 2010 3:52 PM
To: Keen. Pamela (MSA)
Subject: FW: Public meetings, March 2010 Grant Line Road widening

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From: Ralph Askin[SMTP:RANDRASK@CITLINK.NET]
Sent: Wednesday, March 03, 2010 3:51:44 PM
To: InfoConnectorJPA
Subject: Public meetings, March 2010 Grant Line Road widening
Auto forwarded by a Rule

From a resident of the heart of
Sheldon, a simple list of requirements:

Through Sheldon; 80 foot maximum width
four lane maximum
no bypass, no tunnel
no frontage roads
35 mph maximum speed
free access (driveways) to all properties

Sorry, unable to attend Elk Grove meeting since prefer not to drive at night.

Ralph Askin
10500 Sheldon Road
Elk Grove, California 95624
(916) 682-2320
randrask@citlink.net

March 10, 2010

Tom Zlotkowski, Executive Director
10640 Mather Blvd, Suite 120
Mather, CA 95655
info@ConnectorJPA.net

Subject: Notice of Preparation of a Program EIR for the Capital SouthEast Connector Project (SAC200801218)

Dear Mr. Zlotkowski,

Thank you for giving the Sacramento Metropolitan Air Quality Management District (SMAQMD) the opportunity to comment on the project known as the Capital Southeast Connector (Connector). The SMAQMD has the following comments on the Notice of Preparation of the Program Environmental Impact Report:

- The project may result in cumulatively significant greenhouse gas (GHG) emissions during both construction and operation. Include a climate change analysis consistent with SMAQMD's GHG guidance which recommends a discussion of the regulatory framework of GHG emissions, identifying a threshold of significance, making a determination of significance based on that framework and providing an analysis of construction and operation emissions resulting from the project. Mitigation measures to address significant GHG emissions must also be included. The GHG chapter of the SMAQMD's CEQA Guide is available at http://www.airquality.org/ceqa/cequguideupdate/Ch6ghgFINAL.pdf.

- The project may induce travel as well as prematurely direct regional growth to areas with higher vehicle miles traveled per household (VMT/HH) than the regional average. Investigate the Connector's impacts to anticipated VMT/HH on proposed projects in the corridor, including but not limited to, Grantline East, Cordova Hills, Rio del Oro, Folsom South of 50 Specific Plan, Arboretum and other Sunrise-Douglas Plans, New Bridge, Vineyard Springs, Laguna Ridge and East Franklin Specific Plan.

- Alternatives 3 and 4 include an off-corridor multi-use path adjacent to Highway 50. Use the SMAQMD's roadway protocol to determine if there is a health risk to locating the trail there and incorporate mitigation to reduce exposure to particulate matter (including diesel exhaust), such as increasing buffer distances or planting evergreen trees such as deodar cedar. The protocol is available at http://www.airquality.org/ceqa/RoadwayProtocol.

- The project may result in increased particulate matter emissions and adverse health effects on local sensitive receptors. There are also several mining projects have been proposed southeast of the Connector (Teichert Quarry, Granite Walltown Quarry, DeSilva Gates Quarry) and heavy-duty traffic from these projects may utilize the corridor. Disclose the expected traffic, expected mix of light-duty and heavy-duty vehicles, and utilize SMAQMD's roadway protocol to determine if there is a health risk to current and future sensitive receptors and incorporate mitigation, such as increasing buffer distances or planting evergreen trees such as deodar cedar.

- Determine if the future urban and suburban segments of the Connector are compliant with the Sacramento Transportation & Air Quality Collaborative's Best Practices for Complete Streets, available at http://www.completestreets.org/webdocs/resources/cs-bestpractices-sacramento.pdf.

- Because of its size, this project may exceed of SMAQMD's adopted construction NO_x threshold of 85 lbs/day. The environmental document should analyze these emissions using our Roadway Construction Emissions Model, and include the SMAQMD's standard mitigation measures if necessary. The model and mitigation can be found at http://www.airquality.org/ceqa/index.shtml.

SMAQMD staff thanks the Joint Powers Authority for the opportunity to present our comments and any questions may be sent to me at pphilley@airquality.org or by calling (916) 874-4882.

Sincerely,

Paul Philley

Paul Philley
Assistant Air Quality Planner / Analyst

C: Larry Robinson, Program Coordinator, SMAQMD

Attachments:

1) SMAQMD Rules & Regulations Statement

Attachment 1: **SMAQMD Rules & Regulations Statement** (revised 1/07)

*The following statement is recommended as a standard condition of approval or construction document language for **all** development projects within the Sacramento Metropolitan Air Quality Management District (SMAQMD):*

All projects are subject to SMAQMD rules and regulations in effect at the time of construction. A complete listing of current rules is available at www.airquality.org or by calling 916.874.4800. Specific rules that may relate to construction activities or building design may include, but are not limited to:

Rule 201: General Permit Requirements. Any project that includes the use of equipment capable of releasing emissions to the atmosphere may require permit(s) from SMAQMD prior to equipment operation. The applicant, developer, or operator of a project that includes an emergency generator, boiler, or heater should contact the SMAQMD early to determine if a permit is required, and to begin the permit application process. Portable construction equipment (e.g. generators, compressors, pile drivers, lighting equipment, etc) with an internal combustion engine over 50 horsepower are required to have a SMAQMD permit or a California Air Resources Board portable equipment registration. Other general types of uses that require a permit include dry cleaners, gasoline stations, spray booths, and operations that generate airborne particulate emissions.

Rule 403: Fugitive Dust. The developer or contractor is required to control dust emissions from earth moving activities or any other construction activity to prevent airborne dust from leaving the project site.

Rule 417: Wood Burning Appliances. Effective October 26, 2007, this rule prohibits the installation of any new, permanently installed, indoor or outdoor, uncontrolled fireplaces in new or existing developments.

Rule 442: Architectural Coatings. The developer or contractor is required to use coatings that comply with the volatile organic compound content limits specified in the rule.

Rule 902: Asbestos. The developer or contractor is required to notify SMAQMD of any regulated renovation or demolition activity. Rule 902 contains specific requirements for surveying, notification, removal, and disposal of asbestos containing material.

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT
The Power To Do More.®

P.O. Box 15830, Sacramento, CA 95852-1830; 1-888-742-SMUD (7683)

Date: March 3, 2010

To: THE DEPARTMENT OF ENVIRONMENTAL REVIEW AND ASSESSMENT
827 7TH STREET, ROOM 220
SACRAMENTO, CA 95814

Subject: Response to the Capital Southeast Connector Project DEIR

The Capital Southeast Connector Project is within Northeast and South Planning Areas. The portion in Northeast Area begins at Jackson Rd and ends at the Sacramento-El Dorado County Line. The remaining section of the project between I-5 and Jackson Rd is within South Area.

Estimated electrical demand:
Not Applicable

Alternative 1:

1. Existing and future 230 kV and 69 kV lines:

    a. Existing overhead double circuit 230 kV line will cross future Kammerer Rd approximately 1,200 feet East of Franklin Blvd.
    b. Existing overhead double circuit 230 kV line crosses Grant Line Rd approximately 320 feet East of Waterman Rd.
    c. Existing overhead double circuit 230 kV line crosses the existing White Rock Rd approximately 1,900 feet east of Prairie City Rd.
    d. Existing overhead double circuit 230 kV line crosses Sunrise Blvd approximately 650 South of Keifer Blvd.
    e. Existing overhead double circuit 230 kV line crosses the existing White Rock Rd approximately 1,900 feet east of Prairie City Rd.
    f. Existing overhead single circuit 69 kV line along Kammerer Rd from Bruceville Rd to Grant Line/SR-99 interchange.
    g. Existing overhead single circuit 69 kV line along Grant Line Rd from Grant Line/SR-99 interchange to Siefker Ct.
    h. Future overhead single circuit 69 kV line along Grant Line Rd from Siefker Ct to Sunrise Blvd.
    i. Existing overhead single circuit 69kV line along Sunrise Blvd from Jackson Rd to Douglas Rd.

P.O. Box 15830, Sacramento, CA 95852-1830; 1-888-742-SMUD (7683)

j. Existing overhead single circuit 69kV line along Old White Rock Road from New White Rock Rd to Praire City Rd.
k. Future overhead single circuit 69 kV line along White Rock Rd beginning where existing 69 kV line ends at Prairie City Rd to Placerville Rd.

2. Existing and future 12 kV lines:

   a. Existing 12 kV lines along Kammerer Rd from Bruceville Rd to Grant Line/SR-99 interchange.
   b. Future underground 12kV line along Grant Line Road on the SR-99 overpass.
   c. Existing 12 kV lines along Grant Line Rd from Grant Line/SR-99 interchange to Sunrise Blvd.
   d. Existing 12kV lines along Sunrise Blvd from Grant Line Rd to Douglas Rd.
   e. Existing 12kV lines along Old White Rock Rd from Fitzgerald Rd to intersection of Old White Rock Rd and White Rock Rd.
   f. Existing 12kV lines along White Rock Road from Nike Rd to 5000 feet E/O Nike Road.
   g. Existing 12 kV line along White Rock Rd from Grant Line Rd to Placerville Rd.
   h. Existing 12 kV line crosses White Rock Rd at the Placerville Rd-White Rock Rd intersection.

<u>Alternative 2:</u>

1. Existing and future 230 kV and 69 kV lines:

   a. Existing overhead double circuit 230 kV line will cross the future Kammerer Rd approximately 1,200 feet East of Franklin Blvd.
   b. Existing overhead double circuit 230 kV line crosses Grant Line Rd approximately 320 feet East of Waterman Rd.
   c. Existing overhead double circuit 230 kV line crosses Grant Line Rd approximately 5,100 feet north of Douglas Rd.
   d. Existing overhead double circuit 230 kV line crosses the existing White Rock Rd approximately 1,900 feet east of Prairie City Rd.
   e. Existing overhead single circuit 69 kV line along Kammerer Rd from Bruceville Rd to Grant Line/SR-99 interchange.
   f. Existing overhead single circuit 69 kV line along Grant Line Rd from Grant Line/SR-99 interchange to Siefker Ct.
   g. Future overhead single circuit 69 kV line along Grant Line Rd from Siefker Ct to Jackson Rd.
   h. Existing overhead single circuit 69 kV line along Grant Line Rd from Jackson Rd to Kiefer Blvd.
   i. Future overhead single circuit 69 kV line along Grant Line Rd from existing 69 kV line at Kiefer Blvd to existing 69 kV line at Aggregate Dr.

j. Existing overhead single circuit 69 kV line along Grant Line Rd from Aggregate Dr to Old White Rock Rd.
k. Existing overhead single circuit 69 kV line along White Rock Rd from Grant Line Rd to Prairie City Rd.
l. Future overhead single circuit 69 kV line along White Rock Rd beginning where existing 69 kV line ends at Prairie City Rd to Placerville Rd.

2. Existing and future 12kV lines:

   a. Existing 12 kV lines along Kammerer Rd from Bruceville Rd to Grant Line/SR-99 interchange.
   b. Future underground 12kV line along Grant Line Road on the SR-99 overpass.
   c. Existing 12 kV lines along Grant Line Rd from Grant Line/SR-99 interchange to approximately 790 feet North of Sunrise Blvd.
   d. Existing 12 kV lines along Grant Line Rd from approximately 4,400 feet south of Jackson Rd to Whiter Rock Rd.
   e. Existing 12 kV line along White Rock Rd from Grant Line Rd to Placerville Rd.
   f. Existing 12 kV line crosses White Rock Rd at the Placerville Rd-White Rock Rd intersection.

Alternative 3:

The DEIR does not contain enough detail on the route of Alternative 3. If there are any existing SMUD overhead and/or underground facilities along this route SMUD's standard relocation policies will apply where necessary.

Alternative 4:

1. Existing and future 230 kV and 69 kV lines:

   a. Existing overhead double circuit 230 kV line will cross the future Kammerer Rd approximately 1,200 feet East of Franklin Blvd.
   b. Existing overhead double circuit 230 kV line crosses Grant Line Rd approximately 320 feet East of Waterman Rd.
   c. Existing overhead double circuit 230 kV line crosses Bradshaw Rd approximately 540 feet South of Elder Creek Rd.
   d. Existing overhead double circuit 230 kV line crosses Douglas Rd approximately 4,200 feet North of Douglas Rd.
   e. Existing overhead double circuit 230 kV line crosses the existing White Rock Rd approximately 1,900 feet east of Prairie City Rd.
   f. Existing overhead single circuit 69 kV line along Kammerer Rd from Bruceville Rd to Grant Line/SR-99 interchange.

g. Existing overhead single circuit 69 kV line along Grant Line Rd from Grant Line/SR-99 interchange to Bradshaw Rd.

h. Existing overhead single circuit 69 kV line along Bradshaw Rd from Grant Line Rd to approximately 190 feet South of Ridgerock Rd

i. Future overhead single circuit 69 kV line along Bradshaw Rd from approximately 190 feet South of Ridgerock Rd to Florin Rd.
j. Existing overhead single circuit 69 kV line along Florin Rd crosses Bradshaw Rd.
k. Existing overhead single circuit 69 kV line along Elder Creek Rd crosses Bradshaw Rd.
l. Future overhead single circuit 69 kV line along Jackson Hwy that crosses Bradshaw Rd.
m. Existing overhead double circuit 69 kV line along Douglas Rd from Sunrise Blvd to Mather East Rd.
n. Future overhead double circuit 69 kV line along Douglas Rd from Mather East Rd to Transmission Corridor approximately 780 feet East of Mather East Rd.
o. Future overhead single circuit 69 kV line along Douglas Rd from approximately 780 feet East of Mather East Rd to Grant Line Rd.
p. Future overhead single circuit 69 kV line along Grant Line Rd from Douglas Rd to Aggregate Dr.
q. Existing overhead single circuit 69 kV line along Grant Line Rd from Aggregate Dr to Old White Rock Rd.
r. Existing overhead single circuit 69 kV line along White Rock Rd from Grant Line Rd to Prairie City Rd.
g. Future overhead single circuit 69 kV line along White Rock Rd beginning where existing 69 kV line ends at Prairie City Rd to Placerville Rd.

2. Existing and future 12 kV lines:

a. Existing 12 kV lines along Kammerer Rd from Bruceville Rd to Grant Line/SR-99 interchange.
b. Future underground 12kV line along Grant Line Road on the SR-99 overpass.
c. Existing 12 kV lines along Grant Line Rd from Grant Line/SR-99 interchange to Bradshaw Rd.
d. Existing 12 kV lines along Bradshaw Rd from Grant Line Rd to Jackson Rd.
e. Existing underground and overhead 12 kV lines along the proposed route between Bradshaw Rd/Jackson Rd intersection and intersection of Sunrise Blvd/Douglas Rd.
f. Existing 12 kV lines along Douglas Rd from approximately 750 feet East of Eagles Nest Rd to Americanos Blvd.

g. Existing 12 kV lines along Grant Line Rd from Douglas Rd to Whiter Rock Rd.
h. Existing 12 kV lines along White Rock Rd from Grant Line Rd to Placerville Rd.
i. Existing 12 kV line crosses White Rock Rd at the Placerville Rd-White Rock Rd intersection.

SMUD's standard relocation policies will apply if there are conflicts with any existing overhead and/or underground facilities along the alternative routes.

If you have any questions or concerns please call me at (916) 732-5246 or email me at jclark2@smud.org.

Jerry Clark
Land Agent
Real Estate Service
(916) 732-5246

Cc: City of Elk Grove
ICF Jones & Stokes

Subj: **FW: Opposition Letter**
Date: 12/8/2009 12:33:35 P.M. Pacific Standard Time
From: jhe@hsconsultantgroup.com
To: sheldonroads@aol.com

From: Julie He - HS Consultant Group [mailto:jhe@hsconsultantgroup.com]
Sent: Tuesday, December 08, 2009 12:32 PM
To: 'sheldonraods@aol.com'
Subject: Opposition Letter

Dear Karen,
Since my husband and I cannot attend this meeting, please voice our concerns.

We oppose the building of the highway on Grant Line Road. The reason we moved here was the quietness away from the Laguna area in Elk Grove. If you want to make the crossroad to highway 5, please consider another location.

Thank you

Jin and Julie He
Sonoma Creek Resident

SRCSD

Main Office
10060 Goethe Road
Sacramento, CA 95827-3553
Tele: [916] 876-6000
Fax: [916] 876-6160

Sacramento Regional Wastewater Treatment Plant
8521 Laguna Station Road
Elk Grove, CA 95758-9550
Tele: [916] 875-9000
Fax: [916] 875-9068

March 17, 2010

Tom Zlotkowski
Capital Southeast Connector Joint Powers Authority
10640 Mather Boulevard, Suite 120
Mather, CA 95655

Subject: **Notice of Preparation of a Program EIR for the Capital SouthEast Connector Project**

Dear Mr. Zlotkowski:

The Sacramento Regional County Sanitation District (SRCSD) and Sacramento Area Sewer District (SASD) have reviewed the Notice of Preparation for the Capital Southeast Connector Project and have the following comments:

Portions of the project area lie outside the SASD and SRCSD Service area. Generally, with the exception of Folsom and West Sacramento, both the SASD and SRCSD Spheres of Influence correspond to the Sacramento County Urban Services Boundary. Any development in areas that lie outside the SASD and SRCSD Service Area will need to annex through the LAFCO process, should they need sewer services in the future.

For areas within the SASD and SRCSD service areas, local sewer service would be provided by SASD. Conveyance from these local trunk lines to the Sacramento Regional Wastewater Treatment Plant (SRWTP) is provided by SRCSD through large pipelines called interceptors. The SASD Sewerage Facilities Master Plan Update 2006 provides information regarding sewer trunk lines for both relief and expansion projects within its service area. The SRCSD Interceptor Master Plan 2000 provides information regarding the interceptor lines.

There are two major interceptors that are located in this project area, the Bradshaw Interceptor and the Folsom East Interceptor, as well as numerous SASD trunk lines that connect to these interceptors.

If you have any questions regarding these comments, please contact me at (916) 876-9994.

Sincerely,

Sarenna Deeble

Sarenna Deeble
SASD/SRCSD
Policy and Planning

CC: Ruben Robles, Michael Meyer, SASD Development Services,
SRCSD Mid-Range Planning

Appendix B

Technical Information on Operational Emissions Modeling

Appendix B
Technical Information for Operational Emissions Modeling[1]

This appendix provides additional information on the operational emissions modeling procedures for Alternative 2/3. Operational emissions for Alternatives 1 and 4 are discussed qualitatively in Chapter 4 as complete traffic data for these alternatives is not available.

B.1 Criteria Pollutant and CO_2 Emissions Modeling

The estimation of criteria pollutant and CO_2 emissions associated with Alternative 2/3 was conducted using Caltrans' CT-EMFAC model and vehicle activity data provided by the project traffic engineer, DKS (Fugitt pers. comm.; Long pers. comm.).

CT-EMFAC is a California-specific project-level analysis tool developed for Caltrans by the University of California, Davis to model criteria pollutant, mobile source air toxic, and CO_2 emissions from on-road mobile sources. The model uses the latest version of the California Emission Factors model, EMFAC2007, to quantify running exhaust and running loss emissions using user-input traffic data, including peak-hour and off-peak-hour vehicle miles traveled (VMT) data allocated into 5-mph speed bins. Running exhaust emissions are emitted from the vehicle tailpipe while the vehicle is traveling, while running loss emissions are evaporative TOG emissions that occur when hot fuel vapors escape from the fuel system or overwhelm the carbon canister while the vehicle is operating.

Roadway and Traffic Conditions. Modeled traffic volumes and operating conditions were obtained from the traffic data prepared by the project traffic engineers. The data includes volumes within the Traffic Analysis Study Area (TASA), as defined in Chapter 16. Emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and CO_2 were modeled for existing year (2008), open-to-traffic-year (2025) with and without design options, and design year (2035) with and without design options. Table B-1 summaries the traffic data used in this analysis.

Traffic data under future open-to-traffic and design year conditions was provided for the proposed project with all design options. However, for existing conditions, information was only available for the no project alternative and the proposed project with the Reduced Access Roadway Option, as this design option was identified as having the worst traffic impacts in Chapter 16. However, the analysis of air quality impacts completed under future conditions (2025 and 2035) identified both the Reduced Access Roadway Option and the Deer Creek Causeway Option 1 as having the highest emissions. To ensure the analysis included an evaluation of the worst-case condition, an assessment of the proposed project with both the Reduced Access Roadway Option and the Deer Creek Causeway Option 1 was undertaken for existing conditions. Because existing traffic data for the proposed project with the Deer Creek Causeway Option 1 was unavailable, existing emissions generated by the proposed project with the Deer Creek Causeway Option 1 were calculated based on the following equation:

[1] Please refer to Chapter 4 for a discussion on construction related modeling assumptions.

Equation A-1 A = B * (C/D)

Where:

A = 2008 emissions under proposed project with Deer Creek Causeway Option 1

B = 2008 emissions under proposed project with Reduced Access Roadway Option

C = 2035 emissions under proposed project with Deer Creek Causeway Option 1

D = 2035 emissions under proposed project with Reduced Access Roadway Option

Scaling 2008 emissions generated by the proposed project with the Reduced Access Roadway Option by the ratio of 2035 emissions under the Reduced Access Roadway Option and the Deer Creek Causeway Option 1 assumes speed and vehicle characteristics between the proposed design options will remain constant under existing and future conditions, as design elements associated with the proposed project and optional project components are the same for existing and future conditions. Although this approach may generalize actual emissions, as it is based on a ratio approach, rather than estimating emissions from actual modeled traffic volumes, it represents a good-faith effort based on the available existing traffic data.

Vehicle Emission Rates. Vehicle emission rates were determined using Caltrans' CT-EMFAC model. VMT distribution by speed bin is presented in Table B-1. The CT-EMFAC model assumed the Sacramento County[2] regional traffic data, operating over an annual season.

B.2 Additional Congestion Relief Modeling

To further evaluate the effects of the project and options on congestion and emissions, an additional analysis at link level was undertaken to estimate changes in VMT and associated fuel consumption in the project alignment area. The Synchro traffic simulation model was used to evaluate traffic operations along the proposed project alignment. The simulation model tracks individual vehicles on the proposed project alignment and their acceleration/deceleration and delay at signals, allowing fuel consumption to be estimated. As emissions are directly related to fuel consumption, one can infer affects to air quality emissions based on changes in fuel consumption associated with the proposed project and options.

With grade-separated interchanges in the16 miles of the proposed project that are designated as an expressway standard, posted travel speeds would be increased (from 50-55 mph to 60-65 mph) and, more significantly, delay for through travel along the proposed alignment caused by signalized intersections would be almost eliminated. The elimination of signals would also double the capacity of each travel lane on the Connector. The result would be a substantial decrease in travel times along the expressway portions of the Connector, allowing people to travel further in the same amount of time, which would "induce" some travel and increase vehicle miles of travel (VMT) in the corridor, which is seen in the traffic analysis (See Chapter 16). However, the proposed project would substantially reduce the number of stops/starts and deceleration/acceleration for vehicles along its expressway segments. A traffic simulation model (Synchro) was used to evaluate traffic operations

[2] Because the proposed alignment only stretches three miles into El Dorado County, and the traffic conditions do not change dramatically at the border between Sacramento and El Dorado counties, conditions within Sacramento County were assumed to be representative of the three miles in El Dorado County.

Table B-1. Daily VMT Data by 5 mph Speed Bin

Speed Bin	Project-Level Existing (2008) Analysis				Cumulative 2025 Alternatives										Cumulative 2035 Alternatives									
Peak Hour																								
	No Project	%	LAR	%	No Build	%	LAR	%	Causeway 1	%	Causeway 2	%	Sheldon No-Build	%	No Build	%	LAR	%	Causeway 1	%	Causeway 2	%	Sheldon No-Build	%
1–5	17,694	0.4	13,971	0.3	16,314	0.3	16,101	0.3	16,383	0.3	18,901	0.3	18,281	0.3	16,432	0.2	18,846	0.3	19,299	0.3	19,572	0.3	18,855	0.3
6–10	40,502	1.0	38,765	0.9	42,637	0.7	43,831	0.7	43,368	0.7	44,037	0.7	42,186	0.7	45,887	0.6	42,895	0.6	47,084	0.6	45,477	0.6	42,158	0.6
11–15	74,535	1.8	53,674	1.3	74,601	1.2	70,878	1.1	62,091	1.0	63,570	1	66,453	1.0	84,993	1.2	81,500	1.1	75,942	1.0	84,454	1.1	77,176	1.1
16–20	491,470	11.8	433,769	10.2	687,760	11.0	681,311	10.8	691,214	10.9	688,178	10.8	676,926	10.7	788,359	10.9	777,284	10.6	780,894	10.6	774,675	10.5	785,841	10.7
21–25	98,831	2.4	115,741	2.7	154,778	2.5	153,781	2.4	155,545	2.4	155,967	2.5	166,291	2.6	216,828	3.0	229,599	3.1	226,316	3.1	226,927	3.1	232,511	3.2
26–30	241,755	5.8	278,088	6.5	386,199	6.2	357,795	5.6	367,914	5.8	353,145	5.6	380,303	6.0	615,360	8.5	559,145	7.6	559,418	7.6	553,712	7.5	562,164	7.7
31–35	568,532	13.7	517,732	12.2	1,071,539	17.2	1,062,760	16.8	1,042,258	16.4	1,061,372	16.7	1,051,523	16.6	1,427,196	19.7	1,446,241	19.7	1,430,099	19.4	1,419,946	19.3	1,441,950	19.7
36–40	716,575	17.2	686,159	16.1	1,434,194	23.0	1,398,866	22.1	1,398,411	22.0	1,397,430	22	1,396,058	22.0	1,622,840	22.4	1,583,092	21.6	1,612,576	21.9	1,608,397	21.8	1,591,216	21.7
41–45	434,578	10.4	461,872	10.9	589,342	9.5	586,195	9.3	563,077	8.8	560,929	8.8	581,012	9.2	647,338	8.9	576,516	7.9	525,177	7.1	551,900	7.5	553,178	7.5
46–50	354,988	8.5	449,746	10.6	606,156	9.7	566,508	8.9	560,457	8.8	564,482	8.9	559,975	8.8	709,136	9.8	702,329	9.6	720,578	9.8	725,724	9.9	716,755	9.8
51–55	508,716	12.2	459,425	10.8	573,237	9.2	672,538	10.6	673,402	10.6	674,854	10.6	662,976	10.5	480,348	6.6	651,803	8.9	645,605	8.8	635,105	8.6	643,027	8.8
56–60	380,884	9.1	504,462	11.9	358,182	5.7	484,708	7.6	547,600	8.6	533,892	8.4	493,239	7.8	347,852	4.8	427,829	5.8	477,357	6.5	474,535	6.4	428,094	5.8
61–65	151,736	3.6	121,133	2.9	240,778	3.9	240,879	3.8	241,164	3.8	241,760	3.8	240,561	3.8	234,833	3.2	241,317	3.3	246,496	3.3	241,244	3.3	241,665	3.3
66–70	83,167	2.0	116,360	2.7	371	0.0	648	0.0	644	0.0	642	0	647	0.0	1,075	0.0	1,056	0.0	1,047	0.0	1,050	0	1,058	0.0
Total	*4,163,963*	*100*	*4,250,897*	*100*	*6,236,088*	*100*	*6,336,799*	*100*	*6,363,528*	*100*	*6,359,159*	*100*	*6,336,431*	*100*	*7,238,477*	*100*	*7,339,452*	*100*	*7,367,888*	*100*	*7,362,718*	*100*	*7,335,648*	*100*
Off-Peak Hour																								
Speed Bin	Project-Level Existing (2008) Analysis				Cumulative 2025 Alternatives										Cumulative 2035 Alternatives									
	No Project	%	LAR	%	No Build	%	LAR	%	Causeway 1	%	Causeway 2	%	Sheldon No-Build	%	No Build	%	LAR	%	Causeway 1	%	Causeway 2	%	Sheldon No-Build	%
1–5	0	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0	-	0.0	0	0.0	0	0.0	0	0.0	0	0	0	0.0
6–10	2,385	0.1	2,391	0.1	7,779	0.1	7,783	0.1	7,780	0.1	7,789	0.1	7,775	0.1	5,040	0.1	8,527	0.1	8,515	0.1	8,518	0.1	8,531	0.1
11–15	19,140	0.4	19,103	0.4	11,771	0.2	13,501	0.2	13,494	0.2	13,489	0.2	13,469	0.2	17,005	0.2	11,300	0.1	11,308	0.1	11,325	0.1	12,063	0.1
16–20	426,194	9.0	429,646	9.0	686,397	9.6	684,999	9.5	684,146	9.4	682,013	9.4	681,552	9.4	815,553	9.8	818,233	9.7	817,205	9.7	817,952	9.7	816,857	9.7
21–25	35,940	0.8	27,370	0.6	32,934	0.5	32,978	0.5	32,465	0.4	35,346	0.5	35,696	0.5	39,467	0.5	41,420	0.5	40,833	0.5	40,842	0.5	41,153	0.5
26–30	103,083	2.2	102,213	2.1	172,993	2.4	169,762	2.3	169,539	2.3	169,647	2.3	169,752	2.3	237,130	2.9	235,473	2.8	235,422	2.8	234,963	2.8	237,170	2.8
31–35	326,181	6.9	335,298	7.0	712,879	10.0	689,317	9.5	701,440	9.7	701,146	9.7	713,902	9.9	811,918	9.8	781,088	9.3	797,016	9.5	797,036	9.5	808,594	9.6
36–40	873,456	18.5	854,705	17.9	1,903,643	26.7	1,931,294	26.7	1,909,331	26.3	1,909,704	26.3	1,927,191	26.6	2,486,966	30.0	2,486,830	29.6	2,458,155	29.2	2,460,313	29.2	2,479,351	29.5
41–45	524,382	11.1	528,320	11.0	379,058	5.3	344,634	4.8	335,156	4.6	335,069	4.6	334,124	4.6	350,541	4.2	301,533	3.6	294,769	3.5	294,526	3.5	288,863	3.4
46–50	7,984	0.2	72,818	1.5	226,473	3.2	155,257	2.1	136,171	1.9	148,513	2	139,575	1.9	294,796	3.6	199,155	2.4	173,736	2.1	177,661	2.1	195,603	2.3
51–55	255,817	5.4	229,825	4.8	330,665	4.6	286,791	4.0	299,273	4.1	327,210	4.5	312,203	4.3	719,163	8.7	728,009	8.7	663,160	7.9	760,133	9	725,127	8.6
56–60	1,678,026	35.5	1,696,515	35.4	2,150,068	30.1	2,427,875	33.5	2,453,446	33.8	2,418,278	33.3	2,397,749	33.1	2,065,032	24.9	2,354,865	28.0	2,474,268	29.4	2,371,767	28.1	2,339,031	27.8
61–65	234,986	5.0	258,388	5.4	211,968	3.0	188,347	2.6	209,498	2.9	203,143	2.8	194,754	2.7	173,397	2.1	145,152	1.7	137,839	1.6	136,372	1.6	173,988	2.1
66–70	232,807	4.9	230,944	4.8	314,871	4.4	314,156	4.3	313,439	4.3	313,491	4.3	314,511	4.3	278,548	3.4	297,681	3.5	316,429	3.8	316,502	3.8	278,471	3.3
Total	*4,720,381*	*100*	*4,787,536*	*100*	*7,141,499*	*100*	*7,246,694*	*100*	*7,265,178*	*100*	*7,264,838*	*100*	*7,242,253*	*100*	*8,294,556*	*100*	*8,409,266*	*100*	*8,428,655*	*100*	*8,427,910*	*100*	*8,404,802*	*100*

Source: Long pers. comm.

along the proposed project alignment. The simulation model tracks individual vehicles on the proposed project alignment and their acceleration/deceleration and delay at signals. This information allows it to estimate fuel consumption.

Table B-2 summarizes estimated changes in 2035 VMT and fuel consumption due to the proposed project. It shows the following:

- In 2035, the VMT along the proposed project alignment would represent about 1.5 to 2.1 percent of the regional (six county) VMT, depending on scenario.
- Compared to the 2035 Baseline, the proposed project would increase VMT along the proposed alignment by about 26 to 40 percent; yet the traffic simulation model estimates that fuel consumption along the proposed alignment would increase by about 10 to 13 percent.
- Fuel consumption on the remainder of the regional roadway system should change by about the same percentage as the change in VMT because 1) effects to the roadway system and traffic control on all roadways segments other than the proposed project alignment would be the same with the proposed project and its options as the Baseline and 2) the amount of delay at a signalized intersection changes faster than changes in volume (especially when volumes get close to capacity), but the volume changes on most roadway segments would be modest.
- Compared to the 2035 Baseline, the VMT on the remainder of the regional roadway system would decrease by about 0.13 to 0.28 percent due to the proposed project. This would likely result in an equal decrease in fuel consumption for the same reasons as stated above.
- The increase in fuel consumption along the proposed project alignment would be offset by about an equal decrease in fuel consumption on the remainder of the regional roadway system. The change in regional fuel consumption, and thus air quality and greenhouse gas emissions, would be less than 0.06 percent for any of the project options along the proposed project alignment.

Table B-2. Estimated Change in 2035 VMT and Fuel Consumption due to Proposed Project

Scenario	Estimated VMT			Change in VMT (from Baseline) due to Project			Change in Fuel Consumption (from Baseline) due to Project		
	On Proposed Project Alignment	Remainder of Region	Total	On Proposed Project Alignment	Remainder of Region	Total	On Proposed Project Alignment	Remainder of Region	Total
Baseline	1.53%	98.47%	100.00%						
Sheldon LAR	1.95%	98.05%	100.00%	27.44%	-0.212%	0.212%	10.586%	-0.212%	-0.001%
Deer Creek Causeway 1	2.13%	97.87%	100.00%	39.41%	-0.275%	0.333%	12.314%	-0.275%	-0.007%
Deer Creek Causeway 2	2.14%	97.86%	100.00%	40.43%	-0.237%	0.386%	13.089%	-0.237%	0.049%
Sheldon No-Build	1.92%	98.08%	100.00%	25.99%	-0.130%	0.270%	9.780%	-0.130%	0.061%
Source: DKS Associates, 2010									

B.3 Carbon Monoxide Modeling

Roadway and Traffic Conditions. CO hotspots were evaluated at roadway intersections within the project area for existing (2008) and design-year (2035) with and without design options.

Design Year

Peak-hour turning movements at intersections along the Connector corridor and on roadways within the TSAS under design year conditions were obtained from the traffic data prepared by the project traffic engineers (Long pers. comm.).

Ambient CO concentrations near the roadway under future project conditions were modeled using CALINE4 (Benson 1989). CALINE4 is a Gaussian dispersion model specifically designed to evaluate air quality impacts of roadway projects. Each roadway link analyzed in the model is treated as a sequence of short segments. Each segment of a roadway link is treated as a separate emission source producing a plume of pollutants which disperses downwind. Pollutant concentrations at any specific location are calculated using the total contribution from overlapping pollution plumes originating from the sequence of roadway segments.

CO modeling under 2035 conditions was conducted at four intersections on the Connector corridor. In addition, modeling was conducted at two intersections on *non-Connector* roadways within the TSAS. These intersections were chosen as they are anticipated to have the greatest traffic volumes and worst LOS/delay. Only the p.m. peak-hour traffic was modeled as the traffic data indicated that LOS and delays would be worse in the p.m. peak-hour than in the a.m. peak hour. The six intersections modeled are:

On Connector Corridor

- White Rock Road and Latrobe Road
- White Rock Road and Off-Vehicle Road
- Teicher Road and Grant Line Road
- SR 99 Northbound Ramps and Grant Line Road

Non-Connector Intersections

- East Bidwell Road and Iron Point Road
- Scott Road and Easton Valley Parkway

Existing Conditions

Peak hour turning movements under existing conditions were not available. Consequently, volumes were calculated from design year peak hour data using the following equation;

Equation A-2	A = B * (C/D)

Where:

A	=	Existing peak hour turning movements at selected intersections

B	=	2035 peak hour turning movements at selected intersections

C = Existing ADT for selected intersection segments

D = 2035 ADT for selected intersection segments

Equation A-2 assumes that the ratio of peak hour volumes to ADT would remain constant between existing and future conditions. Note that ADT under existing conditions was only provided as a range of minimum and maximum volumes expected to occur under the proposed project and operational options, and the minimum and maximum values were not assigned to any specific option. To ensure emissions were not underrepresented, ADT under the "maximum" scenario was used in this analysis. Because the High Access Roadway represented the option with the greatest ADT under future conditions, the "maximum" scenario provided for existing conditions was assumed to represent the High Access Roadway.

CO modeling under existing conditions was conducted using CALINE4 at the intersection of East Bidwell Road and Iron Point Road only. This intersection was selected as the traffic data indicates that it is the only intersection that will experience higher delay and/or LOS with implementation of the project under existing conditions, as four of the other five intersections will experience operational improvements and the remaining intersection does not exist under existing no project" and proposed project conditions. Conditions at all other intersections will improve under the build condition.

Vehicle Emission Rates. Vehicle emission rates were determined using latest version of the ARB's EMFAC2007 emission rate program. Free-flow traffic speeds were adjusted to a speed of 1.0 mph to represent a worst-case scenario. EMFAC2007 modeling procedures followed the guidelines recommended by Caltrans (California Department of Transportation 2003). The program assumed Sacramento County regional traffic data operating during the winter months. A mean winter temperature of 41° F and humidity of 30% were assumed.

Receptor Locations. CO concentrations were estimated at four receptor locations located at each of the six intersections for a total of 24 receptors under design year conditions (4 receptors under existing conditions). The receptors were placed 3 meters from the end of the pavement (9.7 meters from the centerline) to represent a worst-case scenario. Receptors were chosen based on the CO protocol developed for Caltrans by the Institute of Transportation Studies at the University of California, Davis (Garza et al. 1997). Receptor heights were set at 5.9 feet.

Meteorological Conditions. Meteorological inputs to the CALINE4 model were determined using methodology recommended in Air Quality Technical Analysis Notes (California Department of Transportation 1988). The meteorological conditions used in the modeling represent a calm winter period. The worst-case wind angles were modeled to determine a worst-case concentration for each receptor. The meteorological inputs include: wind speed of 0.5 meters per second, ground-level temperature inversion (atmospheric stability class G), wind direction standard deviation equal to 5 degrees, ambient temperature of 46° F, and a mixing height of 1,000 meters.

Background Concentrations and 8-Hour Values. To account for sources of CO not included in the modeling, a background concentration of 3.2 parts per million was added to the modeled cumulative 1-hour values, while a background concentration of 2.7 parts per million was added to the modeled cumulative 8-hour values. Background concentration data for 1- and 8-hour CO values were obtained from the EPA's Air Data webpage (U.S. Environmental Protection Agency 2010a). Maximum monitored 1- and 8-hour CO values from the nearest monitoring station (Sacramento Del Paso Manor) for the years 2007–2009 were averaged to obtain a background concentration. The 8-hour modeled values were calculated from the 1-hour values using a persistence factor of 0.6. Background concentrations for design-year (2035) conditions were assumed to be the same as those for the current year. Actual 1- and 8-hour background concentrations in future years would likely be lower than those used in the CO modeling analysis because the trend in CO emissions and concentrations is decreasing due to continuing improvements in engine technology and the retirement of older, higher-emitting vehicles.

B.4 Health Risk Assessment Modeling

The Health Risk Assessment (HRA) for Alternative 2/3 was conducted for the Connector corridor, as well as for adjacent freeway (US 50, SR 99, and I-5) segments. In accordance with the SMAQMD's Protocol, the following three steps were followed in conducting the assessment:

1. Identify roadways with average daily traffic (ADT) volumes in excess of the SMAQMD's screening criteria of 50,000.[3] Segments with less than 50,000 ADT were assumed to present minimal health risks and were therefore excluded from further analysis, per SMAQMD guidance. For segments with greater than 50,000 ADT, Step 2 was complete.
2. Determine nearest sensitive receptor's increased cancer risk using peak hour traffic volumes. Receptors with a predicted risk lower than the SMAQMD's screening criteria of 281 cases per million were excluded from further analysis, per SMAQMD guidance. For receptors with a predicted risk greater than 281 cases per million, Step 3 was completed.
3. Complete a site specific HRA.

B.4.1 Screening Criteria

B.4.1.1 Connector Segments

Existing Conditions

Peak hour traffic volumes along the Connector were not available for existing conditions. Consequently, peak hour volumes were calculated from ADT using the following equation, which is based on accepted industry practice. This conversion represents a conservative estimate and likely overestimates peak hour volumes.

Peak Hour = Average Daily Traffic / 10

[3] The screening criterion of 50,000 is recommended by SMAQMD for *rural* roadways; 100,000 ADT is recommended for *urban* roadways. The rural criterion was used to screen all roadways within the TSAS, including those in urban areas, to ensure a conservative analysis.

As discussed above, ADT under existing conditions was only provided as a range of minimum and maximum volumes expected to occur under the proposed project and operational options, and the minimum and maximum values were not assigned to any specific option. To ensure emissions were not underrepresented, ADT under the "maximum" scenario was used in this analysis, which was assumed to represent the High Access Roadway Option, as the High Access Roadway represented the option with the greatest ADT under future conditions.

Based on the calculated peak hour volumes and corresponding receptor locations, the roadway segment along Sunrise Boulevard from Zinfandel Road to US 50 exceeds the SMAQMD's Protocol's cancer screening criteria of 281 cases per million under existing conditions. The highest traffic volumes on all other segments were between 4,000 and 6,000 vehicles per hour. Based on the SMAQMD screening tables, these peak hour traffic volumes are not representative of conditions that either exceed 281 cases per million or warrant a site specific HRA (Sacramento Metropolitan Air Quality Management District 2010). Consequently, a site-specific HRA was only conducted for the segment on Sunrise Boulevard from Zinfandel Road to US 50 under existing conditions.

Design Year

Peak hour volumes at various intersections along the Connector under design year conditions were provided by the traffic engineers. This data indicates that segment volumes are no greater than 6,500 vehicles per hour, and that traffic on the majority of segments falls between 2,000 and 4,000 vehicles per hour. However, note that the intersections provided by the traffic engineers did not cover the roadway segment along Sunrise Boulevard from Zinfandel Road to US 50 (the closet segment was on Sunrise from Grant Line Road to Florin Road). Because this segment exceeded the SMAQMD's screening criteria under existing conditions, peak hour volumes under design year conditions were calculated using the equation A-3 to determine whether design year conditions would also exceed the SMAQMD's screening criteria, necessitating a site-specific HRA.

Equation A-3 $A = B * (C/D)$

Where:

A = 2035 Peak hour volumes on Sunrise Boulevard from Zinfandel Road to US 50

B = 2035 peak hour volumes on Sunrise from Florin Road to Grant Line Road

C = 2035 ADT on Sunrise Boulevard from Zinfandel Road to US 50

D = 2035 ADT on Sunrise from Florin Road to Grant Line Road Based on the calculated peak hour volumes, the roadway segment would exceed the SMAQMD Protocol's cancer screening criteria under design conditions for the proposed project with Deer Creek Causeway Options 1 and 2 and the High Access Roadway Option. Consequently, a site specific HRA was conducted for the segment on Sunrise Boulevard from Zinfandel Road to US 50 under design year conditions.

B.4.1.2 Freeway Segments

The study area for freeway segments includes the following.

- US 50 from Watt Avenue to Bass Lake Road.
- I-5 from Twin Cities Road to Consumes River Boulevard.
- SR 99 from Twin Cities Road to Calvine Road.

Existing year (2008) and design year (2035) ADT was provided for freeways segments with the study area. However, peak hour volumes were unavailable. Consequently, peak hour data for the freeway segments was obtained from the 2008 edition of the *Caltrans' Annual Average Daily Traffic on the California State Highway System* (California Department of Transportation 2008). According to the Caltrans data, peak hour volumes in 2008 represented approximately 9-11% of total ADT along the US 50 segments, and 7-8% of total ADT along SR 99. To estimate peak hour traffic volumes, total ADT for the existing and design years on US 50 and SR 99 was multiplied by these factors. This approach is based on the assumption that these values would remain constant in the future and that the project would not change the ratio of peak hour volumes to ADT, as design elements associated with the proposed project and optional project components are the same for existing and future conditions.

Based on the calculated peak hour traffic volumes and corresponding receptor locations, seven roadway segments (six roadway segments along US 50 and two roadway segments along SR 99) exceed the Protocol's cancer screening criteria of 281 cases per million (see Table B-3). Consequently, a site-specific HRA was conducted for the segments listed in Table B-3.

Table B-3. HRA Study Segments

From	To
US 50 Segments	
Watt Ave	Bradshaw Rd
Bradshaw Rd	Mather Field Rd
Mather Field Rd	Zinfandel Dr
Zinfandel Dr	Sunrise Blvd
Sunrise Blvd	Rancho Cordova Pkwy
Rancho Cordova Pkwy	Hazel Ave
SR 99 Segments	
Laguna Blvd	Sheldon Rd
Sheldon Rd	Calvine Rd

B.4.2 Traffic Data for the Site-Specific HRA

Existing (2008) and design year (2035) total ADT for the eight study segments indicated in Table B-3 was obtained from the traffic engineers (Long pers. comm.). Since only total ADT was available, peak hour volumes were calculated based on the ratio of peak hour volumes to total ADT under existing conditions (2008) using Caltrans data (California Department of Transportation 2008), as described above.

Table B-4 presents the total ADT and peak hour traffic volumes used in this assessment. To represent a worst-case scenario, the maximum traffic volume calculated along US 50 was applied to the entire US 50 segment from Watt Avenue to Hazel Avenue, and the maximum traffic volume calculated along SR 99 was applied to the entire SR 99 segment from Laguna Blvd to Calvine Rd.

Table B-4. Peak Hour Volumes on US 50 and SR 99

	Existing Conditions (2008)		Design Year (2035)	
Alternative 2/3 Design Option	Maximum ADT	Maximum Peak Hour Volumes [a]	Maximum ADT	Maximum Peak Hour Volumes [a]
US 50 (Watt Avenue to Hazel Avenue)				
No Project	177,000	16,600	230,000	23,281
Proposed Project with Reduced Access Roadway	-	-	229,000	22,822
Proposed Project with Deer Creek Causeway Option 1	-	-	228,000	22,708
Proposed Project with Deer Creek Causeway Option 2	-	-	228,000	22,708
Proposed Project with High Access Roadway	176,230	16,528	229,000	22,822
SR 99 (Laguna Blvd to Sheldon Road)				
No Project	130,000	10,300	153,000	13,133
Proposed Project with Reduced Access Roadway	-	-	153,000	13,133
Proposed Project with Deer Creek Causeway Option 1	-	-	152,000	13,047
Proposed Project with Deer Creek Causeway Option 2	-	-	152,000	13,047
Proposed Project with High Access Roadway	129,198	10,300		
Sunrise (Zinfandel to US 50)[b]				
No Project	84,100	8,410	108,800	5,726
Proposed Project with Reduced Access Roadway	-	-	108,900	7,280
Proposed Project with Deer Creek Causeway Option 1	-	-	108.800	9,308
Proposed Project with Deer Creek Causeway Option 2	-	-	108.800	9,337
Proposed Project with High Access Roadway	84,200	8,420	108,900	7,473

[a] Calculated by multiplying projected 2035 ADT by the ratio of peak hour volumes to Total ADT for 2008 .

[b] The ratio of maximum ADT to maximum peak hour volumes between existing and design year conditions is not consistent due to calculation assumptions. As discussed above, peak hour volumes under existing conditions were calculated by dividing ADT to 10, while peak hour volumes under design year conditions were calculated using Equation A-3. These modeling assumptions were required due to the availability of traffic data.

Source: Long pers. comm.; California Department of Transportation 2008

B.4.3 Modeling Procedures

B.4.3.1 Emission Factors

Hourly VMT and PM10 emissions for 2008 and 2035 were modeled using the Burden[4] mode of the EMFAC2007 (Version 2.3) emissions model and guidance from the Protocol (Sacramento Metropolitan Air Quality Management District 2010). The VMT outputs for each year were normalized using the highest hourly VMT count. Hourly traffic volumes on Sunrise Boulevard, US 50, and SR 99 were obtained by multiplying the normalized values by the peak hour volumes presented in Table B-4. Hourly PM10 emissions were also calculated from the EMFAC modeled outputs. Tables B-5 and B-6 summarize the hourly traffic volumes and PM10 emissions factors used in this analysis.

Table B-5. Hourly Traffic Volumes and PM10 Emission Factors under Existing (2008) Conditions

Hour	No Build			Proposed Project with High Access Roadway			PM 10 (grams/ VMT)
	US 50 (veh/hr)	SR 99 (veh/hr)	Sunrise (veh/hr)	US 50 (veh/hr)	SR 99 (veh/hr)	Sunrise (veh/hr)	
hr 00	2,485	1,542	1,259	2,474	1,542	1,260	0.0707
hr 01	1,013	629	513	1,009	629	514	0.0578
hr 02	1,175	729	595	1,170	729	596	0.0997
hr 03	645	400	327	643	400	327	0.2722
hr 04	1,123	697	569	1,118	697	570	0.1043
hr 05	2,001	1,241	1,014	1,992	1,241	1,015	0.0878
hr 06	7,719	4,790	3,911	7,686	4,790	3,915	0.0607
hr 07	15,567	9,659	7,887	15,500	9,659	7,896	0.0339
hr 08	14,722	9,135	7,458	14,658	9,135	7,467	0.0358
hr 09	9,287	5,763	4,705	9,247	5,763	4,711	0.0504
hr 10	9,739	6,043	4,934	9,697	6,043	4,940	0.0481
hr 11	12,192	7,565	6,177	12,139	7,565	6,184	0.0432
hr 12	12,566	7,797	6,366	12,512	7,797	6,374	0.0373
hr 13	12,405	7,697	6,285	12,351	7,697	6,292	0.0378
hr 14	14,238	8,834	7,213	14,176	8,834	7,222	0.0288
hr 15	14,490	8,990	7,341	14,427	8,990	7,349	0.0283
hr 16	15,251	9,463	7,727	15,185	9,463	7,736	0.0307
hr 17	16,600	10,300	8,410	16,528	10,300	8,420	0.0247
hr 18	11,488	7,128	5,820	11,439	7,128	5,827	0.0204
hr 19	8,584	5,326	4,349	8,547	5,326	4,354	0.0205
hr 20	6,603	4,097	3,345	6,574	4,097	3,349	0.0355
hr 21	6,719	4,169	3,404	6,690	4,169	3,408	0.0349
hr 22	5,028	3,120	2,547	5,006	3,120	2,550	0.0233
hr 23	3,789	2,351	1,919	3,772	2,351	1,922	0.0309

[4] The Burden mode is used for calculating regional (area-specific) emission inventories. In this mode, the model reports total emissions as tons per weekday for each pollutant, by vehicle class and the total vehicle fleet. The Burden mode uses emission factors that have been corrected for ambient conditions and speeds combined with vehicle activity to calculate emissions in tons per day. Vehicle activity includes the number of vehicles, how many miles are driven per day and the number of daily trips. In the Burden mode, the user may select either an hourly or daily total output. (California Department of Transportation n.d).

It should be noted that the SMAQMD's HRA modeling protocol does not allow for adjustments in the per-vehicle emission rate over the analysis exposure duration, despite the fact that emission controls are required to be improved, by federal and California regulatory requirements. Not only will new vehicles be required to meet these standards, some existing vehicles (such as heavy duty trucks) will be required to be retrofitted. These emission controls predominantly effect diesel-powered vehicles, which produce the majority of diesel particulate emissions that can contribute to adverse health effects. What this means is that, over time, PM10 emissions are not only expected, but are required, to be substantially reduced from the overall vehicle fleet. Because the modeling protocol does not allow for this adjustment—it assumes vehicle emission rates will remain static at current levels for the 2008 and 2035 analysis scenarios over the entire exposure duration—this can result in a highly conservative risk assessment that can over-predict expected cancer risks.

While the assessment of health risks includes an unrealistic assumption that emission rates will remain constant and do not reflect the anticipated decrease in emission rates over time, this is somewhat offset by assumption that traffic volumes will remain static over the assessment's exposure duration for each scenario evaluated. For example, the analysis scenario evaluates cancer risks associated exposure to 2035 traffic volumes over a 70-year exposure duration. This represents an unrealistic assumption because traffic volumes tend to increase with time, consistent with increases in regional population over time.

B.4.3.2 Roadway and Receptor Locations

Cartesian coordinates marking the beginning and end of the US 50 and SR 99 study segments were converted to x-y coordinates. Segment widths were based on the number of travel lanes under existing conditions and the anticipated under deign year (2035) conditions. According to DKS, the following roadway conditions were assumed (Long pers. comm.)

- Sunrise Boulevard: 6 lanes under existing conditions and 8 lanes under design year conditions
- US 50 between Watt and Hazel Avenue: 8 lanes under existing conditions and 10 lanes under design year conditions
- SR 99 between Laguna and Sheldon: 6 lanes under existing and design year conditions

In accordance with the Protocol, each lane was assumed to be 12 feet in width with an additional 10 feet on each side of the roadway to account for the wake of moving vehicles.

Sixteen receptors were placed perpendicular to midway points on Sunrise Boulevard, US 50, and SR 99 for a total of 32 receptors. These receptors extended northward and southward on US 50, and eastward and westward on SR 99 and Sunrise Boulevard. Based on SMAQMD's Protocol, the receptors were placed at 10, 25, 50, 100, 200, 300, 400, and 500 foot increments from the roadway's edge. To account for breathing height, all receptors were placed at a height of six feet, as per the SMAQMD Protocol.

Table B-6. Hourly Traffic Volumes and PM10 Emission Factors under Design Year (2035) Conditions

Hour	No Project			Proposed Project with Reduced Access Roadway			Proposed Project with Deer Creek Causeway Option 1			Proposed Project with Deer Creek Causeway Option 2			Proposed Project with High Access Roadway			PM 10 (grams/VMT)
	US 50 (veh/hr)	SR 99 (veh/hr)	Sunrise (veh/hr)	US 50 (veh/hr)	SR 99 (veh/hr)	Sunrise (veh/hr)	US 50 (veh/hr)	SR 99 (veh/hr)	Sunrise (veh/hr)	US 50 (veh/hr)	SR 99 (veh/hr)	Sunrise (veh/hr)	US 50 (veh/hr)	SR 99 (veh/hr)	Sunrise (veh/hr)	
hr 00	3,432	1,936	844	3,364	1,936	1,073	3,347	1,923	1,372	3,347	1,923	1,376	3,364	1,936	1,101	0.0181
hr 01	1,356	765	334	1,329	765	424	1,323	760	542	1,323	760	544	1,329	765	435	0.0458
hr 02	1,548	873	381	1,517	873	484	1,510	867	619	1,510	867	621	1,517	873	497	0.0401
hr 03	856	483	211	839	483	268	835	480	342	835	480	343	839	483	275	0.0726
hr 04	1,527	862	376	1,497	862	478	1,490	856	611	1,490	856	613	1,497	862	490	0.0407
hr 05	2,767	1,561	681	2,713	1,561	865	2,699	1,551	1,106	2,699	1,551	1,110	2,713	1,561	888	0.0225
hr 06	10,829	6,109	2,663	10,616	6,109	3,386	10,562	6,069	4,329	10,562	6,069	4,343	10,616	6,109	3,476	0.0230
hr 07	21,884	12,345	5,382	21,453	12,345	6,843	21,345	12,264	8,749	21,345	12,264	8,777	21,453	12,345	7,024	0.0199
hr 08	20,610	11,626	5,069	20,204	11,626	6,445	20,102	11,550	8,240	20,102	11,550	8,266	20,204	11,626	6,616	0.0211
hr 09	12,966	7,314	3,189	12,710	7,314	4,054	12,647	7,266	5,184	12,647	7,266	5,200	12,710	7,314	4,162	0.0240
hr 10	13,630	7,689	3,352	13,362	7,689	4,262	13,295	7,639	5,450	13,295	7,639	5,466	13,362	7,689	4,375	0.0228
hr 11	17,062	9,625	4,196	16,726	9,625	5,335	16,642	9,562	6,821	16,642	9,562	6,843	16,726	9,625	5,477	0.0219
hr 12	17,644	9,953	4,340	17,296	9,953	5,517	17,209	9,888	7,054	17,209	9,888	7,076	17,296	9,953	5,664	0.0211
hr 13	17,404	9,818	4,281	17,061	9,818	5,442	16,976	9,754	6,958	16,976	9,754	6,980	17,061	9,818	5,587	0.0214
hr 14	20,000	11,282	4,919	19,606	11,282	6,254	19,508	11,208	7,996	19,508	11,208	8,021	19,606	11,282	6,420	0.0186
hr 15	20,363	11,487	5,008	19,962	11,487	6,368	19,862	11,412	8,141	19,862	11,412	8,167	19,962	11,487	6,536	0.0214
hr 16	21,445	12,098	5,275	21,023	12,098	6,706	20,917	12,018	8,574	20,917	12,018	8,601	21,023	12,098	6,884	0.0232
hr 17	23,281	13,133	5,726	22,822	13,133	7,280	22,708	13,047	9,308	22,708	13,047	9,337	22,822	13,133	7,473	0.0214
hr 18	16,117	9,091	3,964	15,799	9,091	5,040	15,720	9,032	6,444	15,720	9,032	6,464	15,799	9,091	5,173	0.0193
hr 19	12,055	6,800	2,965	11,817	6,800	3,770	11,758	6,756	4,820	11,758	6,756	4,835	11,817	6,800	3,870	0.0155
hr 20	9,260	5,224	2,278	9,078	5,224	2,896	9,032	5,190	3,702	9,032	5,190	3,714	9,078	5,224	2,972	0.0201
hr 21	9,445	5,328	2,323	9,259	5,328	2,954	9,213	5,293	3,776	9,213	5,293	3,788	9,259	5,328	3,032	0.0197
hr 22	7,055	3,980	1,735	6,916	3,980	2,206	6,881	3,954	2,821	6,881	3,954	2,829	6,916	3,980	2,265	0.0176
hr 23	5,315	2,998	1,307	5,210	2,998	1,662	5,184	2,979	2,125	5,184	2,979	2,132	5,210	2,998	1,706	0.0234

B.4.3.3 CAL3QHCR Parameters

PM10 concentrations at each of the defined receptor locations were modeled using the CAL3QHCR model and methodology recommended by the SMAQMD Protocol. Table B-7 summarizes the main assumptions used in the modeling methodology. Emission factors and hourly traffic volumes were calculated using the EMFAC2007 model outputs and are presented in Table B-5 and Table B-6.

Table B-7. CAL3QHCR Assumptions

Parameter	Assumption
Calculation Averaging Time	60
Surface Roughness Coefficient	108
Settling Velocity (cm/s)	0
Deposition Velocity (cm/s)	0
Hourly Ambient Background Concentration (μg/m^3)	0
Roadway Height (feet)	At grade, 0

B.4.3.4 Calculation of Cancer Risk

The calculation of health risks was done following the ARB's Recommended Interim Risk Management Policy for Inhalation Based Cancer Risk. The cancer risk occurs exclusively through the inhalation pathway; therefore the inhalation dose must first be calculated using the following equation:

$$\mathit{Dose} = \frac{(\text{Cair})(\text{DBR})(\text{A})(\text{EF})(\text{ED})(1\text{X } 10^{-6})}{\text{AT}}$$

where,

Dose = Dose through inhalation (mg/kg/d)

1X 10^{-6} = Micrograms to milligrams conversion

Cair = Concentration in air (μg/m^3), annual average from CAL3QHCR

DBR = Daily breathing rate (L/kg body weight-day), 302

A = Inhalation absorption factor, 1

EF = Exposure frequency, 350 days/year

ED = Exposure duration, 70 years

AT = Averaging time, 25550 days

Once the dose is obtained, the cancer risk can be estimated according to the following equation:

$$\mathit{Cancer\ Risk} = (\text{Dose})(\text{Cancer Potency})(\ 1\text{X } 10^{6})$$

where,

Cancer Risk = Chances per million people

Dose = Dose through inhalation (mg/kg/d)

Cancer Potency = 1.1 /kg-day/mg

1 X 10^6 = Risk per million people

The cancer potency factor incorporates worst case, health-protective assumptions. It was established using data from animal and epidemiological exposure studies and represents the increased chance or probability of developing cancer assuming continuous lifetime exposure.

B.5 References Cited

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Appendix C

Recorded Cultural Resources and Native American Correspondence

C-1. Recorded Cultural Resources

Appendix C1. Recorded Cultural Resources in the Study Area

Site Numbers					
Proposed Project	Sunrise Boulevard Alternative	Bradshaw Road Alternative	Off-Corridor Multi-Use Path	Description	Site Status
P-9-69-H	P-9-69-H	P-9-69-H	P-9-69-H	rock wall	Not evaluated
P-9-71-H	P-9-71-H	P-9-71-H	P-9-71-H	ditch	Not evaluated
P-9-72-H	P-9-72-H	P-9-72-H	P-9-72-H	rock wall	Not evaluated
P-9-12-H	P-9-12-H	P-9-12-H	P-9-12-H	road	Not evaluated
P-9-13-H	P-9-13-H	P-9-13-H	P-9-13-H	prospect pit	Not evaluated
P-9-14-H	P-9-14-H	P-9-14-H	P-9-14-H	rock wall	Not evaluated
P-9-15-H	P-9-15-H	P-9-15-H	P-9-15-H	rock wall	Not evaluated
P-9-16-H	P-9-16-H	P-9-16-H	P-9-16-H	rock wall	Not evaluated
P-9-17	P-9-17	P-9-17	P-9-17	bedrock mortar	Not evaluated
P-9-18-H	P-9-18-H	P-9-18-H	P-9-18-H	fenceline	Not evaluated
P-9-4204-H	P-9-4204-H	P-9-4204-H	P-9-4204-H	Clarksville Cemetery	Not evaluated
P-9-1691-H	P-9-1691-H	P-9-1691-H	P-9-1691-H	ditch	Not evaluated
P-9-1274-H	P-9-1274-H	P-9-1274-H	P-9-1274-H	fenceline	Not evaluated
P-9-1692-H	P-9-1692-H	P-9-1692-H	P-9-1692-H	rock wall	Not evaluated
P-9-809/CA-ELD-721-H	P-9-809/CA-ELD-721-H	P-9-809/CA-ELD-721-H	P-9-809/CA-ELD-721-H	White Rock Rd., Old Placervillle Rd., Lincoln Hwy.	Segment within study area not evaluated but portions outside study area eligible for NRHP
P-34-2150-H	P-34-2150-H	P-34-2150-H		farmhouse site	Not evaluated
P-34-2151-H	P-34-2151-H	P-34-2151-H		rock wall	Not evaluated
CA-SAC-900-H	CA-SAC-900-H	CA-SAC-900-H		ranch complex	Not evaluated
CA-SAC-901-H	CA-SAC-901-H	CA-SAC-901-H		mining shaft	Not evaluated
P-34-980/CA-SAC-680-H	P-34-980/CA-SAC-680-H	P-34-980/CA-SAC-680-H		Yost homesite	Not evaluated
P-34-2188-H	P-34-2188-H	P-34-2188-H		prospect pit	Not evaluated
P-34-1697/CA-SAC-1105	P-34-1697/CA-SAC-1105	P-34-1697/CA-SAC-1105		bedrock mortar	Not evaluated
P-34-1698/CA-SAC-1106	P-34-1698/CA-SAC-1106	P-34-1698/CA-SAC-1106		bedrock mortar	Not evaluated
P-34-2190-H	P-34-2190-H	P-34-2190-H		historic trash scatter	Not evaluated
P-34-2191-H	P-34-2191-H	P-34-2191-H		prospect pits	Not evaluated
P-34-2193-H	P-34-2193-H	P-34-2193-H		historic inn site	Not evaluated
P-34-2194-H	P-34-2194-H	P-34-2194-H		ditch	Not evaluated
P-34-2196	P-34-2196	P-34-2196		pestle isolate	Not evaluated
P-34-2186-H	P-34-2186-H	P-34-2186-H		prospect pit	Not evaluated

Site Numbers					
Proposed Project	Sunrise Boulevard Alternative	Bradshaw Road Alternative	Off-Corridor Multi-Use Path	Description	Site Status
P-34-1702-H/CA-SAC-1011-H	P-34-1702-H/CA-SAC-1011-H	P-34-1702-H/CA-SAC-1011-H		nails	Not evaluated
P-34-1692-H/CA-SAC-1009-H	P-34-1692-H/CA-SAC-1009-H	P-34-1692-H/CA-SAC-1009-H		rock wall	Not evaluated
P-34-1695	P-34-1695	P-34-1695		bedrock mortar	Not evaluated
P-34-1077-H	P-34-1077-H	P-34-1077-H		ditch	Not evaluated
P-34-1076-H/CA-SAC-740-H	P-34-1076-H/CA-SAC-740-H	P-34-1076-H/CA-SAC-740-H		Lewis Gouilinson homestead site	Not evaluated
P-34-1072-H/CA-SAC-738-H	P-34-1072-H/CA-SAC-738-H	P-34-1072-H/CA-SAC-738-H		barn	Not evaluated
P-34-1069-H/CA-SAC-737-H	P-34-1069-H/CA-SAC-737-H	P-34-1069-H/CA-SAC-737-H		mining site	Not evaluated
P-34-1066-H	P-34-1066-H	P-34-1066-H		mining tailings	Not evaluated
P-34-1067-H	P-34-1067-H	P-34-1067-H		ditch	Not evaluated
P-34-2148-H	P-34-2148-H	P-34-2148-H		rock wall	Not evaluated
P-34-2149-H	P-34-2149-H	P-34-2149-H		historic scatter	Not evaluated
P-34-623/CA-SAC-507-H				capped well, collapsed structure	Not evaluated
	P-34-1050-H			trash scatter	Not evaluated
	P-34-1710-H/CA-SAC-1013-H			Areojet Dredge Fields	Not evaluated
	P-34-2145-H			trash scatter	Not eligible
	P-34-2146-H			brick	Not evaluated
	P-34-2147-H			trash scatter	Not evaluated
P-34-523-H/CA-SAC-688-H	P-34-523-H/CA-SAC-688-H	P-34-523-H/CA-SAC-688-H		Lent Ranch Complex	Not eligible for the NRHP/not evaluated for CRHR
P-34-1193-H	P-34-1193-H	P-34-1193-H		aqua glass	Not evaluated
P-34-192/CA-SAC-165	P-34-192/CA-SAC-165	P-34-192/CA-SAC-165		midden mound	Not evaluated
P-34-1520-H/CA-SAC-925-H	P-34-1520-H/CA-SAC-925-H			rock wall	Not evaluated
P-34-1113-H	P-34-1113-H			1930 house	Not eligible
P-34-1294-H/CA-SAC-817-H	P-34-1294-H/CA-SAC-817-H			Central CA traction housing feature	Not evaluated
			P-34-1379-H	1935 house	Not eligible
			P-34-1102-H	1952 Hurley-Tracy transmission Line	Not eligible
					Not evaluated
			P-34-1104	pestle isolate	Not evaluated
			P-34-3865-H	Old County Road	Not eligible
			P-34-1110-H	historic ranch complex	Not evaluated

Site Numbers					
Proposed Project	Sunrise Boulevard Alternative	Bradshaw Road Alternative	Off-Corridor Multi-Use Path	Description	Site Status
			P-34-1111-H	iron beam isolate	Not evaluated
		P-34-1670-H		1946 truss bridge	Not eligible
		P-34-1958-H		pipe	Not evaluated
		P-34-1959-H		pipe	Not evaluated
		P-34-1960-H		pipe	Not evaluated
		P-34-1961-H		pipe	Not evaluated
		P-34-1962-H		pipe	Not evaluated
		P-34-1516-H		1928 house	Not eligible
		P-34-1620-H/CA-SAC-965-H		1949 house	Not evaluated
		P-34-1471-H/CA-SAC-896-H		storage bldg	Not evaluated
		P-34-1470-H/CA-SAC-895-H		1907 house	Not evaluated
		P-34-1618-H		house remnants	Not evaluated
		P-34-1514-H		1908 house	Not eligible
		P-34-1515-H		1925 house	Not eligible
			P-34-694-H/CA-SAC-540-H	homestead site	Not evaluated
			P-34-707-H/CA-SAC-549-H	historic farm	Not eligible
			P-34-1295/CA-SAC-818-H	Mojave Natural Gas pipeline alignment	Not evaluated
		P-34-1507-H		1939 house	Not eligible
		P-34-688-H		ca. 1920 house	Not eligible
		P-34-689-H		1950 and 1948 houses	Not eligible
		P-34-1669-H		trash scatter	Not evaluated
			P-34-981-H/CA-SAC-681-H	Aerojet military debris scatter	Not evaluated
			P-34-1980-H	house foundation	Not evaluated
			P-34-1981-H	military warehouse	Not evaluated
			P-34-596-H	c. 1949 house	Not eligible
			P-34-988-H	hearth	Not evaluated
			P-34-1712	obsidian biface	Not evaluated
			P-34-1762-H	earthen dam	Not evaluated
			P-34-1772-H	mining site	Not evaluated
			P-34-989-H	rock wall	Not evaluated
			P-34-1667-H	Nimbus Winery complex	Not eligible
			P-34-1713-H	aqua glass	Not evaluated

Site Numbers					
Proposed Project	Sunrise Boulevard Alternative	Bradshaw Road Alternative	Off-Corridor Multi-Use Path	Description	Site Status
			P-34-1717-H	earthenware fragments	Not evaluated
			P-34-1715-H	historic glass	Not evaluated
			P-34-1716-H	earthenware fragments	Not evaluated
			P-34-1769-H	Rhoads Branch Ditch	Not evaluated
			P-34-1771-H	prospect pits, historic glass	Not evaluated
			P-34-1773-H	rock wall	Not evaluated
			P-34-1774-H	quartz mine prospect pit	Not evaluated
			P-34-1775-H	road	Not evaluated
			P-34-1776-H	lateral of Natomas Canal	Not evaluated
			P-34-1777-H	mining prospect pits	Not evaluated
			P-34-1778-H	prospect pits	Not evaluated
			P-34-1781-H	earthen dam	Not evaluated
			P-34-1782-H	mining site	Not evaluated
			P-34-1783-H	ditch	Not evaluated
			P-34-1784-H	mining site	Not evaluated
			P-34-1785-H	rock wall	Not evaluated
			P-34-1786-H	ditch	Not evaluated
			P-34-1787-H	earthem dam	Not evaluated
			P-34-1788-H	foundation, trash scatter	Not evaluated
			P-34-1792-H	ditch	Not evaluated
			P-34-1793-H	mining	Not evaluated
			P-34-1795-H	mining site	Not evaluated
			P-34-1796-H	wire fence	Not evaluated
			P-34-1798-H	prospect pits	Not evaluated
			P-34-1799-H	prospect pits	Not evaluated
			P-34-1800-H	placer diggings	Not evaluated
			P-34-1802-H	road	Not evaluated
			P-34-1803-H	drift mine	Not evaluated
			P-34-1804-H	ditch	Not evaluated
			P-34-1805-H	quartz mine	Not evaluated
			P-34-1806-H	placer mining complex	Not evaluated
			P-34-1807-H	ditch	Not evaluated
			P-34-1808-H	mining site	Not evaluated

Site Numbers					
Proposed Project	Sunrise Boulevard Alternative	Bradshaw Road Alternative	Off-Corridor Multi-Use Path	Description	Site Status
			P-34-1822-H	hearth	Not evaluated
			P-34-1823-H	iron pipeline	Not evaluated
			P-34-1825-H	mining complex	Not evaluated
			P-34-1826-H	steel cables	Not evaluated
			P-34-1893-H	Aerojet Building 20015	Not evaluated
			P-34-1895-H	Aerojet Building 20009	Not evaluated
			P-34-1896-H	Aerojet Building 20008	Not evaluated
			P-34-1897-H	Aerojet Building 20006	Not evaluated
			P-34-1900-H	Aerojet Building 49013	Not evaluated
			P-34-1909-H	mining site	Not evaluated
			P-34-1923-H	mining site	Not evaluated
			P-34-1926-H	mining site	Not evaluated
			P-34-1938-H	dredging cable	Not evaluated
			P-34-1939-H	bottle	Not evaluated
			P-34-1956-H	historic refuse	Not evaluated
			P-34-2091-H	mining site	Not evaluated
			P-34-2284-H	Natomas dredge field	Not evaluated
			P-34-2287-H	quartz	Not evaluated
			P-34-2288-H	pick head	Not evaluated
			P-34-2291-H	placer mining site	Not evaluated
			P-34-2292-H	placer mining site	Not evaluated
			P-34-2293-H	placer mining site	Not evaluated
			P-34-2294-H	placer mining site	Not evaluated
			P-34-2183-H	Aeroject Building 49015	Not evaluated
			P-34-2184-H	Aeroject Building 49016	Not evaluated
			P-34-2185-H	Aeroject Building 49022	Not evaluated
			P-34-2240-H	mining tailings	Not evaluated
			P-34-2241-H	mining tailings	Not evaluated
			P-34-2242-H	mining site	Not evaluated
			P-34-2243-H	drift mine	Not evaluated
			P-34-2244-H	mining tailings	Not evaluated
			P-34-2245-H	placer mining site	Not evaluated
			P-34-2247-H	quartz mine	Not evaluated

Site Numbers					
Proposed Project	Sunrise Boulevard Alternative	Bradshaw Road Alternative	Off-Corridor Multi-Use Path	Description	Site Status
			P-34-2254-H	canal	Not evaluated
			P-34-2274-H	placer mining complex	Not evaluated
			P-34-2276-H	Natoma Ground Sluice Diggings	Not evaluated
			P-34-2279-H	mining complex, historic scatter	Not evaluated
			P-34-2280-H	mining site	Not evaluated
			P-34-2283-H	mining site	Not evaluated
			P-34-2806-H	Prairie Diggings Placer Mining District	Eligible for NRHP
			P-34-2237-H	Willow Hill Reservoir mining complex	Not evaluated
CA landmark 680	CA landmark 680	CA landmark 680		Murphy's Ranch	Not evaluated
CA landmark 699	CA landmark 699	CA landmark 699	CA landmark 699	Mormon Tavern stage stop	Not evaluated
			CA landmark 746	Coloma Road	Not evaluated
			CA landmark 464	Site of Prairie City	Not evaluated
			Point of Historical Interest - Sac-010	NE corner of Folsom Blvd. & 50	Not evaluated

C-2. Native American Consultation

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
e-mail: ds_nahc@pacbell.net

July 7, 2010

Tina Sorvari
IFC Jones & Stokes
630 K Street, Suite 400
Sacramento, CA 95814

Sent by Fax: 916-737-3030
Number of Pages: 2

Re: Proposed Capital Southeast Connector Project, Sacramento & ElDorado Counties

Dear Ms. Sorvari:

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe or group. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4038.

Sincerely,

For

Debbie Pilas-Treadway
Environmental Specialist III

Native American Contacts
Sacramento and El Dorado Counties
July 6, 2010

Rose Enos
15310 Bancroft Road
Auburn , CA 95603
(530) 878-2378
Maidu
Washoe

El Dorado County Indian Council
P.O. Box 564
El Dorado , CA 95623
Miwok
Maidu

Randy Yonemura
4305 - 39th Avenue
Sacramento , CA 95824
honortraditions@mail.com
(916) 421-1600
Miwok

El Dorado Miwok Tribe
PO Box 711
El Dorado , CA 95623
chair@eldoradorancheria.org.
916-996-0384
Miwok

April Wallace Moore
19630 Placer Hills Road
Colfax , CA 95713
530-637-4279
Nisenan - So Maidu
Konkow
Washoe

El Dorado Miwok Tribe
Brian Padilla
PO Box 2437
Marysville , CA 95901
Miwok

Buena Vista Rancheria
Rhonda Morningstar Pope, Chairperson
PO Box 162283
Sacramento , CA 95816
rhonda@buenavistatribe.com
916 491-0011
916 491-0012 - fax
Me-Wuk / Miwok

El Dorado Miwok Tribe
Wesly Yielding
3266 Cimmarron Road, Apt 38
Cameron Park , CA 95682
530-672-9819
Miwok

California Valley Miwok Tribe *Formerly-Sheep Ranch Rancheria*
Briana Creekmore, Cultural Committee
PO Box 84
Wilseyville , CA 95257
209-298-7158
Miwok

Ione Band of Miwok Indians
Chairperson
PO Box 699
Plymouth , CA 95669
(209) 274-6753
(209) 274-6636 Fax
Miwok

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Capital SouthEast Connector project, Sacramento and El Dorado Counties

Native American Contacts
Sacramento and El Dorado Counties
July 6, 2010

Ione Band of Miwok Indians Cultural Committee
Ms Billie Blue, Chairperson
604 Pringle Ave, #42 — Miwok
Galt , CA 95632
beblueskу@softcom.net
(209) 756-7112

United Auburn Indian Community of the Auburn Rancheria
Marcos Guerrero, Tribal Preservation Committee
10720 Indian Hill Road — Maidu, Miwok
Auburn , CA 95603
mguerrero@auburnrancheria.com
530-883-2364
530-883-2320 - Fax

Nashville-El Dorado Miwok
Cosme Valdez, Interim Chief Executive Officer
PO Box 580986 — Miwok
Elk Grove , CA 95758
916-429-8047 voice
916-429-8047 fax

United Auburn Indian Community of the Auburn Rancheria
Gregory S. Baker, Tribal Administrator
10720 Indian Hill Road — Maidu, Miwok
Auburn , CA 95603
gbaker@auburnrancheria.com
530-883-2390
530-883-2380 - Fax

Shingle Springs Band of Miwok Indians
John Tayaba, Vice Chairperson
P.O. Box 1340 — Miwok, Maidu
Shingle Springs , CA 95682
(530) 676-8010
(530) 676-8033 Fax

Wilton Rancheria
Mary Daniels-Tarango, Chairperson
7916 Farnell Way — Miwok
Sacramento , CA 95823
(916) 427-2909 Home

Shingle Springs Band of Miwok Indians
Nicholas Fonseca, Chairperson
P.O. Box 1340 — Miwok, Maidu
Shingle Springs , CA 95682
nfonseca@ssband.org
(530) 676-8010
(530) 676-8033 Fax

Wilton Rancheria
Leland Daniels, Cultural Resources Rep
7531 Maple Leaf Lane — Miwok
Sacramento , CA 95828
(916) 689-7330

Todd Valley Miwok-Maidu Cultural Foundation
Christopher Suehead, Cultural Representative
PO Box 1490 — Miwok, Maidu
Foresthill , CA 95631
tvmmcf@foothill.net

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ICF INTERNATIONAL

July 9, 2010

Randy Yonemura
4305 39th Avenue
~~Sacramento, CA 95824~~

Subject: Capital SouthEast Connector PEIR

Dear Mr. Yonemura:

ICF is assisting the Capital SouthEast Connector Joint Powers Authority (JPA) with a cultural resources inventory for a program-level environmental impact report (PEIR). Unlike a project EIR that examines the impacts that would result from development of a specific project, a program EIR is prepared on a series of actions that can be characterized as one large project. The proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years. Individual jurisdictions are the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom.

Several alternatives including bypasses and a multi-use trail are being studied (see enclosed location map). Design information for the Corridor is at a conceptual level. Previous studies and analyses indicate that there are resources in the Connector corridor that are protected under federal and state law and that could be affected by the project, including cultural resources. However, part of this process is to help determine which alternative is most preferable.

We would appreciate your comments identifying any concerns or issues pertinent to this project. Thank you for your cooperation in this matter. If you have any questions or comments regarding cultural resources in the proposed project area, please call me at (916) 737-3000.

Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

ICF INTERNATIONAL

July 9, 2010

Wesly Yielding
El Dorado Miwok Tribe
3266 Cimmarron Road, Apt. 38
Cameron Park, CA 95682

Subject: Capital SouthEast Connector PEIR

Dear Mr. Yielding:

ICF is assisting the Capital SouthEast Connector Joint Powers Authority (JPA) with a cultural resources inventory for a program-level environmental impact report (PEIR). Unlike a project EIR that examines the impacts that would result from development of a specific project, a program EIR is prepared on a series of actions that can be characterized as one large project. The proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years. Individual jurisdictions are the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom.

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

ICF INTERNATIONAL

July 9, 2010

Cosme Valdez, Interim Chief Executive Officer
Nashville-El Dorado Miwok
PO Box 580986
Elk Grove, CA 95758

Subject: Capital SouthEast Connector PEIR

Dear Cosme Valdez:

ICF is assisting the Capital SouthEast Connector Joint Powers Authority (JPA) with a cultural resources inventory for a program-level environmental impact report (PEIR). Unlike a project EIR that examines the impacts that would result from development of a specific project, a program EIR is prepared on a series of actions that can be characterized as one large project. The proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years. Individual jurisdictions are the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom.

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

ICF INTERNATIONAL

July 9, 2010

John Tayaba, Vice Chairperson
Shingle Springs Band of Miwok Indians
PO Box 1340
Shingle Springs, CA 95682

Subject: Capital SouthEast Connector PEIR

Dear Mr. Tayaba:

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

ICF INTERNATIONAL

July 9, 2010

Christopher Suehead, Cultural Representative
Todd Valley Miwok-Maidu Cultural Foundation
PO Box 1490
Foresthill, CA 95631

Subject: Capital SouthEast Connector PEIR

Dear Mr. Suehead:

ICF is assisting the Capital SouthEast Connector Joint Powers Authority (JPA) with a cultural resources inventory for a program-level environmental impact report (PEIR). Unlike a project EIR that examines the impacts that would result from development of a specific project, a program EIR is prepared on a series of actions that can be characterized as one large project. The proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years. Individual jurisdictions are the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom.

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

ICF INTERNATIONAL

July 9, 2010

Rhonda Morningstar Pope, Chairperson
Buena Vista Rancheria
~~PO Box 162283~~
Sacramento, CA 95816

Subject: Capital SouthEast Connector PEIR

Dear Ms. Pope:

ICF is assisting the Capital SouthEast Connector Joint Powers Authority (JPA) with a cultural resources inventory for a program-level environmental impact report (PEIR). Unlike a project EIR that examines the impacts that would result from development of a specific project, a program EIR is prepared on a series of actions that can be characterized as one large project. The proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years. Individual jurisdictions are the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom.

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

ICF INTERNATIONAL

July 9, 2010

Brian Padilla
El Dorado Miwok Tribe
PO Box 2437
Marysville, CA 95901

Subject: Capital SouthEast Connector PEIR

Dear Mr. Padilla:

ICF is assisting the Capital SouthEast Connector Joint Powers Authority (JPA) with a cultural resources inventory for a program-level environmental impact report (PEIR). Unlike a project EIR that examines the impacts that would result from development of a specific project, a program EIR is prepared on a series of actions that can be characterized as one large project. The proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years. Individual jurisdictions are the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom.

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

ICF INTERNATIONAL

July 9, 2010

April Wallace Moore
19630 Placer Hills Road
Colfax, CA 95713

Subject: Capital SouthEast Connector PEIR

Dear Ms. Moore:

ICF is assisting the Capital SouthEast Connector Joint Powers Authority (JPA) with a cultural resources inventory for a program-level environmental impact report (PEIR). Unlike a project EIR that examines the impacts that would result from development of a specific project, a program EIR is prepared on a series of actions that can be characterized as one large project. The proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years. Individual jurisdictions are the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom.

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

ICF INTERNATIONAL

July 9, 2010

Chairperson
Ione Band of Miwok Indians
PO Box 699
Plymouth, CA 95669

Subject: Capital SouthEast Connector PEIR

Dear Sir or Madam:

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

ICF INTERNATIONAL

July 9, 2010

Marcos Guerrero, Tribal Preservation Committee
United Auburn Indian Community of the Auburn Rancheria
10720 Indian Hill Road
Auburn, CA 95603

Subject: Capital SouthEast Connector PEIR

Dear Mr. Guerrero:

ICF is assisting the Capital SouthEast Connector Joint Powers Authority (JPA) with a cultural resources inventory for a program-level environmental impact report (PEIR). Unlike a project EIR that examines the impacts that would result from development of a specific project, a program EIR is prepared on a series of actions that can be characterized as one large project. The proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years. Individual jurisdictions are the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom.

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Tina Sorvari
Project Coordinator

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ICF INTERNATIONAL

July 9, 2010

Nicholas Fonseca, Chairperson
Shingle Springs Band of Miwok Indians
PO Box 1340
Shingle Springs, CA 95682

Subject: Capital SouthEast Connector PEIR

Dear Mr. Fonseca:

ICF is assisting the Capital SouthEast Connector Joint Powers Authority (JPA) with a cultural resources inventory for a program-level environmental impact report (PEIR). Unlike a project EIR that examines the impacts that would result from development of a specific project, a program EIR is prepared on a series of actions that can be characterized as one large project. The proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years. Individual jurisdictions are the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom.

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

ICF INTERNATIONAL

July 9, 2010

Rose Enos
15310 Bancroft Road
~~Auburn, CA 95603~~

Subject: Capital SouthEast Connector PEIR

Dear Ms. Enos:

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Tina Sorvari
Project Coordinator

Enclosure: Location Map

ICF INTERNATIONAL

July 9, 2010

El Dorado Miwok Tribe
PO Box 711
El Dorado, CA 95623

Subject: Capital SouthEast Connector PEIR

Dear Sir or Madam:

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

ICF INTERNATIONAL

July 9, 2010

El Dorado County Indian Council
PO Box 564
El Dorado, CA 95623

Subject: Capital SouthEast Connector PEIR

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Tina Sorvari
Project Coordinator

Enclosure: Location Map

630 K Street, Suite 400 Sacramento, CA 95814 916.737.3000 916.737.3030 fax icfi.com

ICF INTERNATIONAL

July 9, 2010

Gregory S. Baker, Tribal Administrator
United Auburn Indian Community of the Auburn Rancheria
10720 Indian Hill Road
Auburn, CA 95603

Subject: Capital SouthEast Connector PEIR

Dear Mr. Baker:

ICF is assisting the Capital SouthEast Connector Joint Powers Authority (JPA) with a cultural resources inventory for a program-level environmental impact report (PEIR). Unlike a project EIR that examines the impacts that would result from development of a specific project, a program EIR is prepared on a series of actions that can be characterized as one large project. The proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years. Individual jurisdictions are the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom.

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Tina Sorvari
Project Coordinator

Enclosure: Location Map

ICF
INTERNATIONAL

July 9, 2010

Ms. Billie Blue, Chairperson
Ione Cultural Heritage Committee
~~604 Pringle Ave. #42~~
Galt, CA 95632

Subject: Capital SouthEast Connector PEIR

Dear Ms. Billie Blue:

ICF is assisting the Capital SouthEast Connector Joint Powers Authority (JPA) with a cultural resources inventory for a program-level environmental impact report (PEIR). Unlike a project EIR that examines the impacts that would result from development of a specific project, a program EIR is prepared on a series of actions that can be characterized as one large project. The proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years. Individual jurisdictions are the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom.

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

ICF INTERNATIONAL

July 9, 2010

Briana Creekmore, Cultural Preservation Committee
California Valley Miwok Tribe (aka: Sheep Ranch)
~~PO Box 84~~
Wilseyville, CA 95257

Subject: Capital SouthEast Connector PEIR

Dear Ms. Creekmore:

ICF is assisting the Capital SouthEast Connector Joint Powers Authority (JPA) with a cultural resources inventory for a program-level environmental impact report (PEIR). Unlike a project EIR that examines the impacts that would result from development of a specific project, a program EIR is prepared on a series of actions that can be characterized as one large project. The proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years. Individual jurisdictions are the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom.

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

ICF INTERNATIONAL

July 9, 2010

Leland Daniels, Cultural Resources Representative
Wilton Rancheria
~~7531 Maple Leaf Lane~~
Sacramento, CA 95828

Subject: Capital SouthEast Connector PEIR

Dear Mr. Daniels:

ICF is assisting the Capital SouthEast Connector Joint Powers Authority (JPA) with a cultural resources inventory for a program-level environmental impact report (PEIR). Unlike a project EIR that examines the impacts that would result from development of a specific project, a program EIR is prepared on a series of actions that can be characterized as one large project. The proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years. Individual jurisdictions are the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom.

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

July 9, 2010

Mary Daniels-Tarango, Chairperson
Wilton Rancheria
7916 Farnell Way
Sacramento, CA 95823

Subject: Capital SouthEast Connector PEIR

Dear Ms. Daniels-Tarango:

ICF is assisting the Capital SouthEast Connector Joint Powers Authority (JPA) with a cultural resources inventory for a program-level environmental impact report (PEIR). Unlike a project EIR that examines the impacts that would result from development of a specific project, a program EIR is prepared on a series of actions that can be characterized as one large project. The proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years. Individual jurisdictions are the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom.

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

August 4, 2010

Sacramento Archives and Museum Collection Center
551 Sequoia Pacific Blvd.
Sacramento, CA 95811-0229

Subject: Capital SouthEast Connector Program EIR

Dear Sacramento Archives and Museum Collection Center:

ICF is assisting the Capital SouthEast Connector Joint Powers Authority (JPA) with a cultural resources inventory for a program-level environmental impact report (PEIR). Unlike a project EIR that examines the impacts that would result from development of a specific project, a program EIR is prepared in order to assist in choosing a viable alternative. When/if an alternative is chosen, the proposed project will be constructed in segments by the JPA and/or individual jurisdictions within the JPA area over a number of years. Individual jurisdictions are the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom.

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

August 4, 2010

Sacramento County Historical Society
P.O. Box 160065
Sacramento, CA 95816-0065

Subject: Capital SouthEast Connector Program EIR

Dear Sacramento County Historical Society:

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

August 4, 2010

Rancho Cordova Historical Society
2729 Prospect Park Drive
Rancho Cordova, CA 95670

Subject: Capital SouthEast Connector Program EIR

Dear Rancho Cordova Historical Society:

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

August 4, 2010

Elk Grove Historical Society
9941 East Stockton Blvd.
Elk Grove, CA 95759

Subject: Capital SouthEast Connector Program EIR

Dear Elk Grove Historical Society:

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Sincerely,

Tina Sorvari
Project Coordinator

Enclosure: Location Map

August 4, 2010

El Dorado County Historical Museum
104 Placerville Drive
Placerville, CA 95667

Subject: Capital SouthEast Connector Program EIR

Dear El Dorado County Historical Museum:

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Project Coordinator

Enclosure: Location Map

Appendix D

Geotechnical Impact Report

PARSONS BRINCKERHOFF

CAPITAL SOUTHEAST CONNECTOR

GEOTECHNICAL IMPACT REPORT

8/25/2010

TABLE OF CONTENT

Geologic Hazards and Resources

Introduction

This section evaluates the effect of geologic hazards and resources that might be encountered along the project alignment. The objective of this evaluation is to identify site conditions and the potential environmental impacts from the construction or operation of the project. This section presents a summary of the relevant laws, ordinances, regulations, and standards (LORS); the existing site conditions; and the expected direct and indirect impacts due to construction, operation, and maintenance of the project. Proposed mitigation measures and the effectiveness and monitoring plans are also described. Permits that are required and permitting agencies are identified.

Laws, Ordinances, Regulations, and Standards

The LORS that apply to geologic resources and hazards are summarized in Table 1.

TABLE 1
Laws, Ordinances, Regulations, and Standards

Jurisdiction Authority	Authority	Administering Agency	Compliance
State/Local	AASHTO Standards Caltrans Standards Uniform Building Code (UBC), 1997. California Building Code (CBC), 2007.	City of Elk Grove City of Rancho Cordova City of Folsom County of El Dorado County of Sacramento	Acceptable design criteria for structures with respect to seismic design and load-bearing capacity.

Affected Environment

The proposed Capital SouthEast Connector project is approximately 36 mile long new alignment and road widening which starts from junction of Hood Franklin Road/I-5 on the south and ends at the junction of Silva Valley Parkway and U.S. Highway 50 (U.S. 50) on the north. On its way, it crosses cities of Elk Grove, Rancho Cordova, Folsom and Sacramento/Eldorado Counties from south to north. Figure 1 shows the project alignment and its alternative options.

The proposed alignment is relatively flat with approximate elevation of 13 feet on the south and 700 ft on the north. The alignment is underlain by thick Quaternary and Tertiary alluvial deposits that originated from the erosion of the Sierra Nevada. Although the mountainous areas to the west are seismically active, the Central Valley is considered to be relatively seismically stable and is designated as a California UBC Seismic Zone 3.

Regional Geology

The project is located in the central part of the Great Valley geomorphic province. The Great Valley is an approximate 400-mile long northwest-southeast trending deep structural basin that extends along the center of the state from the Tehachapi Mountains in the south to the Klamath Mountains in the north (Norris and Webb 1990). The Sierra Nevada geomorphic province is characterized as a north-northwest trending mountain range sloping gently west to the Central Valley that comprises Jurassic to Cretaceous plutonic (chiefly granitic) rocks (Norris and Webb 1990). The structural trough in bedrock formations between the ranges was filled with alluvial, lacustrine, and marine deposits of Cretaceous, Tertiary, and Quaternary age. Deposits up to 30,000 feet are present near the western edge of the valley and dip relatively uniformly from each side of the valley toward its axis.

Local Geology

The project alignment is located in an area of fairly flat topography in the Central Valley. The project site is underlain by five major geologic units. These units include metamorphic and igneous basement complex, consolidated marine deposits, consolidated volcanic rocks, continental deposits, and unconsolidated older alluvium. Near-surface deposits consist of thick Quaternary alluvial fan and river flood plain deposits derived from fluvial systems originating from higher elevations to the east. The younger geologic units are those that affect the site most directly. These units include dredger tailings, recent river channel and flood plain deposits, and the older Quaternary Victor Formation, Riverbank, and Laguna Formations. Below the Laguna Formation is the Secondary and Tertiary Metamorphic Rocks (Sacramento Water Resources Investigation 1973). These are discussed in further detail below. A portion of geologic map is presented on Figure 2.

Flood basin deposits

These deposits occur along the Sacramento River. They consist primarily of silts and clays.

Dredger tailings

Tailings are exposed primarily along the American River in the northeastern corner of the subbasin. They consist of windows of gravel, cobbles, boulders, sand, and silt resulting from the activities of gold dredging operations. The tailings are highly permeable, but bridge construction is complicated by the presence of cobbles and boulders.

Stream Channel Deposits

The stream channel deposits include sediments deposited in the channels of active streams as well as overbank deposits of those streams, terraces, and local dredger tailings. They occur along the Sacramento, American, and Cosumnes Rivers and their major tributaries and consist primarily of unconsolidated silt, fine- to medium-grained sand, and gravel.

Older alluvium

These deposits consist of loosely to moderately compacted sand, silt and gravel deposited in alluvial fans during the Pliocene and Pleistocene. A number of formational names have been assigned to the older alluvium, including the Modesto and Riverbank Formations (Helley and Harwood, 1985), Victor Formation and Laguna Formation (Olmstead and Davis 1961), and Victor Formation, Laguna Formation, Arroyo Seco Gravels, South Fork Gravels, and Fair Oaks Formation (DWR 1974). The older alluvial units are widely exposed between the Sierra Nevada foothills and overlying younger alluvial units near the axis of the Sacramento Valley. Thickness of the older alluvium is about 100 to 650 feet.

Miocene/Pliocene Volcanics

These consist of the Mehrten Formation, a sequence of fragmental volcanic rocks, which crops out in a discontinuous band along the eastern margin of the basin. It is composed of intervals of “black sands,” stream gravels, silt, and clay interbedded with intervals of dense tuff breccia. The tuff breccia intervals act as confining layers. Thickness of the unit is between 200 and 1,200 feet.

Structure

The structural geology of the area is not complex. No major deformation-associated historic tectonic activity is present. No faults or landslides are within the local area.

Groundwater

A review of 18 long-term hydrographs dating back into the 1960s shows a consistent pattern of water level trends through much of the south American subbasin. Groundwater elevations generally declined consistently from the mid-1960s to about 1980 on the order of 20 feet. From 1980 through 1983 water levels recovered by about 10 feet and remained stable until the beginning of the 1987 through 1992 drought. From 1987 until 1995, water levels declined by about 15 feet. From 1995 to 2000 most water levels recovered by up to 20 feet leaving them generally higher than levels prior to the 1987 through 1992 drought. Exceptions to this trend include: 1) wells in the vicinity of the city of Sacramento, which fluctuated generally less than 10 feet overall since the mid-1970s; and 2) wells in the vicinity of Rancho Cordova, which appear to have recovered less than the other wells in the subbasin since 1995 (generally less than 10 feet).

Seismicity

The nearest fault system east of the project site is part of the Foothills fault system containing the Bear Mountains fault zone. This area is approximately 9 miles east of the north end of the site. This faults system was considered inactive until 1975 when a Richter magnitude 5.7 earthquake occurred near Oroville in far northern California. Subsequent to this event, the Foothills fault system was re-evaluated from inactive to having a potential Richter magnitude of 6.5 anywhere along its trace. The major faults that have historically produced earthquakes of the greatest magnitude in central California are the Calaveras, Hayward, and San Andreas faults in the Coast Ranges; the Greenville and Midland faults on the west side of the Great Valley, and the Sierra Nevada and Owens Valley faults east of the Sierra Nevada mountains. However, given the distance of these faults from the project site (45+ miles) the effect of an earthquake along these faults to the project site would likely be minimal. The site is not located within a special study zone, as delineated by the Alquist-Priolo Special Studies Zone Act of 1972; and no known fault, active or inactive, reaches the surface within the project site. The principal faults that could affect the project site and their respective maximum credible and probable earthquakes are presented on Figure 3 and summarized in Table 2.

TABLE 2
Principal Faults in the Site Region

Fault Name	Distance from Site (miles) (R_{rup})	Magnitude (Mw)	Peak Site Acceleration (g)	
			Deterministic	Probabilistic(1)
Foothills (Bear Mountains – Rescue Section)	8.9(2)	6.5	0.2	0.42
Great Valley Faults 3 & 4	43(3)	6.9	0.2	0.44
Great Valley Fault 4	30(4)	6.6	0.22	0.48

Mw = Moment magnitude
g = 9.8 meters squared per second
(1) USGS 5% in 5 years (2008)
(2) Rupture distance from the north end of the project (White Rock Rd. & Hwy 50)
(3) Rupture distance from the middle of the project (Grant Line Rd. & Sunrise Blvd. Intersection)
(4) Rupture distance from the south end of the project (Kammerer Rd. extension near I-5)

Geologic Hazards

The following subsections discuss the potential geologic hazards that might occur in the project area.

Ground Rupture

Ground rupture is caused when an earthquake event along a fault creates rupture at the surface. Since no known faults exist at the project site, the likelihood of ground rupture to occur at the project site is low.

Seismic Shaking

The most significant geologic hazard at the project alignment is moderate to strong ground shaking due to an earthquake. Based on Caltrans ARS Online using deterministic approach the maximum peak ground acceleration of about 0.22 can be expected for the entire project. Using probabilistic method for the earthquakes of return period of 975 years, a peak ground acceleration of about 0.48 is anticipated. However, based on Caltrans guidelines, a minimum deterministic peak ground acceleration of 0.5 should be used whenever the pick ground acceleration is below 0.5.

Liquefaction

During strong ground-shaking, loose, saturated, cohesionless soils can experience a temporary loss of shear strength. This phenomenon is known as liquefaction. Liquefaction is dependent on grain size distribution, relative density of the soils, degree of saturation, and intensity and duration of the earthquake. The potential hazard associated with liquefaction is seismically induced settlement. The depth to groundwater at the project site is very shallow, approximately 5 feet, and the soil types generally consist of silts and silty sands; therefore, the likelihood that liquefaction will occur is considered moderate.

Landslide

Landslide depends on steepness of the slope, underlying geology, surface soil strength, and moisture in the soil. Significant excavating, grading, or fill work during construction might introduce land sliding hazards along project. Because the project alignment is flat and no significant excavation is planned during site construction, the potential for direct impact from land sliding along the project alignment is considered low.

Subsidence

Subsidence can be a natural or man-made phenomenon resulting from tectonic movement, consolidation, hydrocompaction, or rapid sedimentation. Sacramento County has experienced some regional subsidence, primarily on the central part of the valley. This subsidence has resulted from long-term withdrawal of groundwater causing settlement of fine-grained sediments in the aquifer system. The major subsidence has occurred prior to 1970. Based on USGS report (Ground Water Atlas of the United States - Segment 1 California Nevada), “Importation of surface water and reduction in ground-water withdrawals during the 1970's slowed or stopped the decline of ground-water levels. In many cases, this allowed recovery to pre-1960's water levels and prevented further land subsidence”. However, the potential for subsidence as a hazard that could affect the project site is low to moderate.

Expansive Soils

Expansive soils shrink and swell with wetting and drying. The shrink-swell capacity of expansive soils can result in differential movement beneath foundations/pavements. Based on the Sacramento County soil survey data, the alignment is mainly underlain by San Joaquin silt in low lands near the south end and sand/gravel/dredge tailings (mining activity)/loam in higher elevations near the north of the project limits. In addition, the depth to water is shallow and significant shrink-swelling would not be expected. Based on these, the likelihood of expansive soils to be present at the site is low. Site-specific borings should be advanced along the project site to identify the existence of expansive soils near surface.

Tsunami, Seiches, and Flooding

The site does not lie near large bodies of water, so the threat of tsunami, seiches, or other seismically-induced flooding is unlikely.

Geologic Resources of Recreational, Commercial, or Scientific Value

Geologic resources of recreational, commercial, or scientific value in the project vicinity that could be affected include aggregate, asbestos, and oil/gas reserves. Geologic resources of value were identified from the National Atlas of US and include aggregate resources, discussed in the next paragraph.

Aggregate Resources

There are several aggregate resources in the County, which the project could utilize for construction. These resources are summarized in Table 3 below and some of their locations are shown on Figure 4.

TABLE 3
SOURCES OF IMPORTED BORROW

Source			Location		Approx. Haul Distance (one way, mile)	
Company Name		Operation Name	Lat.	Long.	To North End	To South End
Existing	RMC PACIFIC MATERIALS	RANCHO CORDOVA (#115)	38° 24' 40" North	121° 15' 43" West	18	12
	VULCAN MATERIALS CO.	SACRAMENTO (#048)	38° 29' 56" North	121° 14' 54" West	13	15
	GRANITE FACILITY	GRANTLINE PLANT #118	38° 34' 51" North	121° 10' 56" West	8	21
	GRANITE CONSTRUCTION CO.	BRADSHAW PLANTS	38° 32' 29" North	121° 18' 17" West	10	22
	TEICHERT AGGREGATES, INC.	PERKINS PLANT	38° 32' 35" North	121° 22' 37" West	12	20
	TEICHERT AGGREGATES, INC.	GRANTLINE PLANT #118	38° 34' 51" North	121° 10' 56" West	10	23
Proposed	TEICHERT AGGREGATES, INC.	TEICHERT QUARRY	38° 35’ 50” North	121° 07' 34" West	7	26
	GRANITE CONSTRUCTION CO.	WALLTOWN QUARRY	38° 35’ 06” North	121° 07' 05" West	7	26
	DE SILVA GATES	BARTON QUARRY	38° 33’ 36” North	121° 07' 22" West	9	30

Naturally Occurring Asbestos

"Asbestos" is a commercial term used to identify a group of six silicate minerals (chrysotile, crocidolity, amosite, tremolite, actinolite, anthophyllite) that exhibit fibrous or asbestos form habits and contain several properties that made the mineral very useful in manufactured products and industrial processes during the Twentieth Century. In addition to the silicate group above, some amphiboles such as richterite and winchite are known or suspected of being a health risk (California Department of Conservation, California Geological Survey [CGS], 2006). Because of health concerns related to asbestos exposure, the use of asbestos has decreased significantly. Asbestos is regulated by state, federal, and international regulatory agencies based on its classification as a known human carcinogen.

Natural Oil/Gas

According to on-line maps from the State of California Division of Oil, Gas and Geothermal Resources (CDOGGR 2002), there is one oil well along the alignment, which is shown in Table 4 below.

TABLE 4
Survey of the Oil Wells

Source		Location		Well Status
Company Name	**API NUMBER**	**Lat.**	**Long.**	
M.C.O. & Assoc.	06700302	38° 24' 03" North	121° 20' 03" West	Plugged

Environmental Impacts

Geologic Hazards

Ground-shaking presents the most significant geologic hazard to the proposed project and linear facilities. Table 5 summarizes the geologic hazards associated with the project site.

TABLE 5
Summary of Potential Geologic Hazards

Project Component	Area of Potential Concern	Geologic Hazards of Potential Concern
Proposed Alignment (up to 36 Miles)	Entire site Seismic ground-shaking	Seismic ground-shaking

Geologic Conditions and Topography

Construction will require minor grading and excavation, thereby altering the terrain of the project site. Impacts on the geologic conditions involve changes in drainage, cuts, and fills. Since the site is generally level, site grading is not expected to adversely impact the geologic environment.

Geologic Resources of Recreational, Commercial, and Scientific Value

Aggregate production facilities exist in the vicinity of project alignment that may potentially be affected by the project. Construction and operation of the proposed alignment would not significantly affect this resource. Also, there are no known geologic resources that provide a significant scientific or recreational value in the vicinity of the site. Therefore, the new alignment and roadway widening would not affect these resources.

Naturally Occurring Asbestos

The Teichert Quarry Draft EIR indicates that naturally occurring asbestos (NOA) minerals occur in several types of rocks and the presence of such is dependent on the chemistry and different geologic processes that have acted on those rocks through time (CGS, 2006). Eastern Sacramento County has some geologic settings that are favorable for NOA and include volcanic and igneous rocks that have been metamorphosed and/or faulted or sheared and/or altered by hydrothermal reactions. These settings include the mapped geologic formations of the unnamed igneous intrusive rocks (referred to quartz diorite on the Applicant's geologic maps), Copper Hill Volcanics (metamorphosed mafic rocks), and the Gopher Ridge Volcanics (metamorphosed mafic rocks). According to the California Geologic Society (CGS), naturally occurring asbestos is known to be present in eastern Sacramento County. NOA had previously been discovered in El Dorado County, just east of the Sacramento County line, and in the Folsom area. The CGS was commissioned by the Sacramento Metropolitan Air Quality Management District (SMAQMD) to develop a map identifying areas that may contain NOA within the county (SMAQMD, 2006). The results of the CGS study are published in Special Report 192 which provides information about NOA and a map showing areas that are likely to contain NOA.

The map included in Special Report 192 shows color shaded areas based on their relative likelihood for the presence of NOA. The Project area lies partially within the category of "Areas Moderately Likely to Contain NOA", which includes rock types (metamorphic and igneous) that may contain asbestos minerals. The CGS map states, "The most likely settings for NOA in these rocks are in fault zones and shear zones that contain slivers of serpentinite and/or high concentrations of the minerals talc and chlorite. Statewide both chrysotile asbestos and amphibole asbestos are known to occur in such environments." Figure 5, Potential Areas of Naturally Occurring Asbestos, shows the Project site location in relation to areas that may contain NOA, according to the Special Report 192.

Mitigation Measures

The following subsections describe mitigation measures that could be used to reduce impacts from geologic hazards.

Ground Rupture

No active faults cross the proposed alignment or any of the linear facility corridors (Jennings 1994). Therefore, no mitigation measures are required to reduce the hazard from surface faulting rupture.

Ground-Shaking

The proposed project will need to be designed and constructed to withstand moderate to strong earthquake-shaking as specified in Caltrans Standards or 2007 California Building Code (CBC) for Seismic Zone 3.

Liquefaction

The soil types present at the proposed project may be conducive to liquefaction. A geotechnical investigation should confirm this issue in the future phases of the project.

Subsidence

Subsidence has occurred regionally in the Sacramento County – primarily in the eastern part. Subsidence has not been identified to have occurred in the project vicinity, and as a result, no mitigation measures would be required.

Expansive Soils

Expansive soils can be mitigated by either removing the soil and backfilling with non-expansive soil, instituting a chemical stabilization of the soil, or by constructing a foundation treatment that resists uplift of the expansive soil. A site-specific geotechnical investigation should identify the existence of expansive soil within the project limits.

Involved Agencies and Agency Contacts

Cities of Elk Grove, Rancho Cordova, Folsom, and Counties of Sacramento and Eldorado Public Works Departments are responsible for enforcing compliance to AASHTO/Counties standards.

Permits Required and Permit Schedule

With regards to asbestos, for any grading work to the east of White Rock Road-Scott Road intersection, a permit should be obtained from Sacramento Metropolitan Air Quality Management District (SMAQMD). In reviewing the Applicant's application, the SMAQMD Air Pollution Control Officer will require the application of the California Air Resources Control Board Air Toxic Control Measure (ATCM) for asbestos. As part of the required air permits, the Applicant must either, (1) comply with all dust control requirements of the ATCM when disturbing soil or (2) have a registered geologist conduct a geologic evaluation demonstrating that the property does not contain asbestos at concentrations greater than 0.25%.

Permits will be required from Sacramento County Water Agency and California Department of Fish and Game if structures will be within the creeks right-of-way. Permits will be required from railroad companies if roadway/structures will be crossing at or over railroad tracks. Compliance of roadway construction to AASHTO/Counties standards is covered under engineering and construction permits for the project. There are no other permit requirement that specifically address geologic resources and hazards.

Impact Analysis

Methodology for Impact Evaluation

Potential impacts related to soils, geology, and seismicity were evaluated by comparing possible impacts on each of the proposed corridor alignment alternatives in order to distinguish between alternatives as part of Tier 1 analysis.

Evaluation Criteria

Potential adverse impacts associated with soils, geology, and seismicity have been evaluated using the following criteria:

- Substantial alteration of existing topographic features of the study area;
- Potential constraints to development as a result of seismic hazards within the study area;
- Increased erosion during construction activities and after completion of the proposed project;
- Loss of availability of important mineral resources, and;
- Potential constraints to development as a result of soils and geologic conditions in the area of the proposed alignment.

Direct Impacts

Alternatives 1 Through 4

There would not be any adverse impacts on soils or geology as a result of any of the build alternatives. Likewise, no geologic or seismic factors are anticipated to have adverse effect on any of the proposed alternatives. There is no differentiation between any of the build alternatives with respect to geologic or seismic conditions. From the geotechnical standpoint, seismicity, grading in areas of natural occurring asbestos, and expansive soils are the potential concerns which should be taken into the account and should be further reviewed in future phases of the project.

Secondary and Indirect Impacts

Alternatives 1 Through 4

There would not be any adverse secondary or indirect impacts on soils or geology as a result of any of the proposed alternatives (other than potential water quality impacts that could arise from soil erosion/soil contamination related to deep foundation of the viaducts proposed on the Deer Creek Causeway Options, Figure 1.

Construction of facilities would result in short term soil-disturbing activities including cut and fill, grading, trenching, boring, and removal of vegetation. The project area is generally flat with little potential for slope failure and surficial erosion during and after construction. However, construction activities (i.e., cut & fill, roadway widening) could result in the sedimentation of local waterways and the Sacramento River. Erosion control and BMP's would mitigate this to a non-significant impact.

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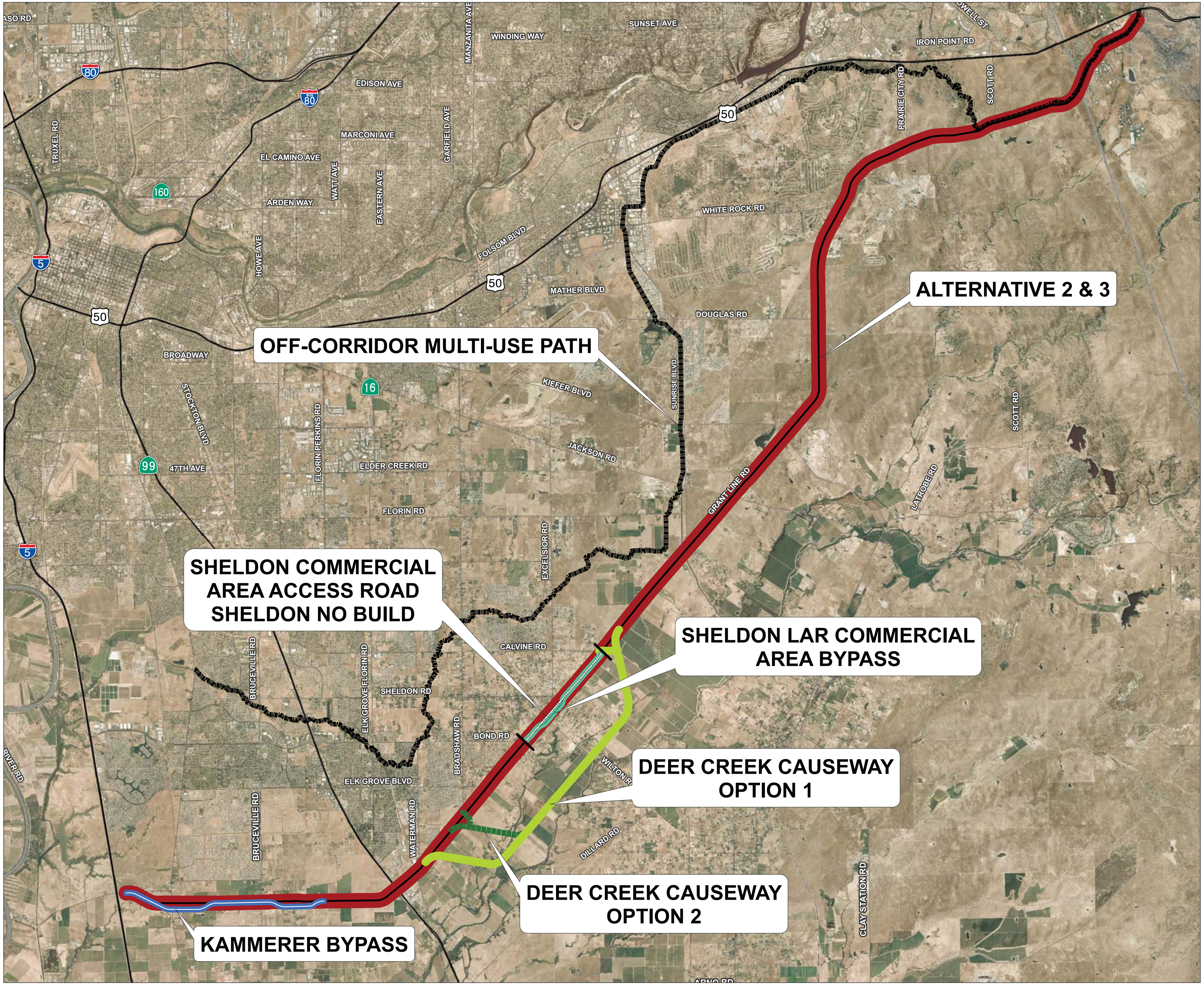
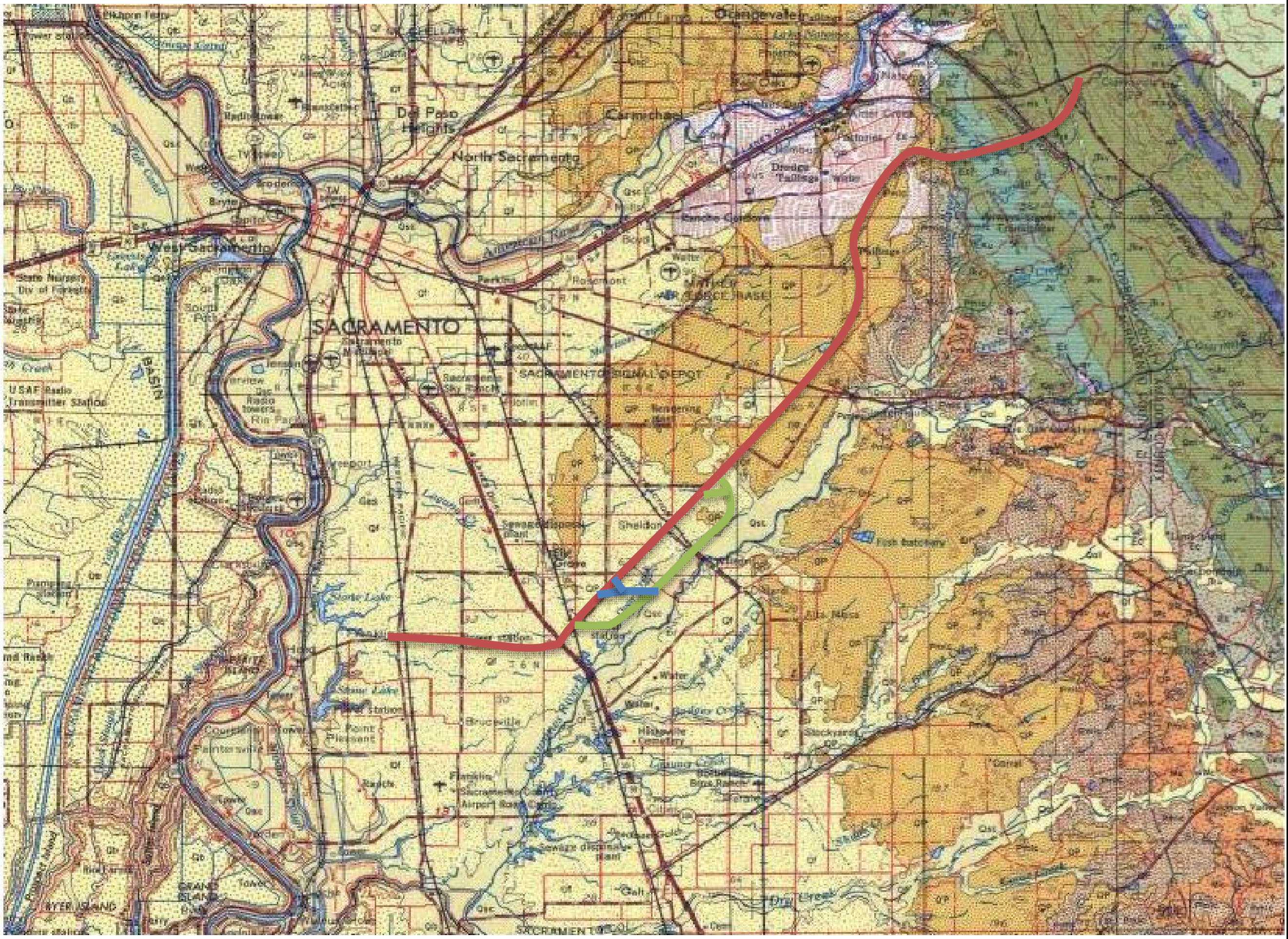


CAPITAL SOUTHEAST CONNECTOR PROPOSED PROJECT

0 1 2 4 Miles

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

FIGURE 1



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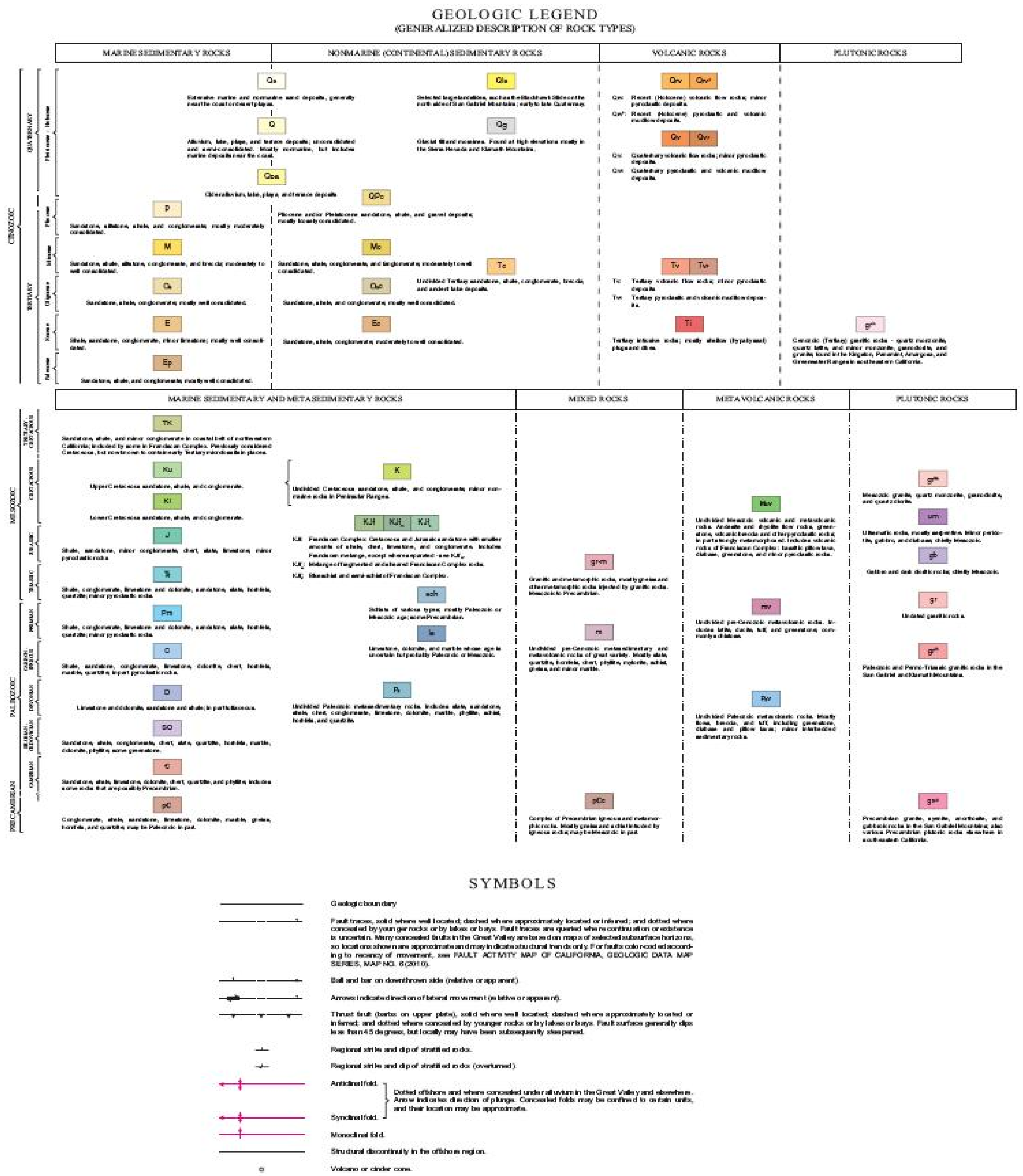
Project Alignment

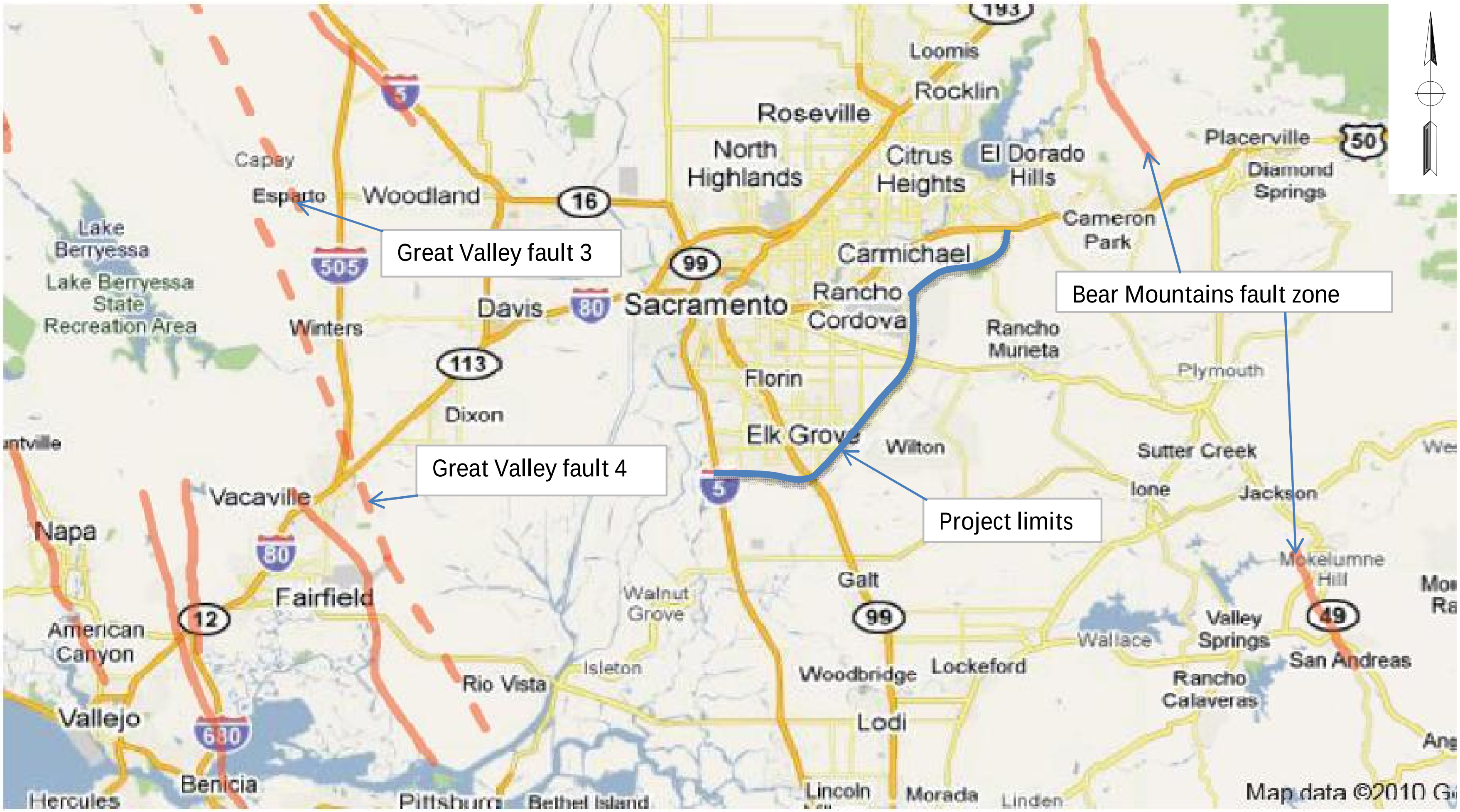
Deer Creek Causeway - Option 1

Deer Creek Causeway - Option 2

CAPITAL SOUTHEAST CONNECTOR
PROPOSED PROJECT
FIGURE 2A

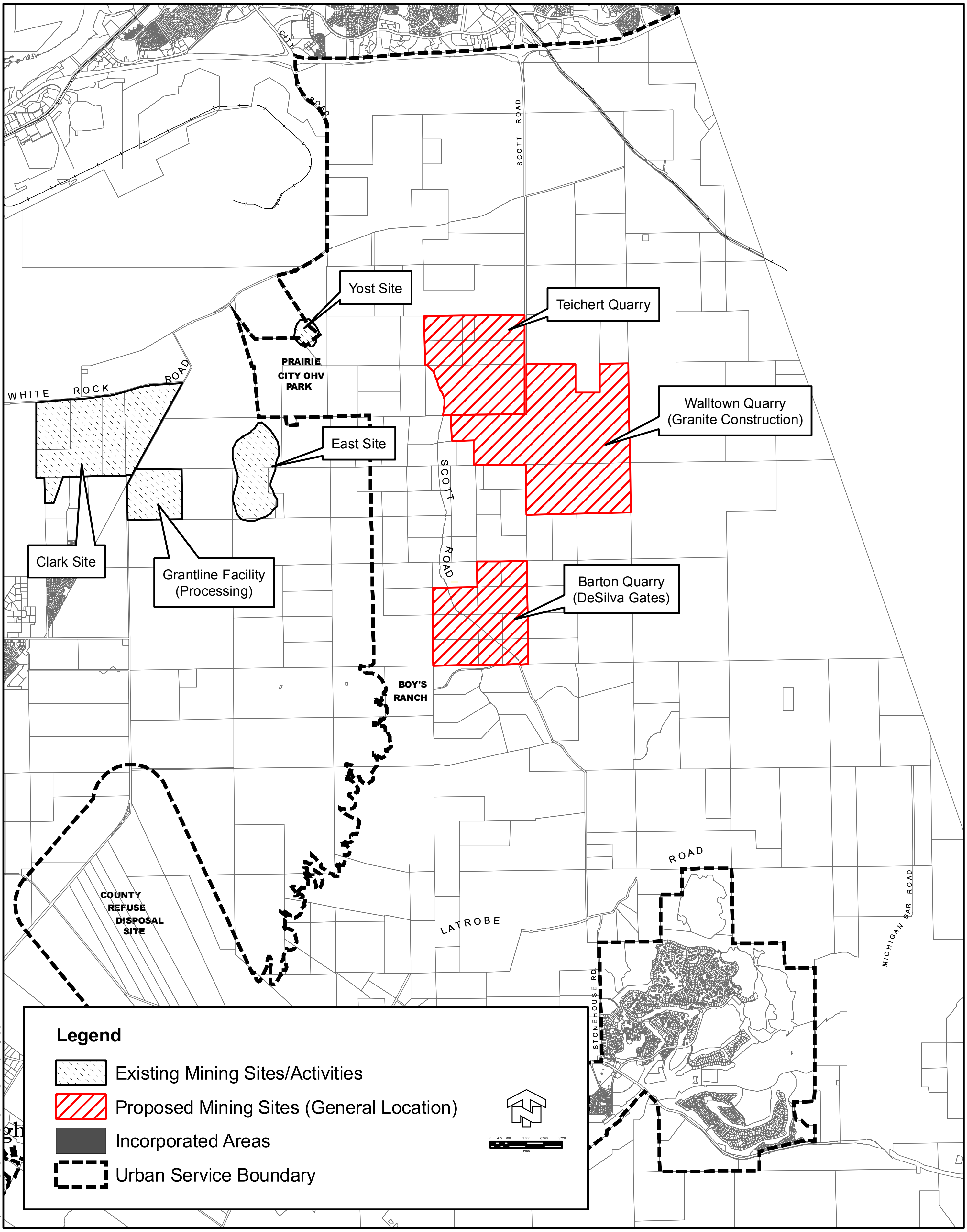


CAPITAL SOUTHEAST CONNECTOR
PROPOSED PROJECT
FIGURE 2B



Source: Caltrans ARS Online

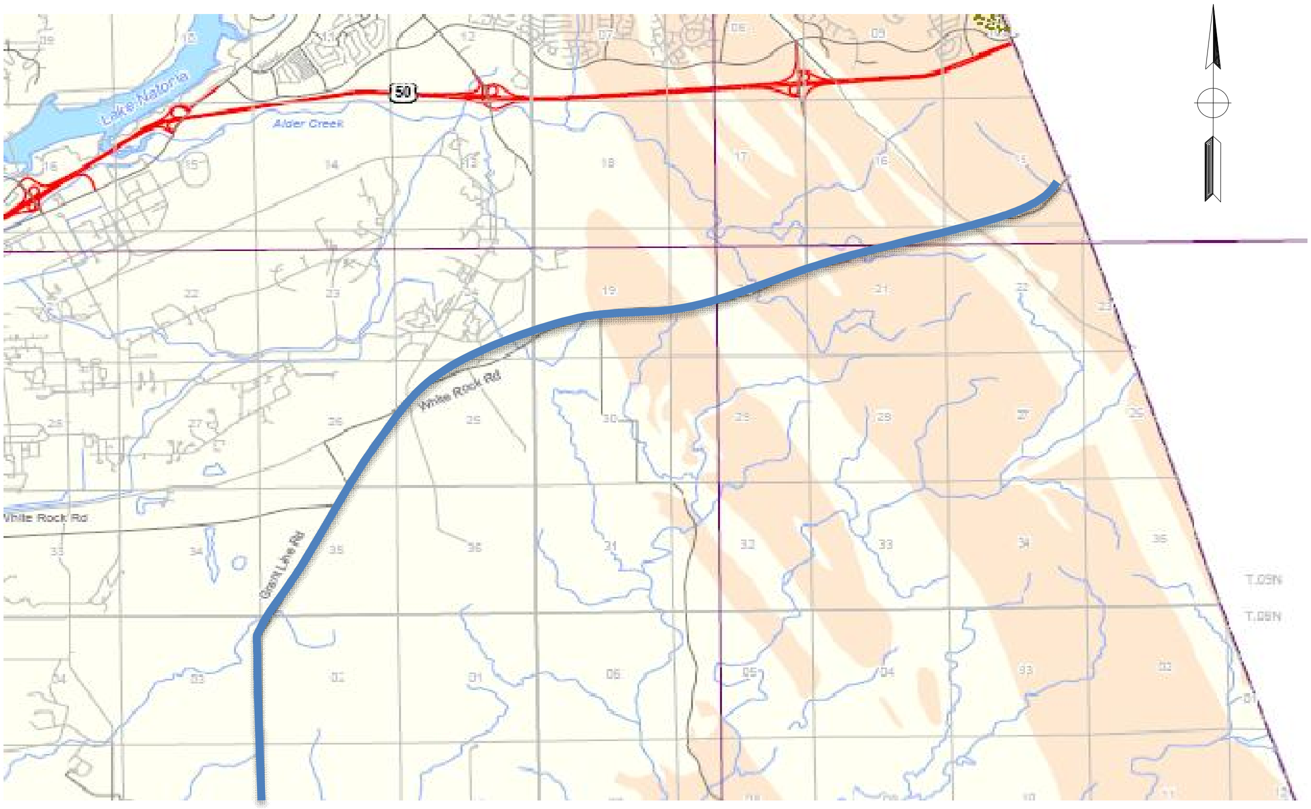
CAPITAL SOUTHEAST CONNECTOR
PROPOSED PROJECT
FIGURE 3



Existing and Proposed Aggregate Mining Sites in the Eastern Portion of Sacramento County

Planning & Community Development Department

Figure 4



Source: CGS Special Report 192

Areas of Relative Likelihood for the Presence of NOA

Areas Most Likely to Contain NOA: These areas include ultramafic rock and serpentinite (serpentine rock), and associated soils, which are most likely to contain NOA. Such areas are not known to be present in eastern Sacramento County at this time and thus do not appear on this map.

Areas Moderately Likely to Contain NOA: These areas include those metamorphic and igneous rocks that are moderately likely to contain NOA.

Areas Least Likely to Contain NOA: These areas include those metamorphic, igneous, and sedimentary rocks that are least likely to contain NOA.

Areas of Faulting or Shearing: These areas are zones of faulted or sheared rock that may locally increase the relative likelihood for the presence of NOA within or adjacent to areas moderately likely to contain NOA. The solid lines represent mapped traces of fault and shear zones.

Project Alignment

CAPITAL SOUTHEAST CONNECTOR
PROPOSED PROJECT
FIGURE 5

Appendix E

Initial Site Assessment (Draft)

DRAFT
INITIAL SITE ASSESSMENT

CAPITAL SOUTHEAST CONNECTOR PROJECT

Submitted to:

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September 2010

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LIST OF ACRONYMS

ACM: Asbestos-Containing Material

ADL: Aerially Deposited Lead

ASTM: American Society of Testing and Material

AWP: Annual Work Plan

BMP: Best Management Practice

CCT: Central California Traction Company

CERCLA: Comprehensive Environmental Response, Compensation and Liability Act of 1980

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

DTSC: California Department of Toxic Substances Control

EDR: Environmental Data Resources

EIR: Environmental Impact Report

ENVIROSTOR: EnviroStor Database

I: Interstate

ID: Identification

ISA: Initial Site Assessment

LBP: Lead-Based Paint

MAFB: Mather Air Force Base

MTP: Metropolitan Transportation Plan

NPDES: National Pollutant Discharge Elimination System

NPL: National Priority List

PB: Parsons Brinckerhoff

PCB: Polychlorinated Biphenyl

PCE: Perchloroethylene

REC: Recognized Environmental Conditions

RESPONSE: State Response Sites

SACOG: Sacramento Area Council of Governments

SPT: Southern Pacific Transportation Company

SR: State Route

SWF/LF: State of California Solid Waste Facilities/Landfill Sites

SWPPP: Storm Water Pollution Prevention Plan

LIST OF ACRONYMS (CONTINUED)

TCE: Trichloroethylene

UPRR: Union Pacific Railroad Company

US: United States

VOC: Volatile Organic Compounds

1.0 INTRODUCTION

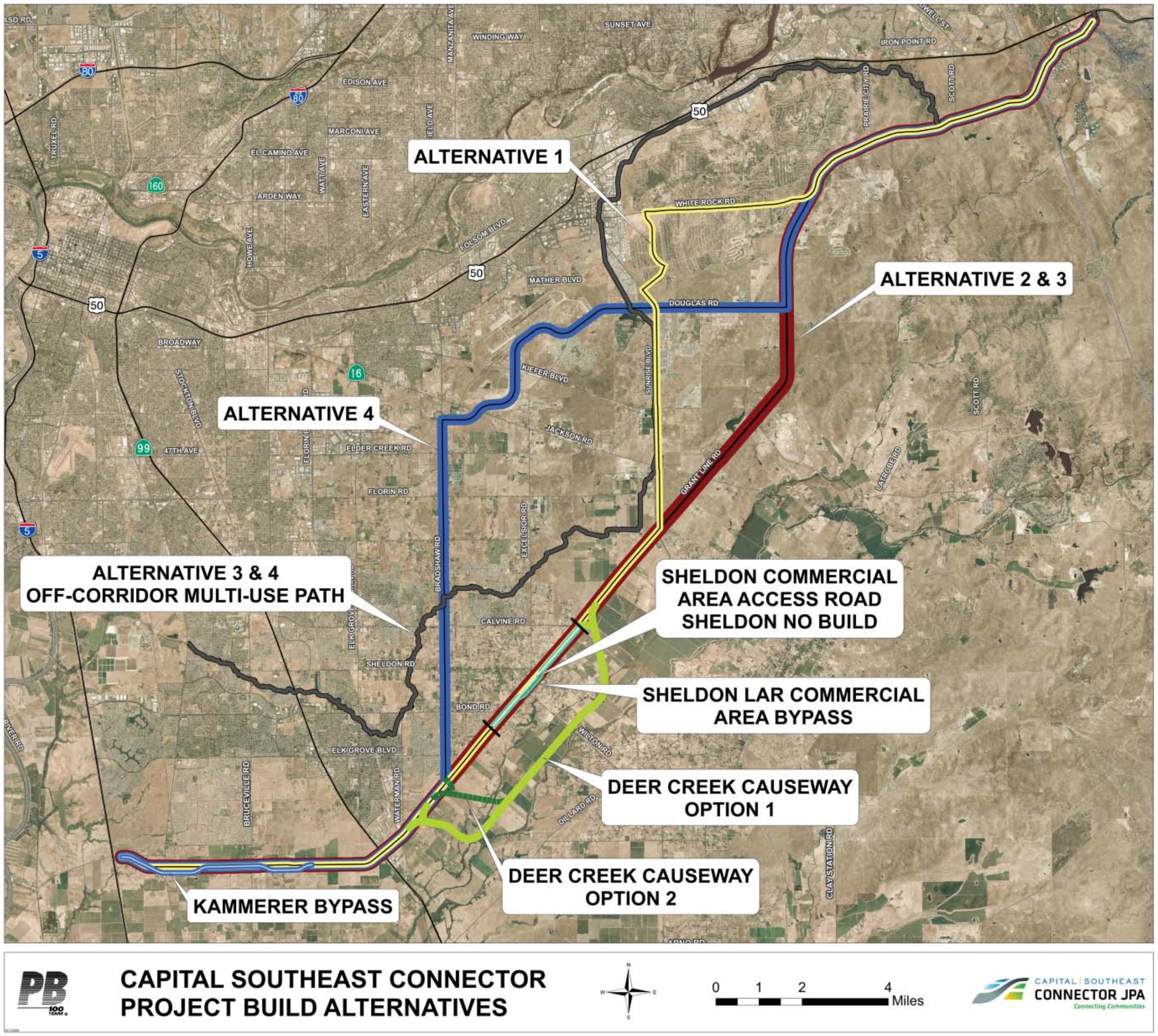
An Initial Site Assessment (ISA) was conducted for the Capital SouthEast Connector Project (Connector Project), located in the counties of Sacramento and El Dorado, and the cities of Elk Grove, Folsom and Rancho Cordova, to identify potential contaminant sources that may affect proposed improvements. For purposes of this assessment, potential contaminant sources are defined as facilities that treat, store, or dispose of hazardous waste, use hazardous substances, store petroleum products on-site, or otherwise may present a source of contamination to the Connector Project. Construction of the Connector Project may also be affected by potential contaminant migration from off-site sources.

The approximate 35-mile-long project is located in the Sacramento region (see Figure 1-1 Project Vicinity Map). The project study area is generally bounded by Interstate 5 (I-5) and Bradshaw Roads on the west, the Cosumnes River on the south, Grant Line and White Rock Roads on the east, and United States (U.S) Highway 50 on the north. Within unincorporated Sacramento County, the corridor passes through the Franklin-Laguna, Vineyard, and Cosumnes communities and within unincorporated El Dorado County, the corridor is located in the El Dorado Hills community (see Figure 1-2 Project Location Map).

In addition to a No Build Alternative, four preliminary Build Alternatives have been proposed. The Build Alternatives include: Alternative 1 (referred to as the Sunrise Alignment), Alternative 2 (referred to as the Grant Line Alignment), Alternative 3 (referred to as the Grant Line Alignment with Off-Corridor Multi-Use Trail), and Alternative 4 (referred to as the Bradshaw Alignment). A bypass option for Kammerer Road is being evaluated as part of Alternatives 1, 2, 3, and 4. Several options consisting of a limited access roadway and a no-build option are being evaluated for the portion of the Connector alignment that runs through the Sheldon community as part of Alternatives 1, 2, and 3. Two options for a causeway through the Cosumnes River Floodplain are also being evaluated as part of Alternatives 1, 2, and 3. A non-motorized trail alignment is being evaluated for both Alternatives 3 and 4.

Figure 1-1 Project Vicinity Map

Figure 1-2 Project Location Map



2.0 Methodology

In support of the Draft Program Environmental Impact Report (EIR) that is being prepared for the Connector Project, this ISA has been prepared to identify potential contaminant sources or recognized environmental conditions (RECs) that may adversely affect the Connector Project. A REC is defined as the "presence or likely presence of any hazardous substance or petroleum product on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property," (ASTM E-1527-05, 2005). This report also assesses the potential of encountering hazardous waste and chemically impacted soil and/or groundwater, the potential usage of hazardous materials, and the generation of hazardous waste during construction.

An ISA is a screening study conducted to identify potential RECs and determine the appropriate level of any subsequent studies that may be required. This ISA has been prepared with guidance provided in applicable sections of the ASTM Standard Practice for Environmental Site Assessments (E-1527-05), applicable sections of Environmental Protection Agency (EPA) Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), and California Public Resources Code Section 21092.6.

The following steps were taken to establish existing conditions, evaluate the potential for impacts, and to evaluate whether project-related activities have the potential to disturb hazardous materials.

Task 1 – Environmental Database Search
Task 2 – Data Analysis and Report Preparation

2.1 Task 1 – Environmental Database Search

A limited database search was conducted by Parsons Brinckerhoff (PB) using an Environmental Data Resources, Inc. (EDR) database dated July 26, 2010. At this stage of analysis for the Program EIR, only databases for major potential hazardous waste/materials risks were searched in order to determine the number of potential hazardous waste/materials sites that could impact the Connector Project. These databases were searched within a study area of 250 feet from the centerline of the proposed Build Alternatives, and are described as follows:

- Federal National Priorities List (NPL)/Superfund. This database lists those sites that pose an immediate public health hazard, and where an immediate response to the discovery was necessary. These listings are also found in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) database, also known as Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS).
- State Response Sites (RESPONSE). This database identifies confirmed release sites where the California Department of Toxic Substances Control (DTSC) is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk. This database has replaced the Annual Work Plan (AWP) database. The AWP database is no longer active and was previously maintained by DTSC to identify known hazardous substance sites targeted for cleanup.

- State of California Solid Waste Facilities/Landfills (SWF/LF). The sites listed in this database have generally been identified by the state as accepting solid wastes. The sites can be either active or closed.

2.2 Task 2 – Data Analysis and Report Preparation

The hazardous waste/materials analysis for this program-level EIR was focused on a quantitative comparison of potential impacts to the Connector Project from hazardous waste/materials. This analysis was limited to 250 feet from the centerline of the proposed Build Alternatives. Potential contaminant sources identified during the EDR database review are assumed to have a potential impact to the Connector Project since preliminary right-of-way parcel acquisition determinations and engineering designs are not available at this stage of analysis. During the tiered or project-level environmental documentation phase for the Connector Project, a determination of which sites will be fully or partially acquired will be made and identified sites by the EDR database search will be assessed.

The number of sites that have the potential to affect a particular Build Alternative was tallied in a matrix for comparative evaluation and are presented in Section 3.0 and Section 4.0.

2.3 Limitations

This report identifies reported potential hazardous material conditions that may affect construction of the Connector Project. This assessment does not provide a definitive determination of the actual presence or absence of contamination, and would not meet "innocent landowner" provisions under CERCLA, which establish a defense for the purchase of real property. This report is based on a limited review of site data and does not include detailed surveys of the project site, such as:

- Asbestos-containing material (ACM);
- Aerially deposited lead (ADL);
- Lead-based paint (LBP);
- Polychlorinated biphenyls (PCBs);
- Radon gas;
- Potentially contaminated soils in areas within and adjacent to the Central California Traction Company (CCT), Southern Pacific Transportation Company (SPT), and the Union Pacific Railroad Company (UPRR) railroad right-of-way; and
- Herbicides and pesticides in former or active agricultural lands.

This assessment does not guarantee, imply, or assert that all potential contaminated sources have been located. There is a possibility of unlisted contaminant occurrences. Conditions at the project location have the potential to change and may need to be reevaluated at a later date.

3.0 AFFECTED ENVIRONMENT

3.1 EDR Database Review

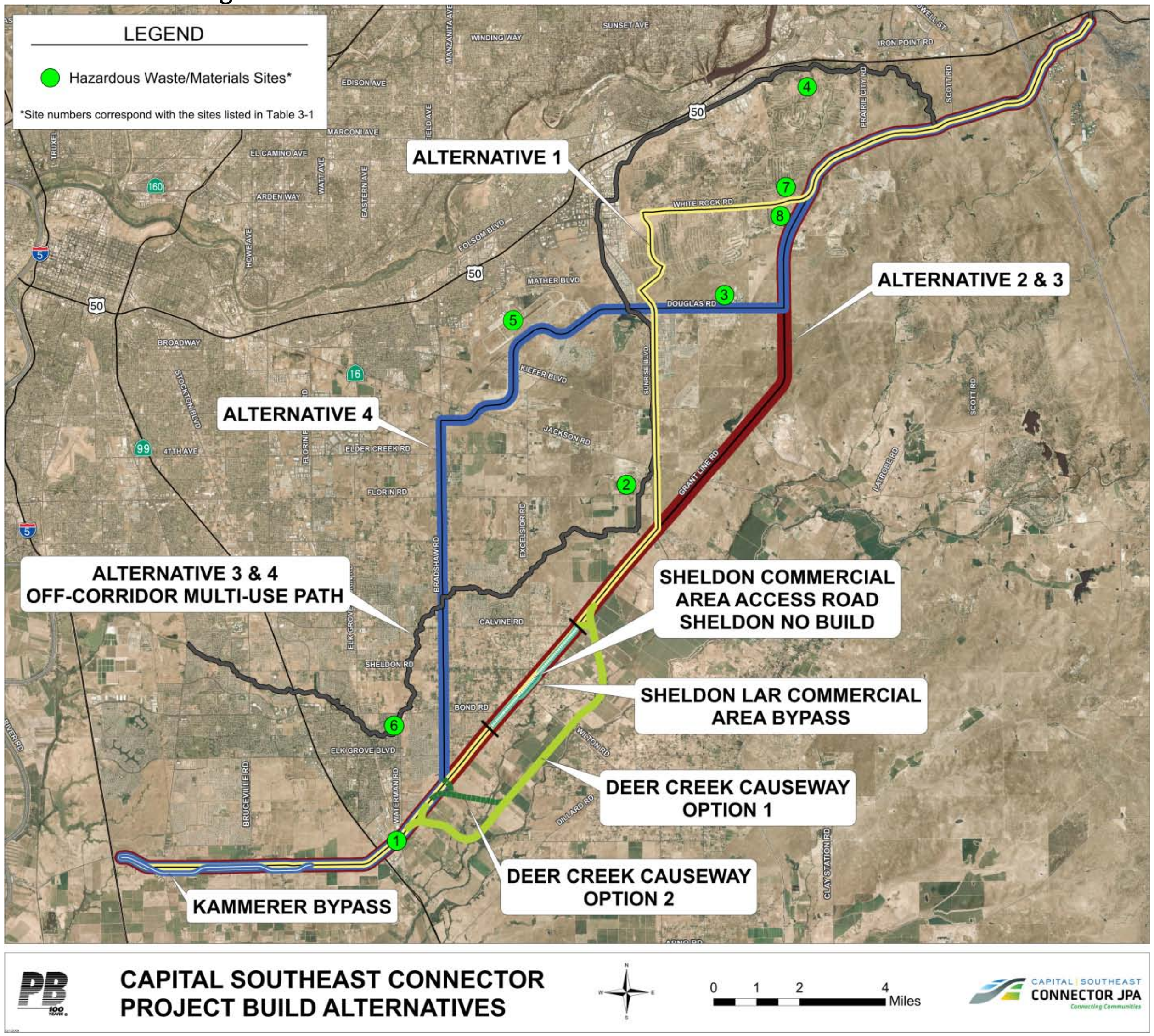
The results of the EDR database search identified eight potential hazardous waste/materials sites that met the criteria listed in Section 2.1. Table 3-1 lists the EDR identified sites that may have the potential to impact the Connector Project. The list of sites includes the site name, site address, EDR identification number, and the database where the site was listed. Figure 3-1 shows the location of the sites of concern in relation to the proposed Build Alternatives.

Table 3-1 EDR Database – Identified Hazardous Waste/Materials Sites

Map ID[1]	Site Name	Site Address	EDR ID	NPL/Superfund Listings[2]	RESPONSE Listings[2]	SWF/LF Listings[2]
1	Super Pallet Recycling	10401 Grant Line Road Elk Grove, California	S106528978			X
2	Lopez Agricultural Services, Inc.	11499 Florin Road Sacramento, California	S105629130			X
3	Aerojet Investments, LTD	11505 Douglas Road Rancho Cordova, California	S101627955		X	
4	Aerojet LRC Landfill	Aerojet Road off Highway 50 Rancho Cordova, California	91236947			X
5	Mather Air Force Base	Mather Air Force Base Rancho Cordova, California	CUSA134616	X		X
6	Elk Grove Disposal Site	Waterman Road/Bond Road Elk Grove, California	S101612318			X
7	White Rock Road Disposal Site – North	White Rock Road/Grant Line Road Rancho Cordova, California	S102361823			X
8	White Rock Road Disposal Site – South	White Rock Road/Grant Line Road Rancho Cordova, California	S109286578			X

Source: Environmental Data Resources, Inc., July 2010
Note: [1]May ID Corresponds to sites identified in Figure 3-1 Hazardous Waste/Materials Sites of Potential Concern
[2]NPL = National Priority List; RESPONSE = State Response Sites; SWF/LF = State of California Solid Waste Facilities/Landfill Sites

Figure 3-1 Hazardous Waste/Materials Sites of Potential Concern



4.0 ENVIRONMENTAL CONSEQUENCES

The following sections describe the potential for hazardous waste and materials sites to impact each Build Alternative of the Connector Project.

4.1 No Build Alternative

The No Build Alternative represents for the most part the transportation system in the Sacramento Area Council of Governments' (SACOG) adopted 2035 Metropolitan Transportation Plan (MTP), with widening of the existing roadways along the Connector alignments to four or six lanes. The exception to this is along White Rock Road from Scott Road North to the Sacramento/El Dorado County line where the general plans for Sacramento County shows a widening of only four lanes. Access along the roadways within the study area under the No Build Alternative represents "business as usual," with only minor limitations on new driveways. The No Build Alternative is also assumed to have numerous at-grade intersections with their locations based on adopted and proposed General Plans and Specific Plans.

Although the No Build Alternative assumes completion of improvement projects that are currently planned and expected to be constructed within the near future, no construction would be undertaken as part of the Connector Project. The impacts associated with development of the individual projects that are currently planned are not detailed in this evaluation because these projects will undergo planning and environmental review as part of their individual project development process. It is assumed that no additional hazardous waste/materials impacts would occur beyond those addressed in the environmental documents for those projects and that any hazardous waste/materials impacts would be mitigated as part of those projects. Therefore, the No Build Alternative is assumed to have no additional hazardous waste/materials impacts.

4.2 Build Alternatives

Based on the analysis performed for this ISA, there are facilities within the study area of the Connector Project that handle, use, and/or store hazardous materials and/or waste. Hazardous waste and materials impacts were analyzed based on conducting a limited EDR database search for sites listed on the NPL, RESPONSE, and SWF/LF databases. The NPL, RESPONSE, and SWF/LF databases were searched within a study area of 250 feet from the centerline of the proposed Build Alternatives. Based on the result of the analysis, a total of eight hazardous waste/materials sites were identified and are assumed to have a potential impact to the Connector Project and as a result, are considered as sites of concern. The sites of concern were evaluated and ranked as either posing a high, medium, or low risk to the Connector Project, as follows:

Table 4-1 Sites of Concern Ranking

Rank	Represents
High	A site with contaminated soil and/or groundwater (an open case site) still under investigation to delineate the contamination.
Medium	A site with contaminated soil and/or groundwater (an open case site) currently undergoing remediation.
Low	A site that is closed with no open cases for soil or groundwater contamination, or a site that does not handle large or specialized hazardous waste and materials.

Since preliminary right-of-way parcel acquisition determinations and engineering designs are not available as this stage of analysis, this report does not differentiate or determine if a potential hazardous waste or material site will be fully or partially acquired. During the tiered or project-level environmental documentation phase for the Connector Project, a determination of which sites will be fully or partially acquired will be made and these sites will be assessed. Table 4-1 summarizes impacts by Build Alternative, alignment, and corresponding options.

Table 4-2 Summary of Hazardous Waste/Materials Sites with Potential Impact to the Connector Project

Alternative	NPL/Superfund Listings[1]	SPL Listings[1]	SWF/LF Listings[1]	Total Number of Sites[2] by Rank[3]
Alternative 1: Sunrise Alignment				
Sunrise Alignment	1 Site • Mather Air Force Base, Rancho Cordova, CA	0 Site	4 Sites • Super Pallet Recycling 10401 Grant Line Road, Elk Grove, CA • Mather Air Force Base, Rancho Cordova, CA • White Rock Road Disposal Site – North White Rock Rd/Grant Line Rd, Rancho Cordova, CA • White Rock Road Disposal Site – South White Rock Rd/Grant Line Rd, Rancho Cordova, CA	2-High 2-Medium
Sheldon Limited Access Road Commercial Bypass Option	0 Site	0 Site	0 Site	
Sheldon Limited Access Road Commercial Access Option	0 Site	0 Site	0 Site	
Sheldon No-Build Option	0 Site	0 Site	0 Site	
Deer Creek Causeway Option 1	0 Site	0 Site	0 Site	
Deer Creek Causeway Option 2	0 Site	0 Site	0 Site	
Kammerer Road Bypass Option	0 Site	0 Site	0 Site	
Alternative 2: Grant Line Alignment				
Grant Line Alignment	0 Site	0 Site	3 Sites • Super Pallet Recycling 10401 Grant Line Road, Elk Grove, CA • White Rock Road Disposal Site – North White Rock Rd/Grant Line Rd, Rancho Cordova, CA • White Rock Road Disposal Site – South White Rock Rd/Grant Line Rd, Rancho Cordova, CA	1-High 2-Medium
Sheldon Limited Access Road Commercial Bypass Option	0 Site	0 Site	0 Site	
Sheldon Limited Access Road Commercial Access Option	0 Site	0 Site	0 Site	
Sheldon No-Build Option	0 Site	0 Site	0 Site	
Deer Creek Causeway Option 1	0 Site	0 Site	0 Site	
Deer Creek Causeway Option 2	0 Site	0 Site	0 Site	
Kammerer Road Bypass Option	0 Site	0 Site	0 Site	

Table 4-2 Summary of Hazardous Waste/Materials Sites with Potential Impact to the Connector Project (Continued)

Alternative	NPL/Superfund Listings[1]	SPL Listings[1]	SWF/LF Listings[1]	Total Number of Sites[2] by Rank[3]
Alternative 3: Grant Line Alignment with Off-Corridor Multi-Use Trail				
Grant Line Alignment	0 Site	0 Site	3 Sites • Super Pallet Recycling 10401 Grant Line Road, Elk Grove, CA • White Rock Road Disposal Site – North White Rock Rd/Grant Line Rd, Rancho Cordova, CA • White Rock Road Disposal Site – South White Rock Rd/Grant Line Rd, Rancho Cordova, CA	2-High 2-Medium 3-Low
Sheldon Limited Access Road Commercial Bypass Option	0 Site	0 Site	0 Site	
Sheldon Limited Access Road Commercial Access Option	0 Site	0 Site	0 Site	
Sheldon No-Build Option	0 Site	0 Site	0 Site	
Deer Creek Causeway Option 1	0 Site	0 Site	0 Site	
Deer Creek Causeway Option 2	0 Site	0 Site	0 Site	
Kammerer Road Bypass Option	0 Site	0 Site	0 Site	
Off-Corridor Multi-Use Trail	1 Site • Mather Air Force Base, Rancho Cordova, CA	0 Site	4 Sites • Lopez Agricultural Services, Inc. 11499 Florin Road, Sacramento, CA • Aerojet LRC Landfill Aerojet Road off Highway 50, Rancho Cordova, CA • Mather Air Force Base, Rancho Cordova, CA • Elk Grove Disposal Site Waterman Road/Bond Road, Elk Grove, CA	
Alternative 4: Bradshaw Alignment				
Bradshaw Alignment	1 Site • Mather Air Force Base, Rancho Cordova, CA	1 Site • Aerojet Investments, LTD 11505 Douglas Road, Rancho Cordova, CA	4 Sites • Super Pallet Recycling 10401 Grant Line Road, Elk Grove, CA • Mather Air Force Base, Mather Air Force Base, CA • White Rock Road Disposal Site – North White Rock Rd/Grant Line Rd, Rancho Cordova, CA • White Rock Road Disposal Site – South White Rock Rd/Grant Line Rd, Rancho Cordova, CA	3-High 2-Medium 3-Low
Kammerer Road Bypass Option	0 Site	0 Site	0 Site	

Table 4-2 Summary of Hazardous Waste/Materials Sites with Potential Impact to the Connector Project (Continued)

Alternative	NPL/Superfund Listings[1]	SPL Listings[1]	SWF/LF Listings[1]	Total Number of Sites[2] by Rank[3]
Off-Corridor Multi-Use Trail	1 Site • Mather Air Force Base, Rancho Cordova, CA	0 Site	4 Sites • Lopez Agricultural Services, Inc. 11499 Florin Road, Sacramento, CA • Aerojet LRC Landfill Aerojet Road off Highway 50, Rancho Cordova, CA • Mather Air Force Base, Rancho Cordova, CA • Elk Grove Disposal Site Waterman Road/Bond Road, Elk Grove, CA	

Source: Environmental Data Resources, Inc., July 2010
Notes: [1]NPL = National Priority List; RESPONSE = State Response Sites; SWF/LF = State of California Solid Waste Facilities/Landfill Sites
[2]The total number of sites represents the total number of physical locations. One location may be listed under more than one regulatory program.
[3]Ranks indicate:
High – A site with contaminated soil and/or groundwater (an open case site) still under investigation to delineate the contamination.
Medium – A site with contaminated soil and/or groundwater (an open case site) currently undergoing remediation.
Low – A site that is closed with no open cases for soil or groundwater contamination, or a site that does not handle large or specialized hazardous waste and materials.

4.2.1 Alternative 1

Sunrise Alignment

The EDR database search identified a total of one NPL site and four landfill sites to be located within the study area of the Sunrise alignment for Alternative 1 (see Figure 3-1, Table 3-1, and Table 4-1). The one NPL site and four landfill sites are identified below, as follows:

<u>Mather Air Force Base (High Risk Site)</u>

The former Mather Air Force Base (MAFB) is listed on the NPL and SWF/LF databases. According to the EDR Radius Report, the MAFB encompasses approximately 6,000 acres, and is located southwest of the intersection of U.S. Highway 50 and Sunrise Boulevard. The MAFB was established in 1918 as an air training command base for navigators to learn how to operate warfare systems. Other activities formerly operated at the base consisted of maintenance of vehicles, aircrafts, and weapons. The MAFB also included a landfill facility that was used to dispose spent trichloroethylene (TCE) between 1958 and 1966. In 1993, the MAFB was officially closed. According to the DTSC EnviroStor database (accessed September 2010), 89 potentially contaminated sites have been identified on the MAFB. Soil and groundwater are contaminated with TCE, perchloroethylene (PCE), volatile organic compounds (VOCs), and hydrocarbons associated with fuels. Site investigation and remediation activities for soil and groundwater contamination are ongoing. Multiple land use restrictions have been placed on the property.

<u>Super Pallet Recycling (High Risk Site)</u>

Super Pallet Recycling is listed on the SWF/LF database, and is located at 10401 Grant Line Road, Elk Grove, California slightly northeast of the intersection of State Route 99 (SR-99) and Grant Line Road. According to the EDR Radius Report, this landfill site is currently active and operates as a small volume construction and demolition wood debris chipping and grinding business. This landfill site is permitted to receive, process, handle, and/or dispose of construction, demolition, industrial, and mixed municipal waste. Site assessments are currently being conducted for this landfill facility to further investigate soil and groundwater contamination that had resulted from leaking underground storage tanks formerly operated by Transcon Lines.

<u>White Rock Road Disposal Site – North and White Rock Road Disposal Site – South (Medium Risk Site)</u>

The White Rock Road Disposal Site – North and White Rock Road Disposal Site – South are listed on the SWF/LF database, and are located northwest and southwest of the intersection of White Rock Road and Grant Line Road, respectively. Both landfill sites are closed. According to the EDR Radius Report, remediation activities are currently being conducted for soil and groundwater contaminated with TCE, petroleum hydrocarbons, heavy metals, as well as waste oil.

4.2.2 Alternative 2

Grant Line Alignment

The Grant Line alignment for Alternative 2 would have the same impacts related to hazardous waste/material sites identified for the Sunrise alignment for Alternative 1 with the exception of the former MAFB (see Figure 3-1, Table 3-1, and Table 4-1).

4.2.3 Alternative 3

Grant Line Alignment

The Grant Line alignment for Alternative 3 would have the same impacts related to hazardous waste/materials sites identified for the Sunrise alignment for Alternative 1 with the exception of the former MAFB (see Figure 3-1, Table 3-1, and Table 4-1).

Off-Corridor Multi-Use Trail

The EDR database search identified a total of one NPL site and four landfill sites to be located within the study area for the off-corridor multi-use trail for Alternative 3 (see Figure 3-1, Table 3-1, and Table 4-1). The one NPL site and four landfill sites are identified below, as follows:

Mather Air Force Base (High Risk Site)

For a description of the former MAFB, see Section 4.2.1 Alternative 1.

Lopez Agricultural Services, Inc. (Low Risk Site)

Lopez Agricultural Services, Inc. is listed on the SWF/LF database, and is located at 11499 Florin Road, Sacramento, California. According to the EDR Radius Report, this landfill site is currently active and operates as a composting business. This landfill facility is permitted to receive, process, handle, and/or dispose of agricultural, construction, demolition, and green materials waste.

Aerojet LRC Landfill (Low Risk Site)

Aerojet LRC Landfill is listed on the SWF/LF database, and is located southeast of the intersection of Folsom Boulevard and Aerojet Road, Rancho Cordova, California. According to the EDR Radius Report, this landfill site has been closed since January 1, 1993.

Elk Grove Disposal Site (Low Risk Site)

Elk Grove Disposal Site is listed on the SWF/LF database, and is located slightly southwest of the intersection of Waterman Road and Bond Road, Elk Grove, California. According to the EDR Radius Report, this landfill site has been closed since January 1, 1980.

4.2.4 Alternative 4

Bradshaw Alignment

The Bradshaw alignment for Alternative 4 would have the same impacts related to hazardous waste/materials sites identified for the Sunrise alignment for Alternative 1 with the addition of one RESPONSE site (see Figure 3-1, Table 3-1, and Table 4-1). The one RESPONSE site is identified below, as follows:

Aerojet Investments, LTD (High Risk Site)

Aerojet Investments, LTD is listed on the RESPONSE database, and is located at 11505 Douglas Road, Rancho Cordova, California. According to the EDR Radius Report, the site is bounded by White Rock Road, Douglas Boulevard, Sunrise Boulevard, and Grant Line Road, and encompasses approximately 4,000 acres. The site was utilized from approximately 1956 to 1972 for the assembly and testing of rocket systems and components. The last static rocket test occurred in 1969. The site consisted of seven areas, six utilized as test areas and one area serving for engineering and administration. Several other areas have been identified at the site including landfills, propellant burn areas and a rice hull burn area. Numerous solvents, including chlorinated solvents, are known to have been used for cleaning tested materials and maintaining test areas. Soil and groundwater are contaminated with multiple hazardous waste and materials, including chlorinated solvents and fuels. Site investigation and remediation activities for soil and groundwater contamination are ongoing. Multiple land use restrictions have been placed on the property.

Off-Corridor Multi-Use Trail

The off-corridor multi-use trail for Alternative 4 would have the same impacts related to hazardous waste/materials sites identified for the off-corridor multi-use trail for Alternative 3 (see Figure 3-1, Table 3-1, and Table 4-1).

4.3 Construction Impacts

Construction of the Connector Project would require the use of hazardous materials and may generate hazardous waste. Regardless of which Build Alternative is selected, similar hazardous materials and wastes will be used or generated and are considered as a short-term construction impact. Examples of hazardous materials likely to be used during construction of the Connector Project include:

- Lubricants (both grease and oils)
- Petroleum fuels
- Cleaning solvents
- Paint

Hazardous wastes generated during construction of the Connector Project would require disposal and could include the following:

- Used oil (not hazardous)
- Lead-based paint and heavy metals from the removal of traffic striping and thermoplastic pavement marking and striping
- Sediment from vehicle washing

The bulk of these materials and wastes would be used or generated at the temporary construction maintenance and storage yard(s). Potential impacts from construction-related hazardous waste and materials would be addressed through the implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP would be developed in compliance with the National Pollutant Discharge Elimination System (NPDES) general construction permit, and would include Best Management Practices (BMPs) to address potential impacts related to the use and potential discharge of construction-related hazardous waste and materials. Hazardous materials and wastes that will be used or generated during construction of the Connector Project, as well as during operation and maintenance, will be further evaluated during the tiered or project-level environmental documentation phase of the Connector Project when construction methods have been identified.

4.4 Cumulative Impacts

Construction of the Connector Project is not anticipated to result in cumuative impacts related to hazardous waste or materials. All eight hazardous waste/materials sites identified by the EDR database search for the Connector Project are located adjacent to the same alignment as the transportation system in SACOG's adopted 2035 MTP. It is assumed SACOG's planned and programmed projects would encounter similar sites of concern. Any hazardous waste/materials impacts that could arise from developing on contaminated sites would be adequately addressed and mitigated under each individual project and would therefore, ultimately reduce the risk to less than substantial of the Connector Project from being potentially impacted by hazardous waste/materials.

6.0 CONCLUSION

Based on the screening analysis provided in this ISA, potential contaminant sources have been identified within the study area and include sites with soil and groundwater contamination. Potential contaminant sources identified during the EDR database review are assumed to have a potential impact to the Connector Project. In addition, since this ISA consisted only of a limited database search, it is possible that other contaminant sources may be located within and surrounding the study area and could affect the Connector Project. Unlisted or unidentified sources may also be present and could affect the Connector Project.

7.0 RECOMMENDATION

A Phase I Environmental Assessment in conformance with the ASTM Standard Practice E1527-05 is recommended during the tiered or project-level environmental documentation phase for the Connector Project to provide a more detailed analysis in identifying impacts from known and unknown sources and to prescribe specific mitigation to address these impacts. In addition, the potential usage of hazardous materials and the generation of hazardous waste during construction, operation, and maintenance, will also be evaluated during the tiered or project-level environmental documentation phase for the Connector Project when construction methods have been identified.

Since preliminary right-of-way parcel acquisition determinations and engineering designs are not available as this stage of analysis, this report does not differentiate or determine if a potential hazardous waste or material site will be fully or partially acquired. During the tiered or project-level environmental documentation phase for the Connector Project, a determination of which sites will be fully or partially acquired will be made and will include the eight hazardous waste/materials sites that have been identified by the EDR database search.

8.0 REFERENCE

1. American Society of Testing and Materials (ASTM). *Standard Practice for Environmental Site Assessments – Phase I Environmental Site Assessment Process (E-1527-05)*. 2005.

2. Department of Toxic Substances Control (DTSC). EnviroStor database website: http://www.envirostor.dtsc.ca.gov/public/. Accessed September 2010.

3. Environmental Data Resources, Inc. *The EDR Radius Map with GeoCheck.* July 26, 2010.

5.0 FINDINGS

Based upon the definition of a REC in the ASTM Standard Practice E-1527-05, the following RECs have been identified for the Connector Project:

- Alternative 1 – The EDR database search identified a total of four sites (two high and two medium risk sites) that could impact the Connector Project. One site is listed on both the NPL and SWF/LF databases, and three additional sites are listed on the SWF/LF database.
- Alternative 2 – The EDR database search identified a total of three sites (one high and two medium risk sites) that could impact the Connector Project. All three sites are listed on the SWF/LF database.
- Alternative 3 – The EDR database search identified a total of seven sites (two high, two medium, and three low risk sites) that could impact the Connector Project. One site is listed on both the NPL and SWF/LF databases, and six additional sites are listed on the SWF/LF database.
- Alternative 4 – The EDR database search identified a total of eight sites (three high, two medium, and three low risk sites) that could impact the Connector Project. One site is listed on both the NPL and SWF/LF databases, one site is listed on the RESPONSE database, and six additional sites are listed on the SWF/LF database.
- The potential usage of hazardous materials (e.g. lubricants, petroleum fuels, cleaning solvents, and paint) and the generation of hazardous waste (e.g. used oil, lead-based paint and heavy metals from the removal of traffic striping and thermoplastic pavement marking and striping, and sediment from vehicle washing) during construction.

9.0 LIST OF PREPARERS

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Appendix F

Floodplain Evaluation Report (Draft)

Capital SouthEast Connector Floodplain Evaluation Report

DRAFT

Submitted to:
Capital SouthEast Connector JPA,
10640 Mather Boulevard, Suite 120
Mather, CA 95655

Submitted by: Parsons Brinckerhoff (PB)
9/14/2010

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1.0 Introduction

The purpose of this report is to present the results of the floodplain evaluation required as a result of the floodplain encroachment identified in the Location Hydraulic study for the Capital SouthEast Connector project. The study focuses on the hydraulic impacts caused by Deer Creek Causeway Options 1 and 2 and the potential impact on Cosumnes River/Deer Creek floodplain.

A Location Hydraulic Study report was prepared for four alternative alignments and two causeway options. The Location Hydraulic Study report concluded that the proposed project Alternative 2/3 (Non-Deer Creek Options), would result in negligible or in significant impact on floodplain encroachment or floodplain values as these alternatives do not cross any FEMA regulatory floodplain or any major waterway. No encroachment analysis was performed for Alternatives 1 and 4. All four alternatives would extend or replace existing culverts or bridges and would therefore only result in negligible or insignificant impact on encroachment or floodplain values. However, the proposed Deer Creek Causeway Options 1 and 2 would result in an increase of approximately 0.6 foot in the 100-year water surface elevation. The increase in water surface elevation can result in a significant risk to people and existing structures in the floodplain. Because Deer Creek Causeway Options 1 and 2 will result in a significant floodplain encroachment, a "Floodplain Evaluation Report" is required for the two options.

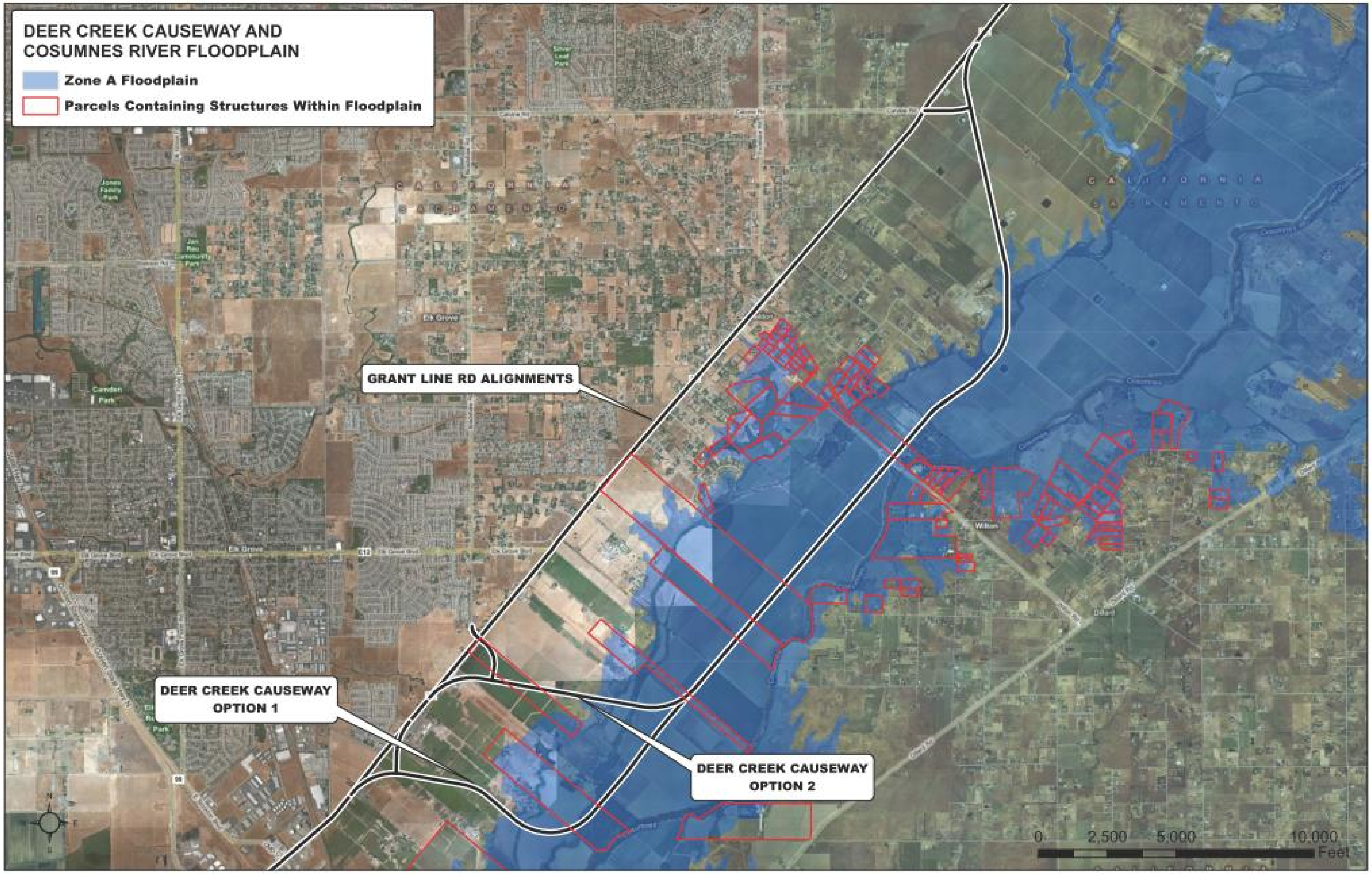
2.0 Project Description

This section describes the proposed Deer Creek Causeway Options 1 and 2, as shown in figure 1.

Deer Creek Causeway Option 1– This option includes the incorporation of a causeway around the central/historic part of the Sheldon community. The bypass facility is a causeway aligned approximately 1.5 miles to the south of Grant Line Road from Waterman Road to Calvine Road.

Deer Creek Causeway Option 2– This option is similar to Deer Creek causeway Option 1 except that the bypass extends from Bradshaw Road to Calvine Road.

Figure 1: Deer Creek Causeway and Cosumnes River / Deer Creek Floodplain



3.0 Risk Assessment.

Title 23 of the Code of Federal Regulations Part 650, Subpart A identifies seven items for assessment. The seven items are described below.

a) Severity of Risk

Deer Creek Causeway Options 1 and 2 increases the floodplain elevation by 0.6 feet, which has the potential to cause significant impact on people and residential structures in the floodplain.

b) Impact on Natural and Beneficial Floodplain Values

Natural and beneficial floodplain values include fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aqua culture, forestry, natural moderation of floods, water quality maintenance, groundwater discharge, etc. Deer Creek Causeway Options 1 and 2 have the potential to impact agriculture, open space, natural beauty and natural moderation of floods. The impact on forestry, outdoor recreation, aquaculture and water quality maintenance is expected to be not significant. The potential impacts of the project on fish, wild life, and plants are evaluated in the Natural Environmental Study found in the Programmatic Draft Environmental Impact Report (DEIR).

c) Support of Probable Incompatible Floodplain Development

Deer Creek Causeway Option 1 and 2 do not create developable space or promote development within the FEMA floodplain. Any future development would need to be individually evaluated to determine impacts to the floodplain and to assure that FEMA and County floodplain requirements are being met.

d) Measures to Minimize Floodplain Impacts

Several measures could be implemented to minimize floodplain impacts resulting from Deer Creek Causeway Options 1 and 2. These measures include minimizing pier footprints and protecting residential structures from increased chance of flooding.

e) Measures to Restore and Preserve Natural and Beneficial Floodplain Values

Measures that can be implemented to restore, preserve, and enhance the floodplain values include the inclusion of temporary and permanent stormwater Best Management Practices (BMP's).

f) Practicability of Alternatives to Significant Encroachment

There are Capital SouthEast Connector alternative alignments that do not encroach on the Cosumnes River/Deer Creek floodplain. These alternative alignments proceed along Grant Line Road and do not require a causeway.

g) Longitudinal encroachment

Although the Causeway options are parallel to Cosumnes River and Deer Creek flow, the project will not cause longitudinal encroachment as there is no embankment within the floodplain. The encroachment will be caused by piers similar to a bridge in a lateral encroachment. There will be local water surface elevation increases at each pier, but the water level will return to normal between the piers as shown in figure 2.

4.0 Conclusions

Deer Creek Causeway Options 1 and 2 could result in a maximum increase of up to 0.6 foot in the 100-year water surface elevation. The increase in water surface elevation can potentially be a “significant risk” to people and existing structures in the floodplain. Mitigation measures need to be implemented to minimize the impacts to people, property and floodplain values.

SUMMARY FLOODPLAIN ENCROACHMENT REPORT

Dist. ___________Co. Sac/El Dorado Rte. Southeast Connector P.M. ______________

Project No.: _12432A__________ Bridge No. ______Cosumnes River/ Deer Creek___

Limits: Interstate 5 to US 50

Floodplain Description: FEMA 100 yr floodplain; Zone A.

		No	Yes
1.	Is the proposed action a longitudinal encroachment of the base floodplain?	_x__	___
2.	Are the risks associated with the implementation of the proposed action significant?	_ __	_x__
3.	Will the proposed action support probable incompatible floodplain development?	_x__	___
4.	Are there any significant impacts on natural and beneficial floodplain values? (*Project impact on biological resources is evaluated in the Natural Environmental Study found in the Programmatic EIR*.)	TBD	TBD
5.	Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.	_x__	___
6.	Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).	____	_x__
7.	Are Location Hydraulic Studies that document the above answers on file? If not explain.	___	_x__

PREPARED BY:

______________________________________ ___________

Signature Date

Appendix G

Location Hydraulic Study (Draft)

Capital SouthEast Connector Location Hydraulic Study

DRAFT

Submitted to:
Capital SouthEast Connector JPA,
10640 Mather Boulevard, Suite 120
Mather, CA 95655

Submitted by: Parsons Brinckerhoff (PB)
9/14/2010

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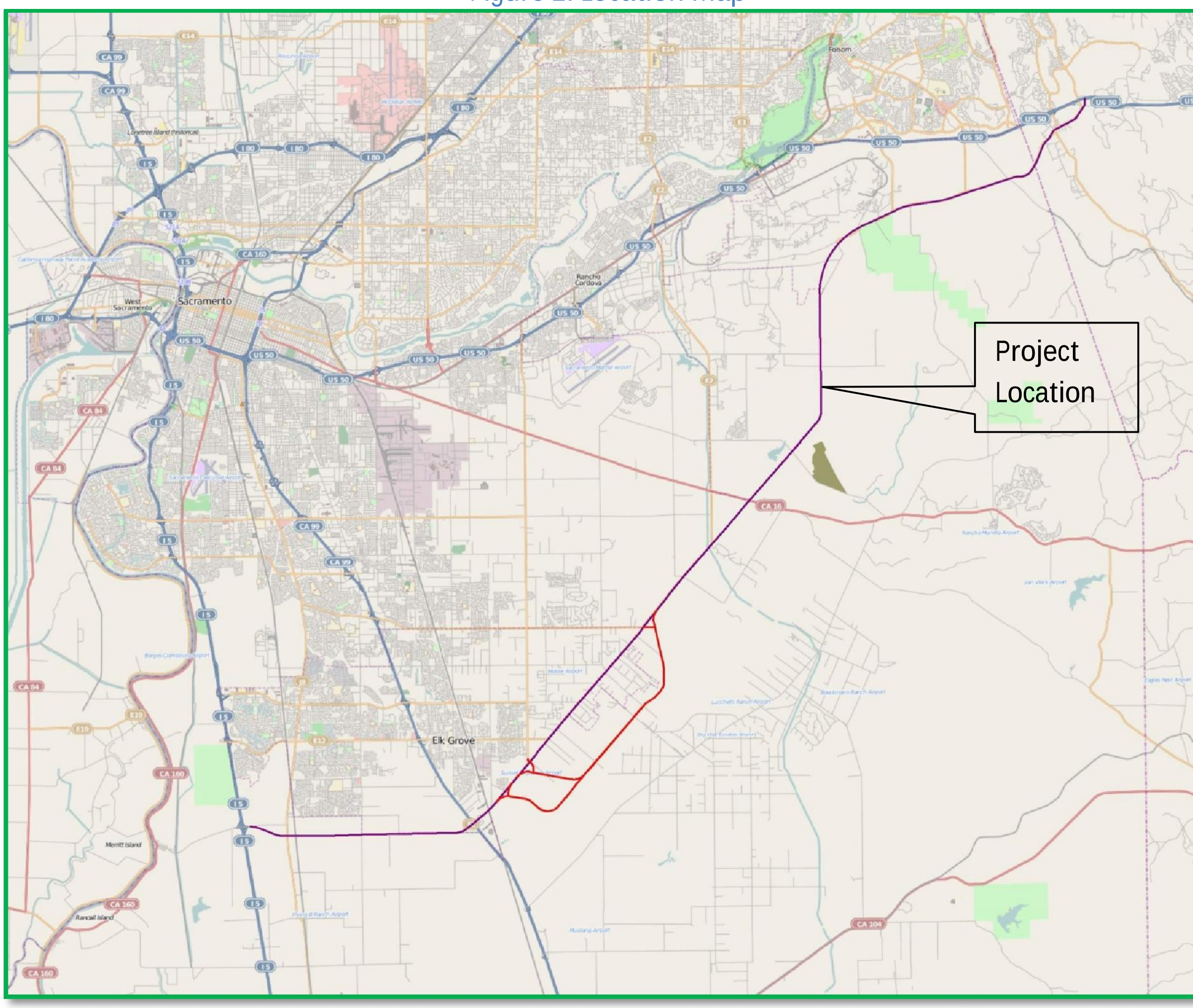
Appendices

1.0 Introduction

The purpose of this report is to present the results of the Location Hydraulic Study (Study) as outlined in 23 CFR 650, Subpart A - Location and Hydraulic Design of Encroachments on Floodplains for the proposed project alternatives of the Capital SouthEast Connector. The study focuses on the hydraulic impacts caused by project alternatives 1, 2, 3, 4 and Deer Creek Causeway Options 1 and 2. The intent of the Study is to identify areas within existing natural stream channels that are being encroached upon or modified by the proposed improvements associated with the proposed project alternatives. The floodplain analysis summarizes the impacts to floodplains at locations where the proposed roadway modifications encroach or impact an identified waterway.

Figure 1: Location Map



1.1 Site Location

The Capital SouthEast Connector is a proposed 35-mile roadway that will link communities in El Dorado and Sacramento Counties and the cities of Folsom, Rancho Cordova and Elk Grove (Figure 1 – Location Map). The Connector will link Interstate 5 south of Elk Grove to Highway 50 in El Dorado County, and will allow drivers to bypass downtown Sacramento, reducing distance traveled and minimizing travel delays during rush hour. The overall need and purpose for the Connector Project is to improve mobility, access, and connections between residential and nonresidential land uses, which have been compromised by increasing congestion, and to assist in preservation of open space and threatened habitats. The project will:

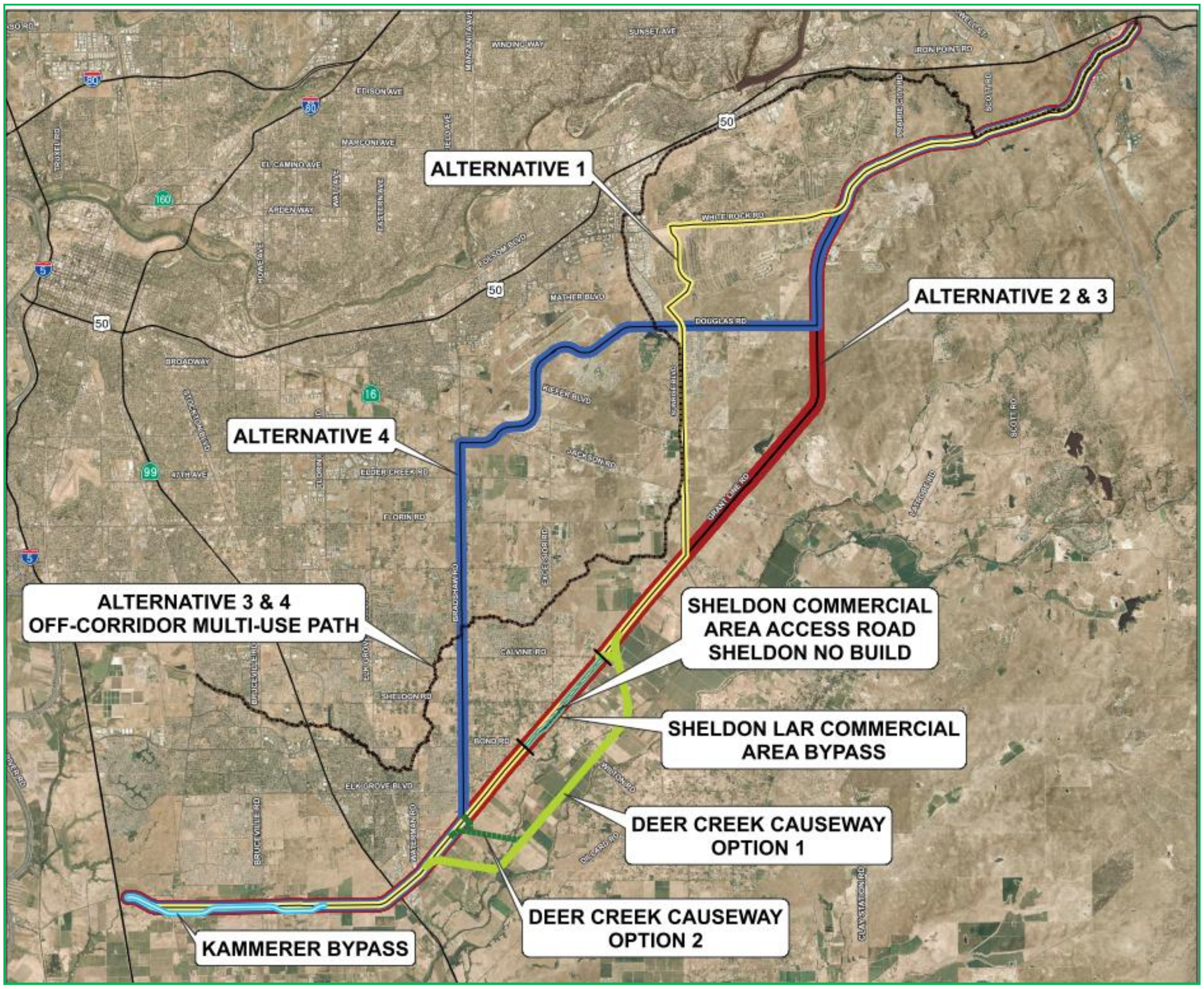
- Improve options for goods freight movement
- Reduce cut-through traffic on local streets
- Improve safety during catastrophic floods or other public safety emergencies
- Improve safety on existing facilities that are degraded by increasing traffic
- Ensure that growth proceeds along planned patterns
- Support sustainable planned growth and development patterns
- Improve livability of communities along the corridor
- Aid economic vitality by improving accessibility for jobs and commerce by facilitating movement of goods
- Provide transportation options for short and long trips, as well as for alternative modes
- Preserve and protect open space, wildlife habitat, and agricultural uses

1.2 Project Description

Figure 2 shows the four alternatives which were studied in this report. The four alternatives are:

Alternative 1 – This alternative is being referred to as the "Sunrise alternative" for its alignment utilizing existing Sunrise Boulevard. The alternative, originating at the I-5/Hood-Franklin Road interchange, would follow the alignment of a new road connecting to Kammerer Road. Following Kammerer Road the alignment would connect to the Grant Line interchange at Highway 99. The alternative alignment would proceed along Grant Line Road to Sheldon, with several options proposed in the Sheldon area including the Sheldon No Build and Sheldon Limited Access Road (LAR) options along Grant Line Road and also the two Deer Creek Causeway options. The alignment then continues on Grant Line Road to Sunrise Boulevard and follows Sunrise Boulevard north to Douglas Road. The alignment would deviate from Sunrise Boulevard requiring an undefined new road to provide a connection to White Rock. White Rock Road would be utilized for the remainder of the Connector proceeding through Rancho Cordova, along the southern boundary of the Folsom sphere of influence, and into El Dorado County. Within El Dorado County the alignment of the Connector would terminate at the Highway 50/Silva Valley Parkway interchange.

Figure 2: Capital SouthEast Connector Alternative Alignments



Alternative 2 – The roadway alignment follows Hood-Franklin, Kammerer Road, Grant Line Road, and White Rock Road. Both the transit and multi-use path facilities follow the main alignment. This is located primarily on Grant Line Road and is therefore understood to be the "Grant Line alternative." From Grant Line Road at the Highway 99 interchange, the Connector would remain on Grant Line Road from Elk Grove to Sheldon, with the Sheldon area options listed in Alternative 1 above, then continue on Grant Line Road through Sacramento County, to White Rock Road in Rancho Cordova. Along White Rock Road, this alternative would match that of the Sunrise alternative into El Dorado County and the terminus at Highway 50.

Alternative 3 – For the purposes of this Location Hydraulics Study, this roadway alternative alignment is the same as under Alternative 2.

Alternative 4 – This roadway alternative alignment follows Hood-Franklin, Kammerer Road, Grant Line Road, Bradshaw Road, a new roadway south of Mather Airport, Douglas Boulevard back to Grant Line Road through Sacramento County to White Rock Road in Rancho Cordova. Along White Rock Road, this alternative would match that of the Sunrise and Grant Line Road alternatives into El Dorado County and the terminus at Highway 50. This alternative has been referred to as the “Bradshaw Alternative” utilizing existing Bradshaw Road for a segment of the Connector. As with all other alternatives, this alternative originates at I-5/Hood-Franklin Road interchange and the first segment, up to Bradshaw Road. This alternative would include the off-corridor multi-use path facilities similar to Alternative 3.

Deer Creek Causeway Option 1– This option includes the incorporation of a causeway around the central/historic part of the Sheldon community. The bypass facility is a causeway aligned approximately 1.5 miles to the south of Grant Line Road from Waterman Road to Calvine Road.

Deer Creek Causeway Option 2– This option is similar to Deer Creek causeway Option 1 except that the bypass extends from Bradshaw Road to Calvine Road.

Alternatives 3 and 4 include the use of an off-corridor multi-use path facility. This non-motorized facility is intended to provide for user travel in both directions. Originating in Elk Grove the trail for these alternatives would optimize the use of existing facilities, constructed and planned along Laguna Creek, the Folsom South Canal, Alder Creek, and other areas along the corridor. A new trail would be proposed to connect to the existing facilities, linking the entire system together. The final segment of the trail would be aligned and adjacent to the road facility in El Dorado County along White Rock Road.

The multi-use path facilities for Alternatives 1 and 2 are aligned adjacent to or in close proximity with the Connector itself. The non-motorized trail is proposed to be separated from the road alignment by use of landscaping and/or barriers where necessary, providing an aesthetic and safe facility. The non-motorized trail on the Alternative 1 would deviate from the road alignment along Sunrise Boulevard starting at Grant Line Road. The existing Folsom South Canal along Sunrise Boulevard would could be utilized and to allow for pedestrians and bicyclists to travel north and south along this route. The non-motorized trail would be connected back to the roadway alignment at White Rock Road where it would remain as it continues into El Dorado County.

2.0 Study Approach

This section of the Study summarizes the analysis approach and results for each of the investigated alternatives.

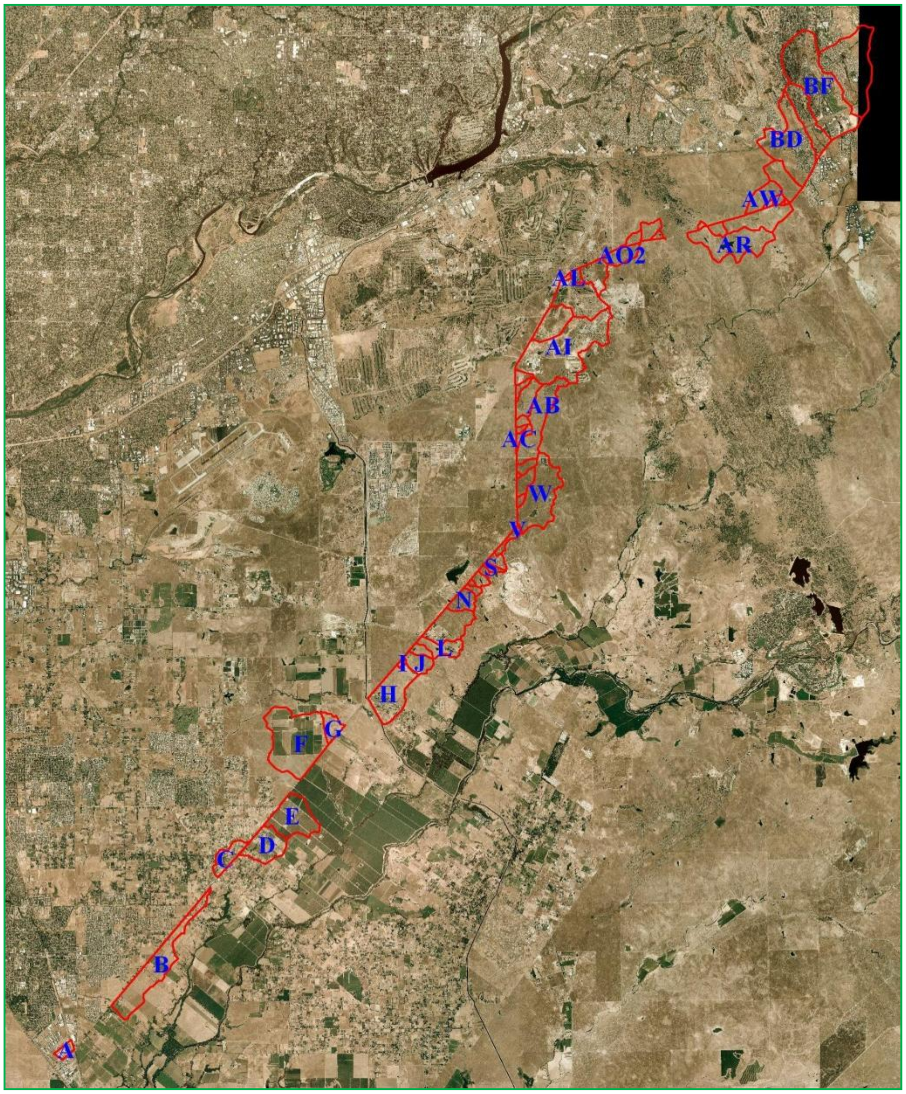
A detailed hydraulic analysis was performed for the proposed Capital SouthEast Connector at the Cosumnes River and minor culvert crossings along Alternative Alignments 2 and 3 and Deer Creek Causeway Options 1 and 2. A floodplain analysis was performed for Alternatives 1 and 4.

2.1 Encroachment Analysis

Except for Deer Creek Causeway Options 1 and 2 which are part of Alternative alignments 1, 2 and 3, no portion of Alternatives 2 and 3 lie within a FEMA regulatory floodplain. For hydraulics purposes, Alternatives 2 and 3 are identical. A floodplain encroachment analysis was therefore performed for Alternatives 2 and 3 using hydraulic analysis. The hydraulics analysis of Alternatives 2 and 3 (Non-Deer

Creek Options) consists of determining the capacities of minor culvert crossings. The proposed Capital SouthEast Connector is anticipated to extend existing culverts to accommodate the widened roadway. It is anticipated that existing culverts will be replaced with larger culverts at locations where the existing roadway would be overtopped with the 100-year event. The discharges for watershed subbasins draining to the minor culvert crossings were estimated using the Sacramento County design charts for subbasins less than 640 acres and SacCalc for subbasins larger than 640 acres. Figure 3 shows the watershed subbasins for the minor culvert crossings.

Figure 3: Watershed Map for Culvert Crossings



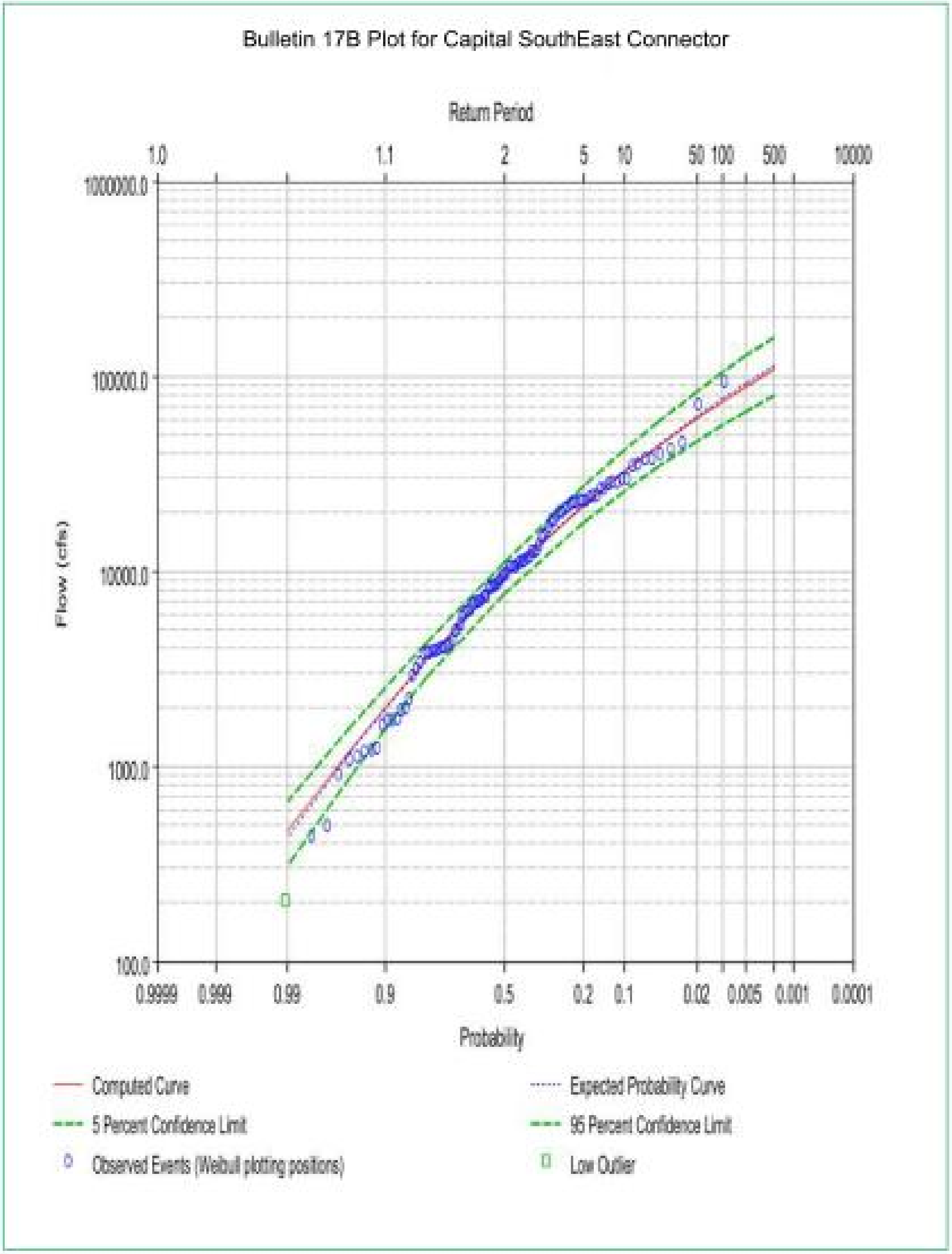
The culvert crossings were analyzed using the Federal Highway Administration's HDS 5 procedures. All structures under the preferred alternative will need to be sized during the design phase of the project in accordance with Caltrans, Federal Emergency Management Agency (FEMA), and local criteria pertaining to floodplain and conveyance designs. The results contained in this Study are for planning purposes only. A more comprehensive sizing and impact analysis is required for preliminary and final designs. Table 1 shows proposed increase in number of culvert barrels to convey the 100-year flows without increasing water surface elevations upstream of the roadway.

Table 1: Proposed Increase in Number Culvert Barrels

SHED	Q (cfs)	DIAMETER (FEET)	EXISTING BARRELS	PROPOSED BARRELS	INCREASE IN BARRELS
F	186	4.4	3	5	2
G	82	2.0	2	6	4
H	71	3.7	2	4	2
I	18	2.0	1	2	1
J	103	4.0	1	2	1
L	108	4.0	1	2	1
M	213	5.0	1	2	1
N	106	2.0	1	5	4
P	15	1.5	1	2	1
Q	48	2.5	1	2	1
T	50	3.0	1	2	1
U	23	2.5	1	2	1
V	15	1.5	1	3	2
W	311	4.7	1	3	2
X	25	1.8	1	2	1
Y	70	1.5	1	8	7
AC	34	1.5	2	4	2
AD	19	2.0	1	2	1
AE	7	0.8	1	4	3
AF	139	2.0	1	8	7
AG	30	1.0	1	8	7
AH	40	2.3	1	2	1
AI	438	3.5	2	9	7
AL	14	1.5	1	2	1
AM	38	1.8	1	4	3
AN	125	3.6	1	3	2
AO1	102	3.7	1	2	1
AQ	20	1.7	1	2	1
AR	287	0.8	1	2	1
AU	17	1.4	1	2	1
AV	82	2.8	1	3	2
AW	30	0.8	1	8	7
AX	27	1.0	1	8	7
AZ	38	1.0	1	7	6
BB	9	0.8	1	4	3
BC	5	6.0	1	3	2

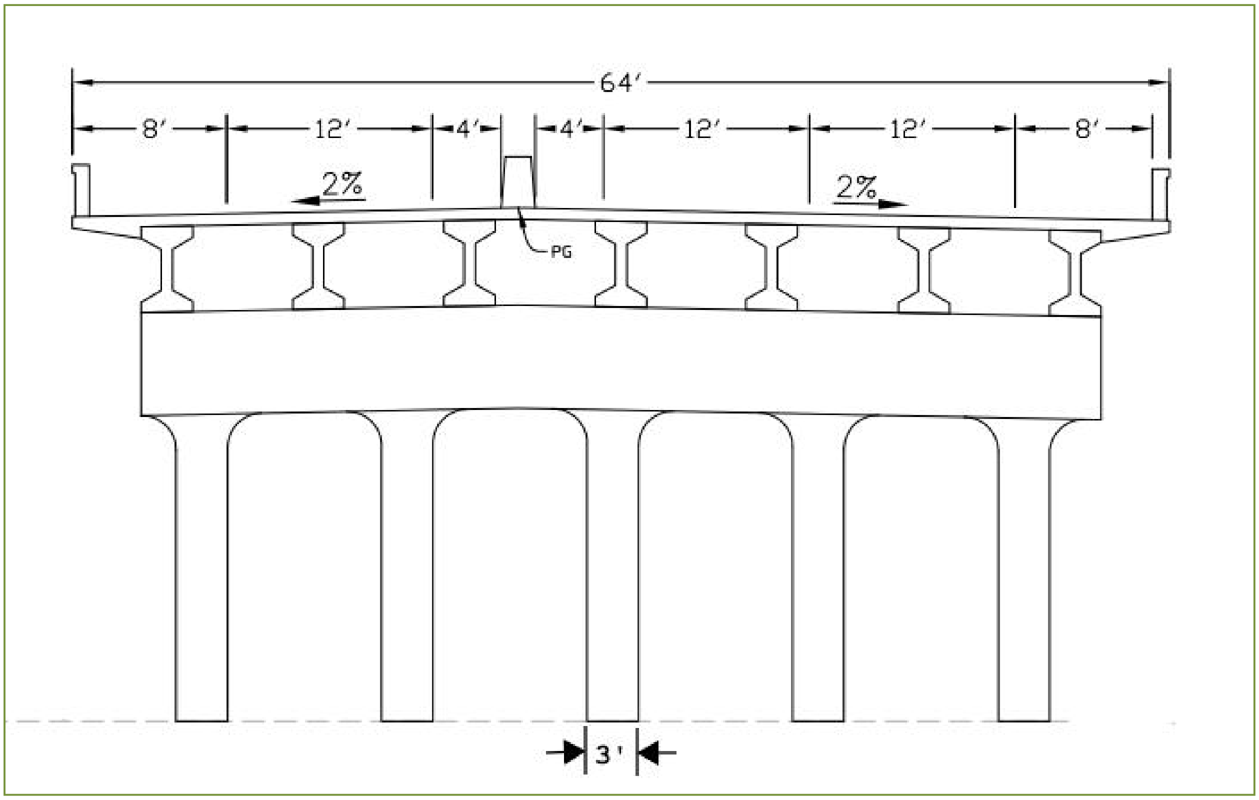
Deer Creek Causeway Options 1 and 2 are proposed to be located within the Cosumnes River/Deer Creek floodplain. The floodplain is identified as Zone A (Base Flood Elevations not Determined) in the FEMA Flood Insurance Rate Maps (FIRM's). Since a regulatory floodplain has been identified by FEMA, the floodplain will be evaluated to meet the requirements of the National Flood Insurance Program (NFIP) as identified in 23 CFR 650. An encroachment analysis was performed for Deer Creek Options 1 and 2 to determine if there would be an impact to the regulatory 100-year water surface elevation. A request was made to FEMA library for hydrologic and hydraulics data but the library indicated that there is no data available. The Water Resources Council Bulletin 17B procedure was used to compute the 100-year flood event flow rate for the Cosumnes River from the United States Geological Survey (USGS) gage at Michigan Bar located approximately 17 miles upstream of the project area. A comparison of the 100-year flow at Michigan Bar (74,500 cfs) with FEMA flow along Cosumnes River at Twin Cities Road approximately 6 miles downstream of the project site (70,500 cfs), indicates that the 100-year flow decreases by approximately 4,000 cfs. The more conservative flow of 74,500 cfs was used in this study. Figure 4 shows the flow frequency curve at Michigan Bar.

Figure 4: Flow Frequency Curve for Cosumnes River at Michigan Bar



Deer Creek Causeway Options 1 and 2 encroachments for Cosumnes River and Deer Creek were analyzed using HEC-RAS. Sacramento County 2-foot interval contour data was used to cut cross sections for the HEC-RAS model. Manning's roughness values were estimated in the field and recent aerial photographs. The results of the analysis indicate an increase in the Cosumnes River 100-year water surface elevation by a maximum of 0.6 foot over existing conditions due to a pier width of 3 feet, as shown in Figure 5.

Figure 5: Deer Creek Causeway Options 1 and 2 Typical Section



Federal Emergency Management Agency (FEMA) requirements allow a maximum increase of up to 1 foot in the 100-year floodplain but they do not allow any increase in the regulatory floodway water surface elevations. A regulatory floodway is the floodplain area that is reserved in an open manner by federal, state or local requirements to provide for the discharge of the base flood so that the cumulative increase in water surface elevation is no more than a 1 foot increase. A floodway is currently not identified for Cosumnes River floodplain because the flood hazard zone is based on an approximate study. It is anticipated that the proposed Causeway would be located in the floodway if a floodway had been identified. Floodplain impacts may be minimized or eliminated during the project's design phase. As encroachments into the floodplains or natural channels are identified, the project design team will need to evaluate design options that meet project design requirements and reduce the project's impact on floodplains. In cases where these requirements cannot be met, a formalized Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) will be required by FEMA.

Executive Order 11988 directs all federal agencies to avoid the long-and short-term adverse impacts associated with the modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative and to restore and preserve the natural and beneficial values served by floodplains. The implementation of Executive Order 11988 in transportation projects is addressed by Title 23, Code of Federal Regulations, Part 650, Subpart A (23 CFR 650A) entitled "Location and Hydraulic Design of Encroachment on Floodplains". The order is applicable to all construction of federal or federally-aided buildings, structures, roads, or facilities which encroach upon or affect the base floodplain. Because there are existing residential structures within the 100-year floodplain, an increase of 0.6 foot by the proposed Deer Creek Options 1 and 2 will be considered a “Significant Encroachment” as defined by 23 CFR 650A. A “Significant Encroachment” occurs when a highway encroachment and any direct support of likely base floodplain development would involve one or more of the following construction or flood related impacts:

- A significant potential for interruption or termination of a transportation facility, which is needed for emergency vehicles or provides a community's only evacuation route.
- A significant risk (to life or property), or
- A significant adverse impact on natural and beneficial floodplain values.

Because Deer Creek Causeway Options 1 and 2 will result in a significant floodplain encroachment, a separate “Floodplain Evaluation Report” has been prepared for the two options. The Location Hydraulics Study form is included in Appendix A.

2.2 Scour Analysis

This section of the Study summarizes the analysis approach and results for the scour analysis for Deer Creek Causeway Options 1 and 2. A pier width of 3 feet and assumed sand with grain diameter of 0.15 millimeters, scour depth of up to 5 feet is expected during the 100-year event around the piers for Deer Creek Causeway Options 1 and 2. Actual grain size distribution is not available at this time. A more comprehensive scour analysis will be required for preliminary and final designs.

2.3 Floodplain Analysis

This section of the Study summarizes the analysis approach and results of floodplain analysis for Alternative 4 . Alternatives 1, 2 and 3 (Non-Deer Creek Options) do not cross any regulatory floodplains or major waterways and are therefore not included in the floodplain analysis. A separate Floodplain Evaluation Report has been prepared for Deer Creek Causeway Options 1 and 2 and are therefore not addressed in this section. A concept level floodplain analysis was conducted to meet the requirements of 23 CFR 650, Subpart A. Floodplain analysis forms are included in Appendix B.

2.3.1 Floodplain Values

Floodplain values include fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aqua culture, forestry, natural moderation of floods, water quality maintenance, groundwater discharge, etc. Generally, floodplains provide additional conveyance capacity for flooding events, and attenuate flooding events by providing storage areas. Alternative 4 would cross FEMA regulatory floodplains along Laguna, Gerber, Elder and Morrison Creeks, however, the alternative would only require extending structures at existing crossings and is therefore not expected to adversely affect floodplain values.

2.3.2 Floodplain Development

The proposed project is necessitated by the planned growth occurring in the greater Sacramento area. Given the current trends for the area, development will continue for many years to come. Some of this development may occur in areas that are currently open space and/or agricultural. However, development within the FEMA floodplain is not anticipated. Future development will need to be individually evaluated to determine impacts to floodplains and to assure that FEMA and County floodplain requirements are being met. FEMA and County Floodplain Manager coordination will be required. FEMA CLOMR or LOMR may be required for addressing the final design's impacts.

2.3.3 Restoration and Preservation of Floodplain Values

Although some negative impacts to the floodplain values may result from the project, several measures can be implemented to restore, preserve, and enhance the floodplain values. These measures include minimizing pier footprints and the inclusion of temporary and permanent Best Management Practices (BMP's).

3.0 Conclusions

From the hydraulic analyses and the information presented in this report, Alternative alignments 1, 2 and 3 (Non-Deer Creek Options) would result in negligible or insignificant impact on floodplain encroachment or floodplain values as these alternatives do not cross any FEMA regulatory floodplain or any major waterway.

All four alternatives would also extend or replace existing culverts or bridges and would therefore only result in negligible or insignificant impact on encroachment or floodplain values.

Assumptions had to be made for grain size distribution for the proposed Deer Creek causeway Options 1 and 2 as the relevant data is not available at the time this report was prepared. Deer Creek Causeway Options 1 and 2 could result in a maximum increase of approximately 0.6 foot in the 100-year water surface elevation and a scour depth of up to 5 feet with 3-foot diameter pier widths and an assumed grain diameter of 0.15 millimeter. The increase in water surface elevation can result in a significant risk to people and existing structures in the floodplain. Because Deer Creek Causeway Options 1 and 2 will result in a significant floodplain encroachment, a separate “Floodplain Evaluation Report” has been prepared for the two options.

Appendix A

Location Hydraulic

Study Form

LOCATION HYDRAULIC STUDY FORM

Dist. ___Co. Sac/El Dorado Rte. SouthEast Connector South P.M._

EA ______________ Bridge No. Cosumnes River/ Deer Creek

Floodplain Description:

FEMA 100 year floodplain; Zone A

1. Description of Proposal (includes any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

Causeway with only the piers in the floodplain

2. ADT: Current 2,500-16,200 Projected 18,100-79,100

3. Hydraulic Data: Base Flood Q_{100}= 74,500 CFS

WSE_{100}= 105.2 The flood of record, if greater than Q_{100}:

Q= 93,000 CFS WSE= 105.91

Overtopping flood Q= _______CFS WSE= ______________

Are NFIP maps and studies available? YES x NO___________

4. Is the highway location alternative within a regulatory floodway?

YES___________ NO x (Zone A)

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q_{100} backwater damages:

A. Residences? NO___________YES x

B. Other Bldgs? NO___________YES x

C. Crops? NO___________YES x

D. Natural and beneficial

Floodplain values? NO___________YES___________

Impact on floodplain values is evaluated in the Natural Environmental Study found in the Programmatic DEIR.

6. Type of Traffic:

A. Emergency supply or evacuation route? NO___________YES x

B. Emergency vehicle access? NO___________YES x

C. Practicable detour available? NO___________YES x

D. School bus or mail route? NO___________YES ___x______

7. Estimated duration of traffic interruption for 100-year event hours:___0______

8. Estimated value of Q_{100} flood damages (if any) – moderate risk level.

A. Roadway $___0______

B Property $___undetermined__

Total $___0______

9. Assessment of Level of Risk Low___x______

Moderate_____

High_________

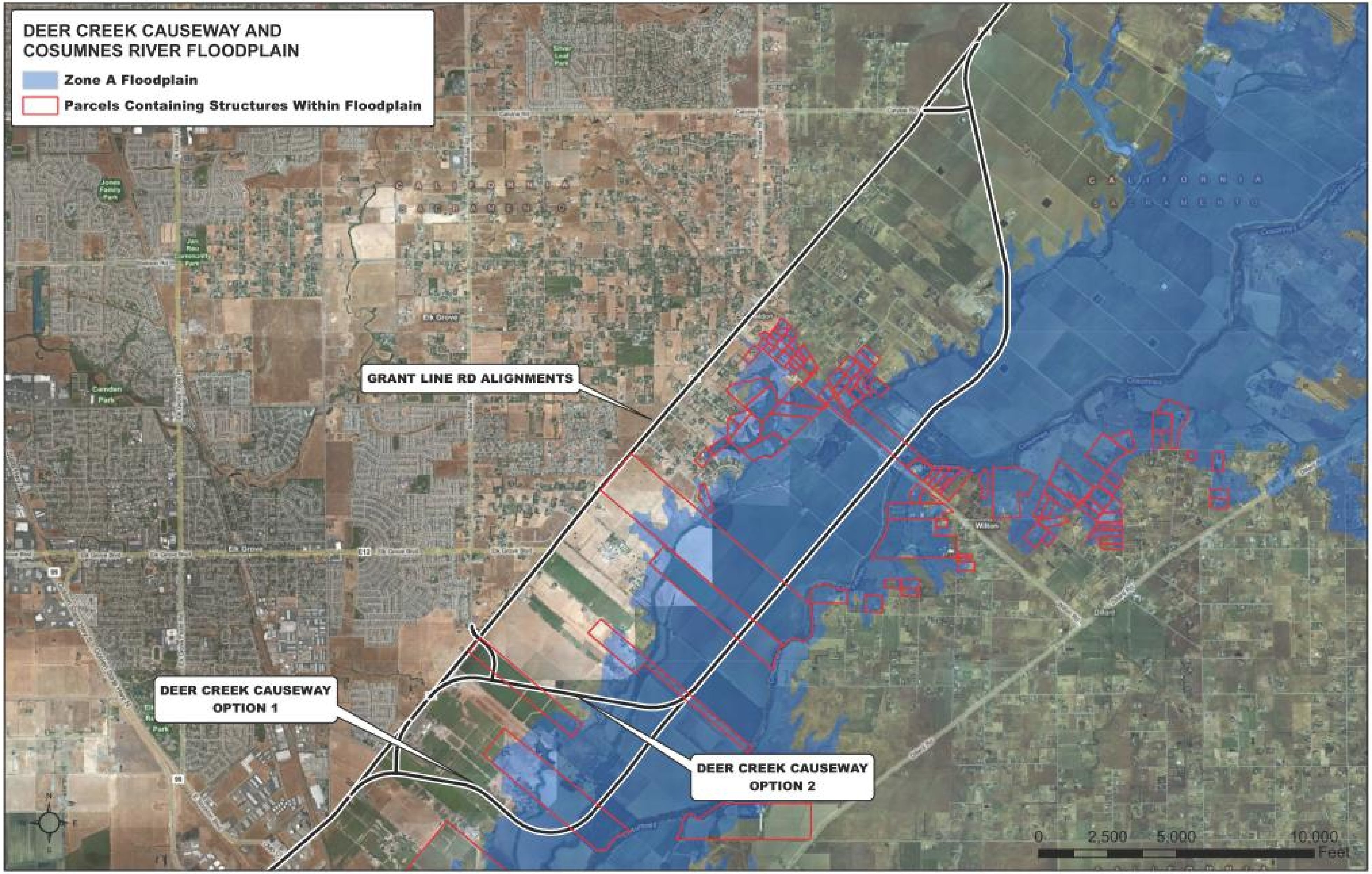
For High Risk projects, during design phase, additional Design Study Risk Analysis
May be necessary to determine design alternative.

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO___________YES___x______

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

Signature _________________________________Date__________


DEER CREEK CAUSEWAY AND
COSUMNES RIVER FLOODPLAIN
Zone A Floodplain
Parcels Containing Structures Within Floodplain
GRANT LINE RD ALIGNMENTS
DEER CREEK CAUSEWAY
OPTION 1
DEER CREEK CAUSEWAY
OPTION 2
0 2,500 5,000 10,000
Feet

LOCATION HYDRAULIC STUDY FORM *

Dist. _______ Co. Sac/ El Dorado Rte. SouthEast Connector P.M. ____________

EA ______________ Bridge No. Elder Creek

Floodplain Description:

FEMA 100 year floodplain; Zone AE.

1. Description of Proposal (includes any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

2. ADT: Current 2,500-16,200 Projected 18,100-79,100

3. Hydraulic Data: Base Flood Q_{100}= 1,000 CFS

WSE_{100}= 80.1 The flood of record, if greater than Q_{100}:

Q= ___________ CFS WSE= ______________

Overtopping flood Q= _______ CFS WSE= ______________

Are NFIP maps and studies available? YES x NO ___________

4. Is the highway location alternative within a regulatory floodway ?

YES ___________ NO x

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q_{100} backwater damages:

A.	Residences?	NO x	YES ___________
B.	Other Bldgs?	NO x	YES ___________
C.	Crops?	NO x	YES ___________
D.	Natural and beneficial Floodplain values?	NO x	YES ___________

6. Type of Traffic:

A. Emergency supply or evacuation route?	NO ___________	YES x
B. Emergency vehicle access?	NO ___________	YES x
C. Practicable detour available?	NO ___________	YES x
D. School bus or mail route?	NO ___________	YES x

7. Estimated duration of traffic interruption for 100-year event hours:___0______

8. Estimated value of Q_{100} flood damages (if any) – moderate risk level.

A.	Roadway	$______0______
B	Property	$______0______
	Total	$______0______

9. Assessment of Level of Risk

Low___x______
Moderate_____
High_________

For High Risk projects, during design phase, additional Design Study Risk Analysis May be necessary to determine design alternative.

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO____x______YES__________

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

Signature________________________________Date_________

* Same as Figure 804.7A Technical Information for Location Hydraulic Study located in Chapter 804 of the Highway Design Manual


Legend
1% annual chance (100-Year) Floodplain
1% annual chance (100-Year) Floodway
0.2% annual chance (500-Year) Floodplain
APPROXIMATE SCALE IN FEET
1,000 0 1,000
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
SACRAMENTO COUNTY, CALIFORNIA (UNINCORPORATED AREAS)
PANEL 215 OF 705
(SEE MAP INDEX FOR PANELS NOT PRINTED)
COMMUNITY - PANEL NUMBER 060262 0215 E
MAP REVISED: JULY 6, 1998
Federal Emergency Management Agency
REVISED TO REFLECT LOMR EFFECTIVE
FRUITRIDGE
BALLENTINE STREET
NEWTON ROAD
MAYHEW ROAD
BRADSHAW ROAD
ELDER CREEK ROAD
JACKSON ROAD
OSAGE AVENUE
REVISED AREA
ZONE X
ZONE AE
ZONE AE (EL 53)
Unnamed Road
ZONE AO (DEPTH 1)
ZONE AO (DEPTH 2)
Private Drive
RM 436
RM 489
RM 488
RM 498
JOINS PANEL 0330
JOINS PANEL 0220

LOCATION HYDRAULIC STUDY FORM

Dist. _______ Co. Sac/ El Dorado Rte. SouthEast Connector P.M. ____________

EA ______________ Bridge No. Gerber Creek

Floodplain Description:

FEMA 100 year floodplain; Zone AE

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

2. ADT: Current 2,500-16,200 Projected 18,100-79,100

3. Hydraulic Data: Base Flood Q_{100}= 1,070 CFS

WSE_{100}= 70.1 The flood of record, if greater than Q_{100}:

Q=___________CFS WSE= ______________

Overtopping flood Q= _______CFS WSE= ______________

Are NFIP maps and studies available? YES x NO___________

4. Is the highway location alternative within a regulatory floodway ?

YES___________ NO x

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q_{100} backwater damages:

A. Residences? NO x YES___________

B. Other Bldgs? NO x YES___________

C. Crops? NO x YES___________

D. Natural and beneficial

Floodplain values? NO x YES___________

6. Type of Traffic:

A. Emergency supply or evacuation route? NO___________ YES x

B. Emergency vehicle access? NO___________ YES x

C. Practicable detour available? NO___________ YES x

D. School bus or mail route? NO___________ YES x

7. Estimated duration of traffic interruption for 100-year event hours:_________

8. Estimated value of Q_{100} flood damages (if any) – moderate risk level.

A.	Roadway	$_____0_____
B	Property	$_____0_____
	Total	$_____0_____

9. Assessment of Level of Risk

Low___x______
Moderate_____
High_________

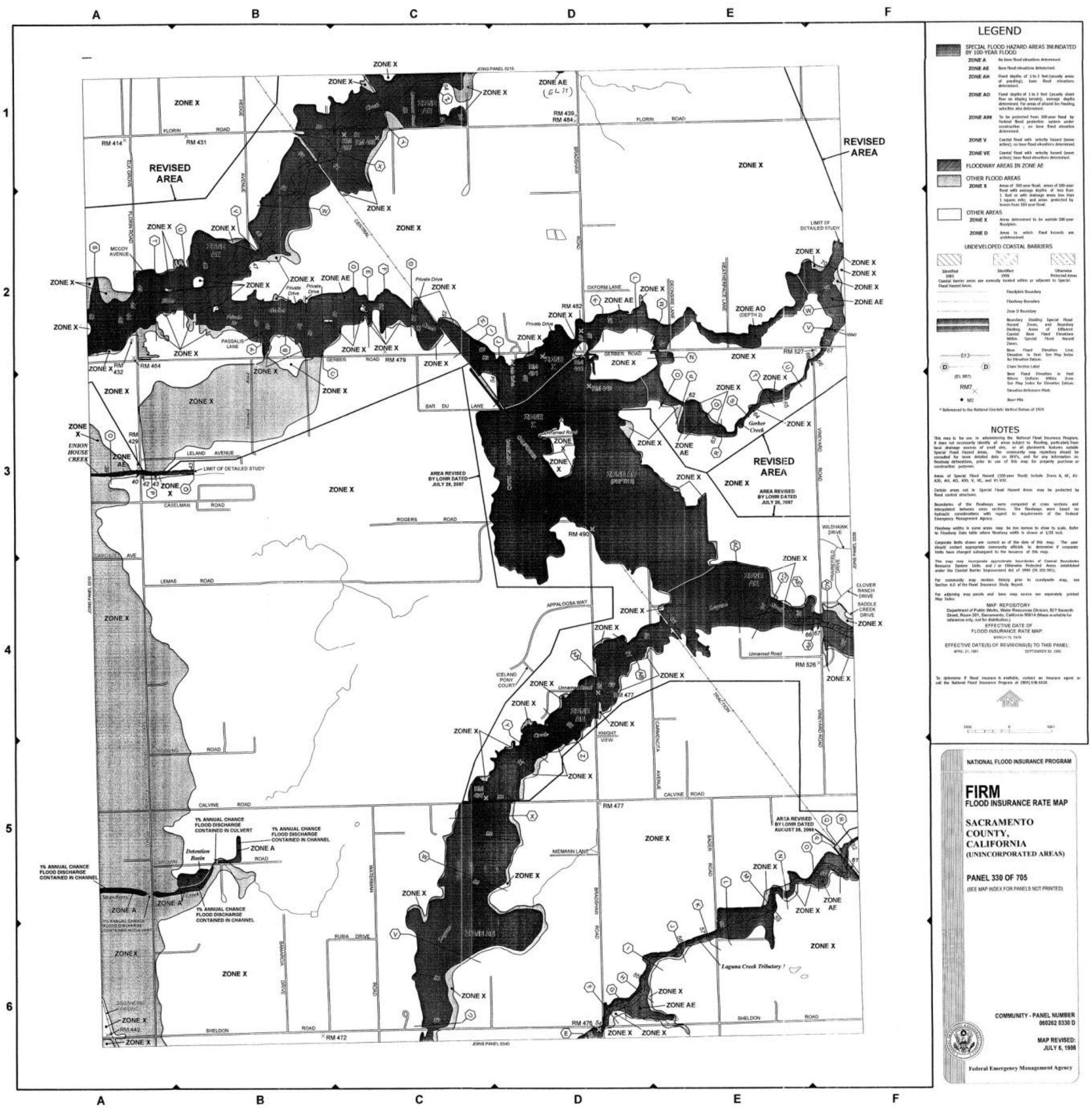
For High Risk projects, during design phase, additional Design Study Risk Analysis
May be necessary to determine design alternative.

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO____x______YES__________

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

Signature________________________________Date_________



LEGEND
NOTES
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
SACRAMENTO COUNTY, CALIFORNIA (UNINCORPORATED AREAS)
PANEL 330 OF 705
COMMUNITY - PANEL NUMBER 060262 0330 D
MAP REVISED: JULY 6, 1998
Federal Emergency Management Agency
REVISED AREA
ZONE X
ZONE AE
FLORIN ROAD
GERBER ROAD
CALVINE ROAD
SHELDON ROAD

LOCATION HYDRAULIC STUDY FORM

Dist. _______Co. Sac/ El Dorado Rte. SouthEast Connector P.M.____________

EA ______________ Bridge No. Laguna Creek

Floodplain Description:

FEMA 100 year floodplain; Zone AE

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

____

____

2. ADT: Current 2,500-16,200 Projected 18,100-79,100

3. Hydraulic Data: Base Flood Q_{100}= 1,378 CFS

WSE_{100}= 60 The flood of record, if greater than Q_{100}:

Q=___________CFS WSE= ______________

Overtopping flood Q= _______CFS WSE= ______________

Are NFIP maps and studies available? YES x NO___________

4. Is the highway location alternative within a regulatory floodway ?

YES___________ NO x

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q_{100} backwater damages:

A. Residences? NO x YES___________

B. Other Bldgs? NO x YES___________

C. Crops? NO x YES___________

D. Natural and beneficial

Floodplain values? NO x YES___________

6. Type of Traffic:

A. Emergency supply or evacuation route? NO___________YES x

B. Emergency vehicle access? NO___________YES x

C. Practicable detour available? NO___________YES x

D. School bus or mail route? NO___________YES x

7. Estimated duration of traffic interruption for 100-year event hours:_________

8. Estimated value of Q_{100} flood damages (if any) – moderate risk level.

A.	Roadway	$ 0
B	Property	$ 0
	Total	$ 0

9. Assessment of Level of Risk Low x
Moderate_____
High_________

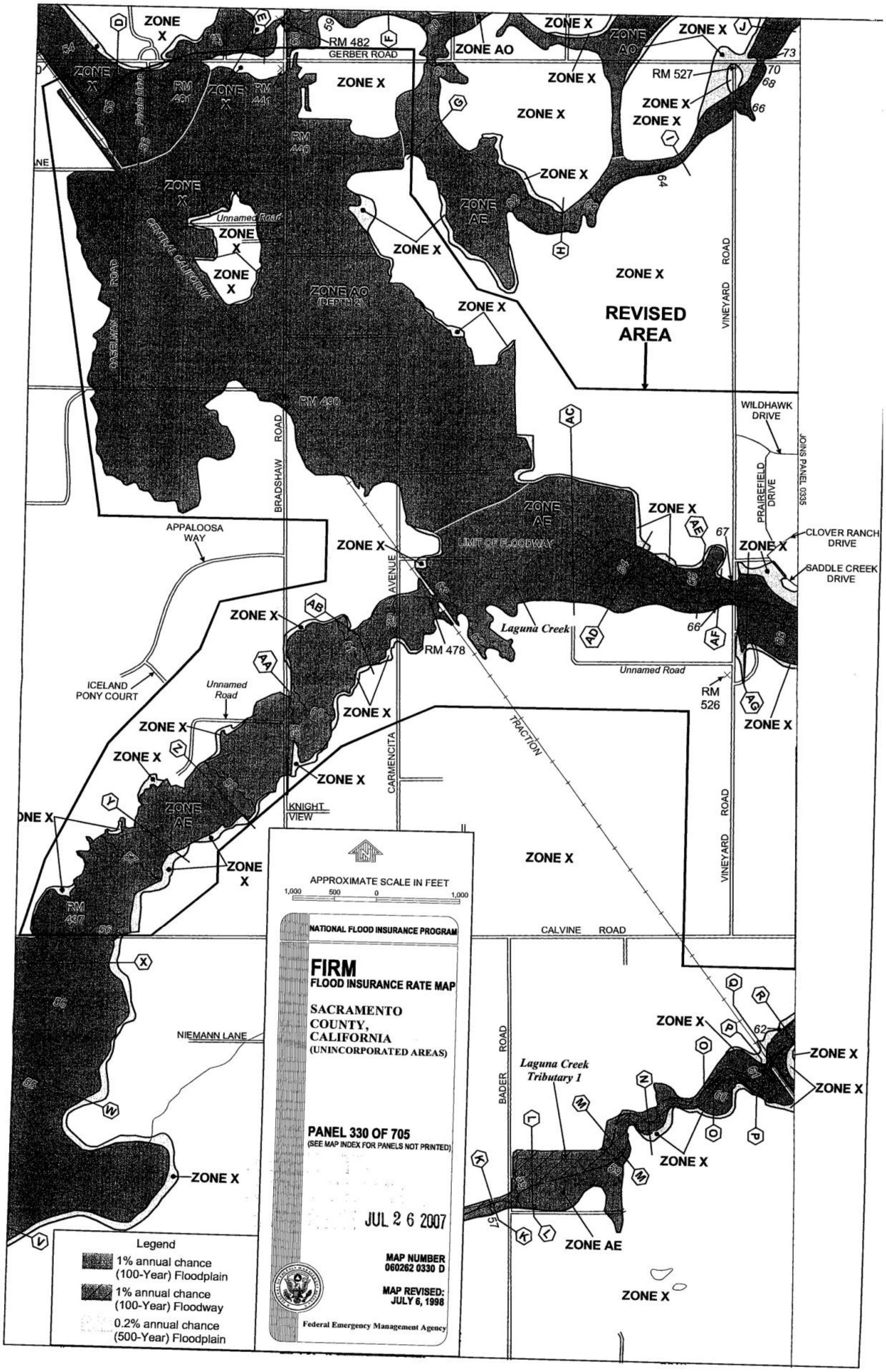
For High Risk projects, during design phase, additional Design Study Risk Analysis May be necessary to determine design alternative.

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO x YES__________

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

Signature –______________________________Date_________


ZONE X
ZONE AO
ZONE AE
RM 482
GERBER ROAD
RM 527
REVISED AREA
VINEYARD ROAD
WILDHAWK DRIVE
PRAIRIEFIELD DRIVE
JOINS PANEL 0335
CLOVER RANCH DRIVE
SADDLE CREEK DRIVE
ZONE AO (DEPTH 2)
Unnamed Road
BRADSHAW ROAD
RM 490
APPALOOSA WAY
LIMIT OF FLOODWAY
Laguna Creek
RM 478
ICELAND PONY COURT
CARMENCITA AVENUE
TRACTION
RM 526
KNIGHT VIEW
CALVINE ROAD
NIEMANN LANE
BADER ROAD
Laguna Creek Tributary 1
APPROXIMATE SCALE IN FEET
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
SACRAMENTO COUNTY, CALIFORNIA
(UNINCORPORATED AREAS)
PANEL 330 OF 705
(SEE MAP INDEX FOR PANELS NOT PRINTED)
JUL 2 6 2007
MAP NUMBER 060262 0330 D
MAP REVISED: JULY 6, 1998
Federal Emergency Management Agency
Legend
1% annual chance (100-Year) Floodplain
1% annual chance (100-Year) Floodway
0.2% annual chance (500-Year) Floodplain

Location Hydraulic Study FORM *

Dist. _______Co. Sac/ El Dorado Rte. SouthEast Connector P.M.____________

EA ______________ Bridge No. Morrison Creek

Floodplain Description:

FEMA 100 year floodplain; Zone AE.

____

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

____

____

2. ADT: Current 2,500-16,200 Projected 18,100-79,100

3. Hydraulic Data: Base Flood Q_{100}= 2,755 CFS

WSE_{100}= ______________ The flood of record, if greater than Q_{100}:

Q=___________CFS WSE= ______________

Overtopping flood Q= _______CFS WSE= ______________

Are NFIP maps and studies available? YES x NO___________

4. Is the highway location alternative within a regulatory floodway ?

YES___________ NO x

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q_{100} backwater damages:

A. Residences? NO x YES___________

B. Other Bldgs? NO x YES___________

C. Crops? NO x YES___________

D. Natural and beneficial

Floodplain values? NO x YES___________

6. Type of Traffic:

A. Emergency supply or evacuation route? NO___________ YES x

B. Emergency vehicle access? NO___________ YES x

C. Practicable detour available? NO___________ YES x

D. School bus or mail route? NO___________ YES x

7. Estimated duration of traffic interruption for 100-year event hours:_________

8. Estimated value of Q_{100} flood damages (if any) – moderate risk level.

A.	Roadway	$ 0
B	Property	$ 0
	Total	$ 0

9. Assessment of Level of Risk — Low x; Moderate_____; High_________

For High Risk projects, during design phase, additional Design Study Risk Analysis
May be necessary to determine design alternative.

Signature – Dist. Hydraulic Engineer ___________________________ Date_________
(Item numbers 3,4,5,7,9)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO x YES__________

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

Signature – ______________________________ Date_________


Legend
1% annual chance (100-Year) Floodplain
1% annual chance (100-Year) Floodway
0.2% annual chance (500-Year) Floodplain
APPROXIMATE SCALE IN FEET
1,000 0 1,000
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
SACRAMENTO COUNTY, CALIFORNIA
(UNINCORPORATED AREAS)
PANEL 215 OF 705
(SEE MAP INDEX FOR PANELS NOT PRINTED)
COMMUNITY - PANEL NUMBER
060262 0215 E
MAP REVISED:
JULY 6, 1998
Federal Emergency Management Agency
REVISED TO REFLECT LOMR EFFECTIVE DEC 6 2007
REVISED AREA
ZONE X
ZONE AE
ZONE AO (DEPTH 1)
ZONE AO (DEPTH 2)
FRUITRIDGE
AVENUE
OSAGE
BALLENTINE STREET
NEWTON ROAD
MAYHEW ROAD
ELDER CREEK ROAD
BRADSHAW ROAD
JACKSON ROAD
RM 436
RM 488
RM 489
RM 498
Unnamed Road
(EL 53)
Private Drive
JOINS PANEL 0330
JOINS PANEL 0220

Appendix B
Summary Floodplain Encroachment Report

SUMMARY FLOODPLAIN ENCROACHMENT REPORT*

Dist. __________Co. Sac/El Dorado Rte. SouthEast Connector P.M. _____________
Project No.: _12432A_________ Bridge No. _Deer Creek Causeway 1 and 2__
Limits: Interstate 5 to US 50

There is no “Summary Floodplain Encroachment Report” for Deer Creek Options 1 and 2. See “Floodplain Evaluation Report.

SUMMARY FLOODPLAIN ENCROACHMENT REPORT*

Dist. ___________Co. Sac/El Dorado Rte. SouthEast Connector P.M. ______________

Project No.: 12432A__________ Bridge No. ______Elder Creek____

Limits: Interstate 5 to US 50

Floodplain Description: FEMA 100 yr floodplain; Zone AE.

		No	Yes
1.	Is the proposed action a longitudinal encroachment of the base floodplain?	_x__	___
2.	Are the risks associated with the implementation of the proposed action significant?	_x__	___
3.	Will the proposed action support probable incompatible floodplain development?	_x__	___
4.	Are there any significant impacts on natural and beneficial floodplain values?	_x__	___
5.	Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.	_x__	___
6.	Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).	_x__	___
7.	Are Location Hydraulic Studies that document the above answers on file? If not explain.	___	_x__

PREPARED BY:

____ ___________

Signature Date

SUMMARY FLOODPLAIN ENCROACHMENT REPORT

Dist. ___________Co. Sac/El Dorado Rte. SouthEast Connector P.M. ______________

Project No.: _12432A__________ Bridge No. _______Gerber Creek_____

Limits: Interstate 5 to US 50

Floodplain Description: FEMA 100 yr floodplain; Zone AE.

		No	Yes
1.	Is the proposed action a longitudinal encroachment of the base floodplain?	_x__	___
2.	Are the risks associated with the implementation of the proposed action significant?	_x__	___
3.	Will the proposed action support probable incompatible floodplain development?	_x__	___
4.	Are there any significant impacts on natural and beneficial floodplain values?	_x__	___
5.	Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.	_x__	___
6.	Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).	_x__	___
7.	Are Location Hydraulic Studies that document the above answers on file? If not explain.	___	_x__

PREPARED BY:

_______________________________________ ___________

Signature Date

SUMMARY FLOODPLAIN ENCROACHMENT REPORT

Dist. __________Co. Sac/El Dorado Rte. SouthEast Connector P.M. ____________
Project No.: _12432A_________ Bridge No. ______Laguna Creek____
Limits: Interstate 5 to US 50

____

Floodplain Description: FEMA 100 yr floodplain; Zone AE.

		No	Yes
1.	Is the proposed action a longitudinal encroachment of the base floodplain?	_x__	___
2.	Are the risks associated with the implementation of the proposed action significant?	_x__	___
3.	Will the proposed action support probable incompatible floodplain development?	_x__	___
4.	Are there any significant impacts on natural and beneficial floodplain values?	_x__	___
5.	Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.	_x__	___
6.	Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).	_x__	___
7.	Are Location Hydraulic Studies that document the above answers on file? If not explain.	___	_x__

PREPARED BY:

____ __________

Signature Date

SUMMARY FLOODPLAIN ENCROACHMENT REPORT

Dist. ___________Co. Sac/El Dorado Rte. SouthEast Connector P.M. ______________
Project No.: _12432A__________ Bridge No. ______Morrison Creek____
Limits: Interstate 5 to US 50

Floodplain Description: FEMA 100 yr floodplain; Zone AE.

		No	Yes
1.	Is the proposed action a longitudinal encroachment of the base floodplain?	_x__	___
2.	Are the risks associated with the implementation of the proposed action significant?	_x__	___
3.	Will the proposed action support probable incompatible floodplain development?	_x__	___
4.	Are there any significant impacts on natural and beneficial floodplain values?	_x__	___
5.	Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.	_x__	___
6.	Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).	_x__	___
7.	Are Location Hydraulic Studies that document the above answers on file? If not explain.	___	_x__

PREPARED BY:

____ ___________

Signature Date

Appendix C
Hydrology

Peak Streamflow for California

USGS 11335000 COSUMNES R A MICHIGAN BAR CA

Available data for this site Surface-water: Peak streamflow GO

Sacramento County, California
Hydrologic Unit Code 18040013
Latitude 38°30'01", Longitude 121°02'39"
NAD27
Drainage area 536 square miles
Gage datum 168.09 feet above sea level
NGVD29

Output formats

- Table
- Graph
- Tab-separated file
- peakfq (watstore) format
- Reselect output format

Water Year	Date	Gage Height (feet)	Stream-flow (cfs)
1907	Mar. 19, 1907	16.30	71,000[2,7]
1908	Jan. 21, 1908		2,200
1909	Jan. 13, 1909	12.00	28,400
1910	Mar. 21, 1910		9,640
1911	Jan. 31, 1911	12.00	28,400
1912	Mar. 06, 1912		1,700
1913	Jan. 18, 1913	5.00	1,700
1914	Jan. 22, 1914	10.00	18,200
1915	Feb. 02, 1915	7.50	8,200
1916	Mar. 20, 1916	8.10	10,400
1917	Feb. 21, 1917	11.00	22,900
1918	Mar. 12, 1918	8.50	11,900
1919	Feb. 10, 1919	10.80	22,000
1920	Mar. 01, 1920	6.00	3,700
1921	Jan. 18, 1921	10.50	20,600
1922	Feb. 09, 1922	8.20	10,600
1923	Dec. 13, 1922	8.50	11,600
1924	Feb. 08, 1924	4.50	1,120
1925	Feb. 06, 1925	11.20	23,800
1926	Feb. 12, 1926	6.00	3,850
1927	Apr. 03, 1927	8.40	11,400
1928	Mar. 25, 1928	11.00	22,900
1929	Mar. 10, 1929	5.70	3,160
1930	Mar. 05, 1930	6.80	6,090

Water Year	Date	Gage Height (feet)	Stream-flow (cfs)
1958	Apr. 03, 1958	12.18	29,300
1959	Feb. 16, 1959	6.37	4,340
1960	Feb. 08, 1960	8.22	11,200
1961	Mar. 25, 1961	3.85	486
1962	Feb. 10, 1962	7.29	7,440
1963	Feb. 01, 1963	14.11	39,400
1964	Jan. 22, 1964	6.29	4,010
1965	Dec. 23, 1964	13.80	37,500
1966	Dec. 29, 1965	5.82	2,880
1967	Jan. 22, 1967	9.56	15,900
1968	Feb. 20, 1968	6.56	4,220
1969	Jan. 21, 1969	10.88	22,500
1970	Jan. 21, 1970	9.71	16,800
1971	Mar. 26, 1971	7.97	8,590
1972	Dec. 25, 1971	6.40	3,840
1973	Jan. 16, 1973	9.39	15,000
1974	Mar. 02, 1974	8.07	8,980
1975	Mar. 25, 1975	8.53	11,000
1976	Oct. 27, 1975	3.80	434
1977	Feb. 22, 1977	3.24	202
1978	Mar. 04, 1978	7.88	8,250
1979	Jan. 11, 1979	7.52	6,990
1980	Jan. 13, 1980	13.17	34,200
1981	Mar. 25, 1981	7.18	5,890
1982	Feb. 16, 1982	13.70	37,000

1931	Feb. 18, 1931	4.87	1,620
1932	Feb. 06, 1932	8.24	10,600
1933	May 30, 1933	4.28	890
1934	Jan. 01, 1934	7.15	7,170
1935	Apr. 08, 1935	10.43	20,100
1936	Feb. 22, 1936	9.95	18,200
1937	Mar. 21, 1937	9.50	15,300
1938	Feb. 11, 1938	10.06	19,300
1939	Mar. 09, 1939	5.05	1,930
1940	Mar. 31, 1940	11.66	26,200
1941	Apr. 04, 1941	7.67	9,280
1942	Jan. 27, 1942	11.28	24,500
1943	Mar. 10, 1943	10.90	22,900
1944	Mar. 04, 1944	7.45	8,490
1945	Feb. 02, 1945	10.51	21,100
1946	Dec. 23, 1945	8.50	12,600
1947	Mar. 10, 1947	6.06	3,930
1948	Mar. 24, 1948	6.86	6,240
1949	Mar. 03, 1949	8.72	13,500
1950	Feb. 04, 1950	7.44	8,360
1951	Nov. 18, 1950	11.84	27,600
1952	Jan. 12, 1952	8.48	12,500
1953	Apr. 27, 1953	6.12	4,080
1954	Mar. 30, 1954	6.03	3,860
1955	Jan. 01, 1955	6.11	4,060
1956	Dec. 23, 1955	14.59	42,000
1957	Mar. 05, 1957	7.41	6,930
1983	Mar. 13, 1983	11.76	26,100
1984	Dec. 25, 1983	10.57	19,800
1985	Feb. 08, 1985	7.39	6,290[E]
1986	Feb. 17, 1986	14.76	45,100
1987	Feb. 13, 1987	5.40	1,950
1988	Jan. 17, 1988	4.83	1,200
1989	Mar. 25, 1989	7.52	6,900
1990	Feb. 16, 1990	5.03	1,220
1991	Mar. 24, 1991	7.47	6,670
1992	Feb. 15, 1992	7.08	5,340
1993	Jan. 21, 1993	8.17	9,570
1994	Feb. 18, 1994	4.90	1,080
1995	Mar. 11, 1995	11.57	24,400
1996	Mar. 05, 1996	8.56	10,600
1997	Jan. 02, 1997	18.54	93,000
1998	Feb. 03, 1998	13.29	29,700
1999	Feb. 09, 1999	11.85	22,400
2000	Feb. 14, 2000	9.69	11,200
2001	Apr. 21, 2001	5.47	1,180
2002	Jan. 03, 2002	6.96	3,390
2003	Apr. 13, 2003	7.21	3,800
2004	Feb. 26, 2004	7.72	4,910
2005	Mar. 23, 2005	10.10	12,800
2006	Dec. 31, 2005	13.68	35,100
2007	Feb. 26, 2007	7.55	4,980
2008	Feb. 03, 2008	5.69	1,730
2009	Mar. 04, 2009	8.48	7,390

Peak Streamflow Qualification Codes.

- 2 -- Discharge is an Estimate
- 7 -- Discharge is an Historic Peak
- E -- Only Annual Maximum Peak available for this year

Appendix D
Hydraulics

HEC-RAS Plan: Existing Plan River: Cosumnes Reach: 1 Profile: 100-year

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	90000	100-year	74500.00	83.26	105.20		105.31	0.000514	2.85	28320.63	5296.93	0.15
1	80000	100-year	74500.00	76.21	95.26	93.66	95.50	0.002323	5.29	19417.87	6581.34	0.30
1	75000	100-year	74500.00	70.85	87.51		87.68	0.001087	3.36	22501.13	5446.59	0.20
1	70000	100-year	74500.00	68.98	86.66		86.73	0.000356	2.14	34449.04	6083.04	0.12
1	65000	100-year	74500.00	69.37	81.76		82.02	0.002103	3.75	18120.29	4803.79	0.27
1	60050	100-year	74500.00	60.79	79.94		80.00	0.000229	1.73	39604.02	7167.41	0.10
1	60000	100-year	74500.00	60.79	78.08		78.20	0.000660	2.73	27311.62	6117.42	0.16
1	55050	100-year	74500.00	55.96	75.89	71.50	75.96	0.000327	1.96	35699.96	6708.81	0.11
1	55000	100-year	74500.00	55.96	71.50	71.50	72.46	0.013672	10.44	10074.72	4722.04	0.70
1	50050	100-year	74500.00	54.60	67.54		67.58	0.000023	0.44	48848.82	2589.76	0.03
1	50000	100-year	74500.00	54.60	67.40		67.43	0.000023	0.44	48477.61	2568.73	0.03
1	45050	100-year	74500.00	52.43	67.07		67.12	0.000191	1.08	42601.91	7304.28	0.08
1	45000	100-year	74500.00	52.43	65.08		65.19	0.000589	2.03	29154.85	6251.62	0.14
1	40050	100-year	74500.00	48.28	62.47		62.54	0.000316	1.59	35248.45	6435.66	0.11
1	40000	100-year	74500.00	48.28	60.72		60.86	0.000961	2.36	24620.83	5710.58	0.18
1	35050	100-year	74500.00	45.35	59.03	54.95	59.09	0.000336	1.25	38608.50	7963.74	0.10
1	35000	100-year	74500.00	45.35	58.06	54.95	58.15	0.000675	1.58	30957.40	7781.30	0.14
1	30050	100-year	74500.00	39.19	57.14	52.58	57.18	0.000227	1.67	47361.58	10694.97	0.10
1	30000	100-year	74500.00	39.19	55.16	52.58	55.27	0.000903	2.85	28418.48	7960.85	0.18
1	25000	100-year	74500.00	40.74	50.47	48.19	50.61	0.001107	2.38	25311.14	6819.55	0.19
1	20000	100-year	74500.00	33.05	49.56	42.36	49.58	0.000069	1.03	64065.50	9099.66	0.05
1	15000	100-year	74500.00	27.98	49.30		49.34	0.000083	1.24	49674.75	5320.76	0.06
1	10000	100-year	74500.00	33.33	47.42	44.39	47.60	0.001001	3.29	22769.40	4678.66	0.20

```
                 HEC-RAS Version 4.0 Beta
                U.S. Army Corp of Engineers
              Hydrologic Engineering Center
                     609 Second Street
                     Davis, California

X     X  XXXXXX   XXXX        XXXX      XX     XXXX
X     X  X       X    X       X   X    X  X   X
X     X  X       X            X   X   X    X  X
XXXXXXX  XXXX    X       XXX  XXXX    XXXXXX   XXXX
X     X  X       X            X  X    X    X       X
X     X  X       X    X       X   X   X    X       X
X     X  XXXXXX   XXXX        X    X  X    X  XXXXX
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```
PROJECT DATA
Project Title: Cosumnes River
Project File : CosumnesRiver.prj
Run Date and Time: 8/31/2010 10:40:36 AM

Project in English units


PLAN DATA

Plan Title: Existing Plan
Plan File : j:\12432A - CAPITAL SEC\ENG\HYDROLOGY\RAS\Cosumnes\RAS\CosumnesRiver.p02

           Geometry Title: Cosumnes Existing
           Geometry File : j:\12432A - CAPITAL SEC\ENG\HYDROLOGY\RAS\Cosumnes\RAS\CosumnesRiver.g04

           Flow Title     : 100-year
           Flow File      : j:\12432A - CAPITAL SEC\ENG\HYDROLOGY\RAS\Cosumnes\RAS\CosumnesRiver.f01

Plan Summary Information:
Number of:  Cross Sections =   23   Multiple Openings  =    0
            Culverts       =    0   Inline Structures  =    0
            Bridges        =    0   Lateral Structures =    0

Computational Information
    Water surface calculation tolerance  =  0.01
    Critical depth calculation tolerance =  0.01
    Maximum number of iterations         =  20
    Maximum difference tolerance         =  0.3
    Flow tolerance factor                =  0.001

Computation Options
```

```
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method:         Average Conveyance
Computational Flow Regime:     Subcritical Flow
```

FLOW DATA

Flow Title: 100-year
Flow File : j:\12432A - CAPITAL SEC\ENG\HYDROLOGY\RAS\Cosumnes\RAS\CosumnesRiver.f01

Flow Data (cfs)

River	Reach	RS	100-year
Cosumnes	1	90000	74500

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Cosumnes	1	100-year		Normal S = 0.001

GEOMETRY DATA

Geometry Title: Cosumnes Existing
Geometry File : j:\12432A - CAPITAL SEC\ENG\HYDROLOGY\RAS\Cosumnes\RAS\CosumnesRiver.g04

CROSS SECTION

RIVER: Cosumnes
REACH: 1   RS: 90000

INPUT
Description: 75792 80000 9000
Station Elevation Data   num=   357

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111.8793145.5973134.2552145.5794 156.631145.2483179.0069145.2304201.3827144.7506
223.7586144.5841246.1344144.1043268.5103143.9378290.8861143.4581402.7654     142
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10329.69     10010384.43      100 10521.392.1815910658.17103.603410685.55106.9757
10795.04   112.1510822.42112.190110931.92132.855310959.29135.895211068.79142.3728
11096.16144.389711123.53144.7793 11260.4142.587611342.53137.022111397.27135.9523
 11479.4130.983511506.77128.303311534.14128.972711561.52126.292511616.27129.0019
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12273.24146.306812300.62147.471712327.99150.147912355.36155.179112437.49163.2075
12574.36158.138512711.23 160.79812765.97172.888512793.35174.3675 12848.1186.4579
12875.47191.534812984.97195.637813012.34196.522413121.84     19813395.58     198
13450.33197.680513532.45196.4805 13587.2      19613614.57     19613751.44     194
13888.31      19413943.06    193.214025.18192.862914052.55193.150514079.93193.3649
 14216.8193.929614326.29192.755214353.67192.825614435.79193.706414463.16193.7064
14490.54      19414627.41190.184214764.28188.4594 14846.4186.895214873.77186.8276
14901.15186.306214928.52185.881915038.02    187.615065.39187.328715174.89184.1119
15202.26183.616915257.01  181.2515284.38 180.88815311.76179.704615448.63179.1383
15503.38179.142815530.75178.4551

Manning's n Values          num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .047017.409     .067373.278     .04

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
      7017.4097373.278               7511     8475    11057               .1        .3

CROSS SECTION OUTPUT  Profile #100-year
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E.G. Elev (ft)	105.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.040	0.060	0.040
W.S. Elev (ft)	105.20	Reach Len. (ft)	7511.00	8475.00	11057.00
Crit W.S. (ft)		Flow Area (sq ft)	5493.62	3036.27	19790.74
E.G. Slope (ft/ft)	0.000514	Area (sq ft)	5493.62	3036.27	19790.74
Q Total (cfs)	74500.00	Flow (cfs)	9863.98	8658.24	55977.79
Top Width (ft)	5296.93	Top Width (ft)	1823.21	261.38	3212.35
Vel Total (ft/s)	2.63	Avg. Vel. (ft/s)	1.80	2.85	2.83
Max Chl Dpth (ft)	21.94	Hydr. Depth (ft)	3.01	11.62	6.16
Conv. Total (cfs)	3287509.0	Conv. (cfs)	435273.9	382067.5	2470167.0
Length Wtd. (ft)	10318.24	Wetted Per. (ft)	1823.43	265.10	3213.43
Min Ch El (ft)	83.26	Shear (lb/sq ft)	0.10	0.37	0.20
Alpha	1.07	Stream Power (lb/ft s)	0.17	1.05	0.56
Frctn Loss (ft)	9.81	Cum Volume (acre-ft)	14778.40	5414.70	63826.42
C & E Loss (ft)	0.01	Cum SA (acres)	3306.66	715.07	11016.02

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Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                 RS: 80000

INPUT
Description: 67317  70000  8000
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Station Elevation Data    num=     443
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         0117.5258 22.2967117.8687133.7802118.0742200.6703120.3875222.9671120.9213
245.2638121.6975267.5605122.1096289.8571122.7639312.1538 123.176334.4505123.6535
356.7472124.0655379.0439124.8515401.3406125.5719423.6373126.3579 445.934127.0557
468.2307127.8417490.5274 129.011512.8241130.2684579.7142133.8047646.6042138.5342
668.9009140.0682691.1976141.6541713.4943144.0708 735.791146.5394758.0877 148.956
780.3844150.2114802.6811152.6281824.9778152.5694847.2745 153.672869.5712153.6133
891.8679155.4833914.1646155.4246936.4612156.4757958.7579155.5981981.0546156.6492
1003.351156.14271025.648157.19381047.945156.69641070.242157.75661092.538157.2592
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1337.803 165.1491360.099165.94741382.396165.94741404.693      1661471.583     166
1516.177164.61561538.473164.3673 1560.77163.67511583.067163.42671605.364162.0979
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7023.479       947045.776     93.97068.073     93.9 7090.37     93.87112.667    93.6
7134.964     93.57313.339     92.47335.63692.533337357.933     92.47380.229      92
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11527.45 101.34511549.75101.234811572.04101.396911594.34101.286611616.64101.4487
11638.93100.758911661.23100.601811683.5399.9120311705.8299.7548811728.1299.06514
11750.4299.0651411772.7198.5325711795.0198.5325711817.31       98 11861.9       98
 11884.2     97.6 11906.5    97.611928.79    97.211951.09    97.211973.39     96.8
11995.68     96.812017.98    96.412040.28    96.412084.87    95.612107.1795.63602
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13824.03 108.74513846.32109.470113868.62110.366413890.92111.783113935.51113.5756
13957.81114.9923 13980.1115.6881 14002.4116.9044 14024.7117.6003   14047118.8166
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14403.75121.614114426.04121.612914448.34122.570514470.64122.569214492.93123.5268
14515.23124.095714537.53 125.19214559.82125.899614582.12127.772414604.42  128.48
14626.71130.352814649.01131.250514671.31133.3134

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .045150.542     .065596.479     .04

Bank Sta: Left    Right     Lengths: Left Channel    Right       Coeff Contr.    Expan.
      5150.5425596.479               7193    6447     4790                .1        .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              95.50    Element                    Left OB    Channel    Right OB
  Vel Head (ft)                0.24    Wt. n-Val.                  0.040      0.060      0.040
  W.S. Elev (ft)              95.26    Reach Len. (ft)           7193.00    6447.00    4790.00
```

Crit W.S. (ft)	93.66	Flow Area (sq ft)	1798.54	1735.45	15883.87
E.G. Slope (ft/ft)	0.002323	Area (sq ft)	1798.54	1735.45	15883.87
Q Total (cfs)	74500.00	Flow (cfs)	8188.10	9181.87	57130.02
Top Width (ft)	6581.34	Top Width (ft)	457.19	182.03	5942.12
Vel Total (ft/s)	3.84	Avg. Vel. (ft/s)	4.55	5.29	3.60
Max Chl Dpth (ft)	19.05	Hydr. Depth (ft)	3.93	9.53	2.67
Conv. Total (cfs)	1545559.0	Conv. (cfs)	169868.4	190484.8	1185206.0
Length Wtd. (ft)	5085.03	Wetted Per. (ft)	457.55	186.00	5942.74
Min Ch El (ft)	76.21	Shear (lb/sq ft)	0.57	1.35	0.39
Alpha	1.06	Stream Power (lb/ft s)	2.60	7.16	1.39
Frctn Loss (ft)	7.80	Cum Volume (acre-ft)	14149.71	4950.51	59298.71
C & E Loss (ft)	0.02	Cum SA (acres)	3110.05	671.93	9854.16

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1 RS: 75000

INPUT
Description: 60870 65000 7500
Station Elevation Data num= 374

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     114 360.187     114408.2119114.1307432.2243113.7307480.2492113.8614
504.2617  114.17528.2741114.9439552.2866115.5276 576.299115.8361600.3115116.4198
624.3239116.3844648.3364116.0738672.3488115.8363696.3613115.7018744.3862114.9498
768.3986114.8358816.4235114.06331080.561     1141128.585   113.21152.598   113.2
1200.623   112.41224.635   112.41248.648     112 1272.66111.72661296.673111.7266
1320.685111.45321344.698111.0994 1368.71 111.0191416.735110.31131440.747110.2309
1488.772111.71161512.785112.3798 1560.81113.86041584.822113.58391608.834113.3796
1632.847112.66061656.859112.38411680.872111.66511704.884110.35831728.897109.4939
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5787.018       905811.031     89.65835.043     89.75859.056     89.65883.069    89.6
5907.082       906051.158       90 6075.17     90.46099.183     90.66123.196      91
6147.208       916195.234     91.46219.247     91.46291.285       926483.386      92
6627.462     93.26651.475     93.3  6699.5     93.36747.52693.466676843.577      94
7203.767        94 7227.7895.172267275.80593.447557299.818 94.61987323.83193.75745
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8140.262     88.48164.275      889124.782       889268.858     86.89292.871   86.84
9316.884     86.729340.896    86.49364.909      8610205.35       8610325.42    85.5
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13182.9386.5641313206.9485.7338613230.95 84.849713254.9784.7602913302.9982.99199
   1332782.4957913351.0282.0862713543.1282.0239813591.14     81.613639.17     80.8
13663.18     80.813711.21       8013903.31       8013927.32     79.613951.3379.78552
13999.3679.3565814023.3779.3565814047.38 79.1421 14071.478.7574714095.4178.58732
14143.4479.6099814167.4579.4398314215.4780.1409814239.4979.81007 14263.580.16064
14287.5180.5700114311.5280.1525214359.55 80.798114383.5680.4452814407.5880.76807
14431.5981.16455 14455.680.8854314503.6381.7805214527.64 81.501414575.66 81.6946
14599.6881.0645314623.6981.16113 14647.781.0800814671.7180.8350814719.7481.44312
14743.75 81.336914767.7781.6409114791.7882.0409214815.7982.0306914863.8283.10899
14887.8383.0987714935.8583.9242614959.8783.7876314983.8884.2003815007.8985.18256
15031.9185.1104115079.9387.2037415103.9487.3884115127.9688.4350815151.9789.35049
15175.9889.4038915224.0193.3373315248.0293.3907415296.0496.8059315320.06 96.6002
15344.07 98.307815368.08 99.2627 15392.199.1983715440.12101.390915464.13101.3704
15488.15102.466715512.16103.266815608.21101.953715800.31     98.815824.32 98.8424
15848.34 98.442415872.3597.9359215896.3697.8718415944.3996.54294 15968.496.47886
16016.4392.5875516040.4491.2422716064.4589.2966216088.4687.8696416112.4888.02681
 16160.588.1777416184.5188.5830216208.5388.6584916232.5488.6193416256.5588.90999
16304.5891.0441216328.5991.3347816376.6293.0149216400.6393.0785916424.6493.91866
16448.6594.3741316472.6694.9599316520.6996.91512 16544.7 96.509116568.71 97.4867
16592.72 98.685416616.7398.5004916664.76100.586316688.77100.401416736.79103.3879
 16760.8103.653316784.82105.146516808.83106.325416832.84106.329316880.86108.1641
16904.88107.956816928.89108.8742 16952.9109.624916976.91 109.25117024.93110.0338
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17048.95109.659917072.96110.252817096.97110.080417120.98110.6733

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .04 7227.78     .067708.034      .04

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
       7227.787708.034               6233    4757    1316              .1         .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              87.68    Element                  Left OB    Channel    Right OB
  Vel Head (ft)                0.17    Wt. n-Val.                            0.060      0.040
  W.S. Elev (ft)              87.51    Reach Len. (ft)          6233.00    4757.00    1316.00
  Crit W.S. (ft)                       Flow Area (sq ft)                   1629.64   20871.49
  E.G. Slope (ft/ft)       0.001087    Area (sq ft)                        1629.64   20871.49
  Q Total (cfs)            74500.00    Flow (cfs)                          5472.74   69027.26
  Top Width (ft)            5446.59    Top Width (ft)                       192.44    5254.15
  Vel Total (ft/s)             3.31    Avg. Vel. (ft/s)                       3.36       3.31
  Max Chl Dpth (ft)           16.66    Hydr. Depth (ft)                       8.47       3.97
  Conv. Total (cfs)       2259354.0     Conv. (cfs)                       165971.3  2093383.0
  Length Wtd. (ft)          1601.68    Wetted Per. (ft)                     195.41    5254.80
  Min Ch El (ft)              70.85    Shear (lb/sq ft)                       0.57       0.27
  Alpha                        1.00    Stream Power (lb/ft s)                 1.90       0.89
  Frctn Loss (ft)              0.92    Cum Volume (acre-ft)    14001.22    4701.49   57277.84
  C & E Loss (ft)              0.03    Cum SA (acres)           3072.31     644.22    9238.57

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 70000

INPUT
Description: 56113  60000  7000
Station Elevation Data    num=     206
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
       0      98129.8456 96.0901285.6604      96363.567795.81077441.475195.81077
597.289896.29276 649.22896.20531675.197196.63992753.104597.51983779.073697.93158
908.919297.963631038.765 96.02071220.54993.113771298.456      921428.30292.02833
1687.99395.931131713.96296.421591739.93196.712871817.83898.184261843.80799.08961
1947.684101.98851999.622102.72762025.591103.3289 2051.56103.6737 2077.53 104.275
2155.437105.60282207.376  105.982337.222104.80192467.068101.86442493.037101.4916
2596.91499.000952622.88498.600952648.85398.45071 2726.7697.223292778.69997.22329
2804.66897.482192856.60797.261862934.51496.061853116.299      963220.17697.99149
3246.14598.275143272.11598.747963375.99199.956473505.838100.06293583.745100.2865
3635.684101.04463687.622101.68153713.592101.68153739.561     1023843.438   100.4
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3869.407   100.43973.284    98.83999.253 98.61344025.222 98.21344051.19298.00669
4284.915      984362.82298.109144804.299      984934.14699.862564986.08499.86256
5063.992     1005141.89999.637635193.83898.837635219.80799.628575297.715101.1638
5323.684101.63455349.653101.88585375.623102.4573 5453.53103.21135583.376103.8057
5609.346 103.0545635.315102.10325661.284 101.3475713.22399.445365765.16196.32155
5843.06992.188355920.97790.782265972.91589.908936076.79288.595056102.76188.83421
 6128.7388.780576232.60790.966326258.57791.573056284.54691.761836362.45493.58204
6388.42393.632426414.392 93.95496440.36193.58732  6492.394.232266544.23894.53518
6570.208 93.99666622.14694.993246700.05494.879626726.02393.804846751.99292.94796
6855.86992.106516881.83891.678257011.68590.084667037.65490.122127141.53180.15051
  7167.576.096377193.46974.572627271.37768.977657323.31574.020837349.28576.88364
7401.22387.046187453.16290.135357479.13189.46149  7505.191.006087531.06990.67159
7608.97794.374027634.946 95.26887660.91696.502947764.79286.500597790.76284.93089
7816.73183.988787920.60883.716447946.57783.703738076.42383.395848102.39383.39584
8258.20782.933338362.08282.755558517.89582.5333310076.02      8210179.89   81.92
10231.8381.9333310335.7181.7333310413.61   81.6810491.52   81.4410543.46   81.36
10647.33   81.04 10673.3   81.0410777.18   80.7210803.14   80.7210907.02    80.4
10958.9680.39304 11088.8       8012075.61       8012205.4673.2973312309.3379.06063
 12335.380.5491912361.2780.4011712439.1878.4297912465.1478.3294912517.0876.67242
12594.9978.3429312620.9678.3429312672.89       8012828.71       8012854.68    80.4
12906.6180.8275912932.5880.6413912984.5281.0689813062.43 80.565213114.3680.18347
13244.21 80.059113296.1481.3046913348.0882.7527813374.0583.3558713451.9685.41573
13503.8986.3723413529.8686.8107813633.74 88.230813659.7188.4959913685.6888.83286
13763.5889.6284613893.4391.4116914023.2794.0062314153.1195.9688214231.0295.04846
14256.9994.1973414282.9693.8801714386.8390.34888 14412.890.0238414542.6492.27921
14568.6194.6236614594.5895.3065514672.49102.339914698.46 104.78314724.43109.2609
14750.39110.042414802.33118.998114854.27124.013514880.24126.326214906.21125.1376
14932.18127.450215010.08 135.96115036.05135.296615062.02136.519515165.89144.4345
15191.86 144.52615321.71146.412715347.68145.887615451.55143.996915477.52142.7896
15503.49141.529915581.39143.696115633.33147.8444 15659.3147.936815711.24 148.873
15789.14     15015815.11      15015918.99148.369915944.96148.359915970.93147.9499
16100.77     148

Manning's n Values        num=       3
     Sta    n Val     Sta   n Val     Sta    n Val
      0     .046700.054     .067660.916     .04

Bank Sta: Left   Right     Lengths: Left Channel    Right      Coeff Contr.   Expan.
      6700.0547660.916               2618    3993    6763               .1        .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              86.73   Element                 Left OB    Channel   Right OB
  Vel Head (ft)                0.07   Wt. n-Val.                           0.060      0.040
  W.S. Elev (ft)              86.66   Reach Len. (ft)        2618.00     3993.00    6763.00
  Crit W.S. (ft)                      Flow Area (sq ft)                  3217.79   31231.25
  E.G. Slope (ft/ft)       0.000356   Area (sq ft)                       3217.79   31231.25
  Q Total (cfs)            74500.00   Flow (cfs)                         6897.53   67602.47
  Top Width (ft)            6083.04   Top Width (ft)                      325.48    5757.56
  Vel Total (ft/s)             2.16   Avg. Vel. (ft/s)                      2.14       2.16
  Max Chl Dpth (ft)           17.68   Hydr. Depth (ft)                      9.89       5.42
  Conv. Total (cfs)        3946875.0   Conv. (cfs)                      365418.6  3581457.0
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 Length Wtd. (ft)         6546.74    Wetted Per. (ft)                       327.70     5758.20
 Min Ch El (ft)             68.98    Shear (lb/sq ft)                         0.22        0.12
 Alpha                       1.00    Stream Power (lb/ft s)                   0.47        0.26
 Frctn Loss (ft)             4.68    Cum Volume (acre-ft)     14001.22     4436.81    56490.80
 C & E Loss (ft)             0.02    Cum SA (acres)            3072.31      615.94     9072.24
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Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1   RS: 65000

INPUT
Description: 52120 55000 6500

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Station Elevation Data    num=      150
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      8884.3809886.36261 140.63585.02579 225.016 84.5233  281.2783.46012
365.650985.47523421.904987.37497506.285887.93258562.539989.96942646.9209 90.9454
703.174991.26934 787.55690.60394  843.81 91.1239 928.19189.86147984.445187.03142
1068.82685.18185 1125.0884.031411265.715      841350.09684.250911378.22384.17046
1434.47684.17683 1490.7384.809561715.746    84.8    1772       841912.635       84
 2053.27      86 2137.65       862193.90486.314152334.53987.60962 2418.92       88
2475.17488.713512559.55590.308492615.80991.755632700.18996.132472756.44397.52634
2840.824 97.55452897.078       982981.45997.983583037.71397.447453122.09494.23798
3178.34889.972773262.729 84.47943318.98282.127383403.36380.046643459.61780.63074
3543.99882.235153600.252 83.20443684.63383.48937 3712.7683.319173825.268     85.6
3853.395      863994.029       864134.664       884162.79187.959874275.29987.08988
4303.42686.775684415.93486.045674500.31486.053764640.94988.115574697.20388.03852
 4725.3388.310034837.83889.910034865.96590.126494978.47390.44703  5006.690.72054
5119.10793.232215147.23493.201235259.74292.161035400.377 90.42865428.504 90.4286
5541.012      905569.13989.975235681.64689.362695709.77388.949855822.28187.94312
5850.40887.408695962.91683.542695991.04382.827296103.55181.440236131.67882.68151
6244.18686.286716272.31386.277896356.69385.443266380.56184.80321 6400.7984.52499
6501.93285.586856522.16185.724046542.38985.642946603.075 86.05456623.30386.54683
 6663.7687.229286683.98987.503326704.21787.844546744.67487.987356906.502       88
6987.41789.754417007.64589.898577048.10288.205257068.33187.653017108.78885.95967
7189.70272.56066 7209.9369.366957230.159 71.73017311.07380.836577331.30182.29036
 7351.5383.986737412.21585.782947452.672 82.15267513.358       808727.069       80
9192.325      799333.92578.666669637.353       78 9940.78      7810698.02     76.2
10853.14      7611318.51       7611473.63     75.211551.1973.8134711577.0473.68014
 11602.973.27588 11654.6 72.583211680.4671.9195311706.3171.4109611783.8773.10247
11835.5880.9742611861.4381.7953611938.99 92.957611964.8593.03578 11990.793.44813
12094.1192.1258412223.3893.9294412352.65       9412430.2193.7896312456.0693.35143
12533.62 92.344912559.4892.3261312585.3391.9906212611.1891.9774812740.4590.13268
12818.0191.2530712843.8791.2265312973.1393.1582612998.9993.1582613050.6993.95221
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13386.79      9413516.06      9213852.15      9213981.42      9414627.76      94

Manning's n Values         num=        3
     Sta    n Val     Sta    n Val      Sta    n Val
       0     .046987.417     .067412.215     .04

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
      6987.4177412.215              9525    8882    3320              .1       .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              82.02    Element                    Left OB    Channel   Right OB
  Vel Head (ft)                0.27    Wt. n-Val.                  0.040      0.060      0.040
  W.S. Elev (ft)              81.76    Reach Len. (ft)           9525.00    8882.00    3320.00
  Crit W.S. (ft)                       Flow Area (sq ft)          177.63    1149.18   16793.47
  E.G. Slope (ft/ft)       0.002103    Area (sq ft)               177.63    1149.18   16793.47
  Q Total (cfs)            74500.00    Flow (cfs)                 283.03    4311.72   69905.24
  Top Width (ft)            4803.79    Top Width (ft)             217.69     189.71    4396.39
  Vel Total (ft/s)             4.11    Avg. Vel. (ft/s)             1.59       3.75       4.16
  Max Chl Dpth (ft)           12.39    Hydr. Depth (ft)             0.82       6.06       3.82
  Conv. Total (cfs)       1624448.0     Conv. (cfs)                6171.3    94015.7  1524261.0
  Length Wtd. (ft)          3778.85    Wetted Per. (ft)           217.73     191.40    4397.09
  Min Ch El (ft)              69.37    Shear (lb/sq ft)             0.11       0.79       0.50
  Alpha                        1.01    Stream Power (lb/ft s)       0.17       2.96       2.09
  Frctn Loss (ft)              1.96    Cum Volume (acre-ft)     13995.88    4236.66   52762.71
  C & E Loss (ft)              0.06    Cum SA (acres)            3065.76     592.33    8284.00

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                   RS: 60050

INPUT
Description: 43238  50000  6000
Station Elevation Data     num=     368
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       090.7535546.27625 91.507169.4143891.26709 92.552592.29581115.690692.70776
161.9669 94.9278 185.10595.33974208.243196.31246231.3812 96.5871277.657598.53253
300.795698.80717323.933799.50169347.0719   99.59  370.21100.2845393.3481100.3728
416.4862101.0673439.6244102.4116462.7625103.1497485.9006 104.494509.0387 105.232
532.1769107.1916 555.315108.3178601.5912113.0131624.7294113.8241647.8675116.1717
671.0056115.9434694.1437117.2518717.2819117.3686  740.42117.1403763.5581 117.257
786.6962117.1822809.8344117.4524832.9725117.3776879.2487117.9181902.3868 117.918
 925.525118.3344948.6631118.3343994.9393119.16711018.077 119.4261041.216120.1013
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1064.354120.36021087.492121.0355 1110.63121.29441226.321     1221295.736121.0747
1318.874120.65681342.012120.3484 1365.15119.76631388.288119.29351434.565118.1292
1457.703118.03771480.841117.30241503.979117.05761550.256114.77261573.394114.5279
1596.532113.7196 1619.67113.80911642.808113.00091665.947113.09041689.085112.2822
1712.223111.70681735.361112.31951758.499111.74411781.637112.35681804.776111.7814
1827.914112.2697 1874.19110.87011897.328111.35831920.467110.79691943.605111.5174
1989.881110.85922013.019111.56262036.157111.23352059.296111.94432082.434111.6227
2105.572112.33352151.848111.76872174.987111.26252198.125 109.7632221.263109.2568
2267.539106.25792290.677105.46692313.816103.81282336.954103.02172360.092101.3676
 2383.23100.57662429.50797.725652452.64597.163282475.78395.737812498.92195.17544
2545.19892.920462568.33692.309392591.47491.181912614.61290.57085 2637.7589.36456
2660.888 88.67472684.02787.468412707.16586.382042730.30385.692182753.44184.91897
2776.57984.542262845.99482.21157 2892.2781.356872915.40880.851262938.547 80.4184
2961.68579.912782984.82379.501133007.96179.162223031.09978.750563054.23878.41166
3077.376       783100.51478.30297 3146.7979.008353169.92879.311323193.067  79.664
3216.20579.711323262.48179.905373308.758        803355.03481.941933378.17282.43689
3424.44884.378813447.58785.223923470.72586.545043493.86387.390153540.13987.43983
3563.27886.844033586.41685.427963609.55484.83215 3655.8382.035293678.969    81.6
3702.107    81.63725.245     81.23748.383    81.23771.521    80.83817.798 81.5645
3840.93681.546753864.074  81.9293887.21281.911254002.903 79.65774072.31875.36828
4095.45674.495634118.59473.054754141.73273.90551 4164.8774.188054188.00875.03882
4211.14676.141514234.28576.992274257.42376.992274280.561 77.24424303.69977.25677
4326.83777.508714349.97677.521274373.11477.77626 4419.39 77.80754442.52878.06249
4488.80578.068924535.08178.837684558.21978.828484581.35779.212864604.49679.21286
4627.63479.606434650.77279.60643 4673.91        804697.048     79.64720.187    79.6
4812.73978.044015067.259        785090.397     77.85113.536    77.85136.674    77.6
5159.812     77.6 5182.95     77.25206.088        775252.365     76.25275.503      76
5298.641     76.45321.77976.916225344.91777.316225368.05677.832445391.19478.23244
5414.33278.54392 5437.4778.971625460.60879.283095483.74779.710785506.885 80.2025
5530.023 75.99155553.16171.716485576.29967.505485599.43865.005915622.576 60.7949
5645.71464.883735668.85267.26113 5691.9972.551465715.12876.640295738.26781.93062
5761.40579.223595807.68176.212555830.81973.505525853.958        726015.925      72
6039.06372.420466085.33972.840916108.47873.261376131.616 73.47166154.75473.89206
6177.89273.41592 6201.0372.875456224.16872.789976247.30772.648616270.44572.63773
6293.58372.489826316.72172.480716339.85972.366676501.82772.366676524.96572.33334
6548.10372.366676571.24172.333346594.37972.366676617.51872.333346640.65672.36667
6802.62372.323816941.45272.41904 6964.5972.397226987.72972.439227010.86772.40741
7034.00572.445767080.28172.411777149.69672.471117172.83472.433337427.35472.56667
7450.49272.533337705.01272.633337774.42772.566677797.56572.510647866.97972.47515
7890.11872.407557936.39472.374157959.53272.306388028.94772.266678075.22372.17117
8098.36172.16666  8121.572.103038190.91472.066678214.052        728607.39372.01905
 9232.11       7410041.9373.9851810065.0773.5177310088.2173.5029110111.3473.03546
10134.4873.0206410180.7671.9821210203.8971.9154810227.0371.3962210250.1771.32958
10273.3172.2636610296.4473.0054110342.7274.8735710365.8675.61532    1038975.80766
10412.1375.8076610435.27        7610481.55        7610550.96     77.2 10574.177.41103
10597.2377.8110410620.37        7810643.51        7810666.6578.2544710689.7978.25447
10736.0678.7394310782.3479.7093410805.4779.9398310828.6180.4247910851.75 81.1395
10898.0281.7695810921.1682.4842810967.4483.0964110990.5882.9938311013.7183.29091
11036.8583.1883211059.9983.5883311083.1383.5883311175.68        8411245.09      84
11268.2383.6604211291.3783.6604211337.6482.1944311360.7881.8010111383.9281.06801
11407.0581.0680111430.1980.5839811453.3380.83293 11499.680.6871311522.7480.93609
11545.8881.0201311569.0281.4260311615.29 81.594111638.43        8211661.5781.59413
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11684.7181.9694711707.8481.5636111730.9881.9389511754.1281.5330811777.2681.05317
11800.3981.3544811823.5380.8745711846.6781.1758711869.8180.7817411892.9580.26682
11916.0880.4473311939.2279.9324111962.3679.83351 11985.579.3185912008.6379.91475
12031.7780.0948812054.9180.9577412078.0581.5538912101.1882.4167612124.3282.56705
 12170.683.4010612193.7483.5513712216.8783.9683712332.5685.7979112425.1186.04623
12448.2586.4445812471.3986.3418412494.5386.5982512517.6686.64613 12540.886.90255
12563.9486.9504212610.2187.6205112633.35  87.74712656.49 87.473512679.63    87.6
12702.7687.62457 12725.988.0491512772.1888.0982912795.3288.4502512818.4588.60281
12841.5989.0827512887.87 89.8336   1291190.3135412934.1490.2090312957.2890.20903
12980.4290.1045213003.5590.1045213026.69       9013049.83      9013072.9790.09475
13096.1190.0947513119.24 90.189513142.38 90.189513165.5290.0947513188.6690.09475
13211.79       9013327.48       9013350.6290.2387513373.7690.23875 13396.990.63875
13420.03     90.813443.1790.9107413466.3191.3107413489.4591.4214813512.5891.71074
13535.7291.7107413558.86      9214414.95      92

Manning's n Values        num=       3
     Sta    n Val     Sta   n Val     Sta    n Val
      0     .045506.885     .065738.267     .04

Bank Sta: Left    Right     Lengths: Left Channel    Right       Coeff Contr.    Expan.
      5506.8855738.267                4038    5254    4975                .1        .3
Ineffective Flow      num=        1
   Sta L    Sta R      Elev  Permanent
   1280014414.95        70        T

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              80.00    Element                   Left OB    Channel   Right OB
  Vel Head (ft)                0.06    Wt. n-Val.                 0.040      0.060      0.040
  W.S. Elev (ft)              79.94    Reach Len. (ft)          4038.00    5254.00    4975.00
  Crit W.S. (ft)                       Flow Area (sq ft)        3627.16    2230.81   33746.05
  E.G. Slope (ft/ft)       0.000229    Area (sq ft)             3627.16    2230.81   33746.05
  Q Total (cfs)            74500.00    Flow (cfs)               3409.63    3860.93   67229.43
  Top Width (ft)            7167.41    Top Width (ft)           1821.80     221.28    5124.33
  Vel Total (ft/s)             1.88    Avg. Vel. (ft/s)            0.94       1.73       1.99
  Max Chl Dpth (ft)           19.15    Hydr. Depth (ft)            1.99      10.08       6.59
  Conv. Total (cfs)       4923783.0     Conv. (cfs)             225346.3   255173.0   4443264.0
  Length Wtd. (ft)          4963.04    Wetted Per. (ft)         1822.19     224.73    5124.86
  Min Ch El (ft)              60.79    Shear (lb/sq ft)            0.03       0.14       0.09
  Alpha                        1.07    Stream Power (lb/ft s)      0.03       0.25       0.19
  Frctn Loss (ft)              1.80    Cum Volume (acre-ft)    13579.89    3892.06   50836.73
  C & E Loss (ft)              0.01    Cum SA (acres)           2842.78     550.43    7921.18

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION
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RIVER: Cosumnes
REACH: 1                RS: 60000

INPUT
Description: 43238  50000  6000
Station Elevation Data    num=     368
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       090.7535546.27625 91.507169.4143891.26709 92.552592.29581115.690692.70776
161.9669 94.9278 185.10595.33974208.243196.31246231.3812 96.5871277.657598.53253
300.795698.80717323.933799.50169347.0719   99.59  370.21100.2845393.3481100.3728
416.4862101.0673439.6244102.4116462.7625103.1497485.9006 104.494509.0387 105.232
532.1769107.1916 555.315108.3178601.5912113.0131624.7294113.8241647.8675116.1717
671.0056115.9434694.1437117.2518717.2819117.3686  740.42117.1403763.5581 117.257
786.6962117.1822809.8344117.4524832.9725117.3776879.2487117.9181902.3868 117.918
 925.525118.3344948.6631118.3343994.9393119.16711018.077 119.4261041.216120.1013
1064.354120.36021087.492121.0355 1110.63121.29441226.321      1221295.736121.0747
1318.874120.65681342.012120.3484 1365.15119.76631388.288119.29351434.565118.1292
1457.703118.03771480.841117.30241503.979117.05761550.256114.77261573.394114.5279
1596.532113.7196 1619.67113.80911642.808113.00091665.947113.09041689.085112.2822
1712.223111.70681735.361112.31951758.499111.74411781.637112.35681804.776111.7814
1827.914112.2697 1874.19110.87011897.328111.35831920.467110.79691943.605111.5174
1989.881110.85922013.019111.56262036.157111.23352059.296111.94432082.434111.6227
2105.572112.33352151.848111.76872174.987111.26252198.125 109.7632221.263109.2568
2267.539106.25792290.677105.46692313.816103.81282336.954103.02172360.092101.3676
 2383.23100.57662429.50797.725652452.64597.163282475.78395.737812498.92195.17544
2545.19892.920462568.33692.309392591.47491.181912614.61290.57085 2637.7589.36456
2660.888 88.67472684.02787.468412707.16586.382042730.30385.692182753.44184.91897
2776.57984.542262845.99482.21157 2892.2781.356872915.40880.851262938.547 80.4184
2961.68579.912782984.82379.501133007.96179.162223031.09978.750563054.23878.41166
3077.376      783100.51478.30297 3146.7979.008353169.92879.311323193.067  79.664
3216.20579.711323262.48179.905373308.758      803355.03481.941933378.17282.43689
3424.44884.378813447.58785.223923470.72586.545043493.86387.390153540.13987.43983
3563.27886.844033586.41685.427963609.55484.83215 3655.8382.035293678.969    81.6
3702.107    81.63725.245    81.23748.383    81.23771.521    80.83817.798 81.5645
3840.93681.546753864.074  81.9293887.21281.911254002.903 79.65774072.31875.36828
4095.45674.495634118.59473.054754141.73273.90551 4164.8774.188054188.00875.03882
4211.14676.141514234.28576.992274257.42376.992274280.561 77.24424303.69977.25677
4326.83777.508714349.97677.521274373.11477.77626 4419.39 77.80754442.52878.06249
4488.80578.068924535.08178.837684558.21978.828484581.35779.212864604.49679.21286
4627.63479.606434650.77279.60643 4673.91      804697.048    79.64720.187    79.6
4812.73978.044015067.259      785090.397    77.85113.536    77.85136.674    77.6
5159.812    77.6 5182.95    77.25206.088      775252.365    76.25275.503      76
5298.641     76.45321.77976.916225344.91777.316225368.05677.832445391.19478.23244
5414.33278.54392 5437.4778.971625460.60879.283095483.74779.710785506.885 80.2025
5530.023 75.99155553.16171.716485576.29967.505485599.43865.005915622.576 60.7949
5645.71464.883735668.85267.26113 5691.9972.551465715.12876.640295738.26781.93062
5761.40579.223595807.68176.212555830.81973.505525853.958      726015.925      72
6039.06372.420466085.33972.840916108.47873.261376131.616 73.47166154.75473.89206
6177.89273.41592 6201.0372.875456224.16872.789976247.30772.648616270.44572.63773
6293.58372.489826316.72172.480716339.85972.366676501.82772.366676524.96572.33334
6548.10372.366676571.24172.333346594.37972.366676617.51872.333346640.65672.36667
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6802.62372.323816941.45272.41904 6964.5972.397226987.72972.439227010.86772.40741
7034.00572.445767080.28172.411777149.69672.471117172.83472.433337427.35472.56667
7450.49272.533337705.01272.633337774.42772.566677797.56572.510647866.97972.47515
7890.11872.407557936.39472.374157959.53272.306388028.94772.266678075.22372.17117
8098.36172.16666  8121.572.103038190.91472.066678214.052      728607.39372.01905
 9232.11      7410041.9373.9851810065.0773.5177310088.2173.5029110111.3473.03546
10134.4873.0206410180.7671.9821210203.8971.9154810227.0371.3962210250.1771.32958
10273.3172.2636610296.4473.0054110342.7274.8735710365.8675.61532   1038975.80766
10412.1375.8076610435.27       7610481.55       7610550.96     77.2 10574.177.41103
10597.2377.8110410620.37       7810643.51       7810666.6578.2544710689.7978.25447
10736.0678.7394310782.3479.7093410805.4779.9398310828.6180.4247910851.75 81.1395
10898.0281.7695810921.1682.4842810967.4483.0964110990.5882.9938311013.7183.29091
11036.8583.1883211059.9983.5883311083.1383.5883311175.68       8411245.09      84
11268.2383.6604211291.3783.6604211337.6482.1944311360.7881.8010111383.9281.06801
11407.0581.0680111430.1980.5839811453.3380.83293 11499.680.6871311522.7480.93609
11545.8881.0201311569.0281.4260311615.29 81.594111638.43       8211661.5781.59413
11684.7181.9694711707.8481.5636111730.9881.9389511754.1281.5330811777.2681.05317
11800.3981.3544811823.5380.8745711846.6781.1758711869.8180.7817411892.9580.26682
11916.0880.4473311939.2279.9324111962.3679.83351 11985.579.3185912008.6379.91475
12031.7780.0948812054.9180.9577412078.0581.5538912101.1882.4167612124.3282.56705
 12170.683.4010612193.7483.5513712216.8783.9683712332.5685.7979112425.1186.04623
12448.2586.4445812471.3986.3418412494.5386.5982512517.6686.64613 12540.886.90255
12563.9486.9504212610.2187.6205112633.35  87.74712656.49 87.473512679.63    87.6
12702.7687.62457 12725.988.0491512772.1888.0982912795.3288.4502512818.4588.60281
12841.5989.0827512887.87 89.8336   1291190.3135412934.1490.2090312957.2890.20903
12980.4290.1045213003.5590.1045213026.69       9013049.83       9013072.9790.09475
13096.1190.0947513119.24 90.189513142.38 90.189513165.5290.0947513188.6690.09475
13211.79      9013327.48       9013350.6290.2387513373.7690.23875 13396.990.63875
13420.03    90.813443.1790.9107413466.3191.3107413489.4591.4214813512.5891.71074
13535.7291.7107413558.86       9214414.95      92

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
      0     .045506.885     .065738.267     .04

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
      5506.8855738.267              4038     5254     4975              .1        .3
Ineffective Flow      num=         1
   Sta L    Sta R     Elev   Permanent
   1280014414.95       70        T

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              78.20    Element                        Left OB     Channel    Right OB
  Vel Head (ft)                0.12    Wt. n-Val.                      0.040       0.060       0.040
  W.S. Elev (ft)              78.08    Reach Len. (ft)               4038.00     5254.00     4975.00
  Crit W.S. (ft)                       Flow Area (sq ft)             1036.73     1834.98    24439.91
  E.G. Slope (ft/ft)       0.000660    Area (sq ft)                  1036.73     1834.98    24439.91
  Q Total (cfs)            74500.00    Flow (cfs)                    1135.80     5017.63    68346.56
  Top Width (ft)            6117.42    Top Width (ft)                1042.92      202.86     4871.64
  Vel Total (ft/s)             2.73    Avg. Vel. (ft/s)                 1.10        2.73        2.80
  Max Chl Dpth (ft)           17.28    Hydr. Depth (ft)                 0.99        9.05        5.02
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Conv. Total (cfs)       2900006.0   Conv. (cfs)               44212.5   195317.7   2660476.0
Length Wtd. (ft)          4925.05   Wetted Per. (ft)          1043.18     205.94     4872.06
Min Ch El (ft)              60.79   Shear (lb/sq ft)             0.04       0.37        0.21
Alpha                        1.03   Stream Power (lb/ft s)       0.04       1.00        0.58
Frctn Loss (ft)              2.22   Cum Volume (acre-ft)     13363.72    3646.86    47514.01
C & E Loss (ft)              0.01   Cum SA (acres)            2710.00     524.85     7350.36
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Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 55050

INPUT
Description: 37984  45000  5500
Station Elevation Data     num=     192
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      821086.533       821113.69681.619831249.51381.619831276.676        82
2254.556      822308.882 81.60392336.04681.598952390.37281.168192417.53681.10877
2444.69981.108772471.86281.287022526.18980.945882580.516      812607.679      80.8
2662.006      803286.762      803313.926     79.83422.579     78.23449.742        78
3667.049      783775.70278.959523802.86579.359513911.519      803938.682        80
4074.49978.473364210.314      764264.64175.373334291.80475.75291 4346.1375.12624
4373.29374.736734481.94574.361084509.108 73.57444590.59873.664884617.76173.27554
4672.08773.441964753.57673.956944807.90274.663164916.55576.258454943.71876.09856
4970.88176.493595025.207 76.94725161.02276.771985242.51276.846425296.83876.15332
 5405.49 75.56035432.65375.121255541.30672.425455649.95870.861975657.99670.85936
5679.45970.478275700.92370.509995722.38770.075675872.634      705894.098      70.4
5915.56270.266675937.02670.217145979.95470.375386001.417   70.326022.881      70.4
6044.345   70.566130.201   70.956151.665     71.16173.128    71.26194.59271.25667
6216.056    71.4 6237.52    71.56258.98471.733336280.448    71.76301.912      71.8
6323.375      726559.478      726666.79775.714996688.261 71.77386709.725 67.8455
6731.18963.904326752.65359.976026774.11755.955396795.58158.600056817.04461.33704
6838.508 63.98176859.97266.626376881.43668.33502  6902.970.166126924.36471.06123
6945.82872.081736967.29273.102236988.75573.997327010.21973.109077031.68372.09541
7074.61170.318897096.07569.305247117.53969.690717139.00271.02969 7181.9371.80064
7203.39473.139637246.32272.345257310.71374.025947332.17773.611347353.641 73.2623
7375.10572.856667396.56972.552437418.033 72.4445 7460.9672.070027482.42471.99469
7503.88871.829357525.352 71.75247546.816    71.52 7568.2871.493337589.74471.40572
7632.67171.371437654.13571.287627697.06371.207627718.527    71.27782.91871.05539
7804.38270.971438061.94970.415098083.41370.34192 8126.3470.264718233.659        70
8426.834      708469.76270.514288512.689    70.68534.15371.066678555.617    71.12
8577.081      718620.009     70.28641.473      709886.377      709993.69669.93996
10101.02      6811047.95      68 11098.667.0249811149.2565.4604811174.5764.97297
11250.5468.2216411275.8669.5992711301.1972.4770311377.1676.1031811402.4875.81178
 11427.877.0204911478.4578.9929511503.7778.6087111579.7481.5482711605.0681.95795
11630.3981.5545911706.3682.7869711731.6882.3869711832.9783.98495 11858.383.59248
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11908.9484.3924811934.27    84.411959.59      8412060.88      8412086.21     83.6
12162.18     83.6 12187.5   83.212238.15      8412567.35      8412617.9983.47202
12643.3283.4720212693.9682.9440312719.2982.7180912744.6182.7561312820.5882.33014
 12845.982.5560812871.2382.9620712896.5583.18802 12947.284.3367912972.52 84.5684
13048.4985.7683913073.81      8613453.66      8613554.95     87.613630.92    87.6
13656.25      8813706.89      8813757.54    87.213782.86     87.213833.51    86.4
13858.8386.3705313884.1686.7410713960.1386.7410713985.4586.3705314010.7786.37053
 14036.1      8614086.7486.7690614112.0786.7845314188.0487.9845314213.36      88
14339.97      90 14694.5      90

Manning's n Values        num=       3
     Sta    n Val     Sta   n Val     Sta    n Val
       0     .046666.797     .066988.755     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      6666.7976988.755             2746    3139    3633               .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   10400 14694.5     60       F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)            75.96   Element                   Left OB    Channel   Right OB
  Vel Head (ft)              0.07   Wt. n-Val.                  0.040      0.060      0.040
  W.S. Elev (ft)            75.89   Reach Len. (ft)           2746.00    3139.00    3633.00
  Crit W.S. (ft)            71.50   Flow Area (sq ft)         6350.77    2978.85   26370.34
  E.G. Slope (ft/ft)     0.000327   Area (sq ft)              6350.77    2978.85   26370.34
  Q Total (cfs)          74500.00   Flow (cfs)               10043.18    5849.28   58607.55
  Top Width (ft)          6708.81   Top Width (ft)            1994.16     321.96    4392.69
  Vel Total (ft/s)           2.09   Avg. Vel. (ft/s)             1.58       1.96       2.22
  Max Chl Dpth (ft)         19.94   Hydr. Depth (ft)             3.18       9.25       6.00
  Conv. Total (cfs)     4118105.0    Conv. (cfs)              555152.4   323327.9  3239625.0
  Length Wtd. (ft)        3480.65   Wetted Per. (ft)          1994.33     324.65    4393.36
  Min Ch El (ft)            55.96   Shear (lb/sq ft)             0.07       0.19       0.12
  Alpha                      1.04   Stream Power (lb/ft s)       0.10       0.37       0.27
  Frctn Loss (ft)            3.42   Cum Volume (acre-ft)     13021.31    3356.55   44612.48
  C & E Loss (ft)            0.09   Cum SA (acres)            2569.23     493.20    6821.32

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION
```

```
RIVER: Cosumnes
REACH: 1                    RS: 55000

INPUT
Description: 37984  45000  5500
Station Elevation Data    num=      192
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      821086.533       821113.69681.619831249.51381.619831276.676        82
2254.556      822308.882 81.60392336.04681.598952390.37281.168192417.53681.10877
2444.69981.108772471.86281.287022526.18980.945882580.516       812607.679    80.8
2662.006      803286.762       803313.926    79.83422.579    78.23449.742      78
3667.049      783775.70278.959523802.86579.359513911.519       803938.682      80
4074.49978.473364210.314       764264.64175.373334291.80475.75291 4346.1375.12624
4373.29374.736734481.94574.361084509.108 73.57444590.59873.664884617.76173.27554
4672.08773.441964753.57673.956944807.90274.663164916.55576.258454943.71876.09856
4970.88176.493595025.207 76.94725161.02276.771985242.51276.846425296.83876.15332
 5405.49 75.56035432.65375.121255541.30672.425455649.95870.861975657.99670.85936
5679.45970.478275700.92370.509995722.38770.075675872.634       705894.098    70.4
5915.56270.266675937.02670.217145979.95470.375386001.417    70.326022.881    70.4
6044.345    70.566130.201    70.956151.665     71.16173.128     71.26194.59271.25667
6216.056     71.4 6237.52     71.56258.98471.733336280.448     71.76301.912    71.8
6323.375      726559.478       726666.79775.714996688.261 71.77386709.725 67.8455
6731.18963.904326752.65359.976026774.11755.955396795.58158.600056817.04461.33704
6838.508 63.98176859.97266.626376881.43668.33502  6902.970.166126924.36471.06123
6945.82872.081736967.29273.102236988.75573.997327010.21973.109077031.68372.09541
7074.61170.318897096.07569.305247117.53969.690717139.00271.02969 7181.9371.80064
7203.39473.139637246.32272.345257310.71374.025947332.17773.611347353.641 73.2623
7375.10572.856667396.56972.552437418.033 72.4445 7460.9672.070027482.42471.99469
7503.88871.829357525.352 71.75247546.816   71.52 7568.2871.493337589.74471.40572
7632.67171.371437654.13571.287627697.06371.207627718.527     71.27782.91871.05539
7804.38270.971438061.94970.415098083.41370.34192 8126.3470.264718233.659      70
8426.834      708469.76270.514288512.689    70.68534.15371.066678555.617   71.12
8577.081      718620.009    70.28641.473       709886.377      709993.69669.93996
10101.02      6811047.95       68 11098.667.0249811149.2565.4604811174.5764.97297
11250.5468.2216411275.8669.5992711301.1972.4770311377.1676.1031811402.4875.81178
 11427.877.0204911478.4578.9929511503.7778.6087111579.7481.5482711605.0681.95795
11630.3981.5545911706.3682.7869711731.6882.3869711832.9783.98495 11858.383.59248
11908.9484.3924811934.27     84.411959.59       8412060.88       8412086.21    83.6
12162.18     83.6 12187.5     83.212238.15       8412567.35       8412617.9983.47202
12643.3283.4720212693.9682.9440312719.2982.7180912744.6182.7561312820.5882.33014
 12845.982.5560812871.2382.9620712896.5583.18802 12947.284.3367912972.52 84.5684
13048.4985.7683913073.81       8613453.66       8613554.95    87.613630.92    87.6
13656.25      8813706.89       8813757.54    87.213782.86    87.213833.51    86.4
13858.8386.3705313884.1686.7410713960.1386.7410713985.4586.3705314010.7786.37053
 14036.1      8614086.7486.7690614112.0786.7845314188.0487.9845314213.36      88
14339.97      90 14694.5       90

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .046666.797     .066988.755     .04

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.   Expan.
```

```
      6666.7976988.755             2746    3139    3633            .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   10400 14694.5      60       F
```

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	72.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.96	Wt. n-Val.	0.040	0.060	0.040
W.S. Elev (ft)	71.50	Reach Len. (ft)	2746.00	3139.00	3633.00
Crit W.S. (ft)	71.50	Flow Area (sq ft)	597.98	1683.52	7793.22
E.G. Slope (ft/ft)	0.013672	Area (sq ft)	597.98	1683.52	7793.22
Q Total (cfs)	74500.00	Flow (cfs)	2505.08	17570.95	54423.97
Top Width (ft)	4722.04	Top Width (ft)	631.31	243.78	3846.94
Vel Total (ft/s)	7.39	Avg. Vel. (ft/s)	4.19	10.44	6.98
Max Chl Dpth (ft)	15.54	Hydr. Depth (ft)	0.95	6.91	2.03
Conv. Total (cfs)	637143.3	Conv. (cfs)	21424.1	150271.3	465447.9
Length Wtd. (ft)	3558.12	Wetted Per. (ft)	631.33	246.04	3847.33
Min Ch El (ft)	55.96	Shear (lb/sq ft)	0.81	5.84	1.73
Alpha	1.13	Stream Power (lb/ft s)	3.39	60.96	12.07
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)	12802.29	3188.56	43187.83
C & E Loss (ft)	0.28	Cum SA (acres)	2486.48	472.81	6477.72

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Cosumnes
REACH: 1   RS: 50050

INPUT

```
Description: 34845  40000  5000
Station Elevation Data    num=     257
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
       078.02666283.4256  78.725386.4894    78.9438.0214    79.1489.553378.79498
541.085378.35634566.851378.39487592.617278.24896618.383278.26395644.149278.18672
721.447278.33543747.213278.24668772.9792 78.2463798.745278.13333824.511278.22667
```

```
850.277278.13333953.341178.13333979.1071    78.21004.873      781391.363       78
1494.427   78.641520.19378.688231597.491    79.21649.023  79.4251726.321       80
3066.147        803117.679     79.23143.44578.851713169.21178.903413220.74378.20683
3246.50978.206833349.572       783375.338       783401.10477.92891 3426.8777.94669
3452.63578.328913478.40178.864463504.167    79.63529.933       804096.782       80
4122.548     80.44148.314      80.44174.08180.203694225.613 80.15584251.379 80.3595
4277.14580.335554380.20981.181564405.976 81.60554483.27480.48672 4509.0480.68398
4534.806 80.50834637.871      80.44663.637       804792.46779.980264818.23379.26336
4921.29877.273244947.064 76.2969 4972.8375.539925050.128 71.90815075.89572.39458
5127.42772.899035178.95974.118045204.72575.012445230.49175.783815282.02377.57259
 5307.7978.626755333.55678.957955359.32279.00637 5436.62       805462.38679.63631
5488.15279.632615565.45178.541555616.98377.701595642.74977.657935694.281 76.7853
5745.813       76 5771.58       765823.112      75.25874.64475.15523 5900.4175.53284
6029.24175.499626055.00775.873626080.77375.870016158.07174.931956183.83775.17628
6209.604 74.8636 6235.3774.645266286.90273.741716312.668 74.08046389.96672.78018
6441.49972.777766467.265  73.1446544.56373.104426570.32973.803636596.09574.15789
 6699.1676.443826853.75677.905626982.58771.899937034.119 66.18117111.417     54.6
7137.184       54.67188.716 70.60027240.24871.177787266.01471.20839 7291.7871.57359
7343.313 71.63487369.07973.082287394.84574.249547420.61174.334537497.90977.83633
7523.67577.748057549.44178.180797600.97478.00423 7626.7477.915967652.50677.47325
7678.272 75.63167704.038 75.70997729.80473.86824 7755.5772.026587781.33666.18601
7807.10360.345447832.86956.424837858.635 53.86767884.40151.310367910.16747.93044
7935.93344.550527961.69939.807227987.46536.427298013.23134.559948038.99834.26627
8064.764 33.9726 8090.5333.678938116.29630.509328142.06230.215658167.82830.17575
8193.59430.135858219.35930.095958245.12529.673368270.89129.633468296.65630.01199
8322.42230.405648348.188 30.79938373.95330.795138399.71931.188798425.48431.18562
 8451.2531.182468477.016 31.93668502.78131.535618528.54732.289758554.31332.69385
8580.07833.097958605.84433.502048631.60933.083778657.37532.332758683.14131.32268
8708.90630.312618734.67229.302558760.43828.292488786.20326.949668811.96928.77673
8837.734 30.6038  8863.532.430888889.26634.257958915.03136.406228940.79737.30036
8966.56341.624988992.32845.949619018.09450.274239043.85954.598869069.62558.30783
9095.39165.126099121.15667.197399146.92269.268699172.68871.339999198.45369.37248
9249.98462.162129301.51657.408159327.281 57.37229404.57856.03594     9688       56
9739.53156.869779816.82861.623949868.359 64.06369894.12564.133589945.65661.37186
9997.18864.4740110022.9567.4759310048.72  69.02710074.4872.8204310126.0272.08746
10151.7870.9294710203.31 70.196510280.6170.1248910306.3869.6671310332.1469.64326
10357.9169.3361610409.44 70.1053 10435.269.3643210460.9769.74889 10512.571.20804
10538.2770.6058210564.0370.2098410667.0967.7580310692.8666.7199910718.6366.30971
10821.6965.7460710847.45 66.232910950.5267.6465810976.2868.5988311002.05     68.4
11105.1171.5264111130.8871.9448111156.6472.7448111233.94      72.8 11259.773.17535
11362.7773.1260311388.5373.5072411465.8373.5248511749.25       7811878.08       78
12006.91        8012109.9778.5416312264.56 76.057612341.8674.5762612367.6374.20959
12419.1673.2023312470.6971.8459212496.4571.4595512522.2270.7813512573.7570.11861
12599.5269.9554612625.2869.9159212651.0569.7527712754.1170.1666112779.8870.39195
12882.9471.58505 12908.7       7213011.7772.1177813037.5372.51778 13063.372.51778
13166.36       7413295.19       7413372.4873.8832913424.0273.3685513449.7873.17673
13527.0871.9458813552.8471.5000513578.6171.5788313604.3871.9116313681.6772.14796
13707.4472.11837 13733.272.48878 13810.5     72.413836.27       7213862.03       72
13939.3371.8183513965.09 72.1525

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

```
      0     .046853.756     .067497.909     .04

Bank Sta: Left   Right    Lengths: Left Channel    Right     Coeff Contr.   Expan.
      6853.7567497.909              3166    4770    6283              .1       .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              67.58   Element                  Left OB    Channel   Right OB
  Vel Head (ft)                0.04   Wt. n-Val.                            0.060     0.040
  W.S. Elev (ft)              67.54   Reach Len. (ft)          3166.00    4770.00   6283.00
  Crit W.S. (ft)                      Flow Area (sq ft)                   1164.04  47684.78
  E.G. Slope (ft/ft)       0.000023   Area (sq ft)                        1164.04  47684.78
  Q Total (cfs)            74500.00   Flow (cfs)                           515.45  73984.55
  Top Width (ft)            2589.76   Top Width (ft)                       156.99   2432.78
  Vel Total (ft/s)             1.53   Avg. Vel. (ft/s)                       0.44      1.55
  Max Chl Dpth (ft)           40.59   Hydr. Depth (ft)                       7.41     19.60
  Conv. Total (cfs)      15651290.0     Conv. (cfs)                      108287.8  15543000.0
  Length Wtd. (ft)          6272.62   Wetted Per. (ft)                     159.89   2439.92
  Min Ch El (ft)              54.60   Shear (lb/sq ft)                       0.01      0.03
  Alpha                        1.03   Stream Power (lb/ft s)                 0.00      0.04
  Frctn Loss (ft)              0.14   Cum Volume (acre-ft)     12783.44   3085.96  40874.34
  C & E Loss (ft)              0.00   Cum SA (acres)            2466.58    458.37   6215.85

Warning: Divided flow computed for this cross-section.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                 RS: 50000

INPUT
Description: 34845  40000  5000
Station Elevation Data    num=     257
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
       078.02666283.4256 78.725386.4894    78.9438.0214    79.1489.553378.79498
541.085378.35634566.851378.39487592.617278.24896618.383278.26395644.149278.18672
721.447278.33543747.213278.24668772.9792 78.2463798.745278.13333824.511278.22667
850.277278.13333953.341178.13333979.1071    78.21004.873       781391.363      78
1494.427   78.641520.19378.688231597.491    79.21649.023  79.4251726.321      80
3066.147      803117.679     79.23143.44578.851713169.21178.903413220.74378.20683
3246.50978.206833349.572       783375.338      783401.10477.92891 3426.8777.94669
3452.63578.328913478.40178.864463504.167    79.63529.933      804096.782      80
4122.548    80.44148.314    80.44174.08180.203694225.613 80.15584251.379 80.3595
4277.14580.335554380.20981.181564405.976 81.60554483.27480.48672 4509.0480.68398
4534.806 80.50834637.871    80.44663.637      804792.46779.980264818.23379.26336
4921.29877.273244947.064 76.2969 4972.8375.539925050.128 71.90815075.89572.39458
5127.42772.899035178.95974.118045204.72575.012445230.49175.783815282.02377.57259
 5307.7978.626755333.55678.957955359.32279.00637 5436.62      805462.38679.63631
5488.15279.632615565.45178.541555616.98377.701595642.74977.657935694.281 76.7853
5745.813       76 5771.58       765823.112    75.25874.64475.15523 5900.4175.53284
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```
6029.24175.499626055.00775.873626080.77375.870016158.07174.931956183.83775.17628
6209.604 74.8636 6235.3774.645266286.90273.741716312.668 74.08046389.96672.78018
6441.49972.777766467.265  73.1446544.56373.104426570.32973.803636596.09574.15789
 6699.1676.443826853.75677.905626982.58771.899937034.119 66.18117111.417    54.6
7137.184    54.67188.716 70.60027240.24871.177787266.01471.20839 7291.7871.57359
7343.313 71.63487369.07973.082287394.84574.249547420.61174.334537497.90977.83633
7523.67577.748057549.44178.180797600.97478.00423 7626.7477.915967652.50677.47325
7678.272 75.63167704.038 75.70997729.80473.86824 7755.5772.026587781.33666.18601
7807.10360.345447832.86956.424837858.635 53.86767884.40151.310367910.16747.93044
7935.93344.550527961.69939.807227987.46536.427298013.23134.559948038.99834.26627
8064.764 33.9726 8090.5333.678938116.29630.509328142.06230.215658167.82830.17575
8193.59430.135858219.35930.095958245.12529.673368270.89129.633468296.65630.01199
8322.42230.405648348.188 30.79938373.95330.795138399.71931.188798425.48431.18562
 8451.2531.182468477.016 31.93668502.78131.535618528.54732.289758554.31332.69385
8580.07833.097958605.84433.502048631.60933.083778657.37532.332758683.14131.32268
8708.90630.312618734.67229.302558760.43828.292488786.20326.949668811.96928.77673
8837.734 30.6038  8863.532.430888889.26634.257958915.03136.406228940.79737.30036
8966.56341.624988992.32845.949619018.09450.274239043.85954.598869069.62558.30783
9095.39165.126099121.15667.197399146.92269.268699172.68871.339999198.45369.37248
9249.98462.162129301.51657.408159327.281 57.37229404.57856.03594    9688      56
9739.53156.869779816.82861.623949868.359 64.06369894.12564.133589945.65661.37186
9997.18864.4740110022.9567.4759310048.72  69.02710074.4872.8204310126.0272.08746
10151.7870.9294710203.31 70.196510280.6170.1248910306.3869.6671310332.1469.64326
10357.9169.3361610409.44 70.1053 10435.269.3643210460.9769.74889 10512.571.20804
10538.2770.6058210564.0370.2098410667.0967.7580310692.8666.7199910718.6366.30971
10821.6965.7460710847.45 66.232910950.5267.6465810976.2868.5988311002.05    68.4
11105.1171.5264111130.8871.9448111156.6472.7448111233.94    72.8 11259.773.17535
11362.7773.1260311388.5373.5072411465.8373.5248511749.25      7811878.08      78
12006.91        8012109.9778.5416312264.56 76.057612341.8674.5762612367.6374.20959
12419.1673.2023312470.6971.8459212496.4571.4595512522.2270.7813512573.7570.11861
12599.5269.9554612625.2869.9159212651.0569.7527712754.1170.1666112779.8870.39195
12882.9471.58505 12908.7      7213011.7772.1177813037.5372.51778 13063.372.51778
13166.36      7413295.19      7413372.4873.8832913424.0273.3685513449.7873.17673
13527.0871.9458813552.8471.5000513578.6171.5788313604.3871.9116313681.6772.14796
13707.4472.11837 13733.272.48878 13810.5    72.413836.27      7213862.03      72
13939.3371.8183513965.09 72.1525

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
      0      .046853.756     .067497.909     .04

Bank Sta: Left   Right    Lengths: Left Channel    Right      Coeff Contr.    Expan.
     6853.7567497.909              3166    4770     6283             .1          .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             67.43    Element                  Left OB     Channel    Right OB
  Vel Head (ft)               0.04    Wt. n-Val.                             0.060       0.040
  W.S. Elev (ft)             67.40    Reach Len. (ft)          3166.00     4770.00     6283.00
  Crit W.S. (ft)                      Flow Area (sq ft)                    1141.57    47336.04
  E.G. Slope (ft/ft)      0.000023    Area (sq ft)                         1141.57    47336.04
  Q Total (cfs)           74500.00    Flow (cfs)                            506.96    73993.04
```

```
 Top Width (ft)          2568.73   Top Width (ft)                      155.23    2413.51
 Vel Total (ft/s)           1.54   Avg. Vel. (ft/s)                      0.44       1.56
 Max Chl Dpth (ft)         40.45   Hydr. Depth (ft)                      7.35      19.61
 Conv. Total (cfs)    15520840.0     Conv. (cfs)                     105616.6 15415230.0
 Length Wtd. (ft)        6204.25   Wetted Per. (ft)                    158.10    2420.61
 Min Ch El (ft)            54.60   Shear (lb/sq ft)                      0.01       0.03
 Alpha                      1.03   Stream Power (lb/ft s)                0.00       0.04
 Frctn Loss (ft)            0.31   Cum Volume (acre-ft)    12783.44   2959.73   34021.54
 C & E Loss (ft)            0.00   Cum SA (acres)           2466.58    441.28    5866.34
```

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1   RS: 45050

INPUT
Description: 30075 35000 4500

```
Station Elevation Data    num=     179
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0     73105.227672.94413131.534572.54413157.841472.33295184.148371.93295
236.762171.40385 263.06971.21101315.682771.45314341.989671.38141368.296571.50247
499.8309    73.6526.1378    73.6578.7516      74894.4342      741289.037      76
1446.879      761473.186   75.921578.41375.333341762.56174.444441815.175   74.25
1841.48274.088891867.789      74 3972.3473.970334103.87572.022244130.18272.01482
4288.02469.507294314.33269.47639 4419.5668.021894445.86768.493844472.17468.52225
4498.48168.084164577.40368.169364656.32469.248734682.63168.878394708.93869.23817
4735.24669.141854840.47467.079994866.78166.001794893.08865.23457 4972.0162.17543
5024.62462.175435050.93162.116955103.545   62.85182.467      645366.617      64
5498.15264.536355629.688 65.91375655.995 65.91375734.91766.929065761.22466.95063
5787.53164.366975813.83861.783315840.14558.666435866.45255.549555892.75952.43268
5919.06655.136655945.37458.056965971.68160.760945997.98863.672016024.29566.58308
6050.60266.740476076.90966.897876103.21667.055266129.52367.221896155.831 67.3866
6287.366      646418.902      646760.89563.290677234.42362.208697313.344      62
7523.801      627576.416   61.867707.95161.333337760.565   61.197786.87361.06667
 7813.18      617839.487   60.88 7997.33 60.39138023.637   60.248049.94460.15556
8076.251      608891.759      608918.06559.918658996.98558.718659023.292    58.4
9049.599      5810733.22      5810759.5358.0324610891.0659.5197810969.9859.80791
10996.2959.13144 11022.659.22748 11048.9      6011233.05      6011259.3659.86666
11285.66   59.6411311.9759.3333311338.28  59.12511390.8958.89336 11417.258.70502
 11443.558.5867111469.8158.3755711496.1258.1066211522.4259.4481711548.7359.48371
11653.9668.5914211680.2670.0265611706.5769.3422911732.8868.19379 11811.866.14098
11890.7266.0349211917.0265.2727211943.3365.2373711969.6465.5713712074.8666.19612
12101.1767.2470912127.4868.84709 12206.4      7212285.32      7212337.9371.81361
12416.8570.6136212443.1670.3068112469.4669.7402612574.6969.74026   12601    69.6
 12627.3   69.612785.14    67.212811.4566.8686212864.0666.0686312890.37    65.6
12969.2965.9105512995.5965.5105513048.2167.1105513127.13      6813206.0569.20832
```

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13258.6670.8083213337.58      7213521.7371.8693913653.26      7013679.57 69.8171
13705.87 69.817113784.79 69.2684 13811.1 68.868413916.33      6813995.25      68
14021.5568.2730714047.86    68.414074.17   68.3514126.78    68.514153.09    68.5
14179.3968.58334 14205.768.5714314232.01  68.67514258.31 68.562514284.6268.55556
14363.5468.7090914389.85    68.714416.15   68.7514442.46  68.62514468.77   68.64
14495.0768.8424114521.3868.8175414573.9967.6636514705.53      6814837.06      68
14889.6767.8653114942.2967.8653114968.5967.7979715047.51      6815626.26      68
15757.79      7015889.33      7015968.25    71.216020.8671.5717616047.1771.57176
16073.4771.7858816126.0871.7858816152.39      7216704.83      72

Manning's n Values        num=       3
     Sta    n Val     Sta   n Val     Sta    n Val
      0     .045761.224     .066155.831     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      5761.2246155.831              2902    5389    6335              .1       .3
Ineffective Flow     num=       1
   Sta L    Sta R    Elev  Permanent
    797016704.83      55       T

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              67.12   Element                    Left OB    Channel   Right OB
  Vel Head (ft)                0.05   Wt. n-Val.                   0.040      0.060      0.040
  W.S. Elev (ft)              67.07   Reach Len. (ft)            2902.00    5389.00    6335.00
  Crit W.S. (ft)                      Flow Area (sq ft)          2496.66    1952.86   38152.39
  E.G. Slope (ft/ft)       0.000191   Area (sq ft)               2496.66    1952.86   38152.39
  Q Total (cfs)            74500.00   Flow (cfs)                 2490.05    2118.36   69891.59
  Top Width (ft)            7304.28   Top Width (ft)              920.45     343.99    6039.84
  Vel Total (ft/s)             1.75   Avg. Vel. (ft/s)              1.00       1.08       1.83
  Max Chl Dpth (ft)           14.64   Hydr. Depth (ft)              2.71       5.68       6.32
  Conv. Total (cfs)       5396472.0    Conv. (cfs)              180369.0   153445.5  5062657.0
  Length Wtd. (ft)          6221.20   Wetted Per. (ft)            920.58     345.55    6040.39
  Min Ch El (ft)              52.43   Shear (lb/sq ft)              0.03       0.07       0.08
  Alpha                        1.05   Stream Power (lb/ft s)        0.03       0.07       0.14
  Frctn Loss (ft)              1.93   Cum Volume (acre-ft)      12692.71    2790.30   27856.21
  C & E Loss (ft)              0.01   Cum SA (acres)             2433.13     413.95    5256.69

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 45000

INPUT
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Description: 30075  35000  4500
Station Elevation Data     num=     179
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
       0      73105.227672.94413131.534572.54413157.841472.33295184.148371.93295
236.762171.40385 263.06971.21101315.682771.45314341.989671.38141368.296571.50247
499.8309     73.6526.1378     73.6578.7516      74894.4342       741289.037      76
1446.879      761473.186    75.921578.41375.333341762.56174.444441815.175   74.25
1841.48274.088891867.789       74 3972.3473.970334103.87572.022244130.18272.01482
4288.02469.507294314.33269.47639 4419.5668.021894445.86768.493844472.17468.52225
4498.48168.084164577.40368.169364656.32469.248734682.63168.878394708.93869.23817
4735.24669.141854840.47467.079994866.78166.001794893.08865.23457 4972.0162.17543
5024.62462.175435050.93162.116955103.545     62.85182.467       645366.617      64
5498.15264.536355629.688 65.91375655.995 65.91375734.91766.929065761.22466.95063
5787.53164.366975813.83861.783315840.14558.666435866.45255.549555892.75952.43268
5919.06655.136655945.37458.056965971.68160.760945997.98863.672016024.29566.58308
6050.60266.740476076.90966.897876103.21667.055266129.52367.221896155.831 67.3866
6287.366      646418.902       646760.89563.290677234.42362.208697313.344      62
7523.801      627576.416    61.867707.95161.333337760.565    61.197786.87361.06667
 7813.18      617839.487    60.88 7997.33 60.39138023.637    60.248049.94460.15556
8076.251      608891.759       608918.06559.918658996.98558.718659023.292    58.4
9049.599      5810733.22       5810759.5358.0324610891.0659.5197810969.9859.80791
10996.2959.13144 11022.659.22748 11048.9       6011233.05       6011259.3659.86666
11285.66   59.6411311.9759.3333311338.28  59.12511390.8958.89336 11417.258.70502
 11443.558.5867111469.8158.3755711496.1258.1066211522.4259.4481711548.7359.48371
11653.9668.5914211680.2670.0265611706.5769.3422911732.8868.19379 11811.866.14098
11890.7266.0349211917.0265.2727211943.3365.2373711969.6465.5713712074.8666.19612
12101.1767.2470912127.4868.84709 12206.4       7212285.32       7212337.9371.81361
12416.8570.6136212443.1670.3068112469.4669.7402612574.6969.74026   12601    69.6
 12627.3    69.612785.14     67.212811.4566.8686212864.0666.0686312890.37    65.6
12969.2965.9105512995.5965.5105513048.2167.1105513127.13       6813206.0569.20832
13258.6670.8083213337.58       7213521.7371.8693913653.26       7013679.57 69.8171
13705.87 69.817113784.79 69.2684 13811.1 68.868413916.33       6813995.25      68
14021.5568.2730714047.86     68.414074.17   68.3514126.78    68.514153.09    68.5
14179.3968.58334 14205.768.5714314232.01  68.67514258.31 68.562514284.6268.55556
14363.5468.7090914389.85     68.714416.15   68.7514442.46  68.62514468.77   68.64
14495.0768.8424114521.3868.8175414573.9967.6636514705.53       6814837.06      68
14889.6767.8653114942.2967.8653114968.5967.7979715047.51       6815626.26      68
15757.79      7015889.33       7015968.25     71.216020.8671.5717616047.1771.57176
16073.4771.7858816126.0871.7858816152.39       7216704.83      72

Manning's n Values          num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .045761.224     .066155.831     .04

Bank Sta: Left    Right     Lengths: Left Channel    Right       Coeff Contr.    Expan.
      5761.2246155.831               2902     5389    6335                .1        .3
Ineffective Flow      num=        1
   Sta L    Sta R     Elev  Permanent
    797016704.83      55        T

CROSS SECTION OUTPUT  Profile #100-year
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```
  E.G. Elev (ft)              65.19    Element                  Left OB    Channel    Right OB
  Vel Head (ft)                0.10    Wt. n-Val.                 0.040      0.060      0.040
  W.S. Elev (ft)              65.08    Reach Len. (ft)          2902.00    5389.00    6335.00
  Crit W.S. (ft)                       Flow Area (sq ft)         929.84    1438.54   26786.47
  E.G. Slope (ft/ft)       0.000589    Area (sq ft)              929.84    1438.54   26786.47
  Q Total (cfs)            74500.00    Flow (cfs)               1060.87    2919.56   70519.57
  Top Width (ft)            6251.62    Top Width (ft)            653.13     230.46    5368.03
  Vel Total (ft/s)             2.56    Avg. Vel. (ft/s)            1.14       2.03       2.63
  Max Chl Dpth (ft)           12.65    Hydr. Depth (ft)            1.42       6.24       4.99
  Conv. Total (cfs)       3069581.0     Conv. (cfs)             43710.4   120292.8  2905578.0
  Length Wtd. (ft)          6259.40    Wetted Per. (ft)          653.20     231.85    5368.37
  Min Ch El (ft)              52.43    Shear (lb/sq ft)            0.05       0.23       0.18
  Alpha                        1.03    Stream Power (lb/ft s)      0.06       0.46       0.48
  Frctn Loss (ft)              2.64    Cum Volume (acre-ft)    12578.58    2580.52   23134.13
  C & E Loss (ft)              0.01    Cum SA (acres)           2380.71     378.41    4427.16
```

```
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
```

CROSS SECTION

```
RIVER: Cosumnes
REACH: 1                  RS: 40050

INPUT
Description: 24686  30000  4000
Station Elevation Data    num=      337
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      7222.57616      7245.1523371.8213567.7284971.8213590.3046671.49821
112.880871.35371 135.45771.03056158.033171.03056180.609370.70742203.185570.98335
225.761770.93614248.337871.21207 270.91471.14389293.490271.41982316.066371.46703
338.642571.85836 406.371      72519.2519      72 790.166     70.4812.742170.53333
835.3183     70.4857.8945      70993.3515      701015.928     70.21038.504     70.2
 1061.08     70.41106.232     70.41128.808     70.21151.385     70.21173.961       70
1422.299      70 1535.18      72 1648.06      721760.941      701873.82268.85117
1986.703      682099.58468.008072212.46569.991872235.041      702257.617     70.1
2280.193     70.32302.769     70.42325.345     70.62347.922     70.72393.07471.06667
2551.107      722663.988      722754.293     70.42776.869     70.22799.445     70.2
2822.021      702980.054      703002.631     70.43025.207     70.63047.783       71
3070.359     71.23115.511      723363.849      723386.426     72.43409.002     72.4
3431.578     72.83454.154     72.8 3476.7373.018163499.30672.836313521.88373.05447
3544.45972.872633567.03573.090783589.61172.814243612.18772.196083634.76371.91954
 3657.3471.301383679.91671.024843702.49270.283233725.06869.883223747.64469.14162
 3770.2268.741623792.797      683815.37367.838243837.94967.838243860.52567.67648
3883.10167.676483905.67767.514723928.25467.27648 3950.8366.876483973.40666.63824
3995.98266.238244018.558      664131.439      66 4244.3264.238724289.47264.93057
4312.04864.882834334.62565.228754357.20165.181014379.77765.581014402.35365.58734
4424.92965.987344447.50565.993674470.08266.373314492.65866.386544515.23466.77308
 4537.8166.776424560.38667.162964582.96267.166314605.53967.501464628.11567.45341
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4650.69167.788574673.26767.740524695.84367.361444718.41966.595854763.57264.40259
4786.14863.662294808.72462.56566  4831.362.318554853.876 61.71514876.45361.46798
4899.02961.749064921.60561.501944944.18162.039424966.757 62.04874989.33362.58618
 5011.9162.397345034.48662.934815057.06262.602595079.63862.996675102.21462.66445
5124.79162.085165147.367       625169.943     61.25192.519     60.85215.095     60.5
5260.24860.533335282.82460.66667  5305.460.666675327.976     60.85350.552     60.8
5373.12860.933335395.70560.933335418.28161.066675440.85761.066675463.433     61.2
5486.009     61.25508.58561.333335531.16261.333335553.73861.466675576.31461.33333
 5598.89     61.45621.46661.799355644.04262.398715666.61962.507245711.77162.54266
5734.34758.539525756.92357.41345  5779.553.410325802.07652.284245824.65248.28111
5847.22851.688665869.80452.21913 5892.3855.626685914.95756.157165937.533 59.5647
5960.10959.835495982.685 60.61276005.26160.372936027.83760.370186050.41460.25167
 6072.9960.370186095.56660.251676118.14259.422116140.71859.066586163.294       58
 6366.48       586682.54657.244456727.69957.113046998.61356.453337179.222       56
9888.362       569956.09157.587999978.66757.8012110001.2458.3305410023.8258.42644
10114.1257.5308910159.2856.8070410204.4356.47253   1022756.1380210249.58 55.6272
10294.73       5510317.31     54.910339.89     54.910407.61     54.610430.19     54.6
10475.34     54.4 10520.554.2370410565.6554.2441910588.22 54.1729 10610.853.97951
10633.3853.9082210655.9553.7148310678.5353.64354 10701.153.3483710723.6852.71812
10746.2652.4229610768.8351.7927110791.4151.4975410813.99 51.655310836.5652.14813
10859.1452.3058910881.7152.7987310904.2952.9564810926.8753.2892210972.02 54.3721
10994.5954.7048311017.1755.1135311039.7555.3135311062.3255.45677 11084.955.65677
11107.48     55.811130.05       5611152.6356.80345 11175.256.8073411197.7857.61079
11220.3657.6146911242.9358.4181411265.5158.8146911288.0860.0107911310.6660.40734
11333.2461.6034511355.81       6211378.39 62.250511400.97 62.250511446.1262.75151
11468.6962.7515111491.2763.1515111513.8563.3010111536.4263.7010111581.58       64
11626.7365.25749 11649.365.2574911671.8865.8862311694.4665.8862311717.0366.48372
11739.6166.4524611762.1867.0499511784.7667.0186911807.3467.3868311829.91 66.9115
11852.4966.8355611875.0766.6380811920.2266.4862111942.7966.3646611965.3766.36466
11987.95 66.243112010.5266.18432 12033.166.0627712055.6766.0627712078.25       66
12484.62       6612529.77     65.212552.35     64.9612574.93     64.8 12597.564.53333
12620.08     64.512665.23       6412687.8164.1546212710.3864.2319312732.9664.18346
12755.5464.0576612823.2664.0288312845.8464.0612112868.42     64.412890.9964.46121
12913.57     64.812936.1564.8612112958.72     65.2 12981.365.2612213003.87     65.6
13026.4565.6612113049.03       66 13071.665.6699113094.1865.2699113116.7564.93983
13139.3364.5398313161.9164.2097513184.4864.1923513207.0664.2448713229.6464.22747
13252.2164.2799913274.79 64.262613297.3664.4731613342.5264.6166113365.0964.82716
13387.6764.8988913410.2565.1508513432.8265.26397 13455.465.5159313477.9765.62905
13500.5565.8810113523.1365.84346 13545.765.8672613568.2865.8297113590.8565.85351
13613.4365.8159613636.01 65.846513658.5865.8156913681.1665.8462313703.7465.81542
13726.3165.8459613748.8965.8270613771.4665.8767713816.6265.8389513839.1965.88867
13861.7765.8697613884.3465.9194813906.9265.9005713952.07       6614629.36       66
14697.0964.9304714719.6664.9304714764.8264.1739514855.12       6415080.88       64
15126.0364.7051815171.1965.8419815238.9265.82223 15351.865.4170415374.3765.42889
15464.68     65.115532.4164.9866615554.9865.0222215577.5664.9777815600.1365.02857
15622.7164.9857215645.29       6515667.8664.9333315690.44   64.9515713.01  64.875
15735.5964.7466715780.7464.35555

Manning's n Values        num=       3
     Sta    n Val      Sta   n Val      Sta   n Val
       0     .045711.771     .065982.685     .04
```

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Bank Sta: Left   Right     Lengths: Left Channel    Right     Coeff Contr.   Expan.
      5711.7715982.685               5191    5120    3182              .1       .3
Ineffective Flow      num=        1
   Sta L    Sta R     Elev  Permanent
    771015780.74       55       T

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             62.54    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               0.07    Wt. n-Val.                 0.040      0.060      0.040
  W.S. Elev (ft)             62.47    Reach Len. (ft)          5191.00    5120.00    3182.00
  Crit W.S. (ft)                      Flow Area (sq ft)         802.06    1874.48   32571.92
  E.G. Slope (ft/ft)      0.000316    Area (sq ft)              802.06    1874.48   33504.31
  Q Total (cfs)           74500.00    Flow (cfs)                593.35    2984.82   70921.83
  Top Width (ft)           6435.66    Top Width (ft)            727.19     270.50    5437.96
  Vel Total (ft/s)            2.11    Avg. Vel. (ft/s)            0.74       1.59       2.18
  Max Chl Dpth (ft)          14.19    Hydr. Depth (ft)            1.10       6.93       5.99
  Conv. Total (cfs)      4191903.0     Conv. (cfs)             33386.0   167947.5  3990570.0
  Length Wtd. (ft)         3272.10    Wetted Per. (ft)          727.26     272.40    5438.25
  Min Ch El (ft)             48.28    Shear (lb/sq ft)            0.02       0.14       0.12
  Alpha                       1.03    Stream Power (lb/ft s)      0.02       0.22       0.26
  Frctn Loss (ft)             1.67    Cum Volume (acre-ft)    12520.88    2375.58   18750.03
  C & E Loss (ft)             0.01    Cum SA (acres)           2334.74     347.43    3641.39


Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                 RS: 40000

INPUT
Description: 24686  30000  4000
Station Elevation Data    num=      337
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0     7222.57616      7245.1523371.8213567.7284971.8213590.3046671.49821
112.880871.35371 135.45771.03056158.033171.03056180.609370.70742203.185570.98335
225.761770.93614248.337871.21207 270.91471.14389293.490271.41982316.066371.46703
338.642571.85836 406.371      72519.2519      72 790.166     70.4812.742170.53333
835.3183     70.4857.8945      70993.3515      701015.928     70.21038.504     70.2
 1061.08     70.41106.232     70.41128.808     70.21151.385     70.21173.961       70
1422.299       70 1535.18       72 1648.06       721760.941       701873.82268.85117
1986.703       682099.58468.008072212.46569.991872235.041       702257.617     70.1
2280.193     70.32302.769     70.42325.345     70.62347.922     70.72393.07471.06667
2551.107       722663.988       722754.293     70.42776.869     70.22799.445     70.2
2822.021       702980.054       703002.631     70.43025.207     70.63047.783       71
```

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3070.359     71.23115.511       723363.849       723386.426      72.43409.002     72.4
3431.578     72.83454.154      72.8 3476.7373.018163499.30672.836313521.88373.05447
3544.45972.872633567.03573.090783589.61172.814243612.18772.196083634.76371.91954
 3657.3471.301383679.91671.024843702.49270.283233725.06869.883223747.64469.14162
 3770.2268.741623792.797        683815.37367.838243837.94967.838243860.52567.67648
3883.10167.676483905.67767.514723928.25467.27648 3950.8366.876483973.40666.63824
3995.98266.238244018.558       664131.439       66 4244.3264.238724289.47264.93057
4312.04864.882834334.62565.228754357.20165.181014379.77765.581014402.35365.58734
4424.92965.987344447.50565.993674470.08266.373314492.65866.386544515.23466.77308
 4537.8166.776424560.38667.162964582.96267.166314605.53967.501464628.11567.45341
4650.69167.788574673.26767.740524695.84367.361444718.41966.595854763.57264.40259
4786.14863.662294808.72462.56566  4831.362.318554853.876 61.71514876.45361.46798
4899.02961.749064921.60561.501944944.18162.039424966.757 62.04874989.33362.58618
 5011.9162.397345034.48662.934815057.06262.602595079.63862.996675102.21462.66445
5124.79162.085165147.367       625169.943     61.25192.519     60.85215.095     60.5
5260.24860.533335282.82460.66667  5305.460.666675327.976     60.85350.552     60.8
5373.12860.933335395.70560.933335418.28161.066675440.85761.066675463.433     61.2
5486.009     61.25508.58561.333335531.16261.333335553.73861.466675576.31461.33333
 5598.89     61.45621.46661.799355644.04262.398715666.61962.507245711.77162.54266
5734.34758.539525756.92357.41345  5779.553.410325802.07652.284245824.65248.28111
5847.22851.688665869.80452.21913 5892.3855.626685914.95756.157165937.533 59.5647
5960.10959.835495982.685 60.61276005.26160.372936027.83760.370186050.41460.25167
 6072.9960.370186095.56660.251676118.14259.422116140.71859.066586163.294        58
 6366.48        586682.54657.244456727.69957.113046998.61356.453337179.222        56
9888.362        569956.09157.587999978.66757.8012110001.2458.3305410023.8258.42644
10114.1257.5308910159.2856.8070410204.4356.47253   1022756.1380210249.58 55.6272
10294.73        5510317.31     54.910339.89     54.910407.61     54.610430.19     54.6
10475.34     54.4 10520.554.2370410565.6554.2441910588.22 54.1729 10610.853.97951
10633.3853.9082210655.9553.7148310678.5353.64354 10701.153.3483710723.6852.71812
10746.2652.4229610768.8351.7927110791.4151.4975410813.99 51.655310836.5652.14813
10859.1452.3058910881.7152.7987310904.2952.9564810926.8753.2892210972.02 54.3721
10994.5954.7048311017.1755.1135311039.7555.3135311062.3255.45677 11084.955.65677
11107.48     55.811130.05       5611152.6356.80345 11175.256.8073411197.7857.61079
11220.3657.6146911242.9358.4181411265.5158.8146911288.0860.0107911310.6660.40734
11333.2461.6034511355.81       6211378.39 62.250511400.97 62.250511446.1262.75151
11468.6962.7515111491.2763.1515111513.8563.3010111536.4263.7010111581.58        64
11626.7365.25749 11649.365.2574911671.8865.8862311694.4665.8862311717.0366.48372
11739.6166.4524611762.1867.0499511784.7667.0186911807.3467.3868311829.91 66.9115
11852.4966.8355611875.0766.6380811920.2266.4862111942.7966.3646611965.3766.36466
11987.95 66.243112010.5266.18432 12033.166.0627712055.6766.0627712078.25        66
12484.62        6612529.77     65.212552.35     64.9612574.93     64.8 12597.564.53333
12620.08     64.512665.23       6412687.8164.1546212710.3864.2319312732.9664.18346
12755.5464.0576612823.2664.0288312845.8464.0612112868.42     64.412890.9964.46121
12913.57     64.812936.1564.8612112958.72     65.2 12981.365.2612213003.87     65.6
13026.4565.6612113049.03        66 13071.665.6699113094.1865.2699113116.7564.93983
13139.3364.5398313161.9164.2097513184.4864.1923513207.0664.2448713229.6464.22747
13252.2164.2799913274.79 64.262613297.3664.4731613342.5264.6166113365.0964.82716
13387.6764.8988913410.2565.1508513432.8265.26397 13455.465.5159313477.9765.62905
13500.5565.8810113523.1365.84346 13545.765.8672613568.2865.8297113590.8565.85351
13613.4365.8159613636.01 65.846513658.5865.8156913681.1665.8462313703.7465.81542
13726.3165.8459613748.8965.8270613771.4665.8767713816.6265.8389513839.1965.88867
13861.7765.8697613884.3465.9194813906.9265.9005713952.07        6614629.36        66
```

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14697.0964.9304714719.6664.9304714764.8264.1739514855.12      6415080.88       64
15126.0364.7051815171.1965.8419815238.9265.82223 15351.865.4170415374.3765.42889
15464.68    65.115532.4164.9866615554.9865.0222215577.5664.9777815600.1365.02857
15622.7164.9857215645.29      6515667.8664.9333315690.44   64.9515713.01  64.875
15735.5964.7466715780.7464.35555

Manning's n Values        num=       3
     Sta    n Val     Sta   n Val     Sta   n Val
       0     .045711.771     .065982.685     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      5711.7715982.685             5191    5120    3182             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R     Elev  Permanent
    771015780.74      55       T
```

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	60.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.040	0.060	0.040
W.S. Elev (ft)	60.72	Reach Len. (ft)	5191.00	5120.00	3182.00
Crit W.S. (ft)		Flow Area (sq ft)	15.23	1410.20	23195.40
E.G. Slope (ft/ft)	0.000961	Area (sq ft)	15.23	1410.20	24127.79
Q Total (cfs)	74500.00	Flow (cfs)	4.53	3322.31	71173.15
Top Width (ft)	5710.58	Top Width (ft)	116.05	260.64	5333.89
Vel Total (ft/s)	3.03	Avg. Vel. (ft/s)	0.30	2.36	3.07
Max Chl Dpth (ft)	12.44	Hydr. Depth (ft)	0.13	5.41	4.35
Conv. Total (cfs)	2402897.0	Conv. (cfs)	146.1	107156.8	2295594.0
Length Wtd. (ft)	3297.07	Wetted Per. (ft)	116.05	262.39	5334.14
Min Ch El (ft)	48.28	Shear (lb/sq ft)	0.01	0.32	0.26
Alpha	1.01	Stream Power (lb/ft s)	0.00	0.76	0.80
Frctn Loss (ft)	1.75	Cum Volume (acre-ft)	12472.19	2182.54	16645.06
C & E Loss (ft)	0.02	Cum SA (acres)	2284.49	316.21	3247.96

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1   RS: 35050

INPUT
Description: 19566 25000 3500
Station Elevation Data   num=   199

```
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
       064.0870397.9020464.43515146.853164.26109171.328664.54897220.279664.37491
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244.7551       64513.9858       64538.4614    64.12562.9369     64.4587.412464.53333
611.8879    64.75636.363565.06667 660.839     65.2685.3145      65.4  709.7965.73333
734.2656       66783.2166       66807.692165.93244832.167765.93244905.594264.73244
930.0698    64.4954.5453        64979.020864.133331003.496      64.21027.972     64.4
1076.923    64.61101.398      64.81125.87464.888891174.825      65.2  1199.365.28333
1223.77665.466671248.251      65.61272.726    65.681297.20265.866671321.677        66
1493.006       661541.957     65.81566.432      65.61615.383    65.41639.858     65.2
1933.564       642178.319       642202.795      63.82227.27163.466672251.74663.33333
2276.222    63.12300.697      62.82325.17362.666672349.64862.428572374.12462.13334
  2398.6       622496.50261.930182520.97861.860352569.92961.060352594.40461.02544
2643.35560.330182692.30760.344352716.78260.239262741.25860.583612790.20960.37344
2814.68559.94684 2839.1659.969672863.63659.543072888.11158.848152912.58758.87098
2986.01456.717743010.48956.717743034.965      563181.81856.027733206.294       56
 3230.77 56.07813255.245 56.07813304.19656.234313328.67256.234313402.09956.59993
3524.47756.630983573.42856.564643646.854 56.1828 3671.3354.410453720.28150.68294
3744.75748.910583769.23245.353133793.70847.262373818.184 50.9567 3891.6156.68439
3916.08656.657733965.03755.530913989.51355.504254013.98854.940834062.93956.45917
4087.41557.755094136.36658.898644160.842 58.75344209.79357.014634234.26956.86938
4258.744       564430.07355.533334454.549     55.524601.40255.066674625.878    55.05
4772.731     54.64993.012       545751.755      545996.51153.803926045.46253.83688
 6167.8453.772366216.791      53.86339.16953.74194 6388.1253.766676510.49853.71429
6559.44953.733336657.35253.666676706.303      53.686730.778     53.646755.25453.66667
6853.15653.466678174.838        52 8664.35      528762.25249.347158786.72848.74707
8811.20349.74715 8884.6352.936798909.10553.947078933.581      549398.617         54
9472.04453.306019520.99552.742429545.471 52.63179569.94652.571439618.89752.34998
9765.751       529888.129 53.472410010.51 55.985310108.41     57.610132.8857.59044
10157.3657.9833410206.3157.1806210230.7957.1639610279.7456.3792610304.2156.38062
10328.6955.9972810377.6455.9842210500.0257.8377710524.4957.5170710548.97 57.5278
 10622.456.5657210646.8756.8413110695.8256.74658 10720.357.0221710744.7756.98327
10793.73 57.8108 10818.258.5390610842.6858.9528210867.1559.6119910891.6359.67577
 10916.159.6704710940.5859.6013811038.4859.6013811185.3359.7777111209.8159.88946
11234.2959.9212211283.2460.1764911356.6660.2857111527.99     60.1511552.47     60.1
11576.9460.13334 11625.9     60.1211650.37    60.0611699.3260.05714 11723.8      60
12409.11       6012458.07    60.1612482.54    60.1212531.49     60.212555.97    60.16
12604.92    60.2512629.3960.2111112653.8760.2666712702.8260.22857 12727.360.17143
12776.2560.1916712800.7260.1333412874.15   60.19212898.63     60.1612947.5860.22667
12972.05  60.195   13021     60.2413045.48      60.213118.9160.2666713143.38    60.24
13192.3360.2933313265.76     60.2813290.24    60.2413363.66     60.2413461.56    60.16
13534.9960.1714313681.8460.0533313706.32      6014954.58      60

Manning's n Values          num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .043524.477      .064136.366      .04

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
      3524.4774136.366               4629     4288     1850              .1        .3
Ineffective Flow      num=        1
   Sta L    Sta R     Elev  Permanent
    781014954.58       50        F
```

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	59.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.040	0.060	0.040
W.S. Elev (ft)	59.03	Reach Len. (ft)	4629.00	4288.00	1850.00
Crit W.S. (ft)	54.95	Flow Area (sq ft)	1575.23	2801.01	34232.27
E.G. Slope (ft/ft)	0.000336	Area (sq ft)	1575.23	2801.01	34232.27
Q Total (cfs)	74500.00	Flow (cfs)	1948.84	3499.40	69051.75
Top Width (ft)	7963.74	Top Width (ft)	642.72	611.89	6709.13
Vel Total (ft/s)	1.93	Avg. Vel. (ft/s)	1.24	1.25	2.02
Max Chl Dpth (ft)	13.68	Hydr. Depth (ft)	2.45	4.58	5.10
Conv. Total (cfs)	4066162.0	Conv. (cfs)	106366.6	190995.0	3768800.0
Length Wtd. (ft)	2026.22	Wetted Per. (ft)	642.77	613.08	6709.46
Min Ch El (ft)	45.35	Shear (lb/sq ft)	0.05	0.10	0.11
Alpha	1.04	Stream Power (lb/ft s)	0.06	0.12	0.22
Frctn Loss (ft)	0.94	Cum Volume (acre-ft)	12377.42	1935.05	14513.50
C & E Loss (ft)	0.00	Cum SA (acres)	2239.28	264.93	2808.09

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1 RS: 35000

INPUT
Description: 19566 25000 3500

```
Station Elevation Data    num=     199
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       064.0870397.9020464.43515146.853164.26109171.328664.54897220.279664.37491
244.7551      64513.9858      64538.4614   64.12562.9369    64.4587.412464.53333
611.8879   64.75636.363565.06667 660.839    65.2685.3145     65.4  709.7965.73333
734.2656      66783.2166      66807.692165.93244832.167765.93244905.594264.73244
930.0698    64.4954.5453      64979.020864.133331003.496    64.21027.972    64.4
1076.923    64.61101.398    64.81125.87464.888891174.825     65.2  1199.365.28333
1223.77665.466671248.251    65.61272.726   65.681297.20265.866671321.677      66
1493.006      661541.957    65.81566.432   65.61615.383    65.41639.858     65.2
1933.564      642178.319      642202.795    63.82227.27163.466672251.74663.33333
2276.222    63.12300.697    62.82325.17362.666672349.64862.428572374.12462.13334
  2398.6      622496.50261.930182520.97861.860352569.92961.060352594.40461.02544
2643.35560.330182692.30760.344352716.78260.239262741.25860.583612790.20960.37344
2814.68559.94684 2839.1659.969672863.63659.543072888.11158.848152912.58758.87098
2986.01456.717743010.48956.717743034.965       563181.81856.027733206.294     56
 3230.77 56.07813255.245 56.07813304.19656.234313328.67256.234313402.09956.59993
3524.47756.630983573.42856.564643646.854 56.1828 3671.3354.410453720.28150.68294
3744.75748.910583769.23245.353133793.70847.262373818.184 50.9567 3891.6156.68439
3916.08656.657733965.03755.530913989.51355.504254013.98854.940834062.93956.45917
4087.41557.755094136.36658.898644160.842 58.75344209.79357.014634234.26956.86938
4258.744      564430.07355.533334454.549    55.524601.40255.066674625.878  55.05
4772.731    54.64993.012      545751.755       545996.51153.803926045.46253.83688
 6167.8453.772366216.791    53.86339.16953.74194 6388.1253.766676510.49853.71429
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6559.44953.733336657.35253.666676706.303   53.686730.778   53.646755.25453.66667
6853.15653.466678174.838      52 8664.35      528762.25249.347158786.72848.74707
8811.20349.74715 8884.6352.936798909.10553.947078933.581       549398.617      54
9472.04453.306019520.99552.742429545.471 52.63179569.94652.571439618.89752.34998
9765.751      529888.129 53.472410010.51 55.985310108.41     57.610132.8857.59044
10157.3657.9833410206.3157.1806210230.7957.1639610279.7456.3792610304.2156.38062
10328.6955.9972810377.6455.9842210500.0257.8377710524.4957.5170710548.97 57.5278
 10622.456.5657210646.8756.8413110695.8256.74658 10720.357.0221710744.7756.98327
10793.73 57.8108 10818.258.5390610842.6858.9528210867.1559.6119910891.6359.67577
 10916.159.6704710940.5859.6013811038.4859.6013811185.3359.7777111209.8159.88946
11234.2959.9212211283.2460.1764911356.6660.2857111527.99   60.1511552.47    60.1
11576.9460.13334 11625.9   60.1211650.37   60.0611699.3260.05714 11723.8      60
12409.11      6012458.07   60.1612482.54   60.1212531.49    60.212555.97   60.16
12604.92   60.2512629.3960.2111112653.8760.2666712702.8260.22857 12727.360.17143
12776.2560.1916712800.7260.1333412874.15  60.19212898.63   60.1612947.5860.22667
12972.05  60.195   13021   60.2413045.48    60.213118.9160.2666713143.38   60.24
13192.3360.2933313265.76   60.2813290.24   60.2413363.66   60.2413461.56   60.16
13534.9960.1714313681.8460.0533313706.32      6014954.58      60

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
      0     .043524.477     .064136.366     .04

Bank Sta: Left   Right    Lengths: Left Channel    Right      Coeff Contr.    Expan.
      3524.4774136.366             4629    4288    1850              .1         .3
Ineffective Flow     num=       1
   Sta L    Sta R     Elev  Permanent
    781014954.58       50       F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              58.15    Element                   Left OB    Channel    Right OB
  Vel Head (ft)                0.09    Wt. n-Val.                 0.040      0.060      0.040
  W.S. Elev (ft)              58.06    Reach Len. (ft)          4629.00    4288.00    1850.00
  Crit W.S. (ft)              54.95    Flow Area (sq ft)         986.23    2220.60   27750.57
  E.G. Slope (ft/ft)       0.000675    Area (sq ft)              986.23    2220.60   27750.57
  Q Total (cfs)            74500.00    Flow (cfs)               1350.07    3510.04   69639.89
  Top Width (ft)            7781.30    Top Width (ft)            584.07     575.78    6621.44
  Vel Total (ft/s)             2.41    Avg. Vel. (ft/s)            1.37       1.58       2.51
  Max Chl Dpth (ft)           12.70    Hydr. Depth (ft)            1.69       3.86       4.19
  Conv. Total (cfs)       2866629.0     Conv. (cfs)              51948.5   135060.0  2679620.0
  Length Wtd. (ft)          2625.29    Wetted Per. (ft)          584.10     576.97    6621.75
  Min Ch El (ft)              45.35    Shear (lb/sq ft)            0.07       0.16       0.18
  Alpha                        1.04    Stream Power (lb/ft s)      0.10       0.26       0.44
  Frctn Loss (ft)              0.95    Cum Volume (acre-ft)    12241.32    1687.89   13197.29
  C & E Loss (ft)              0.02    Cum SA (acres)           2174.10     206.48    2525.02

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
```

CROSS SECTION

RIVER: Cosumnes
REACH: 1   RS: 30050

INPUT
Description: 15278 20000 3000

```
Station Elevation Data    num=     198
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       058.6666754.00158     58.481.00237    58.45108.0032     58.4189.0055     58.7
216.006358.86666243.0071     58.9324.0095    59.44378.011159.71111405.011959.91667
432.0127      60729.0214      60756.0222     59.6783.0229     59.4810.0237     59.4
837.0245    59.2918.0269      581134.03357.970131323.03857.761091350.03957.41053
 1377.0457.11813 1404.0457.000241431.04156.758741458.042 57.01911485.04257.74853
1539.04455.934311566.04555.480761620.04655.480761674.048  54.7121701.048    54.6
1782.051    54.61809.051   54.641836.052    54.751863.053     54.81890.05354.91667
1971.056  55.1252025.05755.384622052.058    55.442079.059     55.552106.059    55.6
2160.061      562214.062      562268.06455.892752295.06455.892752376.06754.83287
2430.06850.87029 2511.0745.147192538.07144.799982565.07244.573912673.07546.85791
2700.07548.083482835.07951.98815 2862.0851.988152970.083      543105.086 54.8102
3132.08754.826293159.08854.66425 3240.09 54.71253267.09154.994873375.09454.55873
3402.09454.315293429.095 53.84623456.09653.816043510.09752.877863564.09952.16054
3645.10152.160543699.103      524212.118      524239.11952.357964293.12153.43183
4320.12253.789794455.12648.977054617.132    50.24644.133      504806.13950.15067
4860.14151.817164887.14251.762874914.14352.162874995.146      52 5670.17      52
5805.175      54 5940.1839.193016021.18346.107416048.18448.336146075.18550.64094
6102.18650.97361 6210.19      526534.202      526615.20550.833446642.20651.05479
6696.208 50.71986750.20951.497516831.212 51.56966885.214 50.76966912.21550.51307
6939.21650.513076993.218      507020.21950.381727128.22350.443877155.22450.34055
7182.22550.369747209.22650.136077290.22950.223637425.234      507479.23651.99973
7506.23752.020247560.23954.01997 7587.2455.557877695.24458.019287722.24556.67286
7776.24754.234057803.24852.830837830.24951.61143 7884.2551.122637965.25351.13519
8019.255      528100.258      528181.26150.594788235.26349.752968316.26649.24793
8343.26749.668848370.26849.453018478.271      528775.282      528910.28750.44304
8937.28850.639788964.28950.488929045.29251.079169072.29351.541429180.297     52
9315.302      529369.30452.575119450.30753.779819504.30955.42899 9531.3156.13956
9585.312 57.98149666.31459.444979720.31659.754269801.31957.79584 9828.32 57.2659
9855.32156.588779963.325      569990.32655.7500310098.3355.7500310125.33     56
10260.34 54.320410395.3448.4478310422.3448.3831110530.3550.5281910557.3551.53976
10611.3553.2565710665.3554.3837210692.35 54.646910719.3555.2104810746.3555.62778
10800.3655.6843510827.36 55.663310854.3655.6969710881.36 55.663310935.36     56
11070.37      5611205.37      5812177.41      5812447.42     58.612609.42    58.4
12690.42    58.212852.4358.2266712933.43      5813257.44      5813284.4557.92889
13311.45      5813338.4557.9333313419.4557.8666613446.45     57.813527.4557.77143
13581.46    57.813608.4657.8666613743.4657.8666613878.4757.8363613905.4757.88889
14013.47    57.914040.47      5815147.51      5815255.52     56.415282.52    56.2
15309.52    56.215336.52    56.315417.5256.2666715471.52      5615660.53     56
15768.5456.1302215795.5455.5909215903.5454.5191115930.5454.8230116065.55     56
16335.56      5616362.5655.8112316497.5655.78136
```

Manning's n Values   num=   3

```
     Sta    n Val      Sta    n Val      Sta    n Val
      0     .045805.175    .06 6210.19     .04

Bank Sta: Left    Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      5805.175 6210.19              4196    4551    5233              .1        .3
Ineffective Flow     num=       1
   Sta L    Sta R    Elev  Permanent
    800016497.56      50       F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              57.18   Element                  Left OB    Channel   Right OB
  Vel Head (ft)                0.04   Wt. n-Val.                 0.040      0.060      0.040
  W.S. Elev (ft)              57.14   Reach Len. (ft)          4196.00    4551.00    5233.00
  Crit W.S. (ft)              52.58   Flow Area (sq ft)       20144.39    3853.31   23363.88
  E.G. Slope (ft/ft)       0.000227   Area (sq ft)            20144.39    3853.31   23363.88
  Q Total (cfs)            74500.00   Flow (cfs)              31491.50    6437.27   36571.23
  Top Width (ft)           10694.97   Top Width (ft)           4389.60     405.02    5900.35
  Vel Total (ft/s)             1.57   Avg. Vel. (ft/s)            1.56       1.67       1.57
  Max Chl Dpth (ft)           17.95   Hydr. Depth (ft)            4.59       9.51       3.96
  Conv. Total (cfs)       4948190.0    Conv. (cfs)           2091623.0   427554.8  2429012.0
  Length Wtd. (ft)          4736.84   Wetted Per. (ft)         4390.30     406.32    5902.43
  Min Ch El (ft)              39.19   Shear (lb/sq ft)            0.06       0.13       0.06
  Alpha                        1.00   Stream Power (lb/ft s)      0.10       0.22       0.09
  Frctn Loss (ft)              1.91   Cum Volume (acre-ft)    11118.58    1388.94   12111.87
  C & E Loss (ft)              0.01   Cum SA (acres)           1909.83     158.20    2259.12

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1                  RS: 30000

INPUT
Description: 15278  20000  3000
Station Elevation Data    num=     198
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       058.6666754.00158    58.481.00237    58.45108.0032    58.4189.0055     58.7
216.006358.86666243.0071    58.9324.0095    59.44378.011159.71111405.011959.91667
432.0127       60729.0214      60756.0222     59.6783.0229     59.4810.0237     59.4
837.0245     59.2918.0269      581134.03357.970131323.03857.761091350.03957.41053
 1377.0457.11813 1404.0457.000241431.04156.758741458.042 57.01911485.04257.74853
1539.04455.934311566.04555.480761620.04655.480761674.048  54.7121701.048     54.6
1782.051     54.61809.051    54.641836.052    54.751863.053    54.81890.05354.91667
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1971.056  55.1252025.05755.384622052.058   55.442079.059   55.552106.059    55.6
2160.061      562214.062      562268.06455.892752295.06455.892752376.06754.83287
2430.06850.87029 2511.0745.147192538.07144.799982565.07244.573912673.07546.85791
2700.07548.083482835.07951.98815 2862.0851.988152970.083      543105.086 54.8102
3132.08754.826293159.08854.66425 3240.09 54.71253267.09154.994873375.09454.55873
3402.09454.315293429.095 53.84623456.09653.816043510.09752.877863564.09952.16054
3645.10152.160543699.103      524212.118      524239.11952.357964293.12153.43183
4320.12253.789794455.12648.977054617.132    50.24644.133      504806.13950.15067
4860.14151.817164887.14251.762874914.14352.162874995.146      52 5670.17       52
5805.175      54 5940.1839.193016021.18346.107416048.18448.336146075.18550.64094
6102.18650.97361 6210.19      526534.202      526615.20550.833446642.20651.05479
6696.208 50.71986750.20951.497516831.212 51.56966885.214 50.76966912.21550.51307
6939.21650.513076993.218      507020.21950.381727128.22350.443877155.22450.34055
7182.22550.369747209.22650.136077290.22950.223637425.234      507479.23651.99973
7506.23752.020247560.23954.01997 7587.2455.557877695.24458.019287722.24556.67286
7776.24754.234057803.24852.830837830.24951.61143 7884.2551.122637965.25351.13519
8019.255      528100.258      528181.26150.594788235.26349.752968316.26649.24793
8343.26749.668848370.26849.453018478.271      528775.282      528910.28750.44304
8937.28850.639788964.28950.488929045.29251.079169072.29351.541429180.297      52
9315.302      529369.30452.575119450.30753.779819504.30955.42899 9531.3156.13956
9585.312 57.98149666.31459.444979720.31659.754269801.31957.79584 9828.32 57.2659
9855.32156.588779963.325      569990.32655.7500310098.3355.7500310125.33       56
10260.34 54.320410395.3448.4478310422.3448.3831110530.3550.5281910557.3551.53976
10611.3553.2565710665.3554.3837210692.35 54.646910719.3555.2104810746.3555.62778
10800.3655.6843510827.36 55.663310854.3655.6969710881.36 55.663310935.36       56
11070.37      5611205.37      5812177.41      5812447.42      58.612609.42    58.4
12690.42    58.212852.4358.2266712933.43      5813257.44      5813284.4557.92889
13311.45      5813338.4557.9333313419.4557.8666613446.45    57.813527.4557.77143
13581.46    57.813608.4657.8666613743.4657.8666613878.4757.8363613905.4757.88889
14013.47    57.914040.47      5815147.51      5815255.52      56.415282.52    56.2
15309.52    56.215336.52    56.315417.5256.2666715471.52      5615660.53       56
15768.5456.1302215795.5455.5909215903.5454.5191115930.5454.8230116065.55       56
16335.56      5616362.5655.8112316497.5655.78136
```

```
Manning's n Values        num=       3
     Sta    n Val     Sta   n Val      Sta    n Val
       0     .045805.175     .06 6210.19     .04

Bank Sta: Left   Right     Lengths: Left Channel    Right       Coeff Contr.   Expan.
      5805.175 6210.19               4196    4551     5233               .1        .3
Ineffective Flow     num=      1
   Sta L   Sta R     Elev  Permanent
    800016497.56      50       F
```

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	55.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.040	0.060	0.040
W.S. Elev (ft)	55.16	Reach Len. (ft)	4196.00	4551.00	5233.00
Crit W.S. (ft)	52.58	Flow Area (sq ft)	11896.94	3052.13	13469.41
E.G. Slope (ft/ft)	0.000903	Area (sq ft)	11896.94	3052.13	13469.41
Q Total (cfs)	74500.00	Flow (cfs)	29835.15	8713.19	35951.67

Top Width (ft)	7960.85	Top Width (ft)	3790.71	405.02	3765.13
Vel Total (ft/s)	2.62	Avg. Vel. (ft/s)	2.51	2.85	2.67
Max Chl Dpth (ft)	15.97	Hydr. Depth (ft)	3.14	7.54	3.58
Conv. Total (cfs)	2478866.0	Conv. (cfs)	992715.8	289917.0	1196233.0
Length Wtd. (ft)	4672.52	Wetted Per. (ft)	3791.37	406.32	3765.69
Min Ch El (ft)	39.19	Shear (lb/sq ft)	0.18	0.42	0.20
Alpha	1.01	Stream Power (lb/ft s)	0.44	1.21	0.54
Frctn Loss (ft)	4.66	Cum Volume (acre-ft)	9575.35	1028.21	9899.42
C & E Loss (ft)	0.00	Cum SA (acres)	1515.84	115.89	1678.55

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1 RS: 25000

INPUT
Description: 10727 15000 2500

```
Station Elevation Data    num=     148
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       052.3627727.9386852.3627755.8773652.4836983.8160452.88369195.5707        54
363.2029      54502.8963      561033.731       56 1061.67     55.81145.486      54.6
1173.424    54.41201.363      541452.812      541508.689     53.61620.444      53.6
1732.199      522011.586      522039.525    51.82095.40251.73333 2151.2851.73333
2179.218    51.82207.157      522290.973      522374.78952.117382514.483        54
2849.748      542989.441      523073.25750.932213129.13550.000933212.95150.69551
3268.82850.947073352.64553.569613408.52254.953823436.46155.001583520.27753.95224
3548.21653.98829 3659.9751.916873687.90950.823763799.66447.422833827.60347.05318
3939.35846.125523967.296      464386.375      464498.12845.866664554.00545.11341
4581.94445.099994665.759      444721.636      444749.575   44.054861.32944.48333
4889.26744.628575084.83645.388895140.713   45.655224.529      465922.991        46
5978.86846.133346034.745    46.4 6481.76      486900.837      486956.71448.08599
 7040.5349.407847096.40752.367087180.22252.245237236.09944.467517319.91540.74237
7375.79246.799777459.60750.472617515.48449.212477543.42248.662757571.36148.37169
7655.17648.274527683.11548.170817711.053      487794.869      487878.68447.65714
7906.623   47.648018.376    47.28046.31547.183338074.253   47.048102.192        47
 8130.13    47.68158.069 47.78688241.88545.228418269.82345.536828297.76246.29514
8381.577 48.02758437.454 47.1018 8521.27 46.25448660.962      468856.531        46
8940.34746.627098996.22448.017179080.03946.333749107.97844.940659135.91643.89349
 9247.6745.301949275.60845.722919331.48545.568739359.424 45.60979387.36245.80727
9415.30146.163889443.23946.313759471.17846.53333 9610.8746.603519638.80946.69162
9694.68647.025629722.62447.066679778.50147.236369862.31647.46667 9974.07        48
10393.15      4810672.53      5210812.22       52 11231.357.8969611398.93        58
11510.6955.9387311538.6355.5387311650.3855.4583411678.3255.3669111790.0754.30856
11818.01      5411929.76      54 11957.754.1654312069.4654.1654312097.39        54
12963.49      54 13047.3    55.213103.1855.73582    1318755.7358213242.87        56
13969.27      5614025.1555.8294414108.9654.6294414164.84      5414528.04        54
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14667.73       5615058.87       5615170.63    55.215282.3854.6666715310.32    54.6
15422.07     54.615450.0154.5333315561.77       5415701.4653.9076815841.15      56
15980.84       5616120.54       5416148.47      54

Manning's n Values          num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .047096.407      .067459.607     .04

Bank Sta: Left   Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
      7096.4077459.607                7416    6117    1229               .1        .3
Ineffective Flow      num=        1
   Sta L   Sta R     Elev  Permanent
   1421716148.47      45        F
```

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	50.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.040	0.060	0.040
W.S. Elev (ft)	50.47	Reach Len. (ft)	7416.00	6117.00	1229.00
Crit W.S. (ft)	48.19	Flow Area (sq ft)	13660.49	1317.57	10333.09
E.G. Slope (ft/ft)	0.001107	Area (sq ft)	13660.49	1317.57	10333.09
Q Total (cfs)	74500.00	Flow (cfs)	42900.27	3142.27	28457.46
Top Width (ft)	6819.55	Top Width (ft)	3446.59	266.66	3106.30
Vel Total (ft/s)	2.94	Avg. Vel. (ft/s)	3.14	2.38	2.75
Max Chl Dpth (ft)	9.73	Hydr. Depth (ft)	3.96	4.94	3.33
Conv. Total (cfs)	2239207.0	Conv. (cfs)	1289431.0	94445.4	855330.7
Length Wtd. (ft)	5638.14	Wetted Per. (ft)	3446.71	267.56	3106.54
Min Ch El (ft)	40.74	Shear (lb/sq ft)	0.27	0.34	0.23
Alpha	1.02	Stream Power (lb/ft s)	0.86	0.81	0.63
Frctn Loss (ft)	1.00	Cum Volume (acre-ft)	8344.42	799.94	8469.68
C & E Loss (ft)	0.03	Cum SA (acres)	1167.26	80.80	1265.80

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Cosumnes
REACH: 1   RS: 20000

INPUT
Description: 4610 10000 2000

```
Station Elevation Data     num=      237
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       046.4511365.17924       46195.5377 43.6179217.264142.84229238.990542.44876
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260.716941.67315282.443441.27963304.169841.25296325.8962 40.8442347.622640.81752
391.075440.004231586.029      401694.66240.768311738.11540.860981759.84141.10732
1781.56741.153661803.294    41.4 1825.02    41.41846.74741.46667  1890.2    41.2
1933.652    41.21955.37941.333331977.10541.333331998.83241.481482042.285   41.52
2064.01141.762962085.73741.766672107.464       422237.822      422259.54841.86565
    230341.865652324.727 41.73132368.179 41.73132389.90641.865652411.63241.86565
2433.358      422498.537      422520.26441.68365 2541.9941.683652563.71641.36731
2607.169      422694.074      422715.801 41.65762759.25341.315212780.97939.78453
2802.70637.599222824.43234.054442867.88530.651772889.61127.106982911.33727.87095
2933.06426.79146 2954.7927.555432976.51626.475952998.24327.239923019.96929.31131
3041.69532.483483063.42234.554873085.14837.727053106.87439.798443128.60141.23749
3150.32741.575773172.05341.08443 3193.7840.864283215.50640.372953237.23241.58648
3258.95842.528823280.685    42.83324.137    42.83345.864    42.43389.316      42
 3606.58      423628.306    41.83650.032    41.43671.759    41.43693.485    41.2
3715.211    41.23758.664      424193.191      424301.824      444323.551    43.6
4345.27743.526724367.00443.12672 4388.7343.053454410.45742.65345 4453.9142.65345
4475.63742.326734497.36342.32673 4519.09      424844.988      424866.715    42.4
4888.441    42.44910.168    42.54931.895    42.74953.621    42.84975.348      43
5018.801    43.25040.527    43.45062.254    43.5 5083.98    43.75105.707    43.8
5127.434      445388.152      445431.605 44.20045475.05944.613395496.78544.92618
5518.51242.178065540.23839.536235561.96536.788115583.69135.802355605.41833.05422
5627.145 33.80185648.87136.311735670.59838.973575692.324 41.48355714.05144.14534
5735.77744.02513 5779.2344.088525800.95743.968317473.902      447495.62944.53333
7517.35544.866667539.082    45.47560.809    45.67582.53545.613957669.44144.05578
7734.621 44.35487778.07445.026767799.80145.076837821.52745.367867843.25445.41794
 7864.9845.708977886.70744.438017908.434    45.6 7995.3443.938368103.973      46
8125.69945.939048147.426 46.33758190.87946.215598212.60546.614058234.33246.21559
8256.05946.276558277.78545.878098321.23846.010838386.418      468429.87146.03944
8473.32446.512068495.05146.512068516.77746.76809 8560.2346.768098581.95746.51206
8603.68446.512068647.137    46 8755.77      468864.402      488973.035      48
9038.215    49.29059.94149.400089081.66849.800089103.39549.800089125.121      50
9537.926      509559.652    50.19603.105    50.4 9950.73      52   10168      52
10276.63      5010385.26      5010428.7150.1408210450.4450.1408210493.8950.28165
10515.6250.6112410537.3551.0112410602.53      5211580.22      5211688.86 53.0472
11710.5852.9890911732.3152.7796511775.7652.6634311797.4952.4539911819.2152.85399
11840.9453.1026611862.6753.5026611906.12      5412058.21      5412079.9354.34169
12101.6654.3416912123.3954.6833912145.1154.3416912166.8454.3416912188.57      54
13101.08      5413187.99  51.99713231.4451.2002213253.1750.9041813274.8950.97525
13296.6250.6792113318.3550.75027 13361.850.1242613383.5350.1783513405.2550.57513
13426.9850.6292313448.7150.9719213470.4350.9719213513.8951.6573113535.6151.72057
13557.34 51.129213579.0750.2583913600.7950.2583913622.5249.3875913644.2549.38759
13665.9750.10537 13687.749.9523513709.4350.6701413731.1550.5171213752.8851.23491
13774.6151.4560613818.0652.5620913839.7952.7832413861.5153.3362613883.2452.98413
13926.69 52.943613948.4252.5914713991.8752.5914714078.78      5415708.27      54
   1573053.6952415751.7253.6761915773.4553.4122515795.1853.37959 15816.953.28571
15882.0852.6857115990.71    52.416055.8952.4268416077.6252.4746316121.0752.41956
 16142.852.4748316164.5352.44504

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .045496.785      .065714.051      .04
```

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Bank Sta: Left   Right     Lengths: Left Channel    Right     Coeff Contr.   Expan.
      5496.7855714.051               4755    2383    2062               .1       .3
Ineffective Flow      num=       1
   Sta L    Sta R     Elev  Permanent
   1264016164.53       54        F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              49.58    Element                    Left OB    Channel    Right OB
  Vel Head (ft)                0.02    Wt. n-Val.                  0.040      0.060      0.040
  W.S. Elev (ft)              49.56    Reach Len. (ft)           4755.00    2383.00    2062.00
  Crit W.S. (ft)              42.36    Flow Area (sq ft)        46173.09    2457.61   15434.80
  E.G. Slope (ft/ft)       0.000069    Area (sq ft)             46173.09    2457.61   15439.30
  Q Total (cfs)            74500.00    Flow (cfs)               58798.33    2535.49   13166.18
  Top Width (ft)            9099.66    Top Width (ft)            5496.79     217.27    3385.61
  Vel Total (ft/s)             1.16    Avg. Vel. (ft/s)             1.27       1.03       0.85
  Max Chl Dpth (ft)           23.08    Hydr. Depth (ft)             8.40      11.31       4.60
  Conv. Total (cfs)        8974973.0    Conv. (cfs)             7083402.0   305449.1  1586122.0
  Length Wtd. (ft)          3219.18    Wetted Per. (ft)          5501.90     218.59    3354.67
  Min Ch El (ft)              33.05    Shear (lb/sq ft)             0.04       0.05       0.02
  Alpha                        1.07    Stream Power (lb/ft s)       0.05       0.05       0.02
  Frctn Loss (ft)              0.24    Cum Volume (acre-ft)      3251.15     534.88    8106.11
  C & E Loss (ft)              0.00    Cum SA (acres)             405.97      46.82    1174.22


Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 15000

INPUT
Description: 2227  5000  1500
Station Elevation Data    num=     309
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
        041.7748825.2108541.6542650.4216941.5858875.6325441.46526100.843441.40298
226.897641.53098252.108541.98942 327.74141.64782352.951842.10626403.373542.17698
453.795237.78407479.006138.39174554.638528.47742579.849427.97678605.060229.91909
655.481834.52496680.692634.38494731.114338.99081781.535939.50431806.746739.82277
882.379240.61965  907.5940.96474983.2224     40.81008.433     40.81058.855      40
2717.178       402823.07638.126192844.25637.582742865.436 37.95752886.61537.41405
2907.79537.788812928.97537.245372950.15536.636972971.33436.946782992.51436.33839
3013.694 36.85663034.87337.166423077.23337.583213098.41237.583213140.772       38
3161.951       383204.31137.32053 3225.4937.32053 3246.6736.98079 3267.8536.98079
 3289.0337.320533310.20937.320533352.569       383437.28736.594113458.46736.19411
3479.64736.194113564.365      363649.084      363670.26436.405153691.44436.52562
3712.62336.240943754.98336.481883776.16236.481883797.34236.551863818.52236.50138
```

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3860.88136.851673882.06136.80118 3924.4237.00232  3945.636.87725 3966.7836.97782
3987.95936.971344009.139 36.68224051.498 36.34114072.67836.570554093.858    36.4
4115.037    36.44136.217    36.84178.57637.353974199.75637.753974242.11537.75397
4263.29537.876984284.47537.876984305.654       384348.01439.639554369.19339.63955
4411.553 41.27914432.732 40.66474475.09241.085384496.27140.470984517.45140.68629
4538.63141.038044559.811 40.5601 4602.1741.26361 4623.3540.785674665.70942.88488
4686.88943.439474729.24845.538694750.42845.650074771.60746.256484792.78746.36786
4856.32647.546664898.68648.894974919.86549.287254941.04549.961414962.22549.96913
4983.40449.395725025.76449.411165046.94348.837755089.303       505152.842      50
 5258.7449.42566 5279.9249.591125322.27949.718325343.45949.883785364.63949.94738
5385.81849.944535406.99850.043555449.35750.066345470.53750.165365491.71750.19099
5576.436       505597.61550.377225639.97550.377225661.15450.754445703.51450.79438
5745.87350.119855788.23250.159795894.131       505915.31150.07288 5936.4950.07288
 5957.6750.145756000.02950.145756021.20950.191296063.56850.136626084.74850.18215
6105.92850.182156127.10750.136626148.28750.136626211.826       506254.18649.25842
6296.54549.258426317.72548.887626360.08449.629216381.26449.629216402.443      50
6847.217       506889.57649.711036910.75649.711036931.93649.566556953.11549.56655
6974.29549.711036995.47549.711037037.834       507080.193       507101.37350.33413
7143.73250.334137164.91250.668277207.271 50.00257376.709       507397.889 49.7102
7419.06849.984777461.42849.405167482.60749.679737524.96749.596757546.14650.11964
7567.32650.009457588.50650.532337630.86550.049547652.04550.441237694.40449.95844
7715.58450.164527757.94350.015267779.12350.221347800.30350.146717821.48250.31621
7842.66250.766417863.84250.935917885.02150.632247906.20151.082447948.56150.36666
 7969.7450.76265 7990.9250.40475  8012.149.326578033.27949.638078054.45949.82146
8075.63949.412668117.99849.779468139.17849.922868181.53751.394078202.71751.53747
8223.896 50.94478245.07650.620628266.25651.032728308.61550.384568329.79549.64839
8350.97549.250038372.15449.464698393.33448.654248435.69349.083558456.87349.21522
8478.053  50.3728499.23250.503678520.41251.660458541.59251.497168562.77151.81385
8605.13151.857328626.31151.09889 8668.6751.12062 8689.8550.340478732.20949.68482
8753.38948.904668795.74849.604228816.92849.501668838.10749.851448859.28750.35533
8880.46750.195498922.826 51.08878944.00650.738938965.18651.185538986.36550.38915
9007.54550.389159028.72550.118829049.90449.322449071.084 49.05219092.26449.13057
9113.44348.682989155.803 48.83999176.982 48.39239219.34249.827479240.52150.20854
9282.881 51.64379304.06151.49646 9325.2451.68573 9346.4251.68969  9367.651.54244
9388.779 51.54649409.95951.158489452.31850.685039473.49850.297119494.67850.06038
9515.857 50.42419537.03750.412039579.39651.139479642.93651.127399664.11550.75159
9706.475     50.89727.654     50.49770.014     50.49791.193       509812.373      50
9833.55350.154839854.73250.154839875.91250.309659897.09250.309659918.27150.46448
9939.45150.464489960.63150.309659981.81150.3096510002.9950.5548210024.17    50.4
10066.53     50.410087.71       5010235.9750.0605210299.5151.2403510320.6951.55864
10341.8751.9384610363.0451.8646110384.2251.8522910426.5851.7045810447.7651.30458
10468.9451.3045810553.6650.0783210638.3850.1626810659.5650.6518410680.74 50.6177
10701.9250.1024310765.46       5010807.82       5010850.1850.2497710913.7250.24977
 10934.950.1248910977.2650.1669410998.44       5011040.79       5011061.9750.77439
11083.1550.7743911104.33     50.411125.51     50.811167.8751.4099711189.0551.80997
11231.4151.8632411252.59 51.984911273.7752.0115411294.95 52.133211337.3152.07992
11358.4952.3713111422.0352.3180311443.21       5211506.75       5211612.65      54
11951.52       54 11972.753.2004912015.0653.2004912036.2452.40097 12078.653.25811
12099.7852.8871612142.1452.8871612163.3252.48716 12184.552.4581112205.6852.05811
12248.04       5212353.94 51.588312459.83       5212502.1952.37947
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Manning's n Values   num=   3

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     Sta    n Val      Sta    n Val      Sta    n Val
       0     .04403.3735      .06  907.59      .04

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.   Expan.
      403.3735  907.59                4829     2227   11611               .1       .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             49.34   Element                   Left OB    Channel    Right OB
  Vel Head (ft)               0.04   Wt. n-Val.                 0.040      0.060      0.040
  W.S. Elev (ft)             49.30   Reach Len. (ft)           4829.00    2227.00   11611.00
  Crit W.S. (ft)                     Flow Area (sq ft)         3071.05    6519.72   40083.98
  E.G. Slope (ft/ft)      0.000083   Area (sq ft)              3071.05    6519.72   40083.98
  Q Total (cfs)           74500.00   Flow (cfs)                3962.92    8068.71   62468.37
  Top Width (ft)           5320.76   Top Width (ft)             403.37     504.22    4413.17
  Vel Total (ft/s)            1.50   Avg. Vel. (ft/s)             1.29       1.24       1.56
  Max Chl Dpth (ft)          21.32   Hydr. Depth (ft)             7.61      12.93       9.08
  Conv. Total (cfs)      8198268.0    Conv. (cfs)             436095.3   887912.2  6874260.0
  Length Wtd. (ft)         8623.86   Wetted Per. (ft)           410.91     505.57    4413.65
  Min Ch El (ft)             27.98   Shear (lb/sq ft)             0.04       0.07       0.05
  Alpha                       1.02   Stream Power (lb/ft s)       0.05       0.08       0.07
  Frctn Loss (ft)             1.72   Cum Volume (acre-ft)       563.41     289.32    6791.96
  C & E Loss (ft)             0.01   Cum SA (acres)              83.94      27.09     989.64

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 10000

INPUT
Description: 0  0  1000
Station Elevation Data    num=     221
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
3266.872 43.7674 3287.68 43.53213308.48942.590263329.29742.354973350.10542.11967
3370.91342.119673391.72141.413123412.52941.413123433.33740.232383454.14539.52582
3474.95340.279883495.76141.03395 3516.5741.788023537.37843.016263544.60343.01626
3565.96743.01626 3587.33 42.26223608.69441.508133630.05740.754073651.421      40
3672.784      403694.148      403715.511      403736.875      403758.239      40
3779.602      403800.966      403822.329      403843.693      403865.056      40
 3886.42      403907.783      403929.147      40 3950.51      403971.874      40
3993.237      404014.601      404035.964      404057.328      404078.691      40
4100.055      404121.419      404142.783      404164.146      40 4185.51      40
4206.874 40.63524228.23841.249114249.602 41.88434270.96542.498214292.32943.11213
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4313.69343.417824335.05743.70224 4356.4243.986654377.78444.292344399.14844.23007
4420.51243.002374441.87541.406714463.23939.811044484.60336.293044505.96734.69737
4527.33136.650084548.69436.680444570.05834.990844591.42235.021214612.786 33.3316
4634.14933.977294655.51336.342954676.87736.988644698.24137.634334719.604      40
4740.968      404762.33239.763884783.69639.76388 4805.0639.763884826.42339.52776
4847.787 40.22354869.15140.919244890.51541.378864911.87842.401094933.24242.86071
4954.60642.80109 4975.9742.741474997.33342.119245018.69742.059625040.061      42
5061.425      425082.789      425104.152      425125.516      42 5146.88      42
5168.244      425189.607      425210.971      425232.335      425253.69942.20194
5275.063      425296.426      42 5317.79      425339.154      425360.518      42
5381.881      425403.245      425424.609      425445.973      425467.336      42
 5488.7       425510.064    42.25531.428    42.45552.792    42.65574.155      43
5595.519    43.25616.883    43.45638.247    43.6 5659.61    43.85680.974      44
5702.338      445723.702      445745.065      445766.429      445787.793      44
5809.157      445830.521      445851.884      445873.248      445894.612      44
5915.976      445937.339      445958.703      445980.067      446001.431      44
6022.79444.374476044.15844.748936065.52245.123396086.88645.49786 6108.2545.89786
6129.61345.897866150.97745.923396172.34145.948936193.70545.974466215.068      46
6236.432      466257.796      46 6279.16    45.66300.523    45.66321.887    45.2
6343.251    44.86364.615    44.86385.979    44.46407.342    44.46428.706      44
 6450.07      446471.434    44.46492.797    44.46514.161    44.46535.525    44.8
6556.88944.602816578.25244.805636599.61644.60844 6620.9844.608446642.34444.81126
6663.70844.608446685.07144.405636706.43544.405636727.79944.202826749.163      44
6770.526      44 6791.89      446813.254      446834.618      446855.981      44
6877.345      446898.709      446920.073      446941.437      44  6962.8      44
6984.164      447005.528      447026.892      447048.255      447069.619      44
7090.983      447112.347      44 7133.71      447155.074      447176.438      44
7197.802      447219.166      447240.529      447261.893      447283.257      44
7304.621      447325.984      447347.348      447368.712      447390.076      44
7411.439      447432.803      447454.167      447475.531      447496.895      44
7518.258      447539.622      447560.986      44 7582.35      447603.713      44
7625.077      447646.441      447667.805      447689.168      447710.532      44
7731.896      44 7753.26      447774.624      447795.987      447817.351      44
7838.71543.923087860.07943.846157881.44243.769237902.806   43.68 7924.17    43.6
7945.534   43.52

Manning's n Values        num=       3
     Sta    n Val     Sta   n Val     Sta   n Val
3266.872    .044377.784    .064933.242    .04

Bank Sta: Left   Right    Lengths: Left Channel    Right      Coeff Contr.   Expan.
      4377.7844933.242                0       0       0                .1       .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             47.60   Element                 Left OB    Channel   Right OB
  Vel Head (ft)               0.18   Wt. n-Val.                0.040      0.060      0.040
  W.S. Elev (ft)             47.42   Reach Len. (ft)
  Crit W.S. (ft)             44.39   Flow Area (sq ft)       7093.39    4798.36   10877.65
  E.G. Slope (ft/ft)      0.001001   Area (sq ft)            7093.39    4798.36   10877.65
  Q Total (cfs)           74500.00   Flow (cfs)             28626.44   15808.42   30065.14
  Top Width (ft)           4678.66   Top Width (ft)          1110.91     555.46    3012.29
```

Vel Total (ft/s)	3.27	Avg. Vel. (ft/s)	4.04	3.29	2.76
Max Chl Dpth (ft)	14.09	Hydr. Depth (ft)	6.39	8.64	3.61
Conv. Total (cfs)	2354725.0	Conv. (cfs)	904796.9	499657.2	950270.3
Length Wtd. (ft)		Wetted Per. (ft)	1114.83	556.53	3016.27
Min Ch El (ft)	33.33	Shear (lb/sq ft)	0.40	0.54	0.23
Alpha	1.09	Stream Power (lb/ft s)	1.60	1.78	0.62
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:Cosumnes

Reach	River Sta.	n1	n2	n3
1	90000	.04	.06	.04
1	80000	.04	.06	.04
1	75000	.04	.06	.04
1	70000	.04	.06	.04
1	65000	.04	.06	.04
1	60050	.04	.06	.04
1	60000	.04	.06	.04
1	55050	.04	.06	.04
1	55000	.04	.06	.04
1	50050	.04	.06	.04
1	50000	.04	.06	.04
1	45050	.04	.06	.04
1	45000	.04	.06	.04
1	40050	.04	.06	.04
1	40000	.04	.06	.04
1	35050	.04	.06	.04
1	35000	.04	.06	.04
1	30050	.04	.06	.04
1	30000	.04	.06	.04
1	25000	.04	.06	.04
1	20000	.04	.06	.04
1	15000	.04	.06	.04
1	10000	.04	.06	.04

SUMMARY OF REACH LENGTHS

River: Cosumnes

Reach	River Sta.	Left	Channel	Right
1	90000	7511	8475	11057

1	80000	7193	6447	4790
1	75000	6233	4757	1316
1	70000	2618	3993	6763
1	65000	9525	8882	3320
1	60050	4038	5254	4975
1	60000	4038	5254	4975
1	55050	2746	3139	3633
1	55000	2746	3139	3633
1	50050	3166	4770	6283
1	50000	3166	4770	6283
1	45050	2902	5389	6335
1	45000	2902	5389	6335
1	40050	5191	5120	3182
1	40000	5191	5120	3182
1	35050	4629	4288	1850
1	35000	4629	4288	1850
1	30050	4196	4551	5233
1	30000	4196	4551	5233
1	25000	7416	6117	1229
1	20000	4755	2383	2062
1	15000	4829	2227	11611
1	10000	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Cosumnes

Reach	River Sta.	Contr.	Expan.
1	90000	.1	.3
1	80000	.1	.3
1	75000	.1	.3
1	70000	.1	.3
1	65000	.1	.3
1	60050	.1	.3
1	60000	.1	.3
1	55050	.1	.3
1	55000	.1	.3
1	50050	.1	.3
1	50000	.1	.3
1	45050	.1	.3
1	45000	.1	.3
1	40050	.1	.3
1	40000	.1	.3
1	35050	.1	.3
1	35000	.1	.3
1	30050	.1	.3
1	30000	.1	.3
1	25000	.1	.3

1	20000	.1	.3
1	15000	.1	.3
1	10000	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	90000	100-year	74500.00	83.26	105.20		105.31	0.000514	2.85	28320.63	5296.93	0.15
1	80000	100-year	74500.00	76.21	95.26	93.66	95.50	0.002323	5.29	19417.87	6581.34	0.30
1	75000	100-year	74500.00	70.85	87.51		87.68	0.001087	3.36	22501.13	5446.59	0.20
1	70000	100-year	74500.00	68.98	86.66		86.73	0.000356	2.14	34449.04	6083.04	0.12
1	65000	100-year	74500.00	69.37	81.76		82.02	0.002103	3.75	18120.29	4803.79	0.27
1	60050	100-year	74500.00	60.79	79.94		80.00	0.000229	1.73	39604.02	7167.41	0.10
1	60000	100-year	74500.00	60.79	78.08		78.20	0.000660	2.73	27311.62	6117.42	0.16
1	55050	100-year	74500.00	55.96	75.89	71.50	75.96	0.000327	1.96	35699.96	6708.81	0.11
1	55000	100-year	74500.00	55.96	71.50	71.50	72.46	0.013672	10.44	10074.72	4722.04	0.70
1	50050	100-year	74500.00	54.60	67.54		67.58	0.000023	0.44	48848.82	2589.76	0.03
1	50000	100-year	74500.00	54.60	67.40		67.43	0.000023	0.44	48477.61	2568.73	0.03
1	45050	100-year	74500.00	52.43	67.07		67.12	0.000191	1.08	42601.91	7304.28	0.08
1	45000	100-year	74500.00	52.43	65.08		65.19	0.000589	2.03	29154.85	6251.62	0.14
1	40050	100-year	74500.00	48.28	62.47		62.54	0.000316	1.59	35248.45	6435.66	0.11
1	40000	100-year	74500.00	48.28	60.72		60.86	0.000961	2.36	24620.83	5710.58	0.18
1	35050	100-year	74500.00	45.35	59.03	54.95	59.09	0.000336	1.25	38608.50	7963.74	0.10
1	35000	100-year	74500.00	45.35	58.06	54.95	58.15	0.000675	1.58	30957.40	7781.30	0.14
1	30050	100-year	74500.00	39.19	57.14	52.58	57.18	0.000227	1.67	47361.58	10694.97	0.10
1	30000	100-year	74500.00	39.19	55.16	52.58	55.27	0.000903	2.85	28418.48	7960.85	0.18

1	25000	100-year	74500.00	40.74	50.47	48.19	50.61	0.001107	2.38	25311.14
6819.55	0.19									
1	20000	100-year	74500.00	33.05	49.56	42.36	49.58	0.000069	1.03	64065.50
9099.66	0.05									
1	15000	100-year	74500.00	27.98	49.30		49.34	0.000083	1.24	49674.75
5320.76	0.06									
1	10000	100-year	74500.00	33.33	47.42	44.39	47.60	0.001001	3.29	22769.40
4678.66	0.20									

HEC-RAS Plan: Proposed Plan River: Cosumnes Reach: 1 Profile: 100-year

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	90000	100-year	74500.00	83.26	105.20		105.31	0.000514	2.85	28319.87	5296.91	0.15
1	80000	100-year	74500.00	76.21	95.26	93.66	95.50	0.002323	5.29	19419.67	6581.61	0.30
1	75000	100-year	74500.00	70.85	87.51		87.68	0.001088	3.36	22498.35	5446.42	0.20
1	70000	100-year	74500.00	68.98	86.66		86.73	0.000356	2.14	34443.24	6082.96	0.12
1	65000	100-year	74500.00	69.37	81.77		82.03	0.002082	3.73	18178.76	4807.15	0.27
1	60050	100-year	74500.00	60.79	80.00	74.77	80.06	0.000223	1.71	40019.51	7222.98	0.09
1	60025		Bridge									
1	60000	100-year	74500.00	60.79	78.05		78.17	0.000669	2.75	27165.25	6060.65	0.16
1	55050	100-year	74500.00	55.96	75.75	71.50	75.83	0.000354	2.02	34767.90	6650.00	0.12
1	55025		Bridge									
1	55000	100-year	74500.00	55.96	71.50	71.50	72.46	0.013672	10.44	10074.72	4722.04	0.70
1	50050	100-year	74500.00	54.60	67.34	37.32	67.38	0.000023	0.44	48341.66	2561.18	0.03
1	50025		Bridge									
1	50000	100-year	74500.00	54.60	67.23		67.27	0.000023	0.45	48058.26	2545.36	0.03
1	45050	100-year	74500.00	52.43	66.89	61.12	66.94	0.000208	1.18	41307.69	7199.94	0.08
1	45025		Bridge									
1	45000	100-year	74500.00	52.43	65.17		65.27	0.000556	1.98	29701.64	6268.29	0.14
1	40050	100-year	74500.00	48.28	63.04	57.91	63.10	0.000234	1.44	39039.96	6686.31	0.09
1	40025		Bridge									
1	40000	100-year	74500.00	48.28	60.90		61.03	0.000843	2.25	25643.26	5779.18	0.17
1	35050	100-year	74500.00	45.35	59.66	54.95	59.71	0.000226	1.12	43676.93	8199.65	0.09
1	35025		Bridge									
1	35000	100-year	74500.00	45.35	58.04	54.95	58.13	0.000685	1.59	30826.70	7778.97	0.14
1	30050	100-year	74500.00	39.19	57.10	52.58	57.14	0.000232	1.69	46975.76	10677.67	0.10
1	30025		Bridge									
1	30000	100-year	74500.00	39.19	55.16	52.58	55.27	0.000903	2.85	28418.48	7960.85	0.18
1	25000	100-year	74500.00	40.74	50.47	48.19	50.61	0.001107	2.38	25311.14	6819.55	0.19
1	20000	100-year	74500.00	33.05	49.56	42.36	49.58	0.000069	1.03	64065.50	9099.66	0.05
1	15000	100-year	74500.00	27.98	49.30		49.34	0.000083	1.24	49674.75	5320.76	0.06
1	10000	100-year	74500.00	33.33	47.42	44.39	47.60	0.001001	3.29	22769.40	4678.66	0.20

```
                    HEC-RAS Version 4.0 Beta
                   U.S. Army Corp of Engineers
                  Hydrologic Engineering Center
                        609 Second Street
                        Davis, California

      X     X  XXXXXX    XXXX        XXXX      XX      XXXX
      X     X  X        X    X       X   X    X  X    X
      X     X  X        X            X   X   X    X   X
      XXXXXXX  XXXX     X      XXX   XXXX    XXXXXX    XXXX
      X     X  X        X            X  X    X    X        X
      X     X  X        X    X       X   X   X    X        X
      X     X  XXXXXX    XXXX        X    X  X    X   XXXXX
```

```
PROJECT DATA
Project Title: Cosumnes River
Project File : CosumnesRiver.prj
Run Date and Time: 8/31/2010 10:39:57 AM

Project in English units



PLAN DATA

Plan Title: Proposed Plan
Plan File : j:\12432A - CAPITAL SEC\ENG\HYDROLOGY\RAS\Cosumnes\RAS\CosumnesRiver.p07

           Geometry Title: Cosumnes
           Geometry File : j:\12432A - CAPITAL SEC\ENG\HYDROLOGY\RAS\Cosumnes\RAS\CosumnesRiver.g01

           Flow Title    : 100-year
           Flow File     : j:\12432A - CAPITAL SEC\ENG\HYDROLOGY\RAS\Cosumnes\RAS\CosumnesRiver.f01

Plan Summary Information:
Number of:  Cross Sections =   23    Multiple Openings  =    0
            Culverts       =    0    Inline Structures  =    0
            Bridges        =    7    Lateral Structures =    0

Computational Information
    Water surface calculation tolerance  =  0.01
    Critical depth calculation tolerance =  0.01
    Maximum number of iterations         =  20
    Maximum difference tolerance         =  0.3
    Flow tolerance factor         .      =  0.001

Computation Options
```

```
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method:         Average Conveyance
Computational Flow Regime:     Subcritical Flow
```

FLOW DATA

Flow Title: 100-year
Flow File : j:\12432A - CAPITAL SEC\ENG\HYDROLOGY\RAS\Cosumnes\RAS\CosumnesRiver.f01

Flow Data (cfs)

River	Reach	RS	100-year
Cosumnes	1	90000	74500

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Cosumnes	1	100-year		Normal S = 0.001

GEOMETRY DATA

Geometry Title: Cosumnes
Geometry File : j:\12432A - CAPITAL SEC\ENG\HYDROLOGY\RAS\Cosumnes\RAS\CosumnesRiver.g01

CROSS SECTION

RIVER: Cosumnes
REACH: 1   RS: 90000

```
INPUT
Description: 75792  80000  9000
Station Elevation Data    num=     357
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0145.219622.37586145.264644.75172145.901467.12758145.946489.50344145.9285
111.8793145.5973134.2552145.5794 156.631145.2483179.0069145.2304201.3827144.7506
223.7586144.5841246.1344144.1043268.5103143.9378290.8861143.4581402.7654      142
514.6447      140537.0206139.9202559.3964139.9202581.7723139.8403604.1481139.8403
648.8998139.7125671.2757139.5846693.6516139.5366716.0274139.4088738.4033139.3608
 783.155137.5764805.5308137.1401827.9067136.2479850.2825135.8115872.6584134.7354
895.0342134.1152917.4101133.0391939.7859132.4188962.1618131.3312984.5377130.8046
1006.914129.81051029.289129.85021051.665128.85621074.041128.89591096.417128.0394
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2573.226110.38262595.602109.63512617.978108.83352640.354108.0859 2662.73107.7657
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2796.986106.40112819.362107.06862841.738106.94562864.114107.6131 2886.49107.0306
2908.866107.23852931.242 106.6562953.618 106.8642975.994106.4576 2998.37106.1007
3020.746105.12933043.122104.75023065.498103.7789 3110.25102.97793132.626103.1482
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3266.882105.34763289.258106.35863311.634106.6173 3334.01107.49433356.385 107.619
3378.761 108.4963401.137108.62073423.513109.27893445.889108.93683468.265109.1282
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5549.231 101.483 5566.56101.09775593.935100.71255648.684100.38565676.058100.4597
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6825.788102.41226853.162102.88056907.911106.19526935.286106.6177 6962.66 108.275
7017.409107.54077099.53391.269047154.28283.257547236.40595.455097291.154105.2929
7318.529106.72387345.903107.39317373.278 108.8247455.401105.64367482.776     102
7893.394      1027948.143   101.87975.517   101.68057.641101.16678085.015  100.96
8167.139    100.58194.513100.41678249.261  100.088276.635      1008523.001     100
8741.99399.414288933.611    98.769179.978       989207.35297.470729289.47495.32076
9344.22294.69856 9398.9795.325839426.34495.466749453.71895.951249481.09296.28384
9617.96297.155329700.084 97.28519836.95497.560079864.32897.938589891.70298.06289
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10192.8298.8333410220.19    98.810247.56    99.210274.94     99.410302.31    99.8
10329.69     10010384.43     100 10521.392.1815910658.17103.603410685.55106.9757
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12574.36158.138512711.23 160.79812765.97172.888512793.35174.3675 12848.1186.4579
12875.47191.534812984.97195.637813012.34196.522413121.84     19813395.58     198
13450.33197.680513532.45196.4805 13587.2     19613614.57     19613751.44     194
13888.31     19413943.06   193.214025.18192.862914052.55193.150514079.93193.3649
 14216.8193.929614326.29192.755214353.67192.825614435.79193.706414463.16193.7064
14490.54     19414627.41190.184214764.28188.4594 14846.4186.895214873.77186.8276
14901.15186.306214928.52185.881915038.02   187.615065.39187.328715174.89184.1119
15202.26183.616915257.01  181.2515284.38 180.88815311.76179.704615448.63179.1383
15503.38179.142815530.75178.4551

Manning's n Values        num=       3
     Sta    n Val      Sta   n Val      Sta    n Val
      0     .047017.409     .067373.278     .04

Bank Sta: Left   Right    Lengths: Left Channel    Right      Coeff Contr.    Expan.
      7017.4097373.278             7511    8475   11057                .1        .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             105.31    Element                  Left OB     Channel    Right OB
  Vel Head (ft)                0.11    Wt. n-Val.                 0.040       0.060       0.040
  W.S. Elev (ft)             105.20    Reach Len. (ft)          7511.00     8475.00    11057.00
  Crit W.S. (ft)                       Flow Area (sq ft)        5493.36     3036.23    19790.28
  E.G. Slope (ft/ft)       0.000514    Area (sq ft)             5493.36     3036.23    19790.28
  Q Total (cfs)            74500.00    Flow (cfs)               9863.65     8658.43    55977.92
  Top Width (ft)            5296.91    Top Width (ft)           1823.19      261.38     3212.35
  Vel Total (ft/s)             2.63    Avg. Vel. (ft/s)            1.80        2.85        2.83
  Max Chl Dpth (ft)           21.94    Hydr. Depth (ft)            3.01       11.62        6.16
  Conv. Total (cfs)       3287374.0     Conv. (cfs)             435241.6    382060.5   2470072.0
  Length Wtd. (ft)         10318.26    Wetted Per. (ft)         1823.41      265.10     3213.43
  Min Ch El (ft)              83.26    Shear (lb/sq ft)            0.10        0.37        0.20
  Alpha                        1.07    Stream Power (lb/ft s)      0.17        1.05        0.56
  Frctn Loss (ft)              9.81    Cum Volume (acre-ft)    15154.35     5466.86    64812.11
  C & E Loss (ft)              0.01    Cum SA (acres)           3454.19      711.50    11343.90


Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                 RS: 80000

INPUT
Description: 67317  70000  8000
```

```
Station Elevation Data    num=      443
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0117.5258 22.2967117.8687133.7802118.0742200.6703120.3875222.9671120.9213
245.2638121.6975267.5605122.1096289.8571122.7639312.1538 123.176334.4505123.6535
356.7472124.0655379.0439124.8515401.3406125.5719423.6373126.3579 445.934127.0557
468.2307127.8417490.5274 129.011512.8241130.2684579.7142133.8047646.6042138.5342
668.9009140.0682691.1976141.6541713.4943144.0708 735.791146.5394758.0877 148.956
780.3844150.2114802.6811152.6281824.9778152.5694847.2745 153.672869.5712153.6133
891.8679155.4833914.1646155.4246936.4612156.4757958.7579155.5981981.0546156.6492
1003.351156.14271025.648157.19381047.945156.69641070.242157.75661092.538157.2592
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1337.803 165.1491360.099165.94741382.396165.94741404.693     1661471.583     166
1516.177164.61561538.473164.3673 1560.77163.67511583.067163.42671605.364162.0979
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3322.207140.01773344.503141.6204  3366.8140.31573389.096141.43753411.393 139.652
 3433.69140.77383455.986138.98833478.283140.1101 3500.58 137.0673522.876136.7798
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4214.07390.26559 4236.3790.531194258.66790.531194280.96490.666414303.26190.53605
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5641.073100.5273 5663.3799.997975685.66798.435495707.96497.906145819.448      94
7023.479      947045.776     93.97068.073     93.9 7090.37     93.87112.667     93.6
7134.964     93.57313.339     92.47335.63692.533337357.933     92.47380.229      92
8004.542      928026.839     92.28049.13692.133338071.433  92.3758093.72992.48333
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8227.511      938249.808    93.18272.104    93.18294.401    93.28316.698    93.2
8338.995    93.38428.18393.244459052.495      929097.089      929119.38692.07566
9141.68391.328519163.97991.496389186.276      929364.651      929386.94891.47534
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9520.729 88.61579543.02688.465549565.32388.150279609.91787.808719676.80888.70409
9699.10489.442679721.40189.528789810.58989.60732 9944.3789.8625610011.26      90
10256.5389.9995310278.8289.4173510301.1289.7751210323.4289.5508410345.7188.89709
10368.0188.6728110390.3188.01907 10412.689.58942 10434.990.73031 10457.292.30067
 10479.593.4415610501.7995.2751810524.0994.2289410546.3993.8754310568.6892.55949
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11081.51104.973811103.81105.1929 11126.1104.9925 11148.4105.2116 11170.7105.0113
   11193104.542111215.29103.958911237.59103.489711259.89102.906611282.18102.4374
11304.48 102.11611326.78101.908611349.07101.587211371.37101.379811393.67101.0584
11415.96100.974411438.26101.162711460.56101.078711482.85 101.26711505.15 101.183
11527.45 101.34511549.75101.234811572.04101.396911594.34101.286611616.64101.4487
11638.93100.758911661.23100.601811683.5399.9120311705.8299.7548811728.1299.06514
11750.4299.0651411772.7198.5325711795.0198.5325711817.31      98 11861.9      98
 11884.2    97.6 11906.5    97.611928.79    97.211951.09    97.211973.39    96.8
11995.68    96.812017.98    96.412040.28    96.412084.87    95.612107.1795.63602
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13021.3494.3026313043.6494.6052613065.9394.6052613088.2395.0763913110.5395.24487
13132.82  95.71613155.1295.8844813199.71  96.85213222.0197.9777613244.3198.47415
 13266.699.59991 13288.9100.0963 13311.2100.9593 13333.5101.192813355.79102.0558
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13712.54107.685713734.84 107.10313757.14107.828113779.43 107.92413801.73108.6491
13824.03 108.74513846.32109.470113868.62110.366413890.92111.783113935.51113.5756
13957.81114.9923 13980.1115.6881 14002.4116.9044 14024.7117.6003   14047118.8166
14069.29118.795514091.59120.011914113.89119.990914136.18 120.36914158.48120.3479
14180.78 120.72614203.07 120.66914225.37 121.01114247.67 120.95414269.96 121.296
14292.26121.044914314.56121.249814336.85120.861414359.15 121.43214381.45121.0436
14403.75121.614114426.04121.612914448.34122.570514470.64122.569214492.93123.5268
14515.23124.095714537.53 125.19214559.82125.899614582.12127.772414604.42  128.48
14626.71130.352814649.01131.250514671.31133.3134

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val      Sta    n Val
       0     .045150.542     .065596.479     .04

Bank Sta: Left   Right    Lengths: Left Channel    Right      Coeff Contr.   Expan.
      5150.5425596.479              7193    6447    4790              .1        .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              95.50    Element                Left OB    Channel    Right OB
  Vel Head (ft)                0.24    Wt. n-Val.               0.040      0.060       0.040
  W.S. Elev (ft)              95.26    Reach Len. (ft)        7193.00    6447.00     4790.00
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Crit W.S. (ft)	93.66	Flow Area (sq ft)	1798.67	1735.50	15885.50
E.G. Slope (ft/ft)	0.002323	Area (sq ft)	1798.67	1735.50	15885.50
Q Total (cfs)	74500.00	Flow (cfs)	8187.82	9180.96	57131.22
Top Width (ft)	6581.61	Top Width (ft)	457.21	182.04	5942.36
Vel Total (ft/s)	3.84	Avg. Vel. (ft/s)	4.55	5.29	3.60
Max Chl Dpth (ft)	19.05	Hydr. Depth (ft)	3.93	9.53	2.67
Conv. Total (cfs)	1545773.0	Conv. (cfs)	169885.9	190492.3	1185394.0
Length Wtd. (ft)	5085.02	Wetted Per. (ft)	457.57	186.00	5942.97
Min Ch El (ft)	76.21	Shear (lb/sq ft)	0.57	1.35	0.39
Alpha	1.06	Stream Power (lb/ft s)	2.59	7.16	1.39
Frctn Loss (ft)	7.80	Cum Volume (acre-ft)	14525.68	5002.67	60284.25
C & E Loss (ft)	0.02	Cum SA (acres)	3257.59	668.37	10182.01

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1 RS: 75000

INPUT
Description: 60870 65000 7500

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Station Elevation Data     num=      374
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
       0      114 360.187      114408.2119114.1307432.2243113.7307480.2492113.8614
504.2617  114.17528.2741114.9439552.2866115.5276 576.299115.8361600.3115116.4198
624.3239116.3844648.3364116.0738672.3488115.8363696.3613115.7018744.3862114.9498
768.3986114.8358816.4235114.06331080.561     1141128.585   113.21152.598   113.2
1200.623   112.41224.635   112.41248.648      112 1272.66111.72661296.673111.7266
1320.685111.45321344.698111.0994 1368.71 111.0191416.735110.31131440.747110.2309
1488.772111.71161512.785112.3798 1560.81113.86041584.822113.58391608.834113.3796
1632.847112.66061656.859112.38411680.872111.66511704.884110.35831728.897109.4939
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1945.009105.33571969.021104.93122041.059104.02822161.121101.70482209.146100.9264
2233.158100.95122281.183100.17282305.19699.826182329.20899.065542401.24598.01539
2569.33398.020292593.34597.659842617.35797.66998 2641.3797.309522689.39597.70164
2713.40797.527112761.43298.269482785.445 98.34212833.46999.578832857.48299.65145
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3361.743 106.9163409.768107.89863481.806107.96323601.868105.9334 3625.88104.7628
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3841.99297.098983866.00597.44885 3914.0398.873883938.04299.223753962.05599.93626
3986.067 100.749 4010.08 101.2394058.104102.86454082.117103.35454130.142103.7789
4154.155103.6683 4202.18103.58734226.193103.27734274.218102.79744298.231102.4874
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4658.421 107.3324682.434107.79094802.498107.96354874.536 106.6024922.561103.3655
4946.574102.99574994.59999.911095018.61299.541275042.62597.998975066.63797.22491
 5090.6597.166445138.67595.618315162.68895.559845210.71394.013135234.72693.95535
5282.75192.610015306.76492.45695 5354.7990.921025378.80290.767965402.815      90
5787.018       905811.031     89.65835.043     89.75859.056     89.65883.069    89.6
5907.082       906051.158      90 6075.17      90.46099.183     90.66123.196      91
6147.208       916195.234     91.46219.247     91.46291.285       926483.386      92
6627.462     93.26651.475     93.3  6699.5     93.36747.52693.466676843.577      94
7203.767        94 7227.7895.172267275.80593.447557299.818 94.61987323.83193.75745
7347.84387.785197371.85683.847557395.86977.875297419.88174.786147443.894 70.8485
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7972.173     89.27996.186   89.258020.199     89.18044.211       89 8116.25    88.4
8140.262     88.48164.275      889124.782        889268.858     86.89292.871   86.84
9316.884    86.729340.896     86.49364.909       8610205.35       8610325.42    85.5
10349.43     85.310397.46     85.110421.47     84.910469.49     84.710493.51    84.5
10541.53     84.310565.54     84.110589.56       8411165.86       8411189.8784.18378
11213.8983.78378 11237.983.9675611285.9283.1675611309.9483.1675611357.96      82
11381.98        8211405.99 81.5264    1143081.8440311454.0182.6352811502.0483.27056
11526.05 82.865311550.0684.8342411646.1289.9487711742.1792.7243311766.1892.49152
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12726.6982.79115 12750.7 83.764712798.7284.9548312822.7485.9283812846.7586.69852
12870.7686.9417512894.78 87.3884 12942.887.8748612966.8188.4894512990.8388.38074
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   1332782.4957913351.0282.0862713543.1282.0239813591.14     81.613639.17    80.8
13663.18     80.813711.21       8013903.31       8013927.32     79.613951.3379.78552
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17048.95109.659917072.96110.252817096.97110.080417120.98110.6733

Manning's n Values        num=       3
     Sta    n Val      Sta   n Val      Sta    n Val
      0      .04 7227.78     .067708.034      .04

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
      7227.787708.034               6233    4757    1316                .1       .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              87.68   Element                      Left OB    Channel   Right OB
  Vel Head (ft)                0.17   Wt. n-Val.                                0.060      0.040
  W.S. Elev (ft)              87.51   Reach Len. (ft)              6233.00    4757.00    1316.00
  Crit W.S. (ft)                      Flow Area (sq ft)                       1629.54   20868.80
  E.G. Slope (ft/ft)       0.001088   Area (sq ft)                            1629.54   20868.80
  Q Total (cfs)            74500.00   Flow (cfs)                              5473.25   69026.76
  Top Width (ft)            5446.42   Top Width (ft)                           192.44    5253.98
  Vel Total (ft/s)             3.31   Avg. Vel. (ft/s)                           3.36       3.31
  Max Chl Dpth (ft)           16.66   Hydr. Depth (ft)                           8.47       3.97
  Conv. Total (cfs)       2258968.0    Conv. (cfs)                           165958.2  2093009.0
  Length Wtd. (ft)          1601.71   Wetted Per. (ft)                         195.40    5254.64
  Min Ch El (ft)              70.85   Shear (lb/sq ft)                           0.57       0.27
  Alpha                        1.00   Stream Power (lb/ft s)                     1.90       0.89
  Frctn Loss (ft)              0.92   Cum Volume (acre-ft)        14377.17    4753.65   58263.44
  C & E Loss (ft)              0.03   Cum SA (acres)               3219.84     640.66    9566.42

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                    RS: 70000

INPUT
Description: 56113  60000  7000
Station Elevation Data     num=     206
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      0      98129.8456 96.0901285.6604      96363.567795.81077441.475195.81077
597.289896.29276 649.22896.20531675.197196.63992753.104597.51983779.073697.93158
908.919297.963631038.765 96.02071220.54993.113771298.456      921428.30292.02833
1687.99395.931131713.96296.421591739.93196.712871817.83898.184261843.80799.08961
1947.684101.98851999.622102.72762025.591103.3289 2051.56103.6737 2077.53 104.275
2155.437105.60282207.376  105.982337.222104.80192467.068101.86442493.037101.4916
2596.91499.000952622.88498.600952648.85398.45071 2726.7697.223292778.69997.22329
2804.66897.482192856.60797.261862934.51496.061853116.299      963220.17697.99149
3246.14598.275143272.11598.747963375.99199.956473505.838100.06293583.745100.2865
3635.684101.04463687.622101.68153713.592101.68153739.561      1023843.438   100.4
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3869.407   100.43973.284    98.83999.253 98.61344025.222 98.21344051.19298.00669
4284.915      984362.82298.109144804.299      984934.14699.862564986.08499.86256
5063.992     1005141.89999.637635193.83898.837635219.80799.628575297.715101.1638
5323.684101.63455349.653101.88585375.623102.4573 5453.53103.21135583.376103.8057
5609.346 103.0545635.315102.10325661.284 101.3475713.22399.445365765.16196.32155
5843.06992.188355920.97790.782265972.91589.908936076.79288.595056102.76188.83421
 6128.7388.780576232.60790.966326258.57791.573056284.54691.761836362.45493.58204
6388.42393.632426414.392 93.95496440.36193.58732  6492.394.232266544.23894.53518
6570.208 93.99666622.14694.993246700.05494.879626726.02393.804846751.99292.94796
6855.86992.106516881.83891.678257011.68590.084667037.65490.122127141.53180.15051
  7167.576.096377193.46974.572627271.37768.977657323.31574.020837349.28576.88364
7401.22387.046187453.16290.135357479.13189.46149  7505.191.006087531.06990.67159
7608.97794.374027634.946 95.26887660.91696.502947764.79286.500597790.76284.93089
7816.73183.988787920.60883.716447946.57783.703738076.42383.395848102.39383.39584
8258.20782.933338362.08282.755558517.89582.5333310076.02      8210179.89   81.92
10231.8381.9333310335.7181.7333310413.61   81.6810491.52   81.4410543.46   81.36
10647.33   81.04 10673.3   81.0410777.18   80.7210803.14   80.7210907.02    80.4
10958.9680.39304 11088.8       8012075.61       8012205.4673.2973312309.3379.06063
 12335.380.5491912361.2780.4011712439.1878.4297912465.1478.3294912517.0876.67242
12594.9978.3429312620.9678.3429312672.89       8012828.71       8012854.68    80.4
12906.6180.8275912932.5880.6413912984.5281.0689813062.43 80.565213114.3680.18347
13244.21 80.059113296.1481.3046913348.0882.7527813374.0583.3558713451.9685.41573
13503.8986.3723413529.8686.8107813633.74 88.230813659.7188.4959913685.6888.83286
13763.5889.6284613893.4391.4116914023.2794.0062314153.1195.9688214231.0295.04846
14256.9994.1973414282.9693.8801714386.8390.34888 14412.890.0238414542.6492.27921
14568.6194.6236614594.5895.3065514672.49102.339914698.46 104.78314724.43109.2609
14750.39110.042414802.33118.998114854.27124.013514880.24126.326214906.21125.1376
14932.18127.450215010.08 135.96115036.05135.296615062.02136.519515165.89144.4345
15191.86 144.52615321.71146.412715347.68145.887615451.55143.996915477.52142.7896
15503.49141.529915581.39143.696115633.33147.8444 15659.3147.936815711.24 148.873
15789.14     15015815.11     15015918.99148.369915944.96148.359915970.93147.9499
16100.77     148
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Manning's n Values        num=       3
     Sta    n Val      Sta   n Val     Sta    n Val
      0     .046700.054     .067660.916     .04

Bank Sta: Left   Right     Lengths: Left Channel    Right      Coeff Contr.   Expan.
      6700.0547660.916               2618    3993    6763               .1       .3
```

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	86.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.060	0.040
W.S. Elev (ft)	86.66	Reach Len. (ft)	2618.00	3993.00	6763.00
Crit W.S. (ft)		Flow Area (sq ft)		3217.48	31225.76
E.G. Slope (ft/ft)	0.000356	Area (sq ft)		3217.48	31225.76
Q Total (cfs)	74500.00	Flow (cfs)		6898.50	67601.49
Top Width (ft)	6082.96	Top Width (ft)		325.46	5757.49
Vel Total (ft/s)	2.16	Avg. Vel. (ft/s)		2.14	2.16
Max Chl Dpth (ft)	17.68	Hydr. Depth (ft)		9.89	5.42
Conv. Total (cfs)	3945806.0	Conv. (cfs)		365371.1	3580435.0

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 Length Wtd. (ft)          6546.82   Wetted Per. (ft)                      327.68     5758.13
 Min Ch El (ft)              68.98   Shear (lb/sq ft)                        0.22        0.12
 Alpha                        1.00   Stream Power (lb/ft s)                  0.47        0.26
 Frctn Loss (ft)              4.67   Cum Volume (acre-ft)      14377.17   4488.99    57476.52
 C & E Loss (ft)              0.02   Cum SA (acres)             3219.84    612.38     9400.09

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 65000

INPUT
Description: 52120  55000  6500
Station Elevation Data    num=     150
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      8884.3809886.36261 140.63585.02579 225.016 84.5233  281.2783.46012
365.650985.47523421.904987.37497506.285887.93258562.539989.96942646.9209 90.9454
703.174991.26934 787.55690.60394  843.81 91.1239 928.19189.86147984.445187.03142
1068.82685.18185 1125.0884.031411265.715      841350.09684.250911378.22384.17046
1434.47684.17683 1490.7384.809561715.746    84.8    1772       841912.635      84
 2053.27      86 2137.65      862193.90486.314152334.53987.60962 2418.92      88
2475.17488.713512559.55590.308492615.80991.755632700.18996.132472756.44397.52634
2840.824 97.55452897.078      982981.45997.983583037.71397.447453122.09494.23798
3178.34889.972773262.729 84.47943318.98282.127383403.36380.046643459.61780.63074
3543.99882.235153600.252 83.20443684.63383.48937 3712.7683.319173825.268    85.6
3853.395      863994.029      864134.664      884162.79187.959874275.29987.08988
4303.42686.775684415.93486.045674500.31486.053764640.94988.115574697.20388.03852
 4725.3388.310034837.83889.910034865.96590.126494978.47390.44703  5006.690.72054
5119.10793.232215147.23493.201235259.74292.161035400.377 90.42865428.504 90.4286
5541.012      905569.13989.975235681.64689.362695709.77388.949855822.28187.94312
5850.40887.408695962.91683.542695991.04382.827296103.55181.440236131.67882.68151
6244.18686.286716272.31386.277896356.69385.443266380.56184.80321 6400.7984.52499
6501.93285.586856522.16185.724046542.38985.642946603.075 86.05456623.30386.54683
 6663.7687.229286683.98987.503326704.21787.844546744.67487.987356906.502      88
6987.41789.754417007.64589.898577048.10288.205257068.33187.653017108.78885.95967
7189.70272.56066 7209.9369.366957230.159 71.73017311.07380.836577331.30182.29036
 7351.5383.986737412.21585.782947452.672 82.15267513.358      808727.069      80
9192.325      799333.92578.666669637.353      78 9940.78      7810698.02    76.2
10853.14      7611318.51      7611473.63    75.211551.1973.8134711577.0473.68014
 11602.973.27588 11654.6 72.583211680.4671.9195311706.3171.4109611783.8773.10247
11835.5880.9742611861.4381.7953611938.99 92.957611964.8593.03578 11990.793.44813
12094.1192.1258412223.3893.9294412352.65      9412430.2193.7896312456.0693.35143
12533.62 92.344912559.4892.3261312585.3391.9906212611.1891.9774812740.4590.13268
12818.0191.2530712843.8791.2265312973.1393.1582612998.9993.1582613050.6993.95221
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13386.79      9413516.06      9213852.15      9213981.42     9414627.76      94

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val      Sta    n Val
       0     .046987.417     .067412.215     .04

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
      6987.4177412.215               9525    8882     3320               .1        .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              82.03   Element                    Left OB    Channel    Right OB
  Vel Head (ft)                0.26   Wt. n-Val.                   0.040      0.060       0.040
  W.S. Elev (ft)              81.77   Reach Len. (ft)            9525.00    8882.00     3320.00
  Crit W.S. (ft)                      Flow Area (sq ft)           180.30    1151.49    16846.98
  E.G. Slope (ft/ft)       0.002082   Area (sq ft)                180.30    1151.49    16846.98
  Q Total (cfs)            74500.00   Flow (cfs)                  286.82    4300.58    69912.60
  Top Width (ft)            4807.15   Top Width (ft)              220.09     189.95     4397.12
  Vel Total (ft/s)             4.10   Avg. Vel. (ft/s)              1.59       3.73        4.15
  Max Chl Dpth (ft)           12.40   Hydr. Depth (ft)              0.82       6.06        3.83
  Conv. Total (cfs)       1632731.0    Conv. (cfs)                6285.8    94250.9   1532195.0
  Length Wtd. (ft)          3779.54   Wetted Per. (ft)            220.13     191.64     4397.81
  Min Ch El (ft)              69.37   Shear (lb/sq ft)              0.11       0.78        0.50
  Alpha                        1.01   Stream Power (lb/ft s)        0.17       2.92        2.07
  Frctn Loss (ft)              1.91   Cum Volume (acre-ft)      14371.75    4288.74    53744.70
  C & E Loss (ft)              0.06   Cum SA (acres)             3213.23     588.75     8611.80


Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 60050

INPUT
Description: 43238  50000  6000
Station Elevation Data     num=      368
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       090.7535546.27625 91.507169.4143891.26709 92.552592.29581115.690692.70776
161.9669 94.9278 185.10595.33974208.243196.31246231.3812 96.5871277.657598.53253
300.795698.80717323.933799.50169347.0719   99.59  370.21100.2845393.3481100.3728
416.4862101.0673439.6244102.4116462.7625103.1497485.9006 104.494509.0387 105.232
532.1769107.1916 555.315108.3178601.5912113.0131624.7294113.8241647.8675116.1717
671.0056115.9434694.1437117.2518717.2819117.3686  740.42117.1403763.5581 117.257
786.6962117.1822809.8344117.4524832.9725117.3776879.2487117.9181902.3868 117.918
 925.525118.3344948.6631118.3343994.9393119.16711018.077 119.4261041.216120.1013
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1064.354120.36021087.492121.0355 1110.63121.29441226.321     1221295.736121.0747
1318.874120.65681342.012120.3484 1365.15119.76631388.288119.29351434.565118.1292
1457.703118.03771480.841117.30241503.979117.05761550.256114.77261573.394114.5279
1596.532113.7196 1619.67113.80911642.808113.00091665.947113.09041689.085112.2822
1712.223111.70681735.361112.31951758.499111.74411781.637112.35681804.776111.7814
1827.914112.2697 1874.19110.87011897.328111.35831920.467110.79691943.605111.5174
1989.881110.85922013.019111.56262036.157111.23352059.296111.94432082.434111.6227
2105.572112.33352151.848111.76872174.987111.26252198.125 109.7632221.263109.2568
2267.539106.25792290.677105.46692313.816103.81282336.954103.02172360.092101.3676
 2383.23100.57662429.50797.725652452.64597.163282475.78395.737812498.92195.17544
2545.19892.920462568.33692.309392591.47491.181912614.61290.57085 2637.7589.36456
2660.888 88.67472684.02787.468412707.16586.382042730.30385.692182753.44184.91897
2776.57984.542262845.99482.21157 2892.2781.356872915.40880.851262938.547 80.4184
2961.68579.912782984.82379.501133007.96179.162223031.09978.750563054.23878.41166
3077.376      783100.51478.30297 3146.7979.008353169.92879.311323193.067  79.664
3216.20579.711323262.48179.905373308.758      803355.03481.941933378.17282.43689
3424.44884.378813447.58785.223923470.72586.545043493.86387.390153540.13987.43983
3563.27886.844033586.41685.427963609.55484.83215 3655.8382.035293678.969    81.6
3702.107    81.63725.245    81.23748.383    81.23771.521    80.83817.798 81.5645
3840.93681.546753864.074  81.9293887.21281.911254002.903 79.65774072.31875.36828
4095.45674.495634118.59473.054754141.73273.90551 4164.8774.188054188.00875.03882
4211.14676.141514234.28576.992274257.42376.992274280.561 77.24424303.69977.25677
4326.83777.508714349.97677.521274373.11477.77626 4419.39 77.80754442.52878.06249
4488.80578.068924535.08178.837684558.21978.828484581.35779.212864604.49679.21286
4627.63479.606434650.77279.60643 4673.91      804697.048    79.64720.187    79.6
4812.73978.044015067.259      785090.397    77.85113.536    77.85136.674    77.6
5159.812    77.6 5182.95    77.25206.088      775252.365    76.25275.503      76
5298.641    76.45321.77976.916225344.91777.316225368.05677.832445391.19478.23244
5414.33278.54392 5437.4778.971625460.60879.283095483.74779.710785506.885 80.2025
5530.023 75.99155553.16171.716485576.29967.505485599.43865.005915622.576 60.7949
5645.71464.883735668.85267.26113 5691.9972.551465715.12876.640295738.26781.93062
5761.40579.223595807.68176.212555830.81973.505525853.958      726015.925      72
6039.06372.420466085.33972.840916108.47873.261376131.616 73.47166154.75473.89206
6177.89273.41592 6201.0372.875456224.16872.789976247.30772.648616270.44572.63773
6293.58372.489826316.72172.480716339.85972.366676501.82772.366676524.96572.33334
6548.10372.366676571.24172.333346594.37972.366676617.51872.333346640.65672.36667
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8098.36172.16666  8121.572.103038190.91472.066678214.052      728607.39372.01905
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10134.4873.0206410180.7671.9821210203.8971.9154810227.0371.3962210250.1771.32958
10273.3172.2636610296.4473.0054110342.7274.8735710365.8675.61532   1038975.80766
10412.1375.8076610435.27      7610481.55      7610550.96    77.2 10574.177.41103
10597.2377.8110410620.37      7810643.51      7810666.6578.2544710689.7978.25447
10736.0678.7394310782.3479.7093410805.4779.9398310828.6180.4247910851.75 81.1395
10898.0281.7695810921.1682.4842810967.4483.0964110990.5882.9938311013.7183.29091
11036.8583.1883211059.9983.5883311083.1383.5883311175.68      8411245.09      84
11268.2383.6604211291.3783.6604211337.6482.1944311360.7881.8010111383.9281.06801
11407.0581.0680111430.1980.5839811453.3380.83293 11499.680.6871311522.7480.93609
11545.8881.0201311569.0281.4260311615.29 81.594111638.43      8211661.5781.59413
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11684.7181.9694711707.8481.5636111730.9881.9389511754.1281.5330811777.2681.05317
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11916.0880.4473311939.2279.9324111962.3679.83351 11985.579.3185912008.6379.91475
12031.7780.0948812054.9180.9577412078.0581.5538912101.1882.4167612124.3282.56705
 12170.683.4010612193.7483.5513712216.8783.9683712332.5685.7979112425.1186.04623
12448.2586.4445812471.3986.3418412494.5386.5982512517.6686.64613 12540.886.90255
12563.9486.9504212610.2187.6205112633.35  87.74712656.49 87.473512679.63    87.6
12702.7687.62457 12725.988.0491512772.1888.0982912795.3288.4502512818.4588.60281
12841.5989.0827512887.87 89.8336   1291190.3135412934.1490.2090312957.2890.20903
12980.4290.1045213003.5590.1045213026.69      9013049.83      9013072.9790.09475
13096.1190.0947513119.24 90.189513142.38 90.189513165.5290.0947513188.6690.09475
13211.79      9013327.48      9013350.6290.2387513373.7690.23875 13396.990.63875
13420.03    90.813443.1790.9107413466.3191.3107413489.4591.4214813512.5891.71074
13535.7291.7107413558.86      9214414.95      92

Manning's n Values        num=       3
     Sta    n Val     Sta   n Val     Sta    n Val
      0     .045506.885     .065738.267     .04

Bank Sta: Left   Right     Lengths: Left Channel    Right      Coeff Contr.   Expan.
      5506.8855738.267               4038    5254    4975              .1        .3
Ineffective Flow      num=        1
   Sta L   Sta R     Elev  Permanent
   1280014414.95      70        T

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             80.06   Element                   Left OB    Channel    Right OB
  Vel Head (ft)               0.06   Wt. n-Val.                 0.040      0.060      0.040
  W.S. Elev (ft)             80.00   Reach Len. (ft)            10.00      10.00      10.00
  Crit W.S. (ft)             74.77   Flow Area (sq ft)        3733.60    2243.60   34042.31
  E.G. Slope (ft/ft)      0.000223   Area (sq ft)             3733.60    2243.60   34042.31
  Q Total (cfs)           74500.00   Flow (cfs)               3454.49    3836.18   67209.33
  Top Width (ft)           7222.98   Top Width (ft)           1863.54     221.85    5137.59
  Vel Total (ft/s)            1.86   Avg. Vel. (ft/s)            0.93       1.71       1.97
  Max Chl Dpth (ft)          19.21   Hydr. Depth (ft)            2.00      10.11       6.63
  Conv. Total (cfs)      4994405.0    Conv. (cfs)            231585.6   257173.5  4505646.0
  Length Wtd. (ft)           10.00   Wetted Per. (ft)         1863.93     225.32    5138.12
  Min Ch El (ft)             60.79   Shear (lb/sq ft)            0.03       0.14       0.09
  Alpha                       1.07   Stream Power (lb/ft s)      0.03       0.24       0.18
  Frctn Loss (ft)             0.00   Cum Volume (acre-ft)    13943.84    3942.61   51805.39
  C & E Loss (ft)             0.00   Cum SA (acres)           2985.42     546.77    8248.45

Warning: Divided flow computed for this cross-section.

BRIDGE

RIVER: Cosumnes
REACH: 1                  RS: 60025
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```
INPUT
Description:
Distance from Upstream XS =      10
Deck/Roadway Width        =      30
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      86      81   14000      86      81

Upstream Bridge Cross Section Data
Station Elevation Data    num=     368
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
       090.7535546.27625 91.507169.4143891.26709 92.552592.29581115.690692.70776
161.9669 94.9278 185.10595.33974208.243196.31246231.3812 96.5871277.657598.53253
300.795698.80717323.933799.50169347.0719   99.59  370.21100.2845393.3481100.3728
416.4862101.0673439.6244102.4116462.7625103.1497485.9006 104.494509.0387 105.232
532.1769107.1916 555.315108.3178601.5912113.0131624.7294113.8241647.8675116.1717
671.0056115.9434694.1437117.2518717.2819117.3686  740.42117.1403763.5581 117.257
786.6962117.1822809.8344117.4524832.9725117.3776879.2487117.9181902.3868 117.918
 925.525118.3344948.6631118.3343994.9393119.16711018.077 119.4261041.216120.1013
1064.354120.36021087.492121.0355 1110.63121.29441226.321     1221295.736121.0747
1318.874120.65681342.012120.3484 1365.15119.76631388.288119.29351434.565118.1292
1457.703118.03771480.841117.30241503.979117.05761550.256114.77261573.394114.5279
1596.532113.7196 1619.67113.80911642.808113.00091665.947113.09041689.085112.2822
1712.223111.70681735.361112.31951758.499111.74411781.637112.35681804.776111.7814
1827.914112.2697 1874.19110.87011897.328111.35831920.467110.79691943.605111.5174
1989.881110.85922013.019111.56262036.157111.23352059.296111.94432082.434111.6227
2105.572112.33352151.848111.76872174.987111.26252198.125 109.7632221.263109.2568
2267.539106.25792290.677105.46692313.816103.81282336.954103.02172360.092101.3676
 2383.23100.57662429.50797.725652452.64597.163282475.78395.737812498.92195.17544
2545.19892.920462568.33692.309392591.47491.181912614.61290.57085 2637.7589.36456
2660.888 88.67472684.02787.468412707.16586.382042730.30385.692182753.44184.91897
2776.57984.542262845.99482.21157 2892.2781.356872915.40880.851262938.547 80.4184
2961.68579.912782984.82379.501133007.96179.162223031.09978.750563054.23878.41166
3077.376      783100.51478.30297 3146.7979.008353169.92879.311323193.067  79.664
3216.20579.711323262.48179.905373308.758      803355.03481.941933378.17282.43689
3424.44884.378813447.58785.223923470.72586.545043493.86387.390153540.13987.43983
3563.27886.844033586.41685.427963609.55484.83215 3655.8382.035293678.969    81.6
3702.107    81.63725.245    81.23748.383    81.23771.521    80.83817.798 81.5645
3840.93681.546753864.074  81.9293887.21281.911254002.903 79.65774072.31875.36828
4095.45674.495634118.59473.054754141.73273.90551 4164.8774.188054188.00875.03882
4211.14676.141514234.28576.992274257.42376.992274280.561 77.24424303.69977.25677
4326.83777.508714349.97677.521274373.11477.77626 4419.39 77.80754442.52878.06249
4488.80578.068924535.08178.837684558.21978.828484581.35779.212864604.49679.21286
4627.63479.606434650.77279.60643 4673.91      804697.048    79.64720.187    79.6
4812.73978.044015067.259      785090.397    77.85113.536    77.85136.674    77.6
5159.812    77.6 5182.95    77.25206.088      775252.365    76.25275.503      76
5298.641     76.45321.77976.916225344.91777.316225368.05677.832445391.19478.23244
5414.33278.54392 5437.4778.971625460.60879.283095483.74779.710785506.885 80.2025
5530.023 75.99155553.16171.716485576.29967.505485599.43865.005915622.576 60.7949
5645.71464.883735668.85267.26113 5691.9972.551465715.12876.640295738.26781.93062
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5761.40579.223595807.68176.212555830.81973.505525853.958      726015.925      72
6039.06372.420466085.33972.840916108.47873.261376131.616 73.47166154.75473.89206
6177.89273.41592 6201.0372.875456224.16872.789976247.30772.648616270.44572.63773
6293.58372.489826316.72172.480716339.85972.366676501.82772.366676524.96572.33334
6548.10372.366676571.24172.333346594.37972.366676617.51872.333346640.65672.36667
6802.62372.323816941.45272.41904 6964.5972.397226987.72972.439227010.86772.40741
7034.00572.445767080.28172.411777149.69672.471117172.83472.433337427.35472.56667
7450.49272.533337705.01272.633337774.42772.566677797.56572.510647866.97972.47515
7890.11872.407557936.39472.374157959.53272.306388028.94772.266678075.22372.17117
8098.36172.16666  8121.572.103038190.91472.066678214.052      728607.39372.01905
 9232.11      7410041.9373.9851810065.0773.5177310088.2173.5029110111.3473.03546
10134.4873.0206410180.7671.9821210203.8971.9154810227.0371.3962210250.1771.32958
10273.3172.2636610296.4473.0054110342.7274.8735710365.8675.61532   1038975.80766
10412.1375.8076610435.27      7610481.55      7610550.96    77.2 10574.177.41103
10597.2377.8110410620.37      7810643.51      7810666.6578.2544710689.7978.25447
10736.0678.7394310782.3479.7093410805.4779.9398310828.6180.4247910851.75 81.1395
10898.0281.7695810921.1682.4842810967.4483.0964110990.5882.9938311013.7183.29091
11036.8583.1883211059.9983.5883311083.1383.5883311175.68      8411245.09      84
11268.2383.6604211291.3783.6604211337.6482.1944311360.7881.8010111383.9281.06801
11407.0581.0680111430.1980.5839811453.3380.83293 11499.680.6871311522.7480.93609
11545.8881.0201311569.0281.4260311615.29 81.594111638.43      8211661.5781.59413
11684.7181.9694711707.8481.5636111730.9881.9389511754.1281.5330811777.2681.05317
11800.3981.3544811823.5380.8745711846.6781.1758711869.8180.7817411892.9580.26682
11916.0880.4473311939.2279.9324111962.3679.83351 11985.579.3185912008.6379.91475
12031.7780.0948812054.9180.9577412078.0581.5538912101.1882.4167612124.3282.56705
 12170.683.4010612193.7483.5513712216.8783.9683712332.5685.7979112425.1186.04623
12448.2586.4445812471.3986.3418412494.5386.5982512517.6686.64613 12540.886.90255
12563.9486.9504212610.2187.6205112633.35  87.74712656.49 87.473512679.63    87.6
12702.7687.62457 12725.988.0491512772.1888.0982912795.3288.4502512818.4588.60281
12841.5989.0827512887.87 89.8336   1291190.3135412934.1490.2090312957.2890.20903
12980.4290.1045213003.5590.1045213026.69      9013049.83      9013072.9790.09475
13096.1190.0947513119.24 90.189513142.38 90.189513165.5290.0947513188.6690.09475
13211.79      9013327.48      9013350.6290.2387513373.7690.23875 13396.990.63875
13420.03    90.813443.1790.9107413466.3191.3107413489.4591.4214813512.5891.71074
13535.7291.7107413558.86      9214414.95      92
```

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Manning's n Values        num=       3
     Sta    n Val     Sta   n Val     Sta   n Val
       0     .045506.885     .065738.267     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      5506.8855738.267             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   1280014414.95      70         T

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      86      81   14000      86      81

Downstream Bridge Cross Section Data
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Station Elevation Data    num=     368
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
        090.7535546.27625 91.507169.4143891.26709 92.552592.29581115.690692.70776
161.9669 94.9278 185.10595.33974208.243196.31246231.3812 96.5871277.657598.53253
300.795698.80717323.933799.50169347.0719   99.59  370.21100.2845393.3481100.3728
416.4862101.0673439.6244102.4116462.7625103.1497485.9006 104.494509.0387 105.232
532.1769107.1916 555.315108.3178601.5912113.0131624.7294113.8241647.8675116.1717
671.0056115.9434694.1437117.2518717.2819117.3686  740.42117.1403763.5581 117.257
786.6962117.1822809.8344117.4524832.9725117.3776879.2487117.9181902.3868 117.918
 925.525118.3344948.6631118.3343994.9393119.16711018.077 119.4261041.216120.1013
1064.354120.36021087.492121.0355 1110.63121.29441226.321      1221295.736121.0747
1318.874120.65681342.012120.3484 1365.15119.76631388.288119.29351434.565118.1292
1457.703118.03771480.841117.30241503.979117.05761550.256114.77261573.394114.5279
1596.532113.7196 1619.67113.80911642.808113.00091665.947113.09041689.085112.2822
1712.223111.70681735.361112.31951758.499111.74411781.637112.35681804.776111.7814
1827.914112.2697 1874.19110.87011897.328111.35831920.467110.79691943.605111.5174
1989.881110.85922013.019111.56262036.157111.23352059.296111.94432082.434111.6227
2105.572112.33352151.848111.76872174.987111.26252198.125 109.7632221.263109.2568
2267.539106.25792290.677105.46692313.816103.81282336.954103.02172360.092101.3676
 2383.23100.57662429.50797.725652452.64597.163282475.78395.737812498.92195.17544
2545.19892.920462568.33692.309392591.47491.181912614.61290.57085 2637.7589.36456
2660.888 88.67472684.02787.468412707.16586.382042730.30385.692182753.44184.91897
2776.57984.542262845.99482.21157 2892.2781.356872915.40880.851262938.547 80.4184
2961.68579.912782984.82379.501133007.96179.162223031.09978.750563054.23878.41166
3077.376      783100.51478.30297 3146.7979.008353169.92879.311323193.067  79.664
3216.20579.711323262.48179.905373308.758      803355.03481.941933378.17282.43689
3424.44884.378813447.58785.223923470.72586.545043493.86387.390153540.13987.43983
3563.27886.844033586.41685.427963609.55484.83215 3655.8382.035293678.969    81.6
3702.107    81.63725.245    81.23748.383    81.23771.521     80.83817.798 81.5645
3840.93681.546753864.074  81.9293887.21281.911254002.903 79.65774072.31875.36828
4095.45674.495634118.59473.054754141.73273.90551 4164.8774.188054188.00875.03882
4211.14676.141514234.28576.992274257.42376.992274280.561 77.24424303.69977.25677
4326.83777.508714349.97677.521274373.11477.77626 4419.39 77.80754442.52878.06249
4488.80578.068924535.08178.837684558.21978.828484581.35779.212864604.49679.21286
4627.63479.606434650.77279.60643 4673.91      804697.048     79.64720.187    79.6
4812.73978.044015067.259      785090.397    77.85113.536    77.85136.674    77.6
5159.812    77.6 5182.95    77.25206.088      775252.365    76.25275.503      76
5298.641    76.45321.77976.916225344.91777.316225368.05677.832445391.19478.23244
5414.33278.54392 5437.4778.971625460.60879.283095483.74779.710785506.885 80.2025
5530.023 75.99155553.16171.716485576.29967.505485599.43865.005915622.576 60.7949
5645.71464.883735668.85267.26113 5691.9972.551465715.12876.640295738.26781.93062
5761.40579.223595807.68176.212555830.81973.505525853.958      726015.925      72
6039.06372.420466085.33972.840916108.47873.261376131.616 73.47166154.75473.89206
6177.89273.41592 6201.0372.875456224.16872.789976247.30772.648616270.44572.63773
6293.58372.489826316.72172.480716339.85972.366676501.82772.366676524.96572.33334
6548.10372.366676571.24172.333346594.37972.366676617.51872.333346640.65672.36667
6802.62372.323816941.45272.41904 6964.5972.397226987.72972.439227010.86772.40741
7034.00572.445767080.28172.411777149.69672.471117172.83472.433337427.35472.56667
7450.49272.533337705.01272.633337774.42772.566677797.56572.510647866.97972.47515
7890.11872.407557936.39472.374157959.53272.306388028.94772.266678075.22372.17117
8098.36172.16666  8121.572.103038190.91472.066678214.052      728607.39372.01905
 9232.11      7410041.9373.9851810065.0773.5177310088.2173.5029110111.3473.03546
```

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10134.4873.0206410180.7671.9821210203.8971.9154810227.0371.3962210250.1771.32958
10273.3172.2636610296.4473.0054110342.7274.8735710365.8675.61532   1038975.80766
10412.1375.8076610435.27      7610481.55      7610550.96     77.2 10574.177.41103
10597.2377.8110410620.37      7810643.51      7810666.6578.2544710689.7978.25447
10736.0678.7394310782.3479.7093410805.4779.9398310828.6180.4247910851.75 81.1395
10898.0281.7695810921.1682.4842810967.4483.0964110990.5882.9938311013.7183.29091
11036.8583.1883211059.9983.5883311083.1383.5883311175.68      8411245.09      84
11268.2383.6604211291.3783.6604211337.6482.1944311360.7881.8010111383.9281.06801
11407.0581.0680111430.1980.5839811453.3380.83293 11499.680.6871311522.7480.93609
11545.8881.0201311569.0281.4260311615.29 81.594111638.43      8211661.5781.59413
11684.7181.9694711707.8481.5636111730.9881.9389511754.1281.5330811777.2681.05317
11800.3981.3544811823.5380.8745711846.6781.1758711869.8180.7817411892.9580.26682
11916.0880.4473311939.2279.9324111962.3679.83351 11985.579.3185912008.6379.91475
12031.7780.0948812054.9180.9577412078.0581.5538912101.1882.4167612124.3282.56705
 12170.683.4010612193.7483.5513712216.8783.9683712332.5685.7979112425.1186.04623
12448.2586.4445812471.3986.3418412494.5386.5982512517.6686.64613 12540.886.90255
12563.9486.9504212610.2187.6205112633.35  87.74712656.49 87.473512679.63    87.6
12702.7687.62457 12725.988.0491512772.1888.0982912795.3288.4502512818.4588.60281
12841.5989.0827512887.87 89.8336   1291190.3135412934.1490.2090312957.2890.20903
12980.4290.1045213003.5590.1045213026.69      9013049.83      9013072.9790.09475
13096.1190.0947513119.24 90.189513142.38 90.189513165.5290.0947513188.6690.09475
13211.79      9013327.48      9013350.6290.2387513373.7690.23875 13396.990.63875
13420.03    90.813443.1790.9107413466.3191.3107413489.4591.4214813512.5891.71074
13535.7291.7107413558.86      9214414.95      92

Manning's n Values        num=      3
     Sta    n Val     Sta    n Val     Sta    n Val
       0    .045506.885    .065738.267    .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      5506.8855738.267            .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   1280014414.95     70       T

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream=   12779    Downstream=   12779
Upstream     num=       2
    Width   Elev    Width   Elev
        5     40        5     81
Downstream     num=       2
    Width   Elev    Width   Elev
```

5	40	5	81

Pier Data
Pier Station Upstream= 12829 Downstream= 12829
Upstream num= 2

Width	Elev	Width	Elev
5	40	5	81

Downstream num= 2

Width	Elev	Width	Elev
5	40	5	81

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #100-year

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	80.06	E.G. Elev (ft)	80.06	80.05
W.S. US. (ft)	80.00	W.S. Elev (ft)	80.00	79.99
Q Total (cfs)	74500.00	Crit W.S. (ft)	74.76	74.76
Q Bridge (cfs)	74500.00	Max Chl Dpth (ft)	19.21	19.20
Q Weir (cfs)		Vel Total (ft/s)	1.86	1.86
Weir Sta Lft (ft)		Flow Area (sq ft)	40003.09	39953.64
Weir Sta Rgt (ft)		Froude # Chl	0.09	0.09
Weir Submerg		Specif Force (cu ft)	145812.90	145542.10
Weir Max Depth (ft)		Hydr Depth (ft)	5.54	5.54
Min El Weir Flow (ft)	86.01	W.P. Total (ft)	7226.44	7219.90
Min El Prs (ft)	81.00	Conv. Total (cfs)	4991474.0	4985136.0
Delta EG (ft)	1.89	Top Width (ft)	7222.05	7215.51
Delta WS (ft)	1.95	Frctn Loss (ft)	0.01	1.87
BR Open Area (sq ft)	47416.83	C & E Loss (ft)	0.00	0.01
BR Open Vel (ft/s)	1.86	Shear Total (lb/sq ft)	0.08	0.08
Coef of Q		Power Total (lb/ft s)	0.14	0.14
Br Sel Method	Energy only			

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1   RS: 60000

INPUT
Description: 43238 50000 6000
Station Elevation Data   num=   368

```
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       090.7535546.27625 91.507169.4143891.26709 92.552592.29581115.690692.70776
161.9669 94.9278 185.10595.33974208.243196.31246231.3812 96.5871277.657598.53253
300.795698.80717323.933799.50169347.0719   99.59  370.21100.2845393.3481100.3728
416.4862101.0673439.6244102.4116462.7625103.1497485.9006 104.494509.0387 105.232
532.1769107.1916 555.315108.3178601.5912113.0131624.7294113.8241647.8675116.1717
671.0056115.9434694.1437117.2518717.2819117.3686  740.42117.1403763.5581 117.257
786.6962117.1822809.8344117.4524832.9725117.3776879.2487117.9181902.3868 117.918
 925.525118.3344948.6631118.3343994.9393119.16711018.077 119.4261041.216120.1013
1064.354120.36021087.492121.0355 1110.63121.29441226.321     1221295.736121.0747
1318.874120.65681342.012120.3484 1365.15119.76631388.288119.29351434.565118.1292
1457.703118.03771480.841117.30241503.979117.05761550.256114.77261573.394114.5279
1596.532113.7196 1619.67113.80911642.808113.00091665.947113.09041689.085112.2822
1712.223111.70681735.361112.31951758.499111.74411781.637112.35681804.776111.7814
1827.914112.2697 1874.19110.87011897.328111.35831920.467110.79691943.605111.5174
1989.881110.85922013.019111.56262036.157111.23352059.296111.94432082.434111.6227
2105.572112.33352151.848111.76872174.987111.26252198.125 109.7632221.263109.2568
2267.539106.25792290.677105.46692313.816103.81282336.954103.02172360.092101.3676
 2383.23100.57662429.50797.725652452.64597.163282475.78395.737812498.92195.17544
2545.19892.920462568.33692.309392591.47491.181912614.61290.57085 2637.7589.36456
2660.888 88.67472684.02787.468412707.16586.382042730.30385.692182753.44184.91897
2776.57984.542262845.99482.21157 2892.2781.356872915.40880.851262938.547 80.4184
2961.68579.912782984.82379.501133007.96179.162223031.09978.750563054.23878.41166
3077.376       783100.51478.30297 3146.7979.008353169.92879.311323193.067  79.664
3216.20579.711323262.48179.905373308.758       803355.03481.941933378.17282.43689
3424.44884.378813447.58785.223923470.72586.545043493.86387.390153540.13987.43983
3563.27886.844033586.41685.427963609.55484.83215 3655.8382.035293678.969    81.6
3702.107    81.63725.245    81.23748.383    81.23771.521    80.83817.798 81.5645
3840.93681.546753864.074  81.9293887.21281.911254002.903 79.65774072.31875.36828
4095.45674.495634118.59473.054754141.73273.90551 4164.8774.188054188.00875.03882
4211.14676.141514234.28576.992274257.42376.992274280.561 77.24424303.69977.25677
4326.83777.508714349.97677.521274373.11477.77626 4419.39 77.80754442.52878.06249
4488.80578.068924535.08178.837684558.21978.828484581.35779.212864604.49679.21286
4627.63479.606434650.77279.60643 4673.91       804697.048    79.64720.187    79.6
4812.73978.044015067.259       785090.397    77.85113.536    77.85136.674    77.6
5159.812    77.6 5182.95    77.25206.088       775252.365    76.25275.503      76
5298.641    76.45321.77976.916225344.91777.316225368.05677.832445391.19478.23244
5414.33278.54392 5437.4778.971625460.60879.283095483.74779.710785506.885 80.2025
5530.023 75.99155553.16171.716485576.29967.505485599.43865.005915622.576 60.7949
5645.71464.883735668.85267.26113 5691.9972.551465715.12876.640295738.26781.93062
5761.40579.223595807.68176.212555830.81973.505525853.958       726015.925      72
6039.06372.420466085.33972.840916108.47873.261376131.616 73.47166154.75473.89206
```

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6177.89273.41592 6201.0372.875456224.16872.789976247.30772.648616270.44572.63773
6293.58372.489826316.72172.480716339.85972.366676501.82772.366676524.96572.33334
6548.10372.366676571.24172.333346594.37972.366676617.51872.333346640.65672.36667
6802.62372.323816941.45272.41904 6964.5972.397226987.72972.439227010.86772.40741
7034.00572.445767080.28172.411777149.69672.471117172.83472.433337427.35472.56667
7450.49272.533337705.01272.633337774.42772.566677797.56572.510647866.97972.47515
7890.11872.407557936.39472.374157959.53272.306388028.94772.266678075.22372.17117
8098.36172.16666  8121.572.103038190.91472.066678214.052      728607.39372.01905
 9232.11      7410041.9373.9851810065.0773.5177310088.2173.5029110111.3473.03546
10134.4873.0206410180.7671.9821210203.8971.9154810227.0371.3962210250.1771.32958
10273.3172.2636610296.4473.0054110342.7274.8735710365.8675.61532   1038975.80766
10412.1375.8076610435.27      7610481.55      7610550.96    77.2 10574.177.41103
10597.2377.8110410620.37      7810643.51      7810666.6578.2544710689.7978.25447
10736.0678.7394310782.3479.7093410805.4779.9398310828.6180.4247910851.75 81.1395
10898.0281.7695810921.1682.4842810967.4483.0964110990.5882.9938311013.7183.29091
11036.8583.1883211059.9983.5883311083.1383.5883311175.68      8411245.09      84
11268.2383.6604211291.3783.6604211337.6482.1944311360.7881.8010111383.9281.06801
11407.0581.0680111430.1980.5839811453.3380.83293 11499.680.6871311522.7480.93609
11545.8881.0201311569.0281.4260311615.29 81.594111638.43      8211661.5781.59413
11684.7181.9694711707.8481.5636111730.9881.9389511754.1281.5330811777.2681.05317
11800.3981.3544811823.5380.8745711846.6781.1758711869.8180.7817411892.9580.26682
11916.0880.4473311939.2279.9324111962.3679.83351 11985.579.3185912008.6379.91475
12031.7780.0948812054.9180.9577412078.0581.5538912101.1882.4167612124.3282.56705
 12170.683.4010612193.7483.5513712216.8783.9683712332.5685.7979112425.1186.04623
12448.2586.4445812471.3986.3418412494.5386.5982512517.6686.64613 12540.886.90255
12563.9486.9504212610.2187.6205112633.35  87.74712656.49 87.473512679.63    87.6
12702.7687.62457 12725.988.0491512772.1888.0982912795.3288.4502512818.4588.60281
12841.5989.0827512887.87 89.8336   1291190.3135412934.1490.2090312957.2890.20903
12980.4290.1045213003.5590.1045213026.69      9013049.83      9013072.9790.09475
13096.1190.0947513119.24 90.189513142.38 90.189513165.5290.0947513188.6690.09475
13211.79      9013327.48      9013350.6290.2387513373.7690.23875 13396.990.63875
13420.03    90.813443.1790.9107413466.3191.3107413489.4591.4214813512.5891.71074
13535.7291.7107413558.86      9214414.95      92

Manning's n Values        num=       3
     Sta    n Val     Sta   n Val     Sta    n Val
      0     .045506.885     .065738.267      .04

Bank Sta: Left   Right     Lengths: Left Channel    Right       Coeff Contr.    Expan.
      5506.8855738.267               4038    5254    4975                .1        .3
Ineffective Flow      num=        1
   Sta L   Sta R     Elev  Permanent
   1280014414.95      70        T

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              78.17   Element                 Left OB     Channel    Right OB
  Vel Head (ft)                0.12   Wt. n-Val.                0.040      0.060       0.040
  W.S. Elev (ft)              78.05   Reach Len. (ft)         4038.00    5254.00     4975.00
  Crit W.S. (ft)                      Flow Area (sq ft)       1012.27    1830.11    24322.87
  E.G. Slope (ft/ft)       0.000669   Area (sq ft)            1012.27    1830.11    24322.87
  Q Total (cfs)            74500.00   Flow (cfs)              1177.20    5033.55    68289.25
```

Top Width (ft)	6060.65	Top Width (ft)	988.94	202.63	4869.09
Vel Total (ft/s)	2.74	Avg. Vel. (ft/s)	1.16	2.75	2.81
Max Chl Dpth (ft)	17.26	Hydr. Depth (ft)	1.02	9.03	5.00
Conv. Total (cfs)	2880317.0	Conv. (cfs)	45513.0	194607.0	2640197.0
Length Wtd. (ft)	4925.59	Wetted Per. (ft)	989.20	205.69	4869.51
Min Ch El (ft)	60.79	Shear (lb/sq ft)	0.04	0.37	0.21
Alpha	1.03	Stream Power (lb/ft s)	0.05	1.02	0.59
Frctn Loss (ft)	2.34	Cum Volume (acre-ft)	13657.40	3696.87	48283.89
C & E Loss (ft)	0.01	Cum SA (acres)	2813.31	521.17	7644.97

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1 RS: 55050

INPUT
Description: 37984 45000 5500
Station Elevation Data num= 192

```
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0     821086.533     821113.69681.619831249.51381.619831276.676       82
2254.556     822308.882 81.60392336.04681.598952390.37281.168192417.53681.10877
2444.69981.108772471.86281.287022526.18980.945882580.516      812607.679     80.8
2662.006     803286.762     803313.926     79.83422.579     78.23449.742       78
3667.049     783775.70278.959523802.86579.359513911.519      803938.682       80
4074.49978.473364210.314     764264.64175.373334291.80475.75291 4346.1375.12624
4373.29374.736734481.94574.361084509.108 73.57444590.59873.664884617.76173.27554
4672.08773.441964753.57673.956944807.90274.663164916.55576.258454943.71876.09856
4970.88176.493595025.207 76.94725161.02276.771985242.51276.846425296.83876.15332
 5405.49 75.56035432.65375.121255541.30672.425455649.95870.861975657.99670.85936
5679.45970.478275700.92370.509995722.38770.075675872.634      705894.098     70.4
5915.56270.266675937.02670.217145979.95470.375386001.417   70.326022.881     70.4
6044.345   70.566130.201   70.956151.665     71.16173.128     71.26194.59271.25667
6216.056 `  71.4 6237.52    71.56258.98471.733336280.448     71.76301.912     71.8
6323.375     726559.478     726666.79775.714996688.261 71.77386709.725 67.8455
6731.18963.904326752.65359.976026774.11755.955396795.58158.600056817.04461.33704
6838.508 63.98176859.97266.626376881.43668.33502  6902.970.166126924.36471.06123
6945.82872.081736967.29273.102236988.75573.997327010.21973.109077031.68372.09541
7074.61170.318897096.07569.305247117.53969.690717139.00271.02969 7181.9371.80064
7203.39473.139637246.32272.345257310.71374.025947332.17773.611347353.641 73.2623
7375.10572.856667396.56972.552437418.033 72.4445 7460.9672.070027482.42471.99469
7503.88871.829357525.352 71.75247546.816   71.52 7568.2871.493337589.74471.40572
7632.67171.371437654.13571.287627697.06371.207627718.527     71.27782.91871.05539
7804.38270.971438061.94970.415098083.41370.34192 8126.3470.264718233.659       70
8426.834     708469.76270.514288512.689     70.68534.15371.066678555.617    71.12
8577.081     718620.009     70.28641.473     709886.377     709993.69669.93996
10101.02     6811047.95     68 11098.667.0249811149.2565.4604811174.5764.97297
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11250.5468.2216411275.8669.5992711301.1972.4770311377.1676.1031811402.4875.81178
 11427.877.0204911478.4578.9929511503.7778.6087111579.7481.5482711605.0681.95795
11630.3981.5545911706.3682.7869711731.6882.3869711832.9783.98495 11858.383.59248
11908.9484.3924811934.27    84.411959.59      8412060.88      8412086.21    83.6
12162.18     83.6 12187.5    83.212238.15      8412567.35      8412617.9983.47202
12643.3283.4720212693.9682.9440312719.2982.7180912744.6182.7561312820.5882.33014
 12845.982.5560812871.2382.9620712896.5583.18802 12947.284.3367912972.52 84.5684
13048.4985.7683913073.81      8613453.66      8613554.95    87.613630.92    87.6
13656.25      8813706.89      8813757.54    87.213782.86    87.213833.51    86.4
13858.8386.3705313884.1686.7410713960.1386.7410713985.4586.3705314010.7786.37053
 14036.1      8614086.7486.7690614112.0786.7845314188.0487.9845314213.36      88
14339.97      90 14694.5      90

Manning's n Values        num=       3
     Sta    n Val      Sta   n Val      Sta    n Val
       0     .046666.797     .066988.755     .04

Bank Sta: Left    Right    Lengths: Left Channel    Right      Coeff Contr.    Expan.
      6666.7976988.755              2746    3139    3633                 .1        .3
Ineffective Flow     num=        1
   Sta L    Sta R    Elev  Permanent
   10400 14694.5      60       F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)            75.83   Element                 Left OB    Channel   Right OB
  Vel Head (ft)              0.07   Wt. n-Val.                0.040      0.060      0.040
  W.S. Elev (ft)            75.75   Reach Len. (ft)           10.00      10.00      10.00
  Crit W.S. (ft)            71.50   Flow Area (sq ft)       6075.72    2933.91   25758.28
  E.G. Slope (ft/ft)     0.000354   Area (sq ft)            6075.72    2933.91   25758.28
  Q Total (cfs)          74500.00   Flow (cfs)              9943.66    5929.74   58626.60
  Top Width (ft)          6650.00   Top Width (ft)          1946.97     321.96    4381.07
  Vel Total (ft/s)           2.14   Avg. Vel. (ft/s)           1.64       2.02       2.28
  Max Chl Dpth (ft)         19.80   Hydr. Depth (ft)           3.12       9.11       5.88
  Conv. Total (cfs)     3960599.0    Conv. (cfs)            528628.9   315239.3  3116731.0
  Length Wtd. (ft)          10.00   Wetted Per. (ft)        1947.14     324.65    4381.73
  Min Ch El (ft)            55.96   Shear (lb/sq ft)           0.07       0.20       0.13
  Alpha                      1.04   Stream Power (lb/ft s)     0.11       0.40       0.30
  Frctn Loss (ft)            0.00   Cum Volume (acre-ft)   13328.87    3409.56   45424.00
  C & E Loss (ft)            0.00   Cum SA (acres)          2677.23     489.53    7116.74

Warning: Divided flow computed for this cross-section.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

BRIDGE

RIVER: Cosumnes
REACH: 1                 RS: 55025
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INPUT
Description:
Distance from Upstream XS =      10
Deck/Roadway Width        =      30
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      85      80   14000      85      80

Upstream Bridge Cross Section Data
Station Elevation Data    num=     192
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      821086.533      821113.69681.619831249.51381.619831276.676      82
2254.556      822308.882 81.60392336.04681.598952390.37281.168192417.53681.10877
2444.69981.108772471.86281.287022526.18980.945882580.516      812607.679    80.8
2662.006      803286.762      803313.926    79.83422.579    78.23449.742      78
3667.049      783775.70278.959523802.86579.359513911.519      803938.682      80
4074.49978.473364210.314      764264.64175.373334291.80475.75291 4346.1375.12624
4373.29374.736734481.94574.361084509.108 73.57444590.59873.664884617.76173.27554
4672.08773.441964753.57673.956944807.90274.663164916.55576.258454943.71876.09856
4970.88176.493595025.207 76.94725161.02276.771985242.51276.846425296.83876.15332
 5405.49 75.56035432.65375.121255541.30672.425455649.95870.861975657.99670.85936
5679.45970.478275700.92370.509995722.38770.075675872.634      705894.098    70.4
5915.56270.266675937.02670.217145979.95470.375386001.417    70.326022.881    70.4
6044.345   70.566130.201   70.956151.665    71.16173.128    71.26194.59271.25667
6216.056     71.4 6237.52    71.56258.98471.733336280.448    71.76301.912    71.8
6323.375      726559.478      726666.79775.714996688.261 71.77386709.725 67.8455
6731.18963.904326752.65359.976026774.11755.955396795.58158.600056817.04461.33704
6838.508 63.98176859.97266.626376881.43668.33502  6902.970.166126924.36471.06123
6945.82872.081736967.29273.102236988.75573.997327010.21973.109077031.68372.09541
7074.61170.318897096.07569.305247117.53969.690717139.00271.02969 7181.9371.80064
7203.39473.139637246.32272.345257310.71374.025947332.17773.611347353.641 73.2623
7375.10572.856667396.56972.552437418.033 72.4445 7460.9672.070027482.42471.99469
7503.88871.829357525.352 71.75247546.816   71.52 7568.2871.493337589.74471.40572
7632.67171.371437654.13571.287627697.06371.207627718.527    71.27782.91871.05539
7804.38270.971438061.94970.415098083.41370.34192 8126.3470.264718233.659      70
8426.834      708469.76270.514288512.689    70.68534.15371.066678555.617   71.12
8577.081      718620.009    70.28641.473      709886.377      709993.69669.93996
10101.02      6811047.95      68 11098.667.0249811149.2565.4604811174.5764.97297
11250.5468.2216411275.8669.5992711301.1972.4770311377.1676.1031811402.4875.81178
 11427.877.0204911478.4578.9929511503.7778.6087111579.7481.5482711605.0681.95795
11630.3981.5545911706.3682.7869711731.6882.3869711832.9783.98495 11858.383.59248
11908.9484.3924811934.27    84.411959.59      8412060.88      8412086.21    83.6
12162.18    83.6 12187.5    83.212238.15      8412567.35      8412617.9983.47202
12643.3283.4720212693.9682.9440312719.2982.7180912744.6182.7561312820.5882.33014
 12845.982.5560812871.2382.9620712896.5583.18802 12947.284.3367912972.52 84.5684
13048.4985.7683913073.81      8613453.66      8613554.95    87.613630.92    87.6
13656.25      8813706.89      8813757.54    87.213782.86    87.213833.51    86.4
13858.8386.3705313884.1686.7410713960.1386.7410713985.4586.3705314010.7786.37053
 14036.1      8614086.7486.7690614112.0786.7845314188.0487.9845314213.36      88
14339.97      90 14694.5      90
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Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .046666.797     .066988.755     .04

Bank Sta: Left    Right     Coeff Contr.   Expan.
      6666.7976988.755                .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R     Elev  Permanent
   10400 14694.5      60        F

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0      85      80   14000      85      80

Downstream Bridge Cross Section Data
Station Elevation Data    num=      192
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      821086.533      821113.69681.619831249.51381.619831276.676        82
2254.556      822308.882 81.60392336.04681.598952390.37281.168192417.53681.10877
2444.69981.108772471.86281.287022526.18980.945882580.516       812607.679    80.8
2662.006      803286.762      803313.926    79.83422.579    78.23449.742      78
3667.049      783775.70278.959523802.86579.359513911.519      803938.682      80
4074.49978.473364210.314      764264.64175.373334291.80475.75291 4346.1375.12624
4373.29374.736734481.94574.361084509.108 73.57444590.59873.664884617.76173.27554
4672.08773.441964753.57673.956944807.90274.663164916.55576.258454943.71876.09856
4970.88176.493595025.207 76.94725161.02276.771985242.51276.846425296.83876.15332
 5405.49 75.56035432.65375.121255541.30672.425455649.95870.861975657.99670.85936
5679.45970.478275700.92370.509995722.38770.075675872.634      705894.098    70.4
5915.56270.266675937.02670.217145979.95470.375386001.417   70.326022.881    70.4
6044.345   70.566130.201   70.956151.665    71.16173.128    71.26194.59271.25667
6216.056    71.4 6237.52    71.56258.98471.733336280.448    71.76301.912    71.8
6323.375      726559.478      726666.79775.714996688.261 71.77386709.725 67.8455
6731.18963.904326752.65359.976026774.11755.955396795.58158.600056817.04461.33704
6838.508 63.98176859.97266.626376881.43668.33502  6902.970.166126924.36471.06123
6945.82872.081736967.29273.102236988.75573.997327010.21973.109077031.68372.09541
7074.61170.318897096.07569.305247117.53969.690717139.00271.02969 7181.9371.80064
7203.39473.139637246.32272.345257310.71374.025947332.17773.611347353.641 73.2623
7375.10572.856667396.56972.552437418.033 72.4445 7460.9672.070027482.42471.99469
7503.88871.829357525.352 71.75247546.816   71.52 7568.2871.493337589.74471.40572
7632.67171.371437654.13571.287627697.06371.207627718.527    71.27782.91871.05539
7804.38270.971438061.94970.415098083.41370.34192 8126.3470.264718233.659      70
8426.834      708469.76270.514288512.689    70.68534.15371.066678555.617   71.12
8577.081      718620.009    70.28641.473      709886.377      709993.69669.93996
10101.02      6811047.95      68 11098.667.0249811149.2565.4604811174.5764.97297
11250.5468.2216411275.8669.5992711301.1972.4770311377.1676.1031811402.4875.81178
 11427.877.0204911478.4578.9929511503.7778.6087111579.7481.5482711605.0681.95795
11630.3981.5545911706.3682.7869711731.6882.3869711832.9783.98495 11858.383.59248
11908.9484.3924811934.27    84.411959.59      8412060.88      8412086.21    83.6
12162.18    83.6 12187.5    83.212238.15      8412567.35      8412617.9983.47202
12643.3283.4720212693.9682.9440312719.2982.7180912744.6182.7561312820.5882.33014
```

```
 12845.982.5560812871.2382.9620712896.5583.18802 12947.284.3367912972.52 84.5684
13048.4985.7683913073.81      8613453.66      8613554.95     87.613630.92     87.6
13656.25       8813706.89      8813757.54    87.213782.86     87.213833.51     86.4
13858.8386.3705313884.1686.7410713960.1386.7410713985.4586.3705314010.7786.37053
 14036.1       8614086.7486.7690614112.0786.7845314188.0487.9845314213.36       88
14339.97       90 14694.5       90

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
       0     .046666.797     .066988.755     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      6666.7976988.755               .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
   10400 14694.5      60        F

Upstream Embankment side slope               =       0 horiz. to 1.0 vertical
Downstream Embankment side slope             =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins          =
Energy head used in spillway design          =
Spillway height used in design               =
Weir crest shape                             = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream=   10393    Downstream=   10393
Upstream     num=        2
    Width    Elev    Width   Elev
       5      40       5      80
Downstream     num=        2
    Width    Elev    Width   Elev
       5      40       5      80

Pier Data
Pier Station     Upstream=   10443    Downstream=   10433
Upstream     num=        2
    Width    Elev    Width   Elev
       5      40       5      80
Downstream     num=        2
    Width    Elev    Width   Elev
       5      40       5      80

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
```

Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #100-year

E.G. US. (ft)	75.83	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	75.75	E.G. Elev (ft)	75.82	75.81
Q Total (cfs)	74500.00	W.S. Elev (ft)	75.75	75.74
Q Bridge (cfs)	74500.00	Crit W.S. (ft)	71.45	71.45
Q Weir (cfs)		Max Chl Dpth (ft)	19.79	19.78
Weir Sta Lft (ft)		Vel Total (ft/s)	2.15	2.15
Weir Sta Rgt (ft)		Flow Area (sq ft)	34663.07	34589.47
Weir Submerg		Froude # Chl	0.12	0.12
Weir Max Depth (ft)		Specif Force (cu ft)	117073.80	116700.20
Min El Weir Flow (ft)	85.01	Hydr Depth (ft)	5.22	5.22
Min El Prs (ft)	80.00	W.P. Total (ft)	6672.40	6666.62
Delta EG (ft)	3.37	Conv. Total (cfs)	3964927.0	3953109.0
Delta WS (ft)	4.25	Top Width (ft)	6637.87	6632.13
BR Open Area (sq ft)	66351.97	Frctn Loss (ft)	0.01	3.27
BR Open Vel (ft/s)	2.15	C & E Loss (ft)	0.00	0.09
Coef of Q		Shear Total (lb/sq ft)	0.11	0.12
Br Sel Method	Energy only	Power Total (lb/ft s)	0.25	0.25

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.
Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Cosumnes
REACH: 1 RS: 55000

INPUT
Description: 37984 45000 5500

```
Station Elevation Data    num=     192
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
       0      821086.533      821113.69681.619831249.51381.619831276.676       82
2254.556      822308.882 81.60392336.04681.598952390.37281.168192417.53681.10877
2444.69981.108772471.86281.287022526.18980.945882580.516      812607.679    80.8
2662.006      803286.762      803313.926     79.83422.579     78.23449.742      78
3667.049      783775.70278.959523802.86579.359513911.519      803938.682      80
4074.49978.473364210.314      764264.64175.373334291.80475.75291 4346.1375.12624
4373.29374.736734481.94574.361084509.108 73.57444590.59873.664884617.76173.27554
4672.08773.441964753.57673.956944807.90274.663164916.55576.258454943.71876.09856
4970.88176.493595025.207 76.94725161.02276.771985242.51276.846425296.83876.15332
 5405.49 75.56035432.65375.121255541.30672.425455649.95870.861975657.99670.85936
5679.45970.478275700.92370.509995722.38770.075675872.634      705894.098    70.4
5915.56270.266675937.02670.217145979.95470.375386001.417   70.326022.881    70.4
6044.345   70.566130.201   70.956151.665    71.16173.128    71.26194.59271.25667
6216.056    71.4 6237.52    71.56258.98471.733336280.448    71.76301.912    71.8
6323.375      726559.478      726666.79775.714996688.261 71.77386709.725 67.8455
6731.18963.904326752.65359.976026774.11755.955396795.58158.600056817.04461.33704
6838.508 63.98176859.97266.626376881.43668.33502  6902.970.166126924.36471.06123
6945.82872.081736967.29273.102236988.75573.997327010.21973.109077031.68372.09541
7074.61170.318897096.07569.305247117.53969.690717139.00271.02969 7181.9371.80064
7203.39473.139637246.32272.345257310.71374.025947332.17773.611347353.641 73.2623
7375.10572.856667396.56972.552437418.033 72.4445 7460.9672.070027482.42471.99469
7503.88871.829357525.352 71.75247546.816    71.52 7568.2871.493337589.74471.40572
7632.67171.371437654.13571.287627697.06371.207627718.527    71.27782.91871.05539
7804.38270.971438061.94970.415098083.41370.34192 8126.3470.264718233.659      70
8426.834      708469.76270.514288512.689    70.68534.15371.066678555.617   71.12
8577.081      718620.009    70.28641.473      709886.377      709993.69669.93996
10101.02      6811047.95      68 11098.667.0249811149.2565.4604811174.5764.97297
11250.5468.2216411275.8669.5992711301.1972.4770311377.1676.1031811402.4875.81178
 11427.877.0204911478.4578.9929511503.7778.6087111579.7481.5482711605.0681.95795
11630.3981.5545911706.3682.7869711731.6882.3869711832.9783.98495 11858.383.59248
11908.9484.3924811934.27    84.411959.59      8412060.88      8412086.21    83.6
12162.18    83.6 12187.5    83.212238.15      8412567.35      8412617.9983.47202
12643.3283.4720212693.9682.9440312719.2982.7180912744.6182.7561312820.5882.33014
 12845.982.5560812871.2382.9620712896.5583.18802 12947.284.3367912972.52 84.5684
13048.4985.7683913073.81      8613453.66      8613554.95    87.613630.92    87.6
13656.25      8813706.89      8813757.54    87.213782.86    87.213833.51    86.4
13858.8386.3705313884.1686.7410713960.1386.7410713985.4586.3705314010.7786.37053
 14036.1      8614086.7486.7690614112.0786.7845314188.0487.9845314213.36      88
14339.97      90 14694.5      90

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
       0     .046666.797     .066988.755     .04

Bank Sta: Left    Right    Lengths: Left Channel    Right        Coeff Contr.    Expan.
      6666.7976988.755              2746    3139    3633                .1        .3
Ineffective Flow      num=         1
   Sta L   Sta R     Elev  Permanent
   10400 14694.5      60        F
```

CROSS SECTION OUTPUT Profile #100-year

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	72.46	Wt. n-Val.	0.040	0.060	0.040
Vel Head (ft)	0.96	Reach Len. (ft)	2746.00	3139.00	3633.00
W.S. Elev (ft)	71.50	Flow Area (sq ft)	597.98	1683.52	7793.22
Crit W.S. (ft)	71.50	Area (sq ft)	597.98	1683.52	7793.22
E.G. Slope (ft/ft)	0.013672	Flow (cfs)	2505.08	17570.95	54423.97
Q Total (cfs)	74500.00	Top Width (ft)	631.31	243.78	3846.94
Top Width (ft)	4722.04	Avg. Vel. (ft/s)	4.19	10.44	6.98
Vel Total (ft/s)	7.39	Hydr. Depth (ft)	0.95	6.91	2.03
Max Chl Dpth (ft)	15.54	Conv. (cfs)	21424.1	150271.3	465447.9
Conv. Total (cfs)	637143.3	Wetted Per. (ft)	631.33	246.04	3847.33
Length Wtd. (ft)	3558.16	Shear (lb/sq ft)	0.81	5.84	1.73
Min Ch El (ft)	55.96	Stream Power (lb/ft s)	3.39	60.96	12.07
Alpha	1.13	Cum Volume (acre-ft)	13086.97	3242.79	44212.09
Frctn Loss (ft)	0.30	Cum SA (acres)	2584.00	469.11	6820.41
C & E Loss (ft)	0.28				

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Cosumnes
REACH: 1 RS: 50050

INPUT
Description: 34845 40000 5000
Station Elevation Data num= 257

```
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
        078.02666283.4256  78.725386.4894    78.9438.0214    79.1489.553378.79498
541.085378.35634566.851378.39487592.617278.24896618.383278.26395644.149278.18672
721.447278.33543747.213278.24668772.9792 78.2463798.745278.13333824.511278.22667
850.277278.13333953.341178.13333979.1071    78.21004.873      781391.363      78
1494.427    78.641520.19378.688231597.491    79.21649.023  79.4251726.321      80
3066.147      803117.679    79.23143.44578.851713169.21178.903413220.74378.20683
3246.50978.206833349.572      783375.338      783401.10477.92891 3426.8777.94669
3452.63578.328913478.40178.864463504.167    79.63529.933      804096.782      80
```

```
4122.548    80.44148.314    80.44174.08180.203694225.613 80.15584251.379 80.3595
4277.14580.335554380.20981.181564405.976 81.60554483.27480.48672 4509.0480.68398
4534.806 80.50834637.871    80.44663.637      804792.46779.980264818.23379.26336
4921.29877.273244947.064 76.2969 4972.8375.539925050.128 71.90815075.89572.39458
5127.42772.899035178.95974.118045204.72575.012445230.49175.783815282.02377.57259
 5307.7978.626755333.55678.957955359.32279.00637 5436.62      805462.38679.63631
5488.15279.632615565.45178.541555616.98377.701595642.74977.657935694.281 76.7853
5745.813      76 5771.58      765823.112    75.25874.64475.15523 5900.4175.53284
6029.24175.499626055.00775.873626080.77375.870016158.07174.931956183.83775.17628
6209.604 74.8636 6235.3774.645266286.90273.741716312.668 74.08046389.96672.78018
6441.49972.777766467.265  73.1446544.56373.104426570.32973.803636596.09574.15789
 6699.1676.443826853.75677.905626982.58771.899937034.119 66.18117111.417    54.6
7137.184    54.67188.716 70.60027240.24871.177787266.01471.20839 7291.7871.57359
7343.313 71.63487369.07973.082287394.84574.249547420.61174.334537497.90977.83633
7523.67577.748057549.44178.180797600.97478.00423 7626.7477.915967652.50677.47325
7678.272 75.63167704.038 75.70997729.80473.86824 7755.5772.026587781.33666.18601
7807.10360.345447832.86956.424837858.635 53.86767884.40151.310367910.16747.93044
7935.93344.550527961.69939.807227987.46536.427298013.23134.559948038.99834.26627
8064.764 33.9726 8090.5333.678938116.29630.509328142.06230.215658167.82830.17575
8193.59430.135858219.35930.095958245.12529.673368270.89129.633468296.65630.01199
8322.42230.405648348.188 30.79938373.95330.795138399.71931.188798425.48431.18562
 8451.2531.182468477.016 31.93668502.78131.535618528.54732.289758554.31332.69385
8580.07833.097958605.84433.502048631.60933.083778657.37532.332758683.14131.32268
8708.90630.312618734.67229.302558760.43828.292488786.20326.949668811.96928.77673
8837.734 30.6038  8863.532.430888889.26634.257958915.03136.406228940.79737.30036
8966.56341.624988992.32845.949619018.09450.274239043.85954.598869069.62558.30783
9095.39165.126099121.15667.197399146.92269.268699172.68871.339999198.45369.37248
9249.98462.162129301.51657.408159327.281 57.37229404.57856.03594    9688       56
9739.53156.869779816.82861.623949868.359 64.06369894.12564.133589945.65661.37186
9997.18864.4740110022.9567.4759310048.72  69.02710074.4872.8204310126.0272.08746
10151.7870.9294710203.31 70.196510280.6170.1248910306.3869.6671310332.1469.64326
10357.9169.3361610409.44 70.1053 10435.269.3643210460.9769.74889 10512.571.20804
10538.2770.6058210564.0370.2098410667.0967.7580310692.8666.7199910718.6366.30971
10821.6965.7460710847.45 66.232910950.5267.6465810976.2868.5988311002.05     68.4
11105.1171.5264111130.8871.9448111156.6472.7448111233.94     72.8 11259.773.17535
11362.7773.1260311388.5373.5072411465.8373.5248511749.25       7811878.08      78
12006.91       8012109.9778.5416312264.56 76.057612341.8674.5762612367.6374.20959
12419.1673.2023312470.6971.8459212496.4571.4595512522.2270.7813512573.7570.11861
12599.5269.9554612625.2869.9159212651.0569.7527712754.1170.1666112779.8870.39195
12882.9471.58505 12908.7      7213011.7772.1177813037.5372.51778 13063.372.51778
13166.36      7413295.19      7413372.4873.8832913424.0273.3685513449.7873.17673
13527.0871.9458813552.8471.5000513578.6171.5788313604.3871.9116313681.6772.14796
13707.4472.11837 13733.272.48878 13810.5     72.413836.27      7213862.03       72
13939.3371.8183513965.09 72.1525

Manning's n Values        num=        3
     Sta    n Val     Sta   n Val      Sta   n Val
      0     .046853.756     .067497.909     .04

Bank Sta: Left   Right     Lengths: Left Channel    Right       Coeff Contr.   Expan.
      6853.7567497.909              3166    4770     6283                .1      .3
```

```
CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)            67.38   Element                   Left OB    Channel    Right OB
  Vel Head (ft)              0.04   Wt. n-Val.                             0.060       0.040
  W.S. Elev (ft)            67.34   Reach Len. (ft)             10.00      10.00       10.00
  Crit W.S. (ft)            37.32   Flow Area (sq ft)                    1133.36    47208.30
  E.G. Slope (ft/ft)     0.000023   Area (sq ft)                         1133.36    47208.30
  Q Total (cfs)          74500.00   Flow (cfs)                            503.85    73996.15
  Top Width (ft)          2561.18   Top Width (ft)                        154.58     2406.60
  Vel Total (ft/s)           1.54   Avg. Vel. (ft/s)                        0.44        1.57
  Max Chl Dpth (ft)         40.39   Hydr. Depth (ft)                        7.33       19.62
  Conv. Total (cfs)    15472870.0     Conv. (cfs)                       104644.7  15368230.0
  Length Wtd. (ft)          10.00   Wetted Per. (ft)                      157.44     2413.69
  Min Ch El (ft)            54.60   Shear (lb/sq ft)                        0.01        0.03
  Alpha                      1.03   Stream Power (lb/ft s)                  0.00        0.04
  Frctn Loss (ft)            0.00   Cum Volume (acre-ft)     13068.12    3141.30    41918.46
  C & E Loss (ft)            0.00   Cum SA (acres)            2564.10     454.76     6559.63

Warning: Divided flow computed for this cross-section.

BRIDGE


RIVER: Cosumnes
REACH: 1                 RS: 50025

INPUT
Description:
Distance from Upstream XS =      10
Deck/Roadway Width        =      30
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0      74      69    12000      74      69

Upstream Bridge Cross Section Data
Station Elevation Data    num=     257
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       078.02666283.4256  78.725386.4894    78.9438.0214    79.1489.553378.79498
541.085378.35634566.851378.39487592.617278.24896618.383278.26395644.149278.18672
721.447278.33543747.213278.24668772.9792 78.2463798.745278.13333824.511278.22667
850.277278.13333953.341178.13333979.1071    78.21004.873     781391.363      78
1494.427   78.641520.19378.688231597.491    79.21649.023  79.4251726.321      80
3066.147      803117.679    79.23143.44578.851713169.21178.903413220.74378.20683
3246.50978.206833349.572      783375.338      783401.10477.92891 3426.8777.94669
3452.63578.328913478.40178.864463504.167    79.63529.933     804096.782      80
4122.548    80.44148.314    80.44174.08180.203694225.613 80.15584251.379 80.3595
4277.14580.335554380.20981.181564405.976 81.60554483.27480.48672 4509.0480.68398
4534.806 80.50834637.871    80.44663.637      804792.46779.980264818.23379.26336
4921.29877.273244947.064 76.2969 4972.8375.539925050.128 71.90815075.89572.39458
```

```
5127.42772.899035178.95974.118045204.72575.012445230.49175.783815282.02377.57259
 5307.7978.626755333.55678.957955359.32279.00637 5436.62      805462.38679.63631
5488.15279.632615565.45178.541555616.98377.701595642.74977.657935694.281 76.7853
5745.813      76 5771.58       765823.112    75.25874.64475.15523 5900.4175.53284
6029.24175.499626055.00775.873626080.77375.870016158.07174.931956183.83775.17628
6209.604 74.8636 6235.3774.645266286.90273.741716312.668 74.08046389.96672.78018
6441.49972.777766467.265  73.1446544.56373.104426570.32973.803636596.09574.15789
 6699.1676.443826853.75677.905626982.58771.899937034.119 66.18117111.417    54.6
7137.184    54.67188.716 70.60027240.24871.177787266.01471.20839 7291.7871.57359
7343.313 71.63487369.07973.082287394.84574.249547420.61174.334537497.90977.83633
7523.67577.748057549.44178.180797600.97478.00423 7626.7477.915967652.50677.47325
7678.272 75.63167704.038 75.70997729.80473.86824 7755.5772.026587781.33666.18601
7807.10360.345447832.86956.424837858.635 53.86767884.40151.310367910.16747.93044
7935.93344.550527961.69939.807227987.46536.427298013.23134.559948038.99834.26627
8064.764 33.9726 8090.5333.678938116.29630.509328142.06230.215658167.82830.17575
8193.59430.135858219.35930.095958245.12529.673368270.89129.633468296.65630.01199
8322.42230.405648348.188 30.79938373.95330.795138399.71931.188798425.48431.18562
 8451.2531.182468477.016 31.93668502.78131.535618528.54732.289758554.31332.69385
8580.07833.097958605.84433.502048631.60933.083778657.37532.332758683.14131.32268
8708.90630.312618734.67229.302558760.43828.292488786.20326.949668811.96928.77673
8837.734 30.6038  8863.532.430888889.26634.257958915.03136.406228940.79737.30036
8966.56341.624988992.32845.949619018.09450.274239043.85954.598869069.62558.30783
9095.39165.126099121.15667.197399146.92269.268699172.68871.339999198.45369.37248
9249.98462.162129301.51657.408159327.281 57.37229404.57856.03594    9688      56
9739.53156.869779816.82861.623949868.359 64.06369894.12564.133589945.65661.37186
9997.18864.4740110022.9567.4759310048.72  69.02710074.4872.8204310126.0272.08746
10151.7870.9294710203.31 70.196510280.6170.1248910306.3869.6671310332.1469.64326
10357.9169.3361610409.44 70.1053 10435.269.3643210460.9769.74889 10512.571.20804
10538.2770.6058210564.0370.2098410667.0967.7580310692.8666.7199910718.6366.30971
10821.6965.7460710847.45 66.232910950.5267.6465810976.2868.5988311002.05    68.4
11105.1171.5264111130.8871.9448111156.6472.7448111233.94     72.8 11259.773.17535
11362.7773.1260311388.5373.5072411465.8373.5248511749.25       7811878.08      78
12006.91       8012109.9778.5416312264.56 76.057612341.8674.5762612367.6374.20959
12419.1673.2023312470.6971.8459212496.4571.4595512522.2270.7813512573.7570.11861
12599.5269.9554612625.2869.9159212651.0569.7527712754.1170.1666112779.8870.39195
12882.9471.58505 12908.7      7213011.7772.1177813037.5372.51778 13063.372.51778
13166.36      7413295.19      7413372.4873.8832913424.0273.3685513449.7873.17673
13527.0871.9458813552.8471.5000513578.6171.5788313604.3871.9116313681.6772.14796
13707.4472.11837 13733.272.48878 13810.5    72.413836.27      7213862.03      72
13939.3371.8183513965.09 72.1525

Manning's n Values       num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
       0     .046853.756      .067497.909     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      6853.7567497.909              .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0      74      69   12000      74      69
```

```
Downstream Bridge Cross Section Data
Station Elevation Data    num=     257
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       078.02666283.4256 78.725386.4894    78.9438.0214    79.1489.553378.79498
541.085378.35634566.851378.39487592.617278.24896618.383278.26395644.149278.18672
721.447278.33543747.213278.24668772.9792 78.2463798.745278.13333824.511278.22667
850.277278.13333953.341178.13333979.1071    78.21004.873      781391.363      78
1494.427   78.641520.19378.688231597.491    79.21649.023 79.4251726.321      80
3066.147      803117.679    79.23143.44578.851713169.21178.903413220.74378.20683
3246.50978.206833349.572     783375.338      783401.10477.92891 3426.8777.94669
3452.63578.328913478.40178.864463504.167    79.63529.933      804096.782      80
4122.548    80.44148.314    80.44174.08180.203694225.613 80.15584251.379 80.3595
4277.14580.335554380.20981.181564405.976 81.60554483.27480.48672 4509.0480.68398
4534.806 80.50834637.871    80.44663.637     804792.46779.980264818.23379.26336
4921.29877.273244947.064 76.2969 4972.8375.539925050.128 71.90815075.89572.39458
5127.42772.899035178.95974.118045204.72575.012445230.49175.783815282.02377.57259
 5307.7978.626755333.55678.957955359.32279.00637 5436.62      805462.38679.63631
5488.15279.632615565.45178.541555616.98377.701595642.74977.657935694.281 76.7853
5745.813      76 5771.58     765823.112    75.25874.64475.15523 5900.4175.53284
6029.24175.499626055.00775.873626080.77375.870016158.07174.931956183.83775.17628
6209.604 74.8636 6235.3774.645266286.90273.741716312.668 74.08046389.96672.78018
6441.49972.777766467.265  73.1446544.56373.104426570.32973.803636596.09574.15789
 6699.1676.443826853.75677.905626982.58771.899937034.119 66.18117111.417    54.6
7137.184    54.67188.716 70.60027240.24871.177787266.01471.20839 7291.7871.57359
7343.313 71.63487369.07973.082287394.84574.249547420.61174.334537497.90977.83633
7523.67577.748057549.44178.180797600.97478.00423 7626.7477.915967652.50677.47325
7678.272 75.63167704.038 75.70997729.80473.86824 7755.5772.026587781.33666.18601
7807.10360.345447832.86956.424837858.635 53.86767884.40151.310367910.16747.93044
7935.93344.550527961.69939.807227987.46536.427298013.23134.559948038.99834.26627
8064.764 33.9726 8090.5333.678938116.29630.509328142.06230.215658167.82830.17575
8193.59430.135858219.35930.095958245.12529.673368270.89129.633468296.65630.01199
8322.42230.405648348.188 30.79938373.95330.795138399.71931.188798425.48431.18562
 8451.2531.182468477.016 31.93668502.78131.535618528.54732.289758554.31332.69385
8580.07833.097958605.84433.502048631.60933.083778657.37532.332758683.14131.32268
8708.90630.312618734.67229.302558760.43828.292488786.20326.949668811.96928.77673
8837.734 30.6038  8863.532.430888889.26634.257958915.03136.406228940.79737.30036
8966.56341.624988992.32845.949619018.09450.274239043.85954.598869069.62558.30783
9095.39165.126099121.15667.197399146.92269.268699172.68871.339999198.45369.37248
9249.98462.162129301.51657.408159327.281 57.37229404.57856.03594     9688      56
9739.53156.869779816.82861.623949868.359 64.06369894.12564.133589945.65661.37186
9997.18864.4740110022.9567.4759310048.72  69.02710074.4872.8204310126.0272.08746
10151.7870.9294710203.31 70.196510280.6170.1248910306.3869.6671310332.1469.64326
10357.9169.3361610409.44 70.1053 10435.269.3643210460.9769.74889 10512.571.20804
10538.2770.6058210564.0370.2098410667.0967.7580310692.8666.7199910718.6366.30971
10821.6965.7460710847.45 66.232910950.5267.6465810976.2868.5988311002.05    68.4
11105.1171.5264111130.8871.9448111156.6472.7448111233.94     72.8 11259.773.17535
11362.7773.1260311388.5373.5072411465.8373.5248511749.25      7811878.08      78
12006.91       8012109.9778.5416312264.56 76.057612341.8674.5762612367.6374.20959
12419.1673.2023312470.6971.8459212496.4571.4595512522.2270.7813512573.7570.11861
12599.5269.9554612625.2869.9159212651.0569.7527712754.1170.1666112779.8870.39195
12882.9471.58505 12908.7      7213011.7772.1177813037.5372.51778 13063.372.51778
```

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13166.36      7413295.19      7413372.4873.8832913424.0273.3685513449.7873.17673
13527.0871.9458813552.8471.5000513578.6171.5788313604.3871.9116313681.6772.14796
13707.4472.11837 13733.272.48878 13810.5    72.413836.27      7213862.03      72
13939.3371.8183513965.09 72.1525

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val      Sta    n Val
       0     .046853.756     .067497.909     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      6853.7567497.909             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream=    7877    Downstream=    7877
Upstream     num=        2
    Width   Elev    Width   Elev
       5      40       5      69
Downstream     num=        2
    Width   Elev    Width   Elev
       5      40       5      69

Pier Data
Pier Station     Upstream=    7927    Downstream=    7927
Upstream     num=        2
    Width   Elev    Width   Elev
       5      40       5      69
Downstream     num=        2
    Width   Elev    Width   Elev
       5      40       5      69

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
```

```
Class B flow critical depth computations use critical depth
    inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line
```

BRIDGE OUTPUT Profile #100-year

E.G. US. (ft)	67.38	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	67.34	E.G. Elev (ft)	67.38	67.38
Q Total (cfs)	74500.00	W.S. Elev (ft)	67.34	67.34
Q Bridge (cfs)	74500.00	Crit W.S. (ft)	37.33	37.33
Q Weir (cfs)		Max Chl Dpth (ft)	40.39	40.39
Weir Sta Lft (ft)		Vel Total (ft/s)	1.55	1.55
Weir Sta Rgt (ft)		Flow Area (sq ft)	48155.62	48153.86
Weir Submerg		Froude # Chl	0.03	0.03
Weir Max Depth (ft)		Specif Force (cu ft)	714098.80	714065.80
Min El Weir Flow (ft)	69.76	Hydr Depth (ft)	18.88	18.88
Min El Prs (ft)	69.00	W.P. Total (ft)	2634.81	2634.71
Delta EG (ft)	0.11	Conv. Total (cfs)	15582090.0	15581480.0
Delta WS (ft)	0.11	Top Width (ft)	2551.10	2551.00
BR Open Area (sq ft)	52576.91	Frctn Loss (ft)	0.00	0.11
BR Open Vel (ft/s)	1.55	C & E Loss (ft)	0.00	0.00
Coef of Q		Shear Total (lb/sq ft)	0.03	0.03
Br Sel Method	Energy only	Power Total (lb/ft s)	0.04	0.04

CROSS SECTION

RIVER: Cosumnes
REACH: 1   RS: 50000

```
INPUT
Description: 34845  40000  5000
Station Elevation Data    num=     257
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       078.02666283.4256  78.725386.4894    78.9438.0214    79.1489.553378.79498
541.085378.35634566.851378.39487592.617278.24896618.383278.26395644.149278.18672
721.447278.33543747.213278.24668772.9792 78.2463798.745278.13333824.511278.22667
850.277278.13333953.341178.13333979.1071    78.21004.873      781391.363      78
1494.427   78.641520.19378.688231597.491    79.21649.023  79.4251726.321      80
3066.147      803117.679    79.23143.44578.851713169.21178.903413220.74378.20683
3246.50978.206833349.572      783375.338      783401.10477.92891 3426.8777.94669
3452.63578.328913478.40178.864463504.167    79.63529.933      804096.782      80
4122.548    80.44148.314    80.44174.08180.203694225.613 80.15584251.379 80.3595
4277.14580.335554380.20981.181564405.976 81.60554483.27480.48672 4509.0480.68398
4534.806 80.50834637.871    80.44663.637      804792.46779.980264818.23379.26336
4921.29877.273244947.064 76.2969 4972.8375.539925050.128 71.90815075.89572.39458
5127.42772.899035178.95974.118045204.72575.012445230.49175.783815282.02377.57259
 5307.7978.626755333.55678.957955359.32279.00637 5436.62      805462.38679.63631
5488.15279.632615565.45178.541555616.98377.701595642.74977.657935694.281 76.7853
5745.813      76 5771.58      765823.112    75.25874.64475.15523 5900.4175.53284
6029.24175.499626055.00775.873626080.77375.870016158.07174.931956183.83775.17628
```

```
6209.604 74.8636 6235.3774.645266286.90273.741716312.668 74.08046389.96672.78018
6441.49972.777766467.265  73.1446544.56373.104426570.32973.803636596.09574.15789
 6699.1676.443826853.75677.905626982.58771.899937034.119 66.18117111.417    54.6
7137.184    54.67188.716 70.60027240.24871.177787266.01471.20839 7291.7871.57359
7343.313 71.63487369.07973.082287394.84574.249547420.61174.334537497.90977.83633
7523.67577.748057549.44178.180797600.97478.00423 7626.7477.915967652.50677.47325
7678.272 75.63167704.038 75.70997729.80473.86824 7755.5772.026587781.33666.18601
7807.10360.345447832.86956.424837858.635 53.86767884.40151.310367910.16747.93044
7935.93344.550527961.69939.807227987.46536.427298013.23134.559948038.99834.26627
8064.764 33.9726 8090.5333.678938116.29630.509328142.06230.215658167.82830.17575
8193.59430.135858219.35930.095958245.12529.673368270.89129.633468296.65630.01199
8322.42230.405648348.188 30.79938373.95330.795138399.71931.188798425.48431.18562
 8451.2531.182468477.016 31.93668502.78131.535618528.54732.289758554.31332.69385
8580.07833.097958605.84433.502048631.60933.083778657.37532.332758683.14131.32268
8708.90630.312618734.67229.302558760.43828.292488786.20326.949668811.96928.77673
8837.734 30.6038  8863.532.430888889.26634.257958915.03136.406228940.79737.30036
8966.56341.624988992.32845.949619018.09450.274239043.85954.598869069.62558.30783
9095.39165.126099121.15667.197399146.92269.268699172.68871.339999198.45369.37248
9249.98462.162129301.51657.408159327.281 57.37229404.57856.03594    9688      56
9739.53156.869779816.82861.623949868.359 64.06369894.12564.133589945.65661.37186
9997.18864.4740110022.9567.4759310048.72  69.02710074.4872.8204310126.0272.08746
10151.7870.9294710203.31 70.196510280.6170.1248910306.3869.6671310332.1469.64326
10357.9169.3361610409.44 70.1053 10435.269.3643210460.9769.74889 10512.571.20804
10538.2770.6058210564.0370.2098410667.0967.7580310692.8666.7199910718.6366.30971
10821.6965.7460710847.45 66.232910950.5267.6465810976.2868.5988311002.05    68.4
11105.1171.5264111130.8871.9448111156.6472.7448111233.94    72.8 11259.773.17535
11362.7773.1260311388.5373.5072411465.8373.5248511749.25      7811878.08      78
12006.91      8012109.9778.5416312264.56 76.057612341.8674.5762612367.6374.20959
12419.1673.2023312470.6971.8459212496.4571.4595512522.2270.7813512573.7570.11861
12599.5269.9554612625.2869.9159212651.0569.7527712754.1170.1666112779.8870.39195
12882.9471.58505 12908.7      7213011.7772.1177813037.5372.51778 13063.372.51778
13166.36      7413295.19      7413372.4873.8832913424.0273.3685513449.7873.17673
13527.0871.9458813552.8471.5000513578.6171.5788313604.3871.9116313681.6772.14796
13707.4472.11837 13733.272.48878 13810.5    72.413836.27      7213862.03      72
13939.3371.8183513965.09 72.1525

Manning's n Values        num=       3
     Sta    n Val      Sta   n Val      Sta   n Val
       0     .046853.756     .067497.909     .04

Bank Sta: Left   Right    Lengths: Left Channel    Right      Coeff Contr.   Expan.
      6853.7567497.909             3166    4770     6283              .1       .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              67.27    Element                 Left OB    Channel    Right OB
  Vel Head (ft)                0.04    Wt. n-Val.                           0.060       0.040
  W.S. Elev (ft)              67.23    Reach Len. (ft)         3166.00    4770.00     6283.00
  Crit W.S. (ft)                       Flow Area (sq ft)                  1116.28    46941.98
  E.G. Slope (ft/ft)       0.000023    Area (sq ft)                       1116.28    46941.98
  Q Total (cfs)            74500.00    Flow (cfs)                          497.37    74002.63
  Top Width (ft)            2545.36    Top Width (ft)                      153.22     2392.14
```

```
  Vel Total (ft/s)          1.55   Avg. Vel. (ft/s)                      0.45        1.58
  Max Chl Dpth (ft)        40.28   Hydr. Depth (ft)                      7.29       19.62
  Conv. Total (cfs)   15372820.0     Conv. (cfs)                     102630.3  15270190.0
  Length Wtd. (ft)       6205.39   Wetted Per. (ft)                    156.06     2399.19
  Min Ch El (ft)           54.60   Shear (lb/sq ft)                      0.01        0.03
  Alpha                     1.03   Stream Power (lb/ft s)                0.00        0.05
  Frctn Loss (ft)           0.33   Cum Volume (acre-ft)   13068.12    3018.13    36773.75
  C & E Loss (ft)           0.00   Cum SA (acres)          2564.10     437.91     6297.44
```

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1 RS: 45050

INPUT

```
Description: 30075  35000  4500
Station Elevation Data    num=     179
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0     73105.227672.94413131.534572.54413157.841472.33295184.148371.93295
236.762171.40385 263.06971.21101315.682771.45314341.989671.38141368.296571.50247
499.8309    73.6526.1378    73.6578.7516      74894.4342       741289.037       76
1446.879      761473.186   75.921578.41375.333341762.56174.444441815.175   74.25
1841.48274.088891867.789      74 3972.3473.970334103.87572.022244130.18272.01482
4288.02469.507294314.33269.47639 4419.5668.021894445.86768.493844472.17468.52225
4498.48168.084164577.40368.169364656.32469.248734682.63168.878394708.93869.23817
4735.24669.141854840.47467.079994866.78166.001794893.08865.23457 4972.0162.17543
5024.62462.175435050.93162.116955103.545     62.85182.467       645366.617       64
5498.15264.536355629.688 65.91375655.995 65.91375734.91766.929065761.22466.95063
5787.53164.366975813.83861.783315840.14558.666435866.45255.549555892.75952.43268
5919.06655.136655945.37458.056965971.68160.760945997.98863.672016024.29566.58308
6050.60266.740476076.90966.897876103.21667.055266129.52367.221896155.831 67.3866
6287.366      646418.902      646760.89563.290677234.42362.208697313.344       62
7523.801      627576.416   61.867707.95161.333337760.565   61.197786.87361.06667
 7813.18      617839.487   60.88 7997.33 60.39138023.637   60.248049.94460.15556
8076.251      608891.759      608918.06559.918658996.98558.718659023.292     58.4
9049.599      5810733.22      5810759.5358.0324610891.0659.5197810969.9859.80791
10996.2959.13144 11022.659.22748 11048.9      6011233.05      6011259.3659.86666
11285.66   59.6411311.9759.3333311338.28  59.12511390.8958.89336 11417.258.70502
 11443.558.5867111469.8158.3755711496.1258.1066211522.4259.4481711548.7359.48371
11653.9668.5914211680.2670.0265611706.5769.3422911732.8868.19379 11811.866.14098
11890.7266.0349211917.0265.2727211943.3365.2373711969.6465.5713712074.8666.19612
12101.1767.2470912127.4868.84709 12206.4      7212285.32      7212337.9371.81361
12416.8570.6136212443.1670.3068112469.4669.7402612574.6969.74026   12601     69.6
 12627.3    69.612785.14    67.212811.4566.8686212864.0666.0686312890.37     65.6
12969.2965.9105512995.5965.5105513048.2167.1105513127.13      6813206.0569.20832
13258.6670.8083213337.58      7213521.7371.8693913653.26      7013679.57 69.8171
```

```
13705.87 69.817113784.79 69.2684 13811.1 68.868413916.33      6813995.25      68
14021.5568.2730714047.86    68.414074.17   68.3514126.78    68.514153.09     68.5
14179.3968.58334 14205.768.5714314232.01  68.67514258.31 68.562514284.6268.55556
14363.5468.7090914389.85    68.714416.15   68.7514442.46  68.62514468.77   68.64
14495.0768.8424114521.3868.8175414573.9967.6636514705.53      6814837.06      68
14889.6767.8653114942.2967.8653114968.5967.7979715047.51      6815626.26      68
15757.79       7015889.33        7015968.25     71.216020.8671.5717616047.1771.57176
16073.4771.7858816126.0871.7858816152.39       7216704.83      72

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .045761.224      .066155.831      .04

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
      5761.2246155.831               2902     5389    6335                .1        .3
Ineffective Flow      num=       1
   Sta L    Sta R     Elev  Permanent
    797016704.83      55        T

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)            66.94   Element                    Left OB    Channel    Right OB
  Vel Head (ft)              0.05   Wt. n-Val.                  0.040      0.060      0.040
  W.S. Elev (ft)            66.89   Reach Len. (ft)             10.00      10.00      10.00
  Crit W.S. (ft)            61.12   Flow Area (sq ft)         2334.33    1894.19   37079.17
  E.G. Slope (ft/ft)     0.000208   Area (sq ft)              2334.33    1894.19   37079.17
  Q Total (cfs)          74500.00   Flow (cfs)                2383.57    2235.49   69880.94
  Top Width (ft)          7199.94   Top Width (ft)             886.73     313.68    5999.52
  Vel Total (ft/s)           1.80   Avg. Vel. (ft/s)             1.02       1.18       1.88
  Max Chl Dpth (ft)         14.46   Hydr. Depth (ft)             2.63       6.04       6.18
  Conv. Total (cfs)     5166958.0    Conv. (cfs)             165312.7   155042.8  4846603.0
  Length Wtd. (ft)          10.00   Wetted Per. (ft)           886.85     315.24    6000.04
  Min Ch El (ft)            52.43   Shear (lb/sq ft)             0.03       0.08       0.08
  Alpha                      1.05   Stream Power (lb/ft s)       0.03       0.09       0.15
  Frctn Loss (ft)            0.00   Cum Volume (acre-ft)     12983.29    2853.30   30714.24
  C & E Loss (ft)            0.00   Cum SA (acres)            2531.88     412.34    5692.25

Warning: Divided flow computed for this cross-section.

BRIDGE


RIVER: Cosumnes
REACH: 1                   RS: 45025

INPUT
Description:
Distance from Upstream XS =      10
Deck/Roadway Width        =      30
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
```

```
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      76      69   16000      76      69

Upstream Bridge Cross Section Data
Station Elevation Data    num=     179
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     73105.227672.94413131.534572.54413157.841472.33295184.148371.93295
236.762171.40385 263.06971.21101315.682771.45314341.989671.38141368.296571.50247
499.8309    73.6526.1378    73.6578.7516      74894.4342      741289.037      76
1446.879     761473.186   75.921578.41375.333341762.56174.444441815.175   74.25
1841.48274.088891867.789      74 3972.3473.970334103.87572.022244130.18272.01482
4288.02469.507294314.33269.47639 4419.5668.021894445.86768.493844472.17468.52225
4498.48168.084164577.40368.169364656.32469.248734682.63168.878394708.93869.23817
4735.24669.141854840.47467.079994866.78166.001794893.08865.23457 4972.0162.17543
5024.62462.175435050.93162.116955103.545    62.85182.467      645366.617      64
5498.15264.536355629.688 65.91375655.995 65.91375734.91766.929065761.22466.95063
5787.53164.366975813.83861.783315840.14558.666435866.45255.549555892.75952.43268
5919.06655.136655945.37458.056965971.68160.760945997.98863.672016024.29566.58308
6050.60266.740476076.90966.897876103.21667.055266129.52367.221896155.831 67.3866
6287.366     646418.902      646760.89563.290677234.42362.208697313.344      62
7523.801     627576.416   61.867707.95161.333337760.565   61.197786.87361.06667
 7813.18     617839.487   60.88 7997.33 60.39138023.637   60.248049.94460.15556
8076.251     608891.759      608918.06559.918658996.98558.718659023.292    58.4
9049.599     5810733.22      5810759.5358.0324610891.0659.5197810969.9859.80791
10996.2959.13144 11022.659.22748 11048.9      6011233.05      6011259.3659.86666
11285.66   59.6411311.9759.3333311338.28  59.12511390.8958.89336 11417.258.70502
 11443.558.5867111469.8158.3755711496.1258.1066211522.4259.4481711548.7359.48371
11653.9668.5914211680.2670.0265611706.5769.3422911732.8868.19379 11811.866.14098
11890.7266.0349211917.0265.2727211943.3365.2373711969.6465.5713712074.8666.19612
12101.1767.2470912127.4868.84709 12206.4      7212285.32      7212337.9371.81361
12416.8570.6136212443.1670.3068112469.4669.7402612574.6969.74026   12601    69.6
 12627.3   69.612785.14    67.212811.4566.8686212864.0666.0686312890.37    65.6
12969.2965.9105512995.5965.5105513048.2167.1105513127.13      6813206.0569.20832
13258.6670.8083213337.58      7213521.7371.8693913653.26      7013679.57 69.8171
13705.87 69.817113784.79 69.2684 13811.1 68.868413916.33      6813995.25      68
14021.5568.2730714047.86    68.414074.17   68.3514126.78   68.514153.09    68.5
14179.3968.58334 14205.768.5714314232.01  68.67514258.31 68.562514284.6268.55556
14363.5468.7090914389.85    68.714416.15   68.7514442.46  68.62514468.77   68.64
14495.0768.8424114521.3868.8175414573.9967.6636514705.53      6814837.06      68
14889.6767.8653114942.2967.8653114968.5967.7979715047.51      6815626.26      68
15757.79      7015889.33      7015968.25    71.216020.8671.5717616047.1771.57176
16073.4771.7858816126.0871.7858816152.39      7216704.83      72

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045761.224     .066155.831     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      5761.2246155.831            .1       .3
Ineffective Flow     num=        1
   Sta L    Sta R     Elev  Permanent
```

```
    797016704.83      55       T

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      76      69   16000      76      69

Downstream Bridge Cross Section Data
Station Elevation Data     num=     179
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
       0      73105.227672.94413131.534572.54413157.841472.33295184.148371.93295
236.762171.40385 263.06971.21101315.682771.45314341.989671.38141368.296571.50247
499.8309    73.6526.1378    73.6578.7516       74894.4342       741289.037       76
1446.879      761473.186   75.921578.41375.333341762.56174.444441815.175   74.25
1841.48274.088891867.789      74 3972.3473.970334103.87572.022244130.18272.01482
4288.02469.507294314.33269.47639 4419.5668.021894445.86768.493844472.17468.52225
4498.48168.084164577.40368.169364656.32469.248734682.63168.878394708.93869.23817
4735.24669.141854840.47467.079994866.78166.001794893.08865.23457 4972.0162.17543
5024.62462.175435050.93162.116955103.545    62.85182.467      645366.617      64
5498.15264.536355629.688 65.91375655.995 65.91375734.91766.929065761.22466.95063
5787.53164.366975813.83861.783315840.14558.666435866.45255.549555892.75952.43268
5919.06655.136655945.37458.056965971.68160.760945997.98863.672016024.29566.58308
6050.60266.740476076.90966.897876103.21667.055266129.52367.221896155.831 67.3866
6287.366      646418.902      646760.89563.290677234.42362.208697313.344      62
7523.801      627576.416   61.867707.95161.333337760.565   61.197786.87361.06667
 7813.18      617839.487   60.88 7997.33 60.39138023.637   60.248049.94460.15556
8076.251      608891.759      608918.06559.918658996.98558.718659023.292    58.4
9049.599      5810733.22      5810759.5358.0324610891.0659.5197810969.9859.80791
10996.2959.13144 11022.659.22748 11048.9       6011233.05       6011259.3659.86666
11285.66   59.6411311.9759.3333311338.28  59.12511390.8958.89336 11417.258.70502
 11443.558.5867111469.8158.3755711496.1258.1066211522.4259.4481711548.7359.48371
11653.9668.5914211680.2670.0265611706.5769.3422911732.8868.19379 11811.866.14098
11890.7266.0349211917.0265.2727211943.3365.2373711969.6465.5713712074.8666.19612
12101.1767.2470912127.4868.84709 12206.4       7212285.32       7212337.9371.81361
12416.8570.6136212443.1670.3068112469.4669.7402612574.6969.74026   12601    69.6
 12627.3    69.612785.14     67.212811.4566.8686212864.0666.0686312890.37    65.6
12969.2965.9105512995.5965.5105513048.2167.1105513127.13       6813206.0569.20832
13258.6670.8083213337.58      7213521.7371.8693913653.26       7013679.57 69.8171
13705.87 69.817113784.79 69.2684 13811.1 68.868413916.33       6813995.25      68
14021.5568.2730714047.86    68.414074.17   68.3514126.78    68.514153.09    68.5
14179.3968.58334 14205.768.5714314232.01  68.67514258.31 68.562514284.6268.55556
14363.5468.7090914389.85    68.714416.15   68.7514442.46  68.62514468.77   68.64
14495.0768.8424114521.3868.8175414573.9967.6636514705.53       6814837.06      68
14889.6767.8653114942.2967.8653114968.5967.7979715047.51       6815626.26      68
15757.79      7015889.33      7015968.25    71.216020.8671.5717616047.1771.57176
16073.4771.7858816126.0871.7858816152.39       7216704.83      72

Manning's n Values         num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
       0     .045761.224     .066155.831     .04

Bank Sta: Left    Right     Coeff Contr.    Expan.
```

```
     5761.2246155.831              .1        .3
Ineffective Flow     num=       1
   Sta L   Sta R     Elev  Permanent
    797016704.83      55        T

Upstream Embankment side slope             =       0 horiz. to 1.0 vertical
Downstream Embankment side slope           =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins        =
Energy head used in spillway design        =
Spillway height used in design             =
Weir crest shape                           = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream=    8287    Downstream=    8287
Upstream     num=        2
    Width   Elev    Width   Elev
       5     40       5      69
Downstream     num=        2
    Width   Elev    Width   Elev
       5     40       5      69

Pier Data
Pier Station     Upstream=    8337    Downstream=    8337
Upstream     num=        2
    Width   Elev    Width   Elev
       5     40       5      69
Downstream     num=        2
    Width   Elev    Width   Elev
       5     40       5      69

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #100-year

  E.G. US. (ft)                  66.94    Element                Inside BR US  Inside BR DS
```

W.S. US. (ft)	66.89	E.G. Elev (ft)	66.94	66.93
Q Total (cfs)	74500.00	W.S. Elev (ft)	66.89	66.88
Q Bridge (cfs)	74500.00	Crit W.S. (ft)	61.11	61.11
Q Weir (cfs)		Max Chl Dpth (ft)	14.45	14.45
Weir Sta Lft (ft)		Vel Total (ft/s)	1.81	1.81
Weir Sta Rgt (ft)		Flow Area (sq ft)	41220.97	41177.22
Weir Submerg		Froude # Chl	0.08	0.08
Weir Max Depth (ft)		Specif Force (cu ft)	151745.70	151499.30
Min El Weir Flow (ft)	71.43	Hydr Depth (ft)	5.73	5.73
Min El Prs (ft)	69.00	W.P. Total (ft)	7218.43	7215.33
Delta EG (ft)	1.67	Conv. Total (cfs)	5310855.0	5303143.0
Delta WS (ft)	1.72	Top Width (ft)	7188.68	7185.60
BR Open Area (sq ft)	58946.68	Frctn Loss (ft)	0.01	1.66
BR Open Vel (ft/s)	1.81	C & E Loss (ft)	0.00	0.00
Coef of Q		Shear Total (lb/sq ft)	0.07	0.07
Br Sel Method	Energy only	Power Total (lb/ft s)	0.13	0.13

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1 RS: 45000

INPUT
Description: 30075 35000 4500
Station Elevation Data num= 179

```
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      73105.227672.94413131.534572.54413157.841472.33295184.148371.93295
236.762171.40385 263.06971.21101315.682771.45314341.989671.38141368.296571.50247
499.8309     73.6526.1378     73.6578.7516      74894.4342      741289.037      76
1446.879      761473.186    75.921578.41375.333341762.56174.444441815.175   74.25
1841.48274.088891867.789      74 3972.3473.970334103.87572.022244130.18272.01482
4288.02469.507294314.33269.47639 4419.5668.021894445.86768.493844472.17468.52225
4498.48168.084164577.40368.169364656.32469.248734682.63168.878394708.93869.23817
4735.24669.141854840.47467.079994866.78166.001794893.08865.23457 4972.0162.17543
5024.62462.175435050.93162.116955103.545     62.85182.467      645366.617      64
5498.15264.536355629.688 65.91375655.995 65.91375734.91766.929065761.22466.95063
5787.53164.366975813.83861.783315840.14558.666435866.45255.549555892.75952.43268
5919.06655.136655945.37458.056965971.68160.760945997.98863.672016024.29566.58308
6050.60266.740476076.90966.897876103.21667.055266129.52367.221896155.831 67.3866
6287.366      646418.902      646760.89563.290677234.42362.208697313.344      62
7523.801      627576.416    61.867707.95161.333337760.565    61.197786.87361.06667
 7813.18      617839.487    60.88 7997.33 60.39138023.637    60.248049.94460.15556
8076.251      608891.759      608918.06559.918658996.98558.718659023.292    58.4
9049.599      5810733.22      5810759.5358.0324610891.0659.5197810969.9859.80791
10996.2959.13144 11022.659.22748 11048.9      6011233.05      6011259.3659.86666
```

```
11285.66   59.6411311.9759.3333311338.28  59.12511390.8958.89336 11417.258.70502
 11443.558.5867111469.8158.3755711496.1258.1066211522.4259.4481711548.7359.48371
11653.9668.5914211680.2670.0265611706.5769.3422911732.8868.19379 11811.866.14098
11890.7266.0349211917.0265.2727211943.3365.2373711969.6465.5713712074.8666.19612
12101.1767.2470912127.4868.84709 12206.4      7212285.32      7212337.9371.81361
12416.8570.6136212443.1670.3068112469.4669.7402612574.6969.74026   12601    69.6
 12627.3    69.612785.14    67.212811.4566.8686212864.0666.0686312890.37    65.6
12969.2965.9105512995.5965.5105513048.2167.1105513127.13      6813206.0569.20832
13258.6670.8083213337.58      7213521.7371.8693913653.26      7013679.57 69.8171
13705.87 69.817113784.79 69.2684 13811.1 68.868413916.33      6813995.25      68
14021.5568.2730714047.86    68.414074.17   68.3514126.78    68.514153.09    68.5
14179.3968.58334 14205.768.5714314232.01  68.67514258.31 68.562514284.6268.55556
14363.5468.7090914389.85    68.714416.15   68.7514442.46  68.62514468.77   68.64
14495.0768.8424114521.3868.8175414573.9967.6636514705.53      6814837.06      68
14889.6767.8653114942.2967.8653114968.5967.7979715047.51      6815626.26      68
15757.79      7015889.33      7015968.25   71.216020.8671.5717616047.1771.57176
16073.4771.7858816126.0871.7858816152.39      7216704.83      72

Manning's n Values        num=       3
     Sta    n Val     Sta   n Val     Sta    n Val
       0     .045761.224     .066155.831     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      5761.2246155.831             2902    5389    6335             .1       .3
Ineffective Flow       num=       1
   Sta L    Sta R    Elev  Permanent
    797016704.83      55       T

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             65.27   Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.10   Wt. n-Val.                  0.040      0.060      0.040
  W.S. Elev (ft)             65.17   Reach Len. (ft)           2902.00    5389.00    6335.00
  Crit W.S. (ft)                     Flow Area (sq ft)          987.35    1458.75   27255.54
  E.G. Slope (ft/ft)      0.000556   Area (sq ft)               987.35    1458.75   27255.54
  Q Total (cfs)           74500.00   Flow (cfs)                1126.93    2889.11   70483.96
  Top Width (ft)           6268.29   Top Width (ft)             663.72     232.14    5372.43
  Vel Total (ft/s)            2.51   Avg. Vel. (ft/s)             1.14       1.98       2.59
  Max Chl Dpth (ft)          12.74   Hydr. Depth (ft)             1.49       6.28       5.07
  Conv. Total (cfs)      3159560.0    Conv. (cfs)               47793.2   122527.8  2989239.0
  Length Wtd. (ft)         6250.76   Wetted Per. (ft)           663.80     233.54    5372.78
  Min Ch El (ft)             52.43   Shear (lb/sq ft)             0.05       0.22       0.18
  Alpha                       1.03   Stream Power (lb/ft s)       0.06       0.43       0.46
  Frctn Loss (ft)             2.15   Cum Volume (acre-ft)     12777.67    2645.86   26737.62
  C & E Loss (ft)             0.01   Cum SA (acres)            2435.92     378.64    4989.26

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
```

CROSS SECTION

RIVER: Cosumnes
REACH: 1 RS: 40050

INPUT
Description: 24686 30000 4000
Station Elevation Data num= 337

```
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      7222.57616      7245.1523371.8213567.7284971.8213590.3046671.49821
112.880871.35371 135.45771.03056158.033171.03056180.609370.70742203.185570.98335
225.761770.93614248.337871.21207 270.91471.14389293.490271.41982316.066371.46703
338.642571.85836 406.371      72519.2519       72 790.166     70.4812.742170.53333
835.3183     70.4857.8945      70993.3515       701015.928     70.21038.504     70.2
 1061.08     70.41106.232     70.41128.808     70.21151.385     70.21173.961       70
1422.299       70 1535.18       72 1648.06       721760.941       701873.82268.85117
1986.703       682099.58468.008072212.46569.991872235.041       702257.617     70.1
2280.193     70.32302.769     70.42325.345     70.62347.922     70.72393.07471.06667
2551.107       722663.988       722754.293     70.42776.869     70.22799.445     70.2
2822.021       702980.054       703002.631     70.43025.207     70.63047.783       71
3070.359     71.23115.511       723363.849       723386.426     72.43409.002     72.4
3431.578     72.83454.154     72.8 3476.7373.018163499.30672.836313521.88373.05447
3544.45972.872633567.03573.090783589.61172.814243612.18772.196083634.76371.91954
 3657.3471.301383679.91671.024843702.49270.283233725.06869.883223747.64469.14162
 3770.2268.741623792.797       683815.37367.838243837.94967.838243860.52567.67648
3883.10167.676483905.67767.514723928.25467.27648 3950.8366.876483973.40666.63824
3995.98266.238244018.558       664131.439       66 4244.3264.238724289.47264.93057
4312.04864.882834334.62565.228754357.20165.181014379.77765.581014402.35365.58734
4424.92965.987344447.50565.993674470.08266.373314492.65866.386544515.23466.77308
 4537.8166.776424560.38667.162964582.96267.166314605.53967.501464628.11567.45341
4650.69167.788574673.26767.740524695.84367.361444718.41966.595854763.57264.40259
4786.14863.662294808.72462.56566  4831.362.318554853.876 61.71514876.45361.46798
4899.02961.749064921.60561.501944944.18162.039424966.757 62.04874989.33362.58618
 5011.9162.397345034.48662.934815057.06262.602595079.63862.996675102.21462.66445
5124.79162.085165147.367       625169.943     61.25192.519     60.85215.095     60.5
5260.24860.533335282.82460.66667  5305.460.666675327.976     60.85350.552     60.8
5373.12860.933335395.70560.933335418.28161.066675440.85761.066675463.433     61.2
5486.009     61.25508.58561.333335531.16261.333335553.73861.466675576.31461.33333
 5598.89     61.45621.46661.799355644.04262.398715666.61962.507245711.77162.54266
5734.34758.539525756.92357.41345  5779.553.410325802.07652.284245824.65248.28111
5847.22851.688665869.80452.21913 5892.3855.626685914.95756.157165937.533 59.5647
5960.10959.835495982.685 60.61276005.26160.372936027.83760.370186050.41460.25167
 6072.9960.370186095.56660.251676118.14259.422116140.71859.066586163.294       58
 6366.48       586682.54657.244456727.69957.113046998.61356.453337179.222       56
9888.362       569956.09157.587999978.66757.8012110001.2458.3305410023.8258.42644
10114.1257.5308910159.2856.8070410204.4356.47253   1022756.1380210249.58 55.6272
10294.73      5510317.31     54.910339.89     54.910407.61     54.610430.19     54.6
10475.34     54.4 10520.554.2370410565.6554.2441910588.22 54.1729 10610.853.97951
10633.3853.9082210655.9553.7148310678.5353.64354 10701.153.3483710723.6852.71812
10746.2652.4229610768.8351.7927110791.4151.4975410813.99 51.655310836.5652.14813
```

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10859.1452.3058910881.7152.7987310904.2952.9564810926.8753.2892210972.02 54.3721
10994.5954.7048311017.1755.1135311039.7555.3135311062.3255.45677 11084.955.65677
11107.48    55.811130.05      5611152.6356.80345 11175.256.8073411197.7857.61079
11220.3657.6146911242.9358.4181411265.5158.8146911288.0860.0107911310.6660.40734
11333.2461.6034511355.81      6211378.39 62.250511400.97 62.250511446.1262.75151
11468.6962.7515111491.2763.1515111513.8563.3010111536.4263.7010111581.58      64
11626.7365.25749 11649.365.2574911671.8865.8862311694.4665.8862311717.0366.48372
11739.6166.4524611762.1867.0499511784.7667.0186911807.3467.3868311829.91 66.9115
11852.4966.8355611875.0766.6380811920.2266.4862111942.7966.3646611965.3766.36466
11987.95 66.243112010.5266.18432 12033.166.0627712055.6766.0627712078.25      66
12484.62      6612529.77     65.212552.35    64.9612574.93    64.8 12597.564.53333
12620.08    64.512665.23      6412687.8164.1546212710.3864.2319312732.9664.18346
12755.5464.0576612823.2664.0288312845.8464.0612112868.42    64.412890.9964.46121
12913.57    64.812936.1564.8612112958.72    65.2 12981.365.2612213003.87    65.6
13026.4565.6612113049.03      66 13071.665.6699113094.1865.2699113116.7564.93983
13139.3364.5398313161.9164.2097513184.4864.1923513207.0664.2448713229.6464.22747
13252.2164.2799913274.79 64.262613297.3664.4731613342.5264.6166113365.0964.82716
13387.6764.8988913410.2565.1508513432.8265.26397 13455.465.5159313477.9765.62905
13500.5565.8810113523.1365.84346 13545.765.8672613568.2865.8297113590.8565.85351
13613.4365.8159613636.01 65.846513658.5865.8156913681.1665.8462313703.7465.81542
13726.3165.8459613748.8965.8270613771.4665.8767713816.6265.8389513839.1965.88867
13861.7765.8697613884.3465.9194813906.9265.9005713952.07      6614629.36      66
14697.0964.9304714719.6664.9304714764.8264.1739514855.12      6415080.88      64
15126.0364.7051815171.1965.8419815238.9265.82223 15351.865.4170415374.3765.42889
15464.68     65.115532.4164.9866615554.9865.0222215577.5664.9777815600.1365.02857
15622.7164.9857215645.29      6515667.8664.9333315690.44   64.9515713.01  64.875
15735.5964.7466715780.7464.35555

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .045711.771     .065982.685     .04

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
      5711.7715982.685               5191    5120     3182                .1        .3
Ineffective Flow      num=        1
   Sta L    Sta R     Elev  Permanent
    771015780.74       55        T

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             63.10    Element                 Left OB    Channel    Right OB
  Vel Head (ft)               0.06    Wt. n-Val.               0.040      0.060      0.040
  W.S. Elev (ft)             63.04    Reach Len. (ft)          10.00      10.00      10.00
  Crit W.S. (ft)             57.91    Flow Area (sq ft)      1291.62    2030.20   35718.14
  E.G. Slope (ft/ft)      0.000234    Area (sq ft)           1291.62    2030.20   36650.52
  Q Total (cfs)           74500.00    Flow (cfs)              925.17    2932.22   70642.61
  Top Width (ft)           6686.31    Top Width (ft)          912.89     270.91    5502.50
  Vel Total (ft/s)            1.91    Avg. Vel. (ft/s)          0.72       1.44       1.98
  Max Chl Dpth (ft)          14.76    Hydr. Depth (ft)          1.41       7.49       6.49
  Conv. Total (cfs)      4869125.0     Conv. (cfs)           60467.0   191642.1  4617016.0
  Length Wtd. (ft)           10.00    Wetted Per. (ft)        912.99     272.82    5502.79
  Min Ch El (ft)             48.28    Shear (lb/sq ft)          0.02       0.11       0.09
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  Alpha                          1.04    Stream Power (lb/ft s)     0.01        0.16        0.19
  Frctn Loss (ft)                0.00    Cum Volume (acre-ft)   12701.76     2430.04    22090.64
  C & E Loss (ft)                0.00    Cum SA (acres)          2383.41      347.52     4198.48
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BRIDGE

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RIVER: Cosumnes
REACH: 1                  RS: 40025

INPUT
Description:
Distance from Upstream XS =      10
Deck/Roadway Width        =      30
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0      70      64   16000      70      64

Upstream Bridge Cross Section Data
Station Elevation Data     num=      337
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      7222.57616       7245.1523371.8213567.7284971.8213590.3046671.49821
112.880871.35371 135.45771.03056158.033171.03056180.609370.70742203.185570.98335
225.761770.93614248.337871.21207 270.91471.14389293.490271.41982316.066371.46703
338.642571.85836 406.371       72519.2519       72 790.166     70.4812.742170.53333
835.3183     70.4857.8945       70993.3515       701015.928     70.21038.504     70.2
 1061.08     70.41106.232     70.41128.808     70.21151.385     70.21173.961       70
1422.299       70 1535.18       72 1648.06       721760.941       701873.82268.85117
1986.703       682099.58468.008072212.46569.991872235.041       702257.617     70.1
2280.193     70.32302.769     70.42325.345     70.62347.922     70.72393.07471.06667
2551.107       722663.988       722754.293     70.42776.869     70.22799.445     70.2
2822.021       702980.054       703002.631     70.43025.207     70.63047.783       71
3070.359     71.23115.511       723363.849       723386.426     72.43409.002     72.4
3431.578     72.83454.154     72.8 3476.7373.018163499.30672.836313521.88373.05447
3544.45972.872633567.03573.090783589.61172.814243612.18772.196083634.76371.91954
 3657.3471.301383679.91671.024843702.49270.283233725.06869.883223747.64469.14162
 3770.2268.741623792.797       683815.37367.838243837.94967.838243860.52567.67648
3883.10167.676483905.67767.514723928.25467.27648 3950.8366.876483973.40666.63824
3995.98266.238244018.558       664131.439       66 4244.3264.238724289.47264.93057
4312.04864.882834334.62565.228754357.20165.181014379.77765.581014402.35365.58734
4424.92965.987344447.50565.993674470.08266.373314492.65866.386544515.23466.77308
 4537.8166.776424560.38667.162964582.96267.166314605.53967.501464628.11567.45341
4650.69167.788574673.26767.740524695.84367.361444718.41966.595854763.57264.40259
4786.14863.662294808.72462.56566  4831.362.318554853.876 61.71514876.45361.46798
4899.02961.749064921.60561.501944944.18162.039424966.757 62.04874989.33362.58618
 5011.9162.397345034.48662.934815057.06262.602595079.63862.996675102.21462.66445
5124.79162.085165147.367       625169.943     61.25192.519     60.85215.095     60.5
5260.24860.533335282.82460.66667  5305.460.666675327.976     60.85350.552     60.8
5373.12860.933335395.70560.933335418.28161.066675440.85761.066675463.433     61.2
```

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5486.009    61.25508.58561.333335531.16261.333335553.73861.466675576.31461.33333
 5598.89    61.45621.46661.799355644.04262.398715666.61962.507245711.77162.54266
5734.34758.539525756.92357.41345  5779.553.410325802.07652.284245824.65248.28111
5847.22851.688665869.80452.21913 5892.3855.626685914.95756.157165937.533 59.5647
5960.10959.835495982.685 60.61276005.26160.372936027.83760.370186050.41460.25167
 6072.9960.370186095.56660.251676118.14259.422116140.71859.066586163.294      58
 6366.48       586682.54657.244456727.69957.113046998.61356.453337179.222      56
9888.362       569956.09157.587999978.66757.8012110001.2458.3305410023.8258.42644
10114.1257.5308910159.2856.8070410204.4356.47253   1022756.1380210249.58 55.6272
10294.73        5510317.31    54.910339.89    54.910407.61    54.610430.19    54.6
10475.34    54.4 10520.554.2370410565.6554.2441910588.22 54.1729 10610.853.97951
10633.3853.9082210655.9553.7148310678.5353.64354 10701.153.3483710723.6852.71812
10746.2652.4229610768.8351.7927110791.4151.4975410813.99 51.655310836.5652.14813
10859.1452.3058910881.7152.7987310904.2952.9564810926.8753.2892210972.02 54.3721
10994.5954.7048311017.1755.1135311039.7555.3135311062.3255.45677 11084.955.65677
11107.48    55.811130.05      5611152.6356.80345 11175.256.8073411197.7857.61079
11220.3657.6146911242.9358.4181411265.5158.8146911288.0860.0107911310.6660.40734
11333.2461.6034511355.81       6211378.39 62.250511400.97 62.250511446.1262.75151
11468.6962.7515111491.2763.1515111513.8563.3010111536.4263.7010111581.58      64
11626.7365.25749 11649.365.2574911671.8865.8862311694.4665.8862311717.0366.48372
11739.6166.4524611762.1867.0499511784.7667.0186911807.3467.3868311829.91 66.9115
11852.4966.8355611875.0766.6380811920.2266.4862111942.7966.3646611965.3766.36466
11987.95 66.243112010.5266.18432 12033.166.0627712055.6766.0627712078.25      66
12484.62      6612529.77     65.212552.35    64.9612574.93     64.8 12597.564.53333
12620.08    64.512665.23       6412687.8164.1546212710.3864.2319312732.9664.18346
12755.5464.0576612823.2664.0288312845.8464.0612112868.42     64.412890.9964.46121
12913.57    64.812936.1564.8612112958.72    65.2 12981.365.2612213003.87     65.6
13026.4565.6612113049.03       66 13071.665.6699113094.1865.2699113116.7564.93983
13139.3364.5398313161.9164.2097513184.4864.1923513207.0664.2448713229.6464.22747
13252.2164.2799913274.79 64.262613297.3664.4731613342.5264.6166113365.0964.82716
13387.6764.8988913410.2565.1508513432.8265.26397 13455.465.5159313477.9765.62905
13500.5565.8810113523.1365.84346 13545.765.8672613568.2865.8297113590.8565.85351
13613.4365.8159613636.01 65.846513658.5865.8156913681.1665.8462313703.7465.81542
13726.3165.8459613748.8965.8270613771.4665.8767713816.6265.8389513839.1965.88867
13861.7765.8697613884.3465.9194813906.9265.9005713952.07       6614629.36      66
14697.0964.9304714719.6664.9304714764.8264.1739514855.12       6415080.88      64
15126.0364.7051815171.1965.8419815238.9265.82223 15351.865.4170415374.3765.42889
15464.68    65.115532.4164.9866615554.9865.0222215577.5664.9777815600.1365.02857
15622.7164.9857215645.29       6515667.8664.9333315690.44   64.9515713.01  64.875
15735.5964.7466715780.7464.35555

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
       0     .045711.771     .065982.685     .04

Bank Sta: Left    Right    Coeff Contr.   Expan.
      5711.7715982.685            .1        .3
Ineffective Flow      num=       1
   Sta L    Sta R     Elev  Permanent
    771015780.74      55        T

Downstream  Deck/Roadway Coordinates
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```
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0      70      64   16000      70      64

Downstream Bridge Cross Section Data
Station Elevation Data    num=      337
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      7222.57616       7245.1523371.8213567.7284971.8213590.3046671.49821
112.880871.35371 135.45771.03056158.033171.03056180.609370.70742203.185570.98335
225.761770.93614248.337871.21207 270.91471.14389293.490271.41982316.066371.46703
338.642571.85836 406.371       72519.2519       72 790.166     70.4812.742170.53333
835.3183     70.4857.8945       70993.3515       701015.928     70.21038.504     70.2
 1061.08     70.41106.232     70.41128.808     70.21151.385     70.21173.961       70
1422.299       70 1535.18       72 1648.06        721760.941        701873.82268.85117
1986.703       682099.58468.008072212.46569.991872235.041        702257.617     70.1
2280.193     70.32302.769     70.42325.345     70.62347.922     70.72393.07471.06667
2551.107       722663.988       722754.293     70.42776.869     70.22799.445     70.2
2822.021       702980.054       703002.631     70.43025.207     70.63047.783       71
3070.359     71.23115.511       723363.849       723386.426     72.43409.002     72.4
3431.578     72.83454.154      72.8 3476.7373.018163499.30672.836313521.88373.05447
3544.45972.872633567.03573.090783589.61172.814243612.18772.196083634.76371.91954
 3657.3471.301383679.91671.024843702.49270.283233725.06869.883223747.64469.14162
 3770.2268.741623792.797       683815.37367.838243837.94967.838243860.52567.67648
3883.10167.676483905.67767.514723928.25467.27648 3950.8366.876483973.40666.63824
3995.98266.238244018.558       664131.439       66 4244.3264.238724289.47264.93057
4312.04864.882834334.62565.228754357.20165.181014379.77765.581014402.35365.58734
4424.92965.987344447.50565.993674470.08266.373314492.65866.386544515.23466.77308
 4537.8166.776424560.38667.162964582.96267.166314605.53967.501464628.11567.45341
4650.69167.788574673.26767.740524695.84367.361444718.41966.595854763.57264.40259
4786.14863.662294808.72462.56566  4831.362.318554853.876 61.71514876.45361.46798
4899.02961.749064921.60561.501944944.18162.039424966.757 62.04874989.33362.58618
 5011.9162.397345034.48662.934815057.06262.602595079.63862.996675102.21462.66445
5124.79162.085165147.367       625169.943     61.25192.519     60.85215.095     60.5
5260.24860.533335282.82460.66667  5305.460.666675327.976     60.85350.552     60.8
5373.12860.933335395.70560.933335418.28161.066675440.85761.066675463.433     61.2
5486.009     61.25508.58561.333335531.16261.333335553.73861.466675576.31461.33333
 5598.89     61.45621.46661.799355644.04262.398715666.61962.507245711.77162.54266
5734.34758.539525756.92357.41345  5779.553.410325802.07652.284245824.65248.28111
5847.22851.688665869.80452.21913 5892.3855.626685914.95756.157165937.533 59.5647
5960.10959.835495982.685 60.61276005.26160.372936027.83760.370186050.41460.25167
 6072.9960.370186095.56660.251676118.14259.422116140.71859.066586163.294       58
 6366.48       586682.54657.244456727.69957.113046998.61356.453337179.222       56
9888.362       569956.09157.587999978.66757.8012110001.2458.3305410023.8258.42644
10114.1257.5308910159.2856.8070410204.4356.47253    1022756.1380210249.58 55.6272
10294.73       5510317.31     54.910339.89     54.910407.61     54.610430.19     54.6
10475.34     54.4 10520.554.2370410565.6554.2441910588.22 54.1729 10610.853.97951
10633.3853.9082210655.9553.7148310678.5353.64354 10701.153.3483710723.6852.71812
10746.2652.4229610768.8351.7927110791.4151.4975410813.99 51.655310836.5652.14813
10859.1452.3058910881.7152.7987310904.2952.9564810926.8753.2892210972.02 54.3721
10994.5954.7048311017.1755.1135311039.7555.3135311062.3255.45677 11084.955.65677
11107.48     55.811130.05       5611152.6356.80345 11175.256.8073411197.7857.61079
11220.3657.6146911242.9358.4181411265.5158.8146911288.0860.0107911310.6660.40734
```

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11333.2461.6034511355.81      6211378.39 62.250511400.97 62.250511446.1262.75151
11468.6962.7515111491.2763.1515111513.8563.3010111536.4263.7010111581.58      64
11626.7365.25749 11649.365.2574911671.8865.8862311694.4665.8862311717.0366.48372
11739.6166.4524611762.1867.0499511784.7667.0186911807.3467.3868311829.91 66.9115
11852.4966.8355611875.0766.6380811920.2266.4862111942.7966.3646611965.3766.36466
11987.95 66.243112010.5266.18432 12033.166.0627712055.6766.0627712078.25      66
12484.62      6612529.77     65.212552.35    64.9612574.93    64.8 12597.564.53333
12620.08    64.512665.23      6412687.8164.1546212710.3864.2319312732.9664.18346
12755.5464.0576612823.2664.0288312845.8464.0612112868.42    64.412890.9964.46121
12913.57    64.812936.1564.8612112958.72    65.2 12981.365.2612213003.87    65.6
13026.4565.6612113049.03      66 13071.665.6699113094.1865.2699113116.7564.93983
13139.3364.5398313161.9164.2097513184.4864.1923513207.0664.2448713229.6464.22747
13252.2164.2799913274.79 64.262613297.3664.4731613342.5264.6166113365.0964.82716
13387.6764.8988913410.2565.1508513432.8265.26397 13455.465.5159313477.9765.62905
13500.5565.8810113523.1365.84346 13545.765.8672613568.2865.8297113590.8565.85351
13613.4365.8159613636.01 65.846513658.5865.8156913681.1665.8462313703.7465.81542
13726.3165.8459613748.8965.8270613771.4665.8767713816.6265.8389513839.1965.88867
13861.7765.8697613884.3465.9194813906.9265.9005713952.07      6614629.36      66
14697.0964.9304714719.6664.9304714764.8264.1739514855.12      6415080.88      64
15126.0364.7051815171.1965.8419815238.9265.82223 15351.865.4170415374.3765.42889
15464.68    65.115532.4164.9866615554.9865.0222215577.5664.9777815600.1365.02857
15622.7164.9857215645.29      6515667.8664.9333315690.44   64.9515713.01  64.875
15735.5964.7466715780.7464.35555

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
       0     .045711.771     .065982.685     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      5711.7715982.685             .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
    771015780.74      55        T

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream=     7675    Downstream=     7675
Upstream     num=        2
    Width   Elev    Width   Elev
       5      40       5      64
Downstream     num=        2
    Width   Elev    Width   Elev
       5      40       5      64
```

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Pier Data
Pier Station     Upstream=    7725    Downstream=    7725
Upstream     num=       2
    Width   Elev    Width   Elev
       5     40       5      64
Downstream     num=       2
    Width   Elev    Width   Elev
       5     40       5      64

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line
```

BRIDGE OUTPUT Profile #100-year

E.G. US. (ft)	63.10	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	63.04	E.G. Elev (ft)	63.10	63.09
Q Total (cfs)	74500.00	W.S. Elev (ft)	63.04	63.03
Q Bridge (cfs)	74500.00	Crit W.S. (ft)	57.91	57.91
Q Weir (cfs)		Max Chl Dpth (ft)	14.76	14.75
Weir Sta Lft (ft)		Vel Total (ft/s)	1.91	1.92
Weir Sta Rgt (ft)		Flow Area (sq ft)	38951.92	38902.87
Weir Submerg		Froude # Chl	0.09	0.09
Weir Max Depth (ft)		Specif Force (cu ft)	136927.60	136647.30
Min El Weir Flow (ft)	70.01	Hydr Depth (ft)	5.83	5.83
Min El Prs (ft)	64.00	W.P. Total (ft)	6706.56	6705.96
Delta EG (ft)	2.07	Conv. Total (cfs)	4851037.0	4841813.0
Delta WS (ft)	2.15	Top Width (ft)	6676.10	6675.54
BR Open Area (sq ft)	45404.70	Frctn Loss (ft)	0.01	2.05
BR Open Vel (ft/s)	1.92	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.09	0.09
Br Sel Method	Energy only	Power Total (lb/ft s)	0.16	0.16

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

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CROSS SECTION


RIVER: Cosumnes
REACH: 1                    RS: 40000

INPUT
Description: 24686  30000  4000
Station Elevation Data    num=      337
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0     7222.57616       7245.1523371.8213567.7284971.8213590.3046671.49821
112.880871.35371 135.45771.03056158.033171.03056180.609370.70742203.185570.98335
225.761770.93614248.337871.21207 270.91471.14389293.490271.41982316.066371.46703
338.642571.85836 406.371      72519.2519       72 790.166     70.4812.742170.53333
835.3183     70.4857.8945       70993.3515       701015.928     70.21038.504     70.2
 1061.08     70.41106.232     70.41128.808     70.21151.385     70.21173.961       70
1422.299       70 1535.18       72 1648.06       721760.941        701873.82268.85117
1986.703       682099.58468.008072212.46569.991872235.041        702257.617     70.1
2280.193     70.32302.769     70.42325.345     70.62347.922     70.72393.07471.06667
2551.107       722663.988       722754.293     70.42776.869     70.22799.445     70.2
2822.021       702980.054       703002.631     70.43025.207     70.63047.783       71
3070.359     71.23115.511       723363.849       723386.426     72.43409.002     72.4
3431.578     72.83454.154     72.8 3476.7373.018163499.30672.836313521.88373.05447
3544.45972.872633567.03573.090783589.61172.814243612.18772.196083634.76371.91954
 3657.3471.301383679.91671.024843702.49270.283233725.06869.883223747.64469.14162
 3770.2268.741623792.797       683815.37367.838243837.94967.838243860.52567.67648
3883.10167.676483905.67767.514723928.25467.27648 3950.8366.876483973.40666.63824
3995.98266.238244018.558       664131.439       66 4244.3264.238724289.47264.93057
4312.04864.882834334.62565.228754357.20165.181014379.77765.581014402.35365.58734
4424.92965.987344447.50565.993674470.08266.373314492.65866.386544515.23466.77308
 4537.8166.776424560.38667.162964582.96267.166314605.53967.501464628.11567.45341
4650.69167.788574673.26767.740524695.84367.361444718.41966.595854763.57264.40259
4786.14863.662294808.72462.56566  4831.362.318554853.876 61.71514876.45361.46798
4899.02961.749064921.60561.501944944.18162.039424966.757 62.04874989.33362.58618
 5011.9162.397345034.48662.934815057.06262.602595079.63862.996675102.21462.66445
5124.79162.085165147.367       625169.943     61.25192.519     60.85215.095     60.5
5260.24860.533335282.82460.66667  5305.460.666675327.976     60.85350.552     60.8
5373.12860.933335395.70560.933335418.28161.066675440.85761.066675463.433     61.2
5486.009     61.25508.58561.333335531.16261.333335553.73861.466675576.31461.33333
 5598.89     61.45621.46661.799355644.04262.398715666.61962.507245711.77162.54266
5734.34758.539525756.92357.41345  5779.553.410325802.07652.284245824.65248.28111
5847.22851.688665869.80452.21913 5892.3855.626685914.95756.157165937.533 59.5647
5960.10959.835495982.685 60.61276005.26160.372936027.83760.370186050.41460.25167
 6072.9960.370186095.56660.251676118.14259.422116140.71859.066586163.294       58
 6366.48       586682.54657.244456727.69957.113046998.61356.453337179.222       56
9888.362       569956.09157.587999978.66757.8012110001.2458.3305410023.8258.42644
10114.1257.5308910159.2856.8070410204.4356.47253    1022756.1380210249.58 55.6272
10294.73       5510317.31     54.910339.89     54.910407.61     54.610430.19     54.6
10475.34     54.4 10520.554.2370410565.6554.2441910588.22 54.1729 10610.853.97951
10633.3853.9082210655.9553.7148310678.5353.64354 10701.153.3483710723.6852.71812
10746.2652.4229610768.8351.7927110791.4151.4975410813.99 51.655310836.5652.14813
10859.1452.3058910881.7152.7987310904.2952.9564810926.8753.2892210972.02 54.3721
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10994.5954.7048311017.1755.1135311039.7555.3135311062.3255.45677 11084.955.65677
11107.48    55.811130.05      5611152.6356.80345 11175.256.8073411197.7857.61079
11220.3657.6146911242.9358.4181411265.5158.8146911288.0860.0107911310.6660.40734
11333.2461.6034511355.81      6211378.39 62.250511400.97 62.250511446.1262.75151
11468.6962.7515111491.2763.1515111513.8563.3010111536.4263.7010111581.58      64
11626.7365.25749 11649.365.2574911671.8865.8862311694.4665.8862311717.0366.48372
11739.6166.4524611762.1867.0499511784.7667.0186911807.3467.3868311829.91 66.9115
11852.4966.8355611875.0766.6380811920.2266.4862111942.7966.3646611965.3766.36466
11987.95 66.243112010.5266.18432 12033.166.0627712055.6766.0627712078.25      66
12484.62      6612529.77     65.212552.35   64.9612574.93     64.8 12597.564.53333
12620.08    64.512665.23      6412687.8164.1546212710.3864.2319312732.9664.18346
12755.5464.0576612823.2664.0288312845.8464.0612112868.42     64.412890.9964.46121
12913.57    64.812936.1564.8612112958.72     65.2 12981.365.2612213003.87     65.6
13026.4565.6612113049.03      66 13071.665.6699113094.1865.2699113116.7564.93983
13139.3364.5398313161.9164.2097513184.4864.1923513207.0664.2448713229.6464.22747
13252.2164.2799913274.79 64.262613297.3664.4731613342.5264.6166113365.0964.82716
13387.6764.8988913410.2565.1508513432.8265.26397 13455.465.5159313477.9765.62905
13500.5565.8810113523.1365.84346 13545.765.8672613568.2865.8297113590.8565.85351
13613.4365.8159613636.01 65.846513658.5865.8156913681.1665.8462313703.7465.81542
13726.3165.8459613748.8965.8270613771.4665.8767713816.6265.8389513839.1965.88867
13861.7765.8697613884.3465.9194813906.9265.9005713952.07      6614629.36      66
14697.0964.9304714719.6664.9304714764.8264.1739514855.12      6415080.88      64
15126.0364.7051815171.1965.8419815238.9265.82223 15351.865.4170415374.3765.42889
15464.68    65.115532.4164.9866615554.9865.0222215577.5664.9777815600.1365.02857
15622.7164.9857215645.29      6515667.8664.9333315690.44   64.9515713.01  64.875
15735.5964.7466715780.7464.35555

Manning's n Values        num=       3
     Sta    n Val     Sta   n Val     Sta    n Val
      0     .045711.771     .065982.685     .04

Bank Sta: Left   Right     Lengths: Left Channel    Right       Coeff Contr.    Expan.
      5711.7715982.685               5191    5120    3182                .1        .3
Ineffective Flow      num=        1
   Sta L   Sta R     Elev  Permanent
    771015780.74      55        T

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)               61.03  . Element                 Left OB    Channel   Right OB
  Vel Head (ft)                 0.13    Wt. n-Val.                0.040      0.060      0.040
  W.S. Elev (ft)               60.90    Reach Len. (ft)         5191.00    5120.00    3182.00
  Crit W.S. (ft)                        Flow Area (sq ft)         41.88    1456.67   24144.71
  E.G. Slope (ft/ft)        0.000843    Area (sq ft)              41.88    1456.67   25077.10
  Q Total (cfs)             74500.00    Flow (cfs)                17.07    3274.51   71208.42
  Top Width (ft)             5779.18    Top Width (ft)           180.29     261.64    5337.25
  Vel Total (ft/s)              2.91    Avg. Vel. (ft/s)          0.41       2.25       2.95
  Max Chl Dpth (ft)            12.62    Hydr. Depth (ft)          0.23       5.57       4.52
  Conv. Total (cfs)        2566676.0     Conv. (cfs)              588.0   112813.5  2453275.0
  Length Wtd. (ft)           3302.23    Wetted Per. (ft)        180.29     263.40    5337.51
  Min Ch El (ft)               48.28    Shear (lb/sq ft)          0.01       0.29       0.24
  Alpha                         1.01    Stream Power (lb/ft s)    0.00       0.65       0.70
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  Frctn Loss (ft)             1.30    Cum Volume (acre-ft)    12623.35     2225.02   18465.01
  C & E Loss (ft)             0.03    Cum SA (acres)           2318.84      316.22    3561.98


Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
        0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
        section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                    RS: 35050

INPUT
Description: 19566  25000  3500
Station Elevation Data    num=     199
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       064.0870397.9020464.43515146.853164.26109171.328664.54897220.279664.37491
244.7551     64513.9858     64538.4614   64.12562.9369    64.4587.412464.53333
611.8879  64.75636.363565.06667 660.839   65.2685.3145    65.4  709.7965.73333
734.2656     66783.2166     66807.692165.93244832.167765.93244905.594264.73244
930.0698   64.4954.5453     64979.020864.133331003.496    64.21027.972    64.4
1076.923   64.61101.398   64.81125.87464.888891174.825    65.2  1199.365.28333
1223.77665.466671248.251   65.61272.726   65.681297.20265.866671321.677      66
1493.006     661541.957   65.81566.432    65.61615.383    65.41639.858    65.2
1933.564     642178.319     642202.795    63.82227.27163.466672251.74663.33333
2276.222   63.12300.697   62.82325.17362.666672349.64862.428572374.12462.13334
  2398.6     622496.50261.930182520.97861.860352569.92961.060352594.40461.02544
2643.35560.330182692.30760.344352716.78260.239262741.25860.583612790.20960.37344
2814.68559.94684 2839.1659.969672863.63659.543072888.11158.848152912.58758.87098
2986.01456.717743010.48956.717743034.965      563181.81856.027733206.294      56
 3230.77 56.07813255.245 56.07813304.19656.234313328.67256.234313402.09956.59993
3524.47756.630983573.42856.564643646.854 56.1828 3671.3354.410453720.28150.68294
3744.75748.910583769.23245.353133793.70847.262373818.184 50.9567 3891.6156.68439
3916.08656.657733965.03755.530913989.51355.504254013.98854.940834062.93956.45917
4087.41557.755094136.36658.898644160.842 58.75344209.79357.014634234.26956.86938
4258.744     564430.07355.533334454.549   55.524601.40255.066674625.878   55.05
4772.731   54.64993.012     545751.755      545996.51153.803926045.46253.83688
 6167.8453.772366216.791   53.86339.16953.74194 6388.1253.766676510.49853.71429
6559.44953.733336657.35253.666676706.303   53.686730.778   53.646755.25453.66667
6853.15653.466678174.838     52 8664.35      528762.25249.347158786.72848.74707
8811.20349.74715 8884.6352.936798909.10553.947078933.581      549398.617      54
9472.04453.306019520.99552.742429545.471 52.63179569.94652.571439618.89752.34998
9765.751     529888.129 53.472410010.51 55.985310108.41    57.610132.8857.59044
10157.3657.9833410206.3157.1806210230.7957.1639610279.7456.3792610304.2156.38062
10328.6955.9972810377.6455.9842210500.0257.8377710524.4957.5170710548.97 57.5278
 10622.456.5657210646.8756.8413110695.8256.74658 10720.357.0221710744.7756.98327
10793.73 57.8108 10818.258.5390610842.6858.9528210867.1559.6119910891.6359.67577
 10916.159.6704710940.5859.6013811038.4859.6013811185.3359.7777111209.8159.88946
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11234.2959.9212211283.2460.1764911356.6660.2857111527.99   60.1511552.47     60.1
11576.9460.13334 11625.9    60.1211650.37   60.0611699.3260.05714 11723.8      60
12409.11        6012458.07   60.1612482.54   60.1212531.49    60.212555.97   60.16
12604.92    60.2512629.3960.2111112653.8760.2666712702.8260.22857 12727.360.17143
12776.2560.1916712800.7260.1333412874.15  60.19212898.63   60.1612947.5860.22667
12972.05   60.195    13021   60.2413045.48    60.213118.9160.2666713143.38   60.24
13192.3360.2933313265.76   60.2813290.24   60.2413363.66   60.2413461.56   60.16
13534.9960.1714313681.8460.0533313706.32       6014954.58      60

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
       0     .043524.477     .064136.366     .04

Bank Sta: Left    Right    Lengths: Left Channel    Right      Coeff Contr.    Expan.
      3524.4774136.366              4629    4288     1850                .1        .3
Ineffective Flow      num=        1
   Sta L    Sta R     Elev  Permanent
    781014954.58       50        F
```

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	59.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.040	0.060	0.040
W.S. Elev (ft)	59.66	Reach Len. (ft)	10.00	10.00	10.00
Crit W.S. (ft)	54.95	Flow Area (sq ft)	1989.63	3188.65	38498.65
E.G. Slope (ft/ft)	0.000226	Area (sq ft)	1989.63	3188.65	38498.65
Q Total (cfs)	74500.00	Flow (cfs)	2301.70	3565.07	68633.24
Top Width (ft)	8199.65	Top Width (ft)	667.67	611.89	6920.09
Vel Total (ft/s)	1.71	Avg. Vel. (ft/s)	1.16	1.12	1.78
Max Chl Dpth (ft)	14.31	Hydr. Depth (ft)	2.98	5.21	5.56
Conv. Total (cfs)	4953722.0	Conv. (cfs)	153046.4	237051.7	4563624.0
Length Wtd. (ft)	10.00	Wetted Per. (ft)	667.73	613.08	6920.42
Min Ch El (ft)	45.35	Shear (lb/sq ft)	0.04	0.07	0.08
Alpha	1.04	Stream Power (lb/ft s)	0.05	0.08	0.14
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	12502.30	1952.01	16142.95
C & E Loss (ft)	0.00	Cum SA (acres)	2268.31	264.88	3114.29

Warning: Divided flow computed for this cross-section.

BRIDGE

RIVER: Cosumnes
REACH: 1   RS: 35025

INPUT
Description:
Distance from Upstream XS =   10
Deck/Roadway Width   =   30
Weir Coefficient   =   2.6
Upstream Deck/Roadway Coordinates

```
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      66      61   14000      66      61

Upstream Bridge Cross Section Data
Station Elevation Data    num=     199
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
       064.0870397.9020464.43515146.853164.26109171.328664.54897220.279664.37491
244.7551      64513.9858      64538.4614   64.12562.9369    64.4587.412464.53333
611.8879   64.75636.363565.06667 660.839    65.2685.3145    65.4  709.7965.73333
734.2656      66783.2166      66807.692165.93244832.167765.93244905.594264.73244
930.0698    64.4954.5453      64979.020864.133331003.496    64.21027.972    64.4
1076.923    64.61101.398    64.81125.87464.888891174.825    65.2  1199.365.28333
1223.77665.466671248.251    65.61272.726   65.681297.20265.866671321.677      66
1493.006      661541.957    65.81566.432    65.61615.383    65.41639.858    65.2
1933.564      642178.319      642202.795    63.82227.27163.466672251.74663.33333
2276.222    63.12300.697    62.82325.17362.666672349.64862.428572374.12462.13334
  2398.6      622496.50261.930182520.97861.860352569.92961.060352594.40461.02544
2643.35560.330182692.30760.344352716.78260.239262741.25860.583612790.20960.37344
2814.68559.94684 2839.1659.969672863.63659.543072888.11158.848152912.58758.87098
2986.01456.717743010.48956.717743034.965       563181.81856.027733206.294      56
 3230.77 56.07813255.245 56.07813304.19656.234313328.67256.234313402.09956.59993
3524.47756.630983573.42856.564643646.854 56.1828 3671.3354.410453720.28150.68294
3744.75748.910583769.23245.353133793.70847.262373818.184 50.9567 3891.6156.68439
3916.08656.657733965.03755.530913989.51355.504254013.98854.940834062.93956.45917
4087.41557.755094136.36658.898644160.842 58.75344209.79357.014634234.26956.86938
4258.744      564430.07355.533334454.549   55.524601.40255.066674625.878   55.05
4772.731    54.64993.012      545751.755      545996.51153.803926045.46253.83688
 6167.8453.772366216.791    53.86339.16953.74194 6388.1253.766676510.49853.71429
6559.44953.733336657.35253.666676706.303   53.686730.778    53.646755.25453.66667
6853.15653.466678174.838      52 8664.35      528762.25249.347158786.72848.74707
8811.20349.74715 8884.6352.936798909.10553.947078933.581      549398.617      54
9472.04453.306019520.99552.742429545.471 52.63179569.94652.571439618.89752.34998
9765.751      529888.129 53.472410010.51 55.985310108.41    57.610132.8857.59044
10157.3657.9833410206.3157.1806210230.7957.1639610279.7456.3792610304.2156.38062
10328.6955.9972810377.6455.9842210500.0257.8377710524.4957.5170710548.97 57.5278
 10622.456.5657210646.8756.8413110695.8256.74658 10720.357.0221710744.7756.98327
10793.73 57.8108 10818.258.5390610842.6858.9528210867.1559.6119910891.6359.67577
 10916.159.6704710940.5859.6013811038.4859.6013811185.3359.7777111209.8159.88946
11234.2959.9212211283.2460.1764911356.6660.2857111527.99   60.1511552.47    60.1
11576.9460.13334 11625.9   60.1211650.37   60.0611699.3260.05714 11723.8      60
12409.11      6012458.07   60.1612482.54   60.1212531.49    60.212555.97   60.16
12604.92   60.2512629.3960.2111112653.8760.2666712702.8260.22857 12727.360.17143
12776.2560.1916712800.7260.1333412874.15  60.19212898.63   60.1612947.5860.22667
12972.05   60.195   13021   60.2413045.48    60.213118.9160.2666713143.38   60.24
13192.3360.2933313265.76   60.2813290.24   60.2413363.66   60.2413461.56   60.16
13534.9960.1714313681.8460.0533313706.32      6014954.58      60

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .043524.477    .064136.366    .04
```

```
Bank Sta: Left   Right     Coeff Contr.   Expan.
      3524.4774136.366              .1       .3
Ineffective Flow      num=        1
   Sta L   Sta R     Elev  Permanent
    781014954.58      50        F

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0      66      61   14000      66      61

Downstream Bridge Cross Section Data
Station Elevation Data    num=     199
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
       064.0870397.9020464.43515146.853164.26109171.328664.54897220.279664.37491
244.7551       64513.9858       64538.4614   64.12562.9369     64.4587.412464.53333
611.8879    64.75636.363565.06667 660.839     65.2685.3145     65.4  709.7965.73333
734.2656       66783.2166       66807.692165.93244832.167765.93244905.594264.73244
930.0698    64.4954.5453        64979.020864.133331003.496     64.21027.972      64.4
1076.923    64.61101.398     64.81125.87464.888891174.825      65.2  1199.365.28333
1223.77665.466671248.251     65.61272.726    65.681297.20265.866671321.677       66
1493.006       661541.957     65.81566.432     65.61615.383     65.41639.858     65.2
1933.564       642178.319       642202.795     63.82227.27163.466672251.74663.33333
2276.222    63.12300.697     62.82325.17362.666672349.64862.428572374.12462.13334
  2398.6       622496.50261.930182520.97861.860352569.92961.060352594.40461.02544
2643.35560.330182692.30760.344352716.78260.239262741.25860.583612790.20960.37344
2814.68559.94684 2839.1659.969672863.63659.543072888.11158.848152912.58758.87098
2986.01456.717743010.48956.717743034.965        563181.81856.027733206.294       56
 3230.77 56.07813255.245 56.07813304.19656.234313328.67256.234313402.09956.59993
3524.47756.630983573.42856.564643646.854 56.1828 3671.3354.410453720.28150.68294
3744.75748.910583769.23245.353133793.70847.262373818.184 50.9567 3891.6156.68439
3916.08656.657733965.03755.530913989.51355.504254013.98854.940834062.93956.45917
4087.41557.755094136.36658.898644160.842 58.75344209.79357.014634234.26956.86938
4258.744       564430.07355.533334454.549    55.524601.40255.066674625.878    55.05
4772.731    54.64993.012       545751.755       545996.51153.803926045.46253.83688
 6167.8453.772366216.791     53.86339.16953.74194 6388.1253.766676510.49853.71429
6559.44953.733336657.35253.666676706.303    53.686730.778     53.646755.25453.66667
6853.15653.466678174.838       52 8664.35       528762.25249.347158786.72848.74707
8811.20349.74715 8884.6352.936798909.10553.947078933.581       549398.617       54
9472.04453.306019520.99552.742429545.471 52.63179569.94652.571439618.89752.34998
9765.751       529888.129 53.472410010.51 55.985310108.41     57.610132.8857.59044
10157.3657.9833410206.3157.1806210230.7957.1639610279.7456.3792610304.2156.38062
10328.6955.9972810377.6455.9842210500.0257.8377710524.4957.5170710548.97 57.5278
 10622.456.5657210646.8756.8413110695.8256.74658 10720.357.0221710744.7756.98327
10793.73 57.8108 10818.258.5390610842.6858.9528210867.1559.6119910891.6359.67577
 10916.159.6704710940.5859.6013811038.4859.6013811185.3359.7777111209.8159.88946
11234.2959.9212211283.2460.1764911356.6660.2857111527.99    60.1511552.47     60.1
11576.9460.13334 11625.9    60.1211650.37    60.0611699.3260.05714 11723.8       60
12409.11       6012458.07    60.1612482.54    60.1212531.49    60.212555.97    60.16
12604.92    60.2512629.3960.2111112653.8760.2666712702.8260.22857 12727.360.17143
12776.2560.1916712800.7260.1333412874.15   60.19212898.63    60.1612947.5860.22667
12972.05  60.195    13021    60.2413045.48    60.213118.9160.2666713143.38    60.24
```

```
13192.3360.2933313265.76   60.2813290.24   60.2413363.66   60.2413461.56   60.16
13534.9960.1714313681.8460.0533313706.32      6014954.58      60

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
       0     .043524.477     .064136.366     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      3524.4774136.366            .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    781014954.58      50        F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream=    7902    Downstream=    7902
Upstream     num=        2
    Width   Elev    Width   Elev
       5     40       5      61
Downstream     num=        2
    Width   Elev    Width   Elev
       5     40       5      61

Pier Data
Pier Station     Upstream=    7952    Downstream=    7952
Upstream     num=        2
    Width   Elev    Width   Elev
       5     40       5      61
Downstream     num=        2
    Width   Elev    Width   Elev
       5     40       5      61

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
```

```
      Do not add Weight component to Momentum
      Class B flow critical depth computations use critical depth
          inside the bridge at the upstream end
      Criteria to check for pressure flow = Upstream energy grade line
```

BRIDGE OUTPUT Profile #100-year

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	59.71	E.G. Elev (ft)	59.71	59.70
W.S. US. (ft)	59.66	W.S. Elev (ft)	59.66	59.65
Q Total (cfs)	74500.00	Crit W.S. (ft)	54.93	54.93
Q Bridge (cfs)	74500.00	Max Chl Dpth (ft)	14.31	14.30
Q Weir (cfs)		Vel Total (ft/s)	1.71	1.71
Weir Sta Lft (ft)		Flow Area (sq ft)	43582.79	43524.84
Weir Sta Rgt (ft)		Froude # Chl	0.09	0.09
Weir Submerg		Specif Force (cu ft)	138408.30	138105.20
Weir Max Depth (ft)		Hydr Depth (ft)	5.32	5.32
Min El Weir Flow (ft)	60.01	W.P. Total (ft)	8216.74	8205.18
Min El Prs (ft)	61.00	Conv. Total (cfs)	4927288.0	4918013.0
Delta EG (ft)	1.58	Top Width (ft)	8185.62	8174.08
Delta WS (ft)	1.62	Frctn Loss (ft)	0.01	1.56
BR Open Area (sq ft)	57396.81	C & E Loss (ft)	0.00	0.00
BR Open Vel (ft/s)	1.71	Shear Total (lb/sq ft)	0.08	0.08
Coef of Q		Power Total (lb/ft s)	0.13	0.13
Br Sel Method	Energy only			

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1   RS: 35000

INPUT
Description: 19566 25000 3500
Station Elevation Data   num=   199

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       064.0870397.9020464.43515146.853164.26109171.328664.54897220.279664.37491
244.7551     64513.9858      64538.4614    64.12562.9369    64.4587.412464.53333
611.8879   64.75636.363565.06667 660.839    65.2685.3145    65.4  709.7965.73333
734.2656     66783.2166      66807.692165.93244832.167765.93244905.594264.73244
930.0698    64.4954.5453      64979.020864.133331003.496    64.21027.972    64.4
1076.923    64.61101.398    64.81125.87464.888891174.825    65.2  1199.365.28333
1223.77665.466671248.251    65.61272.726    65.681297.20265.866671321.677     66
1493.006     661541.957     65.81566.432    65.61615.383    65.41639.858    65.2
1933.564     642178.319      642202.795     63.82227.27163.466672251.74663.33333
2276.222    63.12300.697    62.82325.17362.666672349.64862.428572374.12462.13334
  2398.6     622496.50261.930182520.97861.860352569.92961.060352594.40461.02544
```

```
2643.35560.330182692.30760.344352716.78260.239262741.25860.583612790.20960.37344
2814.68559.94684 2839.1659.969672863.63659.543072888.11158.848152912.58758.87098
2986.01456.717743010.48956.717743034.965      563181.81856.027733206.294       56
 3230.77 56.07813255.245 56.07813304.19656.234313328.67256.234313402.09956.59993
3524.47756.630983573.42856.564643646.854 56.1828 3671.3354.410453720.28150.68294
3744.75748.910583769.23245.353133793.70847.262373818.184 50.9567 3891.6156.68439
3916.08656.657733965.03755.530913989.51355.504254013.98854.940834062.93956.45917
4087.41557.755094136.36658.898644160.842 58.75344209.79357.014634234.26956.86938
4258.744      564430.07355.533334454.549   55.524601.40255.066674625.878   55.05
4772.731    54.64993.012       545751.755      545996.51153.803926045.46253.83688
 6167.8453.772366216.791    53.86339.16953.74194 6388.1253.766676510.49853.71429
6559.44953.733336657.35253.666676706.303   53.686730.778   53.646755.25453.66667
6853.15653.466678174.838      52 8664.35       528762.25249.347158786.72848.74707
8811.20349.74715 8884.6352.936798909.10553.947078933.581      549398.617       54
9472.04453.306019520.99552.742429545.471 52.63179569.94652.571439618.89752.34998
9765.751      529888.129 53.472410010.51 55.985310108.41    57.610132.8857.59044
10157.3657.9833410206.3157.1806210230.7957.1639610279.7456.3792610304.2156.38062
10328.6955.9972810377.6455.9842210500.0257.8377710524.4957.5170710548.97 57.5278
 10622.456.5657210646.8756.8413110695.8256.74658 10720.357.0221710744.7756.98327
10793.73 57.8108 10818.258.5390610842.6858.9528210867.1559.6119910891.6359.67577
 10916.159.6704710940.5859.6013811038.4859.6013811185.3359.7777111209.8159.88946
11234.2959.9212211283.2460.1764911356.6660.2857111527.99   60.1511552.47    60.1
11576.9460.13334 11625.9   60.1211650.37   60.0611699.3260.05714 11723.8      60
12409.11      6012458.07   60.1612482.54   60.1212531.49    60.212555.97   60.16
12604.92   60.2512629.3960.2111112653.8760.2666712702.8260.22857 12727.360.17143
12776.2560.1916712800.7260.1333412874.15  60.19212898.63   60.1612947.5860.22667
12972.05   60.195   13021   60.2413045.48    60.213118.9160.2666713143.38   60.24
13192.3360.2933313265.76   60.2813290.24   60.2413363.66   60.2413461.56   60.16
13534.9960.1714313681.8460.0533313706.32      6014954.58      60

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      0     .043524.477     .064136.366     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      3524.4774136.366              4629    4288    1850             .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
    781014954.58      50       F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              58.13   Element                  Left OB    Channel   Right OB
  Vel Head (ft)                0.09   Wt. n-Val.                0.040      0.060      0.040
  W.S. Elev (ft)              58.04   Reach Len. (ft)         4629.00    4288.00    1850.00
  Crit W.S. (ft)              54.95   Flow Area (sq ft)        976.42    2210.93   27639.34
  E.G. Slope (ft/ft)       0.000685   Area (sq ft)             976.42    2210.93   27639.34
  Q Total (cfs)            74500.00   Flow (cfs)              1337.64    3511.13   69651.23
  Top Width (ft)            7778.97   Top Width (ft)           583.50     575.07    6620.41
  Vel Total (ft/s)             2.42   Avg. Vel. (ft/s)           1.37       1.59       2.52
  Max Chl Dpth (ft)           12.69   Hydr. Depth (ft)           1.67       3.84       4.17
  Conv. Total (cfs)       2847338.0    Conv. (cfs)             51123.8   134193.1  2662022.0
```

```
 Length Wtd. (ft)          2625.25   Wetted Per. (ft)          583.53     576.25    6620.71
 Min Ch El (ft)              45.35   Shear (lb/sq ft)            0.07       0.16       0.18
 Alpha                        1.04   Stream Power (lb/ft s)      0.10       0.26       0.45
 Frctn Loss (ft)              0.97   Cum Volume (acre-ft)    12356.16    1686.09   12889.60
 C & E Loss (ft)              0.02   Cum SA (acres)           2206.72     206.44    2448.94
```

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1   RS: 30050

INPUT
Description: 15278 20000 3000
Station Elevation Data   num=   198

```
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       058.6666754.00158    58.481.00237    58.45108.0032    58.4189.0055     58.7
216.006358.86666243.0071    58.9324.0095    59.44378.011159.71111405.011959.91667
432.0127       60729.0214      60756.0222    59.6783.0229    59.4810.0237     59.4
837.0245    59.2918.0269      581134.03357.970131323.03857.761091350.03957.41053
 1377.0457.11813 1404.0457.000241431.04156.758741458.042 57.01911485.04257.74853
1539.04455.934311566.04555.480761620.04655.480761674.048  54.7121701.048     54.6
1782.051    54.61809.051   54.641836.052    54.751863.053    54.81890.05354.91667
1971.056  55.1252025.05755.384622052.058    55.442079.059   55.552106.059     55.6
2160.061      562214.062      562268.06455.892752295.06455.892752376.06754.83287
2430.06850.87029 2511.0745.147192538.07144.799982565.07244.573912673.07546.85791
2700.07548.083482835.07951.98815 2862.0851.988152970.083      543105.086 54.8102
3132.08754.826293159.08854.66425 3240.09 54.71253267.09154.994873375.09454.55873
3402.09454.315293429.095 53.84623456.09653.816043510.09752.877863564.09952.16054
3645.10152.160543699.103      524212.118      524239.11952.357964293.12153.43183
4320.12253.789794455.12648.977054617.132    50.24644.133      504806.13950.15067
4860.14151.817164887.14251.762874914.14352.162874995.146      52 5670.17       52
5805.175      54 5940.1839.193016021.18346.107416048.18448.336146075.18550.64094
6102.18650.97361 6210.19      526534.202      526615.20550.833446642.20651.05479
6696.208 50.71986750.20951.497516831.212 51.56966885.214 50.76966912.21550.51307
6939.21650.513076993.218      507020.21950.381727128.22350.443877155.22450.34055
7182.22550.369747209.22650.136077290.22950.223637425.234      507479.23651.99973
7506.23752.020247560.23954.01997 7587.2455.557877695.24458.019287722.24556.67286
7776.24754.234057803.24852.830837830.24951.61143 7884.2551.122637965.25351.13519
8019.255      528100.258      528181.26150.594788235.26349.752968316.26649.24793
8343.26749.668848370.26849.453018478.271      528775.282      528910.28750.44304
8937.28850.639788964.28950.488929045.29251.079169072.29351.541429180.297       52
9315.302      529369.30452.575119450.30753.779819504.30955.42899 9531.3156.13956
9585.312 57.98149666.31459.444979720.31659.754269801.31957.79584 9828.32 57.2659
9855.32156.588779963.325      569990.32655.7500310098.3355.7500310125.33       56
10260.34 54.320410395.3448.4478310422.3448.3831110530.3550.5281910557.3551.53976
10611.3553.2565710665.3554.3837210692.35 54.646910719.3555.2104810746.3555.62778
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10800.3655.6843510827.36 55.663310854.3655.6969710881.36 55.663310935.36      56
11070.37       5611205.37       5812177.41       5812447.42     58.612609.42     58.4
12690.42     58.212852.4358.2266712933.43       5813257.44       5813284.4557.92889
13311.45       5813338.4557.9333313419.4557.8666613446.45     57.813527.4557.77143
13581.46     57.813608.4657.8666613743.4657.8666613878.4757.8363613905.4757.88889
14013.47     57.914040.47       5815147.51       5815255.52     56.415282.52     56.2
15309.52     56.215336.52     56.315417.5256.2666715471.52       5615660.53       56
15768.5456.1302215795.5455.5909215903.5454.5191115930.5454.8230116065.55       56
16335.56       5616362.5655.8112316497.5655.78136

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .045805.175      .06 6210.19      .04

Bank Sta: Left   Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
      5805.175 6210.19               4196     4551     5233               .1        .3
Ineffective Flow      num=        1
   Sta L    Sta R     Elev  Permanent
    800016497.56       50        F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              57.14    Element                   Left OB    Channel    Right OB
  Vel Head (ft)                0.04    Wt. n-Val.                  0.040      0.060       0.040
  W.S. Elev (ft)              57.10    Reach Len. (ft)             10.00      10.00       10.00
  Crit W.S. (ft)              52.58    Flow Area (sq ft)        19986.03    3838.69    23151.04
  E.G. Slope (ft/ft)       0.000232    Area (sq ft)             19986.03    3838.69    23151.04
  Q Total (cfs)            74500.00    Flow (cfs)               31468.32    6474.02    36557.66
  Top Width (ft)           10677.67    Top Width (ft)            4381.98     405.02     5890.67
  Vel Total (ft/s)             1.59    Avg. Vel. (ft/s)             1.57       1.69        1.58
  Max Chl Dpth (ft)           17.91    Hydr. Depth (ft)             4.56       9.48        3.93
  Conv. Total (cfs)       4889026.0     Conv. (cfs)            2065093.0   424854.3   2399079.0
  Length Wtd. (ft)            10.00    Wetted Per. (ft)          4382.68     406.32     5892.71
  Min Ch El (ft)              39.19    Shear (lb/sq ft)             0.07       0.14        0.06
  Alpha                        1.00    Stream Power (lb/ft s)       0.10       0.23        0.09
  Frctn Loss (ft)              0.00    Cum Volume (acre-ft)     11242.35    1388.33    11811.06
  C & E Loss (ft)              0.00    Cum SA (acres)            1942.88     158.20     2183.26


Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.

BRIDGE


RIVER: Cosumnes
REACH: 1                  RS: 30025

INPUT
Description:
Distance from Upstream XS =      10
Deck/Roadway Width        =      30
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Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      63      58   16000      63      58

Upstream Bridge Cross Section Data
Station Elevation Data    num=      198
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
       058.6666754.00158    58.481.00237   58.45108.0032    58.4189.0055    58.7
216.006358.86666243.0071    58.9324.0095   59.44378.011159.71111405.011959.91667
432.0127      60729.0214      60756.0222    59.6783.0229    59.4810.0237    59.4
837.0245    59.2918.0269      581134.03357.970131323.03857.761091350.03957.41053
 1377.0457.11813 1404.0457.000241431.04156.758741458.042 57.01911485.04257.74853
1539.04455.934311566.04555.480761620.04655.480761674.048  54.7121701.048    54.6
1782.051    54.61809.051   54.641836.052   54.751863.053   54.81890.05354.91667
1971.056  55.1252025.05755.384622052.058   55.442079.059   55.552106.059    55.6
2160.061      562214.062      562268.06455.892752295.06455.892752376.06754.83287
2430.06850.87029 2511.0745.147192538.07144.799982565.07244.573912673.07546.85791
2700.07548.083482835.07951.98815 2862.0851.988152970.083      543105.086 54.8102
3132.08754.826293159.08854.66425 3240.09 54.71253267.09154.994873375.09454.55873
3402.09454.315293429.095 53.84623456.09653.816043510.09752.877863564.09952.16054
3645.10152.160543699.103      524212.118      524239.11952.357964293.12153.43183
4320.12253.789794455.12648.977054617.132   50.24644.133      504806.13950.15067
4860.14151.817164887.14251.762874914.14352.162874995.146      52 5670.17      52
5805.175      54 5940.1839.193016021.18346.107416048.18448.336146075.18550.64094
6102.18650.97361 6210.19      526534.202      526615.20550.833446642.20651.05479
6696.208 50.71986750.20951.497516831.212 51.56966885.214 50.76966912.21550.51307
6939.21650.513076993.218      507020.21950.381727128.22350.443877155.22450.34055
7182.22550.369747209.22650.136077290.22950.223637425.234      507479.23651.99973
7506.23752.020247560.23954.01997 7587.2455.557877695.24458.019287722.24556.67286
7776.24754.234057803.24852.830837830.24951.61143 7884.2551.122637965.25351.13519
8019.255      528100.258      528181.26150.594788235.26349.752968316.26649.24793
8343.26749.668848370.26849.453018478.271      528775.282      528910.28750.44304
8937.28850.639788964.28950.488929045.29251.079169072.29351.541429180.297      52
9315.302      529369.30452.575119450.30753.779819504.30955.42899 9531.3156.13956
9585.312 57.98149666.31459.444979720.31659.754269801.31957.79584 9828.32 57.2659
9855.32156.588779963.325      569990.32655.7500310098.3355.7500310125.33      56
10260.34 54.320410395.3448.4478310422.3448.3831110530.3550.5281910557.3551.53976
10611.3553.2565710665.3554.3837210692.35 54.646910719.3555.2104810746.3555.62778
10800.3655.6843510827.36 55.663310854.3655.6969710881.36 55.663310935.36      56
11070.37      5611205.37      5812177.41      5812447.42    58.612609.42    58.4
12690.42    58.212852.4358.2266712933.43      5813257.44      5813284.4557.92889
13311.45      5813338.4557.9333313419.4557.8666613446.45    57.813527.4557.77143
13581.46    57.813608.4657.8666613743.4657.8666613878.4757.8363613905.4757.88889
14013.47    57.914040.47      5815147.51      5815255.52    56.415282.52    56.2
15309.52    56.215336.52    56.315417.5256.2666715471.52      5615660.53      56
15768.5456.1302215795.5455.5909215903.5454.5191115930.5454.8230116065.55      56
16335.56      5616362.5655.8112316497.5655.78136

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
```

```
       0     .045805.175     .06 6210.19     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      5805.175 6210.19            .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    800016497.56      50       F

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      63      58   16000      63      58

Downstream Bridge Cross Section Data
Station Elevation Data    num=     198
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       058.6666754.00158    58.481.00237   58.45108.0032    58.4189.0055    58.7
216.006358.86666243.0071    58.9324.0095   59.44378.011159.71111405.011959.91667
432.0127      60729.0214      60756.0222    59.6783.0229    59.4810.0237    59.4
837.0245    59.2918.0269      581134.03357.970131323.03857.761091350.03957.41053
 1377.0457.11813 1404.0457.000241431.04156.758741458.042 57.01911485.04257.74853
1539.04455.934311566.04555.480761620.04655.480761674.048  54.7121701.048    54.6
1782.051    54.61809.051   54.641836.052   54.751863.053    54.81890.05354.91667
1971.056  55.1252025.05755.384622052.058   55.442079.059    55.552106.059    55.6
2160.061      562214.062      562268.06455.892752295.06455.892752376.06754.83287
2430.06850.87029 2511.0745.147192538.07144.799982565.07244.573912673.07546.85791
2700.07548.083482835.07951.98815 2862.0851.988152970.083      543105.086 54.8102
3132.08754.826293159.08854.66425 3240.09 54.71253267.09154.994873375.09454.55873
3402.09454.315293429.095 53.84623456.09653.816043510.09752.877863564.09952.16054
3645.10152.160543699.103      524212.118      524239.11952.357964293.12153.43183
4320.12253.789794455.12648.977054617.132    50.24644.133      504806.13950.15067
4860.14151.817164887.14251.762874914.14352.162874995.146      52 5670.17      52
5805.175      54 5940.1839.193016021.18346.107416048.18448.336146075.18550.64094
6102.18650.97361 6210.19      526534.202      526615.20550.833446642.20651.05479
6696.208 50.71986750.20951.497516831.212 51.56966885.214 50.76966912.21550.51307
6939.21650.513076993.218      507020.21950.381727128.22350.443877155.22450.34055
7182.22550.369747209.22650.136077290.22950.223637425.234      507479.23651.99973
7506.23752.020247560.23954.01997 7587.2455.557877695.24458.019287722.24556.67286
7776.24754.234057803.24852.830837830.24951.61143 7884.2551.122637965.25351.13519
8019.255      528100.258      528181.26150.594788235.26349.752968316.26649.24793
8343.26749.668848370.26849.453018478.271      528775.282      528910.28750.44304
8937.28850.639788964.28950.488929045.29251.079169072.29351.541429180.297      52
9315.302      529369.30452.575119450.30753.779819504.30955.42899 9531.3156.13956
9585.312 57.98149666.31459.444979720.31659.754269801.31957.79584 9828.32 57.2659
9855.32156.588779963.325      569990.32655.7500310098.3355.7500310125.33      56
10260.34 54.320410395.3448.4478310422.3448.3831110530.3550.5281910557.3551.53976
10611.3553.2565710665.3554.3837210692.35 54.646910719.3555.2104810746.3555.62778
10800.3655.6843510827.36 55.663310854.3655.6969710881.36 55.663310935.36      56
11070.37      5611205.37      5812177.41      5812447.42    58.612609.42    58.4
12690.42    58.212852.4358.2266712933.43      5813257.44      5813284.4557.92889
13311.45      5813338.4557.9333313419.4557.8666613446.45    57.813527.4557.77143
13581.46    57.813608.4657.8666613743.4657.8666613878.4757.8363613905.4757.88889
```

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14013.47    57.914040.47      5815147.51      5815255.52     56.415282.52    56.2
15309.52    56.215336.52    56.315417.5256.2666715471.52      5615660.53      56
15768.5456.1302215795.5455.5909215903.5454.5191115930.5454.8230116065.55      56
16335.56      5616362.5655.8112316497.5655.78136

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045805.175     .06 6210.19     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      5805.175 6210.19             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    800016497.56     50        F

Upstream Embankment side slope             =       0 horiz. to 1.0 vertical
Downstream Embankment side slope           =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins        =
Energy head used in spillway design        =
Spillway height used in design             =
Weir crest shape                           = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream=    8076    Downstream=     8076
Upstream     num=        2
    Width   Elev    Width   Elev
       5     40       5      58
Downstream     num=       2
    Width   Elev    Width   Elev
       5     40       5      58

Pier Data
Pier Station     Upstream=    8126    Downstream=     8126
Upstream     num=        2
    Width   Elev    Width   Elev
       5     40       5      58
Downstream     num=       2
    Width   Elev    Width   Elev
       5     40       5      58

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only
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Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #100-year

  E.G. US. (ft)                  57.14   Element                  Inside BR US  Inside BR DS
  W.S. US. (ft)                  57.10   E.G. Elev (ft)                  57.14         57.13
  Q Total (cfs)               74500.00   W.S. Elev (ft)                  57.10         57.09
  Q Bridge (cfs)              74118.65   Crit W.S. (ft)                  52.59         52.59
  Q Weir (cfs)                           Max Chl Dpth (ft)               17.91         17.90
  Weir Sta Lft (ft)                      Vel Total (ft/s)                 1.59          1.59
  Weir Sta Rgt (ft)                      Flow Area (sq ft)            46896.07      46818.66
  Weir Submerg                           Froude # Chl                     0.07          0.07
  Weir Max Depth (ft)                    Specif Force (cu ft)        146469.80     146135.70
  Min El Weir Flow (ft)          55.44   Hydr Depth (ft)                  4.40          4.39
  Min El Prs (ft)                58.00   W.P. Total (ft)              10693.28      10689.14
  Delta EG (ft)                   1.87   Conv. Total (cfs)           4873382.0     4861569.0
  Delta WS (ft)                   1.94   Top Width (ft)               10666.28      10662.18
  BR Open Area (sq ft)        55733.07   Frctn Loss (ft)                  0.01          1.86
  BR Open Vel (ft/s)              1.60   C & E Loss (ft)                  0.00          0.01
  Coef of Q                              Shear Total (lb/sq ft)           0.06          0.06
  Br Sel Method            Energy only   Power Total (lb/ft s)            0.10          0.10

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 30000

INPUT
Description: 15278  20000  3000
Station Elevation Data    num=      198
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       058.6666754.00158    58.481.00237   58.45108.0032    58.4189.0055    58.7
216.006358.86666243.0071    58.9324.0095   59.44378.011159.71111405.011959.91667
432.0127       60729.0214      60756.0222    59.6783.0229    59.4810.0237    59.4
837.0245    59.2918.0269       581134.03357.970131323.03857.761091350.03957.41053
 1377.0457.11813 1404.0457.000241431.04156.758741458.042 57.01911485.04257.74853
1539.04455.934311566.04555.480761620.04655.480761674.048  54.7121701.048    54.6
1782.051    54.61809.051   54.641836.052   54.751863.053    54.81890.05354.91667
1971.056  55.1252025.05755.384622052.058   55.442079.059   55.552106.059    55.6
2160.061      562214.062      562268.06455.892752295.06455.892752376.06754.83287
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2430.06850.87029 2511.0745.147192538.07144.799982565.07244.573912673.07546.85791
2700.07548.083482835.07951.98815 2862.0851.988152970.083       543105.086 54.8102
3132.08754.826293159.08854.66425 3240.09 54.71253267.09154.994873375.09454.55873
3402.09454.315293429.095 53.84623456.09653.816043510.09752.877863564.09952.16054
3645.10152.160543699.103      524212.118      524239.11952.357964293.12153.43183
4320.12253.789794455.12648.977054617.132    50.24644.133       504806.13950.15067
4860.14151.817164887.14251.762874914.14352.162874995.146       52 5670.17       52
5805.175       54 5940.1839.193016021.18346.107416048.18448.336146075.18550.64094
6102.18650.97361 6210.19      526534.202      526615.20550.833446642.20651.05479
6696.208 50.71986750.20951.497516831.212 51.56966885.214 50.76966912.21550.51307
6939.21650.513076993.218      507020.21950.381727128.22350.443877155.22450.34055
7182.22550.369747209.22650.136077290.22950.223637425.234       507479.23651.99973
7506.23752.020247560.23954.01997 7587.2455.557877695.24458.019287722.24556.67286
7776.24754.234057803.24852.830837830.24951.61143 7884.2551.122637965.25351.13519
8019.255       528100.258      528181.26150.594788235.26349.752968316.26649.24793
8343.26749.668848370.26849.453018478.271       528775.282      528910.28750.44304
8937.28850.639788964.28950.488929045.29251.079169072.29351.541429180.297       52
9315.302       529369.30452.575119450.30753.779819504.30955.42899 9531.3156.13956
9585.312 57.98149666.31459.444979720.31659.754269801.31957.79584 9828.32 57.2659
9855.32156.588779963.325      569990.32655.7500310098.3355.7500310125.33       56
10260.34 54.320410395.3448.4478310422.3448.3831110530.3550.5281910557.3551.53976
10611.3553.2565710665.3554.3837210692.35 54.646910719.3555.2104810746.3555.62778
10800.3655.6843510827.36 55.663310854.3655.6969710881.36 55.663310935.36       56
11070.37       5611205.37      5812177.41      5812447.42    58.612609.42    58.4
12690.42    58.212852.4358.2266712933.43       5813257.44       5813284.4557.92889
13311.45       5813338.4557.9333313419.4557.8666613446.45    57.813527.4557.77143
13581.46    57.813608.4657.8666613743.4657.8666613878.4757.8363613905.4757.88889
14013.47    57.914040.47      5815147.51      5815255.52    56.415282.52    56.2
15309.52    56.215336.52    56.315417.5256.2666715471.52       5615660.53       56
15768.5456.1302215795.5455.5909215903.5454.5191115930.5454.8230116065.55       56
16335.56       5616362.5655.8112316497.5655.78136

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      0    .045805.175    .06 6210.19     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      5805.175 6210.19             4196    4551    5233              .1       .3
Ineffective Flow      num=       1
   Sta L    Sta R     Elev  Permanent
    800016497.56      50        F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             55.27    Element                 Left OB    Channel   Right OB
  Vel Head (ft)               0.11    Wt. n-Val.                0.040      0.060      0.040
  W.S. Elev (ft)             55.16    Reach Len. (ft)         4196.00    4551.00    5233.00
  Crit W.S. (ft)             52.58    Flow Area (sq ft)      11896.94    3052.13   13469.41
  E.G. Slope (ft/ft)      0.000903    Area (sq ft)           11896.94    3052.13   13469.41
  Q Total (cfs)           74500.00    Flow (cfs)             29835.15    8713.19   35951.67
  Top Width (ft)           7960.85    Top Width (ft)          3790.71     405.02    3765.13
  Vel Total (ft/s)            2.62    Avg. Vel. (ft/s)           2.51       2.85       2.67
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 Max Chl Dpth (ft)            15.97   Hydr. Depth (ft)          3.14        7.54       3.58
 Conv. Total (cfs)        2478866.0    Conv. (cfs)          992715.8    289917.0  1196233.0
 Length Wtd. (ft)           4672.52   Wetted Per. (ft)       3791.37      406.32    3765.69
 Min Ch El (ft)               39.19   Shear (lb/sq ft)          0.18        0.42       0.20
 Alpha                         1.01   Stream Power (lb/ft s)    0.44        1.21       0.54
 Frctn Loss (ft)               4.66   Cum Volume (acre-ft)   9575.35     1028.21    9899.42
 C & E Loss (ft)               0.00   Cum SA (acres)         1515.84      115.89    1678.55

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 25000

INPUT
Description: 10727  15000  2500
Station Elevation Data    num=      148
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       052.3627727.9386852.3627755.8773652.4836983.8160452.88369195.5707      54
363.2029      54502.8963      561033.731      56 1061.67     55.81145.486    54.6
1173.424    54.41201.363      541452.812      541508.689     53.61620.444    53.6
1732.199      522011.586      522039.525    51.82095.40251.73333 2151.2851.73333
2179.218    51.82207.157      522290.973      522374.78952.117382514.483      54
2849.748      542989.441      523073.25750.932213129.13550.000933212.95150.69551
3268.82850.947073352.64553.569613408.52254.953823436.46155.001583520.27753.95224
3548.21653.98829 3659.9751.916873687.90950.823763799.66447.422833827.60347.05318
3939.35846.125523967.296      464386.375      464498.12845.866664554.00545.11341
4581.94445.099994665.759      444721.636      444749.575   44.054861.32944.48333
4889.26744.628575084.83645.388895140.713   45.655224.529      465922.991      46
5978.86846.133346034.745    46.4 6481.76      486900.837      486956.71448.08599
 7040.5349.407847096.40752.367087180.22252.245237236.09944.467517319.91540.74237
7375.79246.799777459.60750.472617515.48449.212477543.42248.662757571.36148.37169
7655.17648.274527683.11548.170817711.053      487794.869      487878.68447.65714
7906.623   47.648018.376    47.28046.31547.183338074.253   47.048102.192      47
 8130.13   47.68158.069 47.78688241.88545.228418269.82345.536828297.76246.29514
8381.577 48.02758437.454 47.1018 8521.27 46.25448660.962      468856.531      46
8940.34746.627098996.22448.017179080.03946.333749107.97844.940659135.91643.89349
 9247.6745.301949275.60845.722919331.48545.568739359.424 45.60979387.36245.80727
9415.30146.163889443.23946.313759471.17846.53333 9610.8746.603519638.80946.69162
9694.68647.025629722.62447.066679778.50147.236369862.31647.46667 9974.07      48
10393.15      4810672.53      5210812.22      52 11231.357.8969611398.93      58
11510.6955.9387311538.6355.5387311650.3855.4583411678.3255.3669111790.0754.30856
11818.01      5411929.76      54 11957.754.1654312069.4654.1654312097.39      54
12963.49      54 13047.3    55.213103.1855.73582   1318755.7358213242.87      56
13969.27      5614025.1555.8294414108.9654.6294414164.84      5414528.04      54
14667.73      5615058.87      5615170.63    55.215282.3854.6666715310.32    54.6
15422.07    54.615450.0154.5333315561.77      5415701.4653.9076815841.15      56
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15980.84      5616120.54      5416148.47      54

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
       0     .047096.407     .067459.607     .04

Bank Sta: Left   Right     Lengths: Left Channel    Right      Coeff Contr.   Expan.
      7096.4077459.607              7416    6117    1229              .1        .3
Ineffective Flow     num=        1
   Sta L    Sta R    Elev  Permanent
   1421716148.47      45       F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)               50.61    Element                   Left OB    Channel   Right OB
  Vel Head (ft)                 0.14    Wt. n-Val.                  0.040      0.060      0.040
  W.S. Elev (ft)               50.47    Reach Len. (ft)           7416.00    6117.00    1229.00
  Crit W.S. (ft)               48.19    Flow Area (sq ft)        13660.49    1317.57   10333.09
  E.G. Slope (ft/ft)        0.001107    Area (sq ft)             13660.49    1317.57   10333.09
  Q Total (cfs)             74500.00    Flow (cfs)               42900.27    3142.27   28457.46
  Top Width (ft)             6819.55    Top Width (ft)            3446.59     266.66    3106.30
  Vel Total (ft/s)              2.94    Avg. Vel. (ft/s)             3.14       2.38       2.75
  Max Chl Dpth (ft)             9.73    Hydr. Depth (ft)             3.96       4.94       3.33
  Conv. Total (cfs)        2239207.0     Conv. (cfs)            1289431.0    94445.4   855330.7
  Length Wtd. (ft)           5638.14    Wetted Per. (ft)          3446.71     267.56    3106.54
  Min Ch El (ft)               40.74    Shear (lb/sq ft)             0.27       0.34       0.23
  Alpha                         1.02    Stream Power (lb/ft s)       0.86       0.81       0.63
  Frctn Loss (ft)               1.00    Cum Volume (acre-ft)      8344.42     799.94    8469.68
  C & E Loss (ft)               0.03    Cum SA (acres)            1167.26      80.80    1265.80

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 20000

INPUT
Description: 4610  10000  2000
Station Elevation Data    num=      237
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
       046.4511365.17924      46195.5377 43.6179217.264142.84229238.990542.44876
260.716941.67315282.443441.27963304.169841.25296325.8962 40.8442347.622640.81752
391.075440.004231586.029      401694.66240.768311738.11540.860981759.84141.10732
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1781.56741.153661803.294    41.4 1825.02    41.41846.74741.46667  1890.2     41.2
1933.652    41.21955.37941.333331977.10541.333331998.83241.481482042.285    41.52
2064.01141.762962085.73741.766672107.464       422237.822       422259.54841.86565
    230341.865652324.727 41.73132368.179 41.73132389.90641.865652411.63241.86565
2433.358       422498.537       422520.26441.68365 2541.9941.683652563.71641.36731
2607.169       422694.074       422715.801 41.65762759.25341.315212780.97939.78453
2802.70637.599222824.43234.054442867.88530.651772889.61127.106982911.33727.87095
2933.06426.79146 2954.7927.555432976.51626.475952998.24327.239923019.96929.31131
3041.69532.483483063.42234.554873085.14837.727053106.87439.798443128.60141.23749
3150.32741.575773172.05341.08443 3193.7840.864283215.50640.372953237.23241.58648
3258.95842.528823280.685    42.83324.137    42.83345.864    42.43389.316       42
 3606.58       423628.306    41.83650.032    41.43671.759    41.43693.485    41.2
3715.211    41.23758.664       424193.191       424301.824       444323.551    43.6
4345.27743.526724367.00443.12672 4388.7343.053454410.45742.65345 4453.9142.65345
4475.63742.326734497.36342.32673 4519.09       424844.988       424866.715    42.4
4888.441    42.44910.168    42.54931.895    42.74953.621    42.84975.348       43
5018.801    43.25040.527    43.45062.254    43.5 5083.98    43.75105.707     43.8
5127.434       445388.152       445431.605 44.20045475.05944.613395496.78544.92618
5518.51242.178065540.23839.536235561.96536.788115583.69135.802355605.41833.05422
5627.145 33.80185648.87136.311735670.59838.973575692.324 41.48355714.05144.14534
5735.77744.02513 5779.2344.088525800.95743.968317473.902       447495.62944.53333
7517.35544.866667539.082    45.47560.809    45.67582.53545.613957669.44144.05578
7734.621 44.35487778.07445.026767799.80145.076837821.52745.367867843.25445.41794
 7864.9845.708977886.70744.438017908.434    45.6 7995.3443.938368103.973       46
8125.69945.939048147.426 46.33758190.87946.215598212.60546.614058234.33246.21559
8256.05946.276558277.78545.878098321.23846.010838386.418       468429.87146.03944
8473.32446.512068495.05146.512068516.77746.76809 8560.2346.768098581.95746.51206
8603.68446.512068647.137       46 8755.77       468864.402       488973.035       48
9038.215    49.29059.94149.400089081.66849.800089103.39549.800089125.121       50
9537.926       509559.652    50.19603.105    50.4 9950.73       52   10168       52
10276.63       5010385.26       5010428.7150.1408210450.4450.1408210493.8950.28165
10515.6250.6112410537.3551.0112410602.53       5211580.22       5211688.86 53.0472
11710.5852.9890911732.3152.7796511775.7652.6634311797.4952.4539911819.2152.85399
11840.9453.1026611862.6753.5026611906.12       5412058.21       5412079.9354.34169
12101.6654.3416912123.3954.6833912145.1154.3416912166.8454.3416912188.57       54
13101.08       5413187.99  51.99713231.4451.2002213253.1750.9041813274.8950.97525
13296.6250.6792113318.3550.75027 13361.850.1242613383.5350.1783513405.2550.57513
13426.9850.6292313448.7150.9719213470.4350.9719213513.8951.6573113535.6151.72057
13557.34 51.129213579.0750.2583913600.7950.2583913622.5249.3875913644.2549.38759
13665.9750.10537 13687.749.9523513709.4350.6701413731.1550.5171213752.8851.23491
13774.6151.4560613818.0652.5620913839.7952.7832413861.5153.3362613883.2452.98413
13926.69 52.943613948.4252.5914713991.8752.5914714078.78       5415708.27       54
   1573053.6952415751.7253.6761915773.4553.4122515795.1853.37959 15816.953.28571
15882.0852.6857115990.71    52.416055.8952.4268416077.6252.4746316121.0752.41956
 16142.852.4748316164.5352.44504

Manning's n Values        num=       3
     Sta    n Val      Sta   n Val      Sta    n Val
       0     .045496.785     .065714.051     .04

Bank Sta: Left    Right     Lengths: Left Channel    Right       Coeff Contr.    Expan.
      5496.7855714.051              4755    2383    2062                .1       .3
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Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   1264016164.53      54        F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             49.58   Element                 Left OB    Channel   Right OB
  Vel Head (ft)               0.02   Wt. n-Val.                0.040      0.060      0.040
  W.S. Elev (ft)             49.56   Reach Len. (ft)         4755.00    2383.00    2062.00
  Crit W.S. (ft)             42.36   Flow Area (sq ft)      46173.09    2457.61   15434.80
  E.G. Slope (ft/ft)      0.000069   Area (sq ft)           46173.09    2457.61   15439.30
  Q Total (cfs)           74500.00   Flow (cfs)             58798.33    2535.49   13166.18
  Top Width (ft)           9099.66   Top Width (ft)          5496.79     217.27    3385.61
  Vel Total (ft/s)            1.16   Avg. Vel. (ft/s)           1.27       1.03       0.85
  Max Chl Dpth (ft)          23.08   Hydr. Depth (ft)           8.40      11.31       4.60
  Conv. Total (cfs)      8974973.0    Conv. (cfs)          7083402.0   305449.1  1586122.0
  Length Wtd. (ft)         3219.18   Wetted Per. (ft)        5501.90     218.59    3354.67
  Min Ch El (ft)             33.05   Shear (lb/sq ft)           0.04       0.05       0.02
  Alpha                       1.07   Stream Power (lb/ft s)     0.05       0.05       0.02
  Frctn Loss (ft)             0.24   Cum Volume (acre-ft)    3251.15     534.88    8106.11
  C & E Loss (ft)             0.00   Cum SA (acres)           405.97      46.82    1174.22

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 15000

INPUT
Description: 2227  5000  1500
Station Elevation Data    num=      309
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       041.7748825.2108541.6542650.4216941.5858875.6325441.46526100.843441.40298
226.897641.53098252.108541.98942 327.74141.64782352.951842.10626403.373542.17698
453.795237.78407479.006138.39174554.638528.47742579.849427.97678605.060229.91909
655.481834.52496680.692634.38494731.114338.99081781.535939.50431806.746739.82277
882.379240.61965  907.5940.96474983.2224     40.81008.433     40.81058.855       40
2717.178       402823.07638.126192844.25637.582742865.436 37.95752886.61537.41405
2907.79537.788812928.97537.245372950.15536.636972971.33436.946782992.51436.33839
3013.694 36.85663034.87337.166423077.23337.583213098.41237.583213140.772       38
3161.951       383204.31137.32053 3225.4937.32053 3246.6736.98079 3267.8536.98079
 3289.0337.320533310.20937.320533352.569       383437.28736.594113458.46736.19411
3479.64736.194113564.365       363649.084       363670.26436.405153691.44436.52562
3712.62336.240943754.98336.481883776.16236.481883797.34236.551863818.52236.50138
3860.88136.851673882.06136.80118 3924.4237.00232  3945.636.87725 3966.7836.97782
3987.95936.971344009.139 36.68224051.498 36.34114072.67836.570554093.858     36.4
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4115.037    36.44136.217    36.84178.57637.353974199.75637.753974242.11537.75397
4263.29537.876984284.47537.876984305.654       384348.01439.639554369.19339.63955
4411.553 41.27914432.732 40.66474475.09241.085384496.27140.470984517.45140.68629
4538.63141.038044559.811 40.5601 4602.1741.26361 4623.3540.785674665.70942.88488
4686.88943.439474729.24845.538694750.42845.650074771.60746.256484792.78746.36786
4856.32647.546664898.68648.894974919.86549.287254941.04549.961414962.22549.96913
4983.40449.395725025.76449.411165046.94348.837755089.303       505152.842      50
 5258.7449.42566 5279.9249.591125322.27949.718325343.45949.883785364.63949.94738
5385.81849.944535406.99850.043555449.35750.066345470.53750.165365491.71750.19099
5576.436       505597.61550.377225639.97550.377225661.15450.754445703.51450.79438
5745.87350.119855788.23250.159795894.131       505915.31150.07288 5936.4950.07288
 5957.6750.145756000.02950.145756021.20950.191296063.56850.136626084.74850.18215
6105.92850.182156127.10750.136626148.28750.136626211.826       506254.18649.25842
6296.54549.258426317.72548.887626360.08449.629216381.26449.629216402.443      50
6847.217       506889.57649.711036910.75649.711036931.93649.566556953.11549.56655
6974.29549.711036995.47549.711037037.834       507080.193      507101.37350.33413
7143.73250.334137164.91250.668277207.271 50.00257376.709       507397.889 49.7102
7419.06849.984777461.42849.405167482.60749.679737524.96749.596757546.14650.11964
7567.32650.009457588.50650.532337630.86550.049547652.04550.441237694.40449.95844
7715.58450.164527757.94350.015267779.12350.221347800.30350.146717821.48250.31621
7842.66250.766417863.84250.935917885.02150.632247906.20151.082447948.56150.36666
 7969.7450.76265 7990.9250.40475  8012.149.326578033.27949.638078054.45949.82146
8075.63949.412668117.99849.779468139.17849.922868181.53751.394078202.71751.53747
8223.896 50.94478245.07650.620628266.25651.032728308.61550.384568329.79549.64839
8350.97549.250038372.15449.464698393.33448.654248435.69349.083558456.87349.21522
8478.053  50.3728499.23250.503678520.41251.660458541.59251.497168562.77151.81385
8605.13151.857328626.31151.09889 8668.6751.12062 8689.8550.340478732.20949.68482
8753.38948.904668795.74849.604228816.92849.501668838.10749.851448859.28750.35533
8880.46750.195498922.826 51.08878944.00650.738938965.18651.185538986.36550.38915
9007.54550.389159028.72550.118829049.90449.322449071.084 49.05219092.26449.13057
9113.44348.682989155.803 48.83999176.982 48.39239219.34249.827479240.52150.20854
9282.881 51.64379304.06151.49646 9325.2451.68573 9346.4251.68969  9367.651.54244
9388.779 51.54649409.95951.158489452.31850.685039473.49850.297119494.67850.06038
9515.857 50.42419537.03750.412039579.39651.139479642.93651.127399664.11550.75159
9706.475    50.89727.654    50.49770.014    50.49791.193       509812.373      50
9833.55350.154839854.73250.154839875.91250.309659897.09250.309659918.27150.46448
9939.45150.464489960.63150.309659981.81150.3096510002.9950.5548210024.17    50.4
10066.53    50.410087.71       5010235.9750.0605210299.5151.2403510320.6951.55864
10341.8751.9384610363.0451.8646110384.2251.8522910426.5851.7045810447.7651.30458
10468.9451.3045810553.6650.0783210638.3850.1626810659.5650.6518410680.74 50.6177
10701.9250.1024310765.46       5010807.82      5010850.1850.2497710913.7250.24977
 10934.950.1248910977.2650.1669410998.44       5011040.79      5011061.9750.77439
11083.1550.7743911104.33    50.411125.51    50.811167.8751.4099711189.0551.80997
11231.4151.8632411252.59 51.984911273.7752.0115411294.95 52.133211337.3152.07992
11358.4952.3713111422.0352.3180311443.21       5211506.75      5211612.65      54
11951.52       54 11972.753.2004912015.0653.2004912036.2452.40097 12078.653.25811
12099.7852.8871612142.1452.8871612163.3252.48716 12184.552.4581112205.6852.05811
12248.04       5212353.94 51.588312459.83      5212502.1952.37947

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04403.3735     .06  907.59     .04
```

```
Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
      403.3735  907.59               4829    2227   11611              .1       .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)               49.34    Element                   Left OB    Channel   Right OB
  Vel Head (ft)                 0.04    Wt. n-Val.                 0.040      0.060      0.040
  W.S. Elev (ft)               49.30    Reach Len. (ft)          4829.00    2227.00   11611.00
  Crit W.S. (ft)                        Flow Area (sq ft)        3071.05    6519.72   40083.98
  E.G. Slope (ft/ft)        0.000083    Area (sq ft)             3071.05    6519.72   40083.98
  Q Total (cfs)             74500.00    Flow (cfs)               3962.92    8068.71   62468.37
  Top Width (ft)             5320.76    Top Width (ft)            403.37     504.22    4413.17
  Vel Total (ft/s)              1.50    Avg. Vel. (ft/s)            1.29       1.24       1.56
  Max Chl Dpth (ft)            21.32    Hydr. Depth (ft)            7.61      12.93       9.08
  Conv. Total (cfs)        8198268.0     Conv. (cfs)            436095.3   887912.2  6874260.0
  Length Wtd. (ft)           8623.86    Wetted Per. (ft)          410.91     505.57    4413.65
  Min Ch El (ft)               27.98    Shear (lb/sq ft)            0.04       0.07       0.05
  Alpha                         1.02    Stream Power (lb/ft s)      0.05       0.08       0.07
  Frctn Loss (ft)               1.72    Cum Volume (acre-ft)      563.41     289.32    6791.96
  C & E Loss (ft)               0.01    Cum SA (acres)             83.94      27.09     989.64

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 10000

INPUT
Description: 0  0  1000
Station Elevation Data    num=     221
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
3266.872 43.7674 3287.68 43.53213308.48942.590263329.29742.354973350.10542.11967
3370.91342.119673391.72141.413123412.52941.413123433.33740.232383454.14539.52582
3474.95340.279883495.76141.03395 3516.5741.788023537.37843.016263544.60343.01626
3565.96743.01626 3587.33 42.26223608.69441.508133630.05740.754073651.421      40
3672.784      403694.148      403715.511      403736.875      403758.239      40
3779.602      403800.966      403822.329      403843.693      403865.056      40
 3886.42      403907.783      403929.147      40 3950.51      403971.874      40
3993.237      404014.601      404035.964      404057.328      404078.691      40
4100.055      404121.419      404142.783      404164.146      40 4185.51      40
4206.874 40.63524228.23841.249114249.602 41.88434270.96542.498214292.32943.11213
4313.69343.417824335.05743.70224 4356.4243.986654377.78444.292344399.14844.23007
4420.51243.002374441.87541.406714463.23939.811044484.60336.293044505.96734.69737
```

```
4527.33136.650084548.69436.680444570.05834.990844591.42235.021214612.786 33.3316
4634.14933.977294655.51336.342954676.87736.988644698.24137.634334719.604      40
4740.968       404762.33239.763884783.69639.76388 4805.0639.763884826.42339.52776
4847.787 40.22354869.15140.919244890.51541.378864911.87842.401094933.24242.86071
4954.60642.80109 4975.9742.741474997.33342.119245018.69742.059625040.061      42
5061.425       425082.789      425104.152      425125.516      42 5146.88     42
5168.244       425189.607      425210.971      425232.335      425253.69942.20194
5275.063       425296.426      42 5317.79      425339.154      425360.518     42
5381.881       425403.245      425424.609      425445.973      425467.336     42
 5488.7        425510.064    42.25531.428    42.45552.792    42.65574.155     43
5595.519     43.25616.883    43.45638.247    43.6 5659.61    43.85680.974     44
5702.338       445723.702      445745.065      445766.429      445787.793     44
5809.157       445830.521      445851.884      445873.248      445894.612     44
5915.976       445937.339      445958.703      445980.067      446001.431     44
6022.79444.374476044.15844.748936065.52245.123396086.88645.49786 6108.2545.89786
6129.61345.897866150.97745.923396172.34145.948936193.70545.974466215.068      46
6236.432       466257.796      46 6279.16    45.66300.523    45.66321.887   45.2
6343.251     44.86364.615    44.86385.979    44.46407.342    44.46428.706     44
 6450.07       446471.434    44.46492.797    44.46514.161    44.46535.525   44.8
6556.88944.602816578.25244.805636599.61644.60844 6620.9844.608446642.34444.81126
6663.70844.608446685.07144.405636706.43544.405636727.79944.202826749.163      44
6770.526       44 6791.89      446813.254      446834.618      446855.981     44
6877.345       446898.709      446920.073      446941.437      44  6962.8     44
6984.164       447005.528      447026.892      447048.255      447069.619     44
7090.983       447112.347      44 7133.71      447155.074      447176.438     44
7197.802       447219.166      447240.529      447261.893      447283.257     44
7304.621       447325.984      447347.348      447368.712      447390.076     44
7411.439       447432.803      447454.167      447475.531      447496.895     44
7518.258       447539.622      447560.986      44 7582.35      447603.713     44
7625.077       447646.441      447667.805      447689.168      447710.532     44
7731.896       44 7753.26      447774.624      447795.987      447817.351     44
7838.71543.923087860.07943.846157881.44243.769237902.806   43.68 7924.17    43.6
7945.534   43.52

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
3266.872     .044377.784     .064933.242     .04

Bank Sta: Left   Right     Lengths: Left Channel    Right      Coeff Contr.   Expan.
      4377.7844933.242                 0       0        0               .1       .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             47.60    Element                   Left OB    Channel    Right OB
  Vel Head (ft)               0.18    Wt. n-Val.                  0.040      0.060      0.040
  W.S. Elev (ft)             47.42    Reach Len. (ft)
  Crit W.S. (ft)             44.39    Flow Area (sq ft)         7093.39    4798.36   10877.65
  E.G. Slope (ft/ft)      0.001001    Area (sq ft)              7093.39    4798.36   10877.65
  Q Total (cfs)           74500.00    Flow (cfs)               28626.44   15808.42   30065.14
  Top Width (ft)           4678.66    Top Width (ft)            1110.91     555.46    3012.29
  Vel Total (ft/s)            3.27    Avg. Vel. (ft/s)             4.04       3.29       2.76
  Max Chl Dpth (ft)          14.09    Hydr. Depth (ft)             6.39       8.64       3.61
```

Conv. Total (cfs)	2354725.0	Conv. (cfs)	904796.9	499657.2	950270.3
Length Wtd. (ft)		Wetted Per. (ft)	1114.83	556.53	3016.27
Min Ch El (ft)	33.33	Shear (lb/sq ft)	0.40	0.54	0.23
Alpha	1.09	Stream Power (lb/ft s)	1.60	1.78	0.62
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:Cosumnes

Reach	River Sta.	n1	n2	n3
1	90000	.04	.06	.04
1	80000	.04	.06	.04
1	75000	.04	.06	.04
1	70000	.04	.06	.04
1	65000	.04	.06	.04
1	60050	.04	.06	.04
1	60025	Bridge		
1	60000	.04	.06	.04
1	55050	.04	.06	.04
1	55025	Bridge		
1	55000	.04	.06	.04
1	50050	.04	.06	.04
1	50025	Bridge		
1	50000	.04	.06	.04
1	45050	.04	.06	.04
1	45025	Bridge		
1	45000	.04	.06	.04
1	40050	.04	.06	.04
1	40025	Bridge		
1	40000	.04	.06	.04
1	35050	.04	.06	.04
1	35025	Bridge		
1	35000	.04	.06	.04
1	30050	.04	.06	.04
1	30025	Bridge		
1	30000	.04	.06	.04
1	25000	.04	.06	.04
1	20000	.04	.06	.04
1	15000	.04	.06	.04
1	10000	.04	.06	.04

SUMMARY OF REACH LENGTHS

River: Cosumnes

Reach	River Sta.	Left	Channel	Right
1	90000	7511	8475	11057
1	80000	7193	6447	4790
1	75000	6233	4757	1316
1	70000	2618	3993	6763
1	65000	9525	8882	3320
1	60050	4038	5254	4975
1	60025	Bridge		
1	60000	4038	5254	4975
1	55050	2746	3139	3633
1	55025	Bridge		
1	55000	2746	3139	3633
1	50050	3166	4770	6283
1	50025	Bridge		
1	50000	3166	4770	6283
1	45050	2902	5389	6335
1	45025	Bridge		
1	45000	2902	5389	6335
1	40050	5191	5120	3182
1	40025	Bridge		
1	40000	5191	5120	3182
1	35050	4629	4288	1850
1	35025	Bridge		
1	35000	4629	4288	1850
1	30050	4196	4551	5233
1	30025	Bridge		
1	30000	4196	4551	5233
1	25000	7416	6117	1229
1	20000	4755	2383	2062
1	15000	4829	2227	11611
1	10000	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Cosumnes

Reach	River Sta.	Contr.	Expan.
1	90000	.1	.3
1	80000	.1	.3
1	75000	.1	.3
1	70000	.1	.3
1	65000	.1	.3
1	60050	.1	.3
1	60025	Bridge	
1	60000	.1	.3

1	55050	.1	.3
1	55025	Bridge	
1	55000	.1	.3
1	50050	.1	.3
1	50025	Bridge	
1	50000	.1	.3
1	45050	.1	.3
1	45025	Bridge	
1	45000	.1	.3
1	40050	.1	.3
1	40025	Bridge	
1	40000	.1	.3
1	35050	.1	.3
1	35025	Bridge	
1	35000	.1	.3
1	30050	.1	.3
1	30025	Bridge	
1	30000	.1	.3
1	25000	.1	.3
1	20000	.1	.3
1	15000	.1	.3
1	10000	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	90000	100-year	74500.00	83.26	105.20		105.31	0.000514	2.85	28319.87	5296.91	0.15
1	80000	100-year	74500.00	76.21	95.26	93.66	95.50	0.002323	5.29	19419.67	6581.61	0.30
1	75000	100-year	74500.00	70.85	87.51		87.68	0.001088	3.36	22498.35	5446.42	0.20
1	70000	100-year	74500.00	68.98	86.66		86.73	0.000356	2.14	34443.24	6082.96	0.12
1	65000	100-year	74500.00	69.37	81.77		82.03	0.002082	3.73	18178.76	4807.15	0.27
1	60050	100-year	74500.00	60.79	80.00	74.77	80.06	0.000223	1.71	40019.51	7222.98	0.09
1	60025		Bridge									
1	60000	100-year	74500.00	60.79	78.05		78.17	0.000669	2.75	27165.25	6060.65	0.16
1	55050	100-year	74500.00	55.96	75.75	71.50	75.83	0.000354	2.02	34767.90	6650.00	0.12
1	55025		Bridge									

1	55000	100-year	74500.00	55.96	71.50	71.50	72.46	0.013672	10.44	10074.72
4722.04	0.70									
1	50050	100-year	74500.00	54.60	67.34	37.32	67.38	0.000023	0.44	48341.66
2561.18	0.03									
1	50025		Bridge							
1	50000	100-year	74500.00	54.60	67.23		67.27	0.000023	0.45	48058.26
2545.36	0.03									
1	45050	100-year	74500.00	52.43	66.89	61.12	66.94	0.000208	1.18	41307.69
7199.94	0.08									
1	45025		Bridge							
1	45000	100-year	74500.00	52.43	65.17		65.27	0.000556	1.98	29701.64
6268.29	0.14									
1	40050	100-year	74500.00	48.28	63.04	57.91	63.10	0.000234	1.44	39039.96
6686.31	0.09									
1	40025		Bridge							
1	40000	100-year	74500.00	48.28	60.90		61.03	0.000843	2.25	25643.26
5779.18	0.17									
1	35050	100-year	74500.00	45.35	59.66	54.95	59.71	0.000226	1.12	43676.93
8199.65	0.09									
1	35025		Bridge							
1	35000	100-year	74500.00	45.35	58.04	54.95	58.13	0.000685	1.59	30826.70
7778.97	0.14									
1	30050	100-year	74500.00	39.19	57.10	52.58	57.14	0.000232	1.69	46975.76
10677.67	0.10									
1	30025		Bridge							
1	30000	100-year	74500.00	39.19	55.16	52.58	55.27	0.000903	2.85	28418.48
7960.85	0.18									
1	25000	100-year	74500.00	40.74	50.47	48.19	50.61	0.001107	2.38	25311.14
6819.55	0.19									
1	20000	100-year	74500.00	33.05	49.56	42.36	49.58	0.000069	1.03	64065.50
9099.66	0.05									
1	15000	100-year	74500.00	27.98	49.30		49.34	0.000083	1.24	49674.75
5320.76	0.06									
1	10000	100-year	74500.00	33.33	47.42	44.39	47.60	0.001001	3.29	22769.40
4678.66	0.20									

HEC-RAS Plan: Flood Of Record River: Cosumnes Reach: 1 Profile: 100-year

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	90000	100-year	93000.00	83.26	105.91		106.04	0.000549	2.95	32118.43	5397.71	0.15
1	80000	100-year	93000.00	76.21	95.85	93.97	96.10	0.002093	5.12	23346.54	6811.25	0.29
1	75000	100-year	93000.00	70.85	88.26		88.45	0.001140	3.55	26947.42	6772.14	0.21
1	70000	100-year	93000.00	68.98	87.36		87.45	0.000381	2.25	38771.35	6154.60	0.12
1	65000	100-year	93000.00	69.37	83.09		83.31	0.001227	3.04	24724.34	5103.89	0.21
1	60050	100-year	93000.00	60.79	82.02	75.04	82.07	0.000137	1.48	55703.61	8495.07	0.08
1	60025		Bridge									
1	60000	100-year	93000.00	60.79	78.82		78.96	0.000658	2.81	31977.27	6469.51	0.16
1	55050	100-year	93000.00	55.96	76.44	71.84	76.53	0.000381	2.20	39443.92	6922.45	0.12
1	55025		Bridge									
1	55000	100-year	93000.00	55.96	71.84	71.84	72.90	0.013912	10.62	11709.92	4913.92	0.71
1	50050	100-year	93000.00	54.60	68.52	38.22	68.57	0.000032	0.54	51437.26	2728.81	0.03
1	50025		Bridge									
1	50000	100-year	93000.00	54.60	68.36		68.42	0.000032	0.54	51025.89	2691.40	0.03
1	45050	100-year	93000.00	52.43	67.96	61.49	68.02	0.000193	1.11	49287.06	7915.35	0.08
1	45025		Bridge									
1	45000	100-year	93000.00	52.43	66.51		66.61	0.000392	1.78	38626.61	7025.25	0.12
1	40050	100-year	93000.00	48.28	65.22	58.24	65.27	0.000135	1.30	55026.48	8631.18	0.07
1	40025		Bridge									
1	40000	100-year	93000.00	48.28	62.06		62.19	0.000615	2.15	32669.86	6274.01	0.15
1	35050	100-year	93000.00	45.35	60.80	55.21	60.84	0.000279	1.42	55926.26	12344.06	0.10
1	35025		Bridge									
1	35000	100-year	93000.00	45.35	59.46	55.21	59.54	0.000397	1.44	42056.04	7995.00	0.11
1	30050	100-year	93000.00	39.19	58.94	52.84	58.97	0.000131	1.43	71272.07	15777.41	0.07
1	30025		Bridge									
1	30000	100-year	93000.00	39.19	55.60	52.84	55.73	0.000993	3.11	31959.68	8391.60	0.19
1	25000	100-year	93000.00	40.74	51.53	48.47	51.66	0.000765	2.22	32717.98	7127.00	0.16
1	20000	100-year	93000.00	33.05	50.71	42.71	50.73	0.000068	1.09	75022.57	10241.89	0.05
1	15000	100-year	93000.00	27.98	50.42		50.46	0.000105	1.47	57392.75	9524.09	0.07
1	10000	100-year	93000.00	33.33	48.14	44.89	48.35	0.001000	3.47	26150.04	4678.66	0.20

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                  HEC-RAS Version 4.0 Beta
                U.S. Army Corp of Engineers
               Hydrologic Engineering Center
                     609 Second Street
                     Davis, California

     X     X  XXXXXX    XXXX        XXXX      XX      XXXX
     X     X  X        X    X       X   X    X  X    X
     X     X  X        X            X   X   X    X   X
     XXXXXXX  XXXX     X      XXX   XXXX    XXXXXX    XXXX
     X     X  X        X            X  X    X    X        X
     X     X  X        X    X       X   X   X    X        X
     X     X  XXXXXX    XXXX        X    X  X    X   XXXXX
```

```
PROJECT DATA
Project Title: Cosumnes River
Project File : CosumnesRiver.prj
Run Date and Time: 8/31/2010 10:36:02 AM

Project in English units



PLAN DATA

Plan Title: Flood of Recod
Plan File : j:\12432A - CAPITAL SEC\ENG\HYDROLOGY\RAS\Cosumnes\RAS\CosumnesRiver.p03

           Geometry Title: Cosumnes
           Geometry File : j:\12432A - CAPITAL SEC\ENG\HYDROLOGY\RAS\Cosumnes\RAS\CosumnesRiver.g01

           Flow Title    : FloodRecord
           Flow File     : j:\12432A - CAPITAL SEC\ENG\HYDROLOGY\RAS\Cosumnes\RAS\CosumnesRiver.f03

Plan Summary Information:
Number of:  Cross Sections =   23    Multiple Openings  =    0
            Culverts       =    0    Inline Structures  =    0
            Bridges        =    7    Lateral Structures =    0

Computational Information
    Water surface calculation tolerance  =  0.01
    Critical depth calculation tolerance =  0.01
    Maximum number of iterations         =  20
    Maximum difference tolerance         =  0.3
    Flow tolerance factor                =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow
```

FLOW DATA

Flow Title: FloodRecord
Flow File : j:\12432A - CAPITAL SEC\ENG\HYDROLOGY\RAS\Cosumnes\RAS\CosumnesRiver.f03

Flow Data (cfs)

River	Reach	RS	100-year
Cosumnes	1	90000	93000

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Cosumnes	1	100-year		Normal S = 0.001

GEOMETRY DATA

Geometry Title: Cosumnes
Geometry File : j:\12432A - CAPITAL SEC\ENG\HYDROLOGY\RAS\Cosumnes\RAS\CosumnesRiver.g01

CROSS SECTION

RIVER: Cosumnes
REACH: 1   RS: 90000

INPUT
Description: 75792 80000 9000
Station Elevation Data   num=   357

```
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0145.219622.37586145.264644.75172145.901467.12758145.946489.50344145.9285
111.8793145.5973134.2552145.5794 156.631145.2483179.0069145.2304201.3827144.7506
223.7586144.5841246.1344144.1043268.5103143.9378290.8861143.4581402.7654     142
514.6447     140537.0206139.9202559.3964139.9202581.7723139.8403604.1481139.8403
648.8998139.7125671.2757139.5846693.6516139.5366716.0274139.4088738.4033139.3608
 783.155137.5764805.5308137.1401827.9067136.2479850.2825135.8115872.6584134.7354
895.0342134.1152917.4101133.0391939.7859132.4188962.1618131.3312984.5377130.8046
1006.914129.81051029.289129.85021051.665128.85621074.041128.89591096.417128.0394
1118.793128.21671141.169127.36031163.545127.5375 1185.92126.99191208.296127.3769
1230.672 127.0391253.048127.28671275.424126.9488  1297.8127.19651320.176127.7922
1342.551128.97351364.927129.56921387.303130.75051409.679131.75371432.055131.6463
1454.431131.36091476.807131.78511499.182131.49971521.558131.92391543.934131.0681
 1566.31130.92191588.686130.06611611.062129.91991633.438129.03141655.813128.7265
1678.189127.67921700.565128.05581722.941127.00851745.317127.38511767.693126.2516
1790.068126.54191812.444125.4084 1834.82125.69881857.196124.67091879.572124.3413
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2573.226110.38262595.602109.63512617.978108.83352640.354108.0859 2662.73107.7657
2685.106107.49962707.482107.17942729.858106.91332752.234106.3986 2774.61106.5242
2796.986106.40112819.362107.06862841.738106.94562864.114107.6131 2886.49107.0306
2908.866107.23852931.242 106.6562953.618 106.8642975.994106.4576 2998.37106.1007
3020.746105.12933043.122104.75023065.498103.7789 3110.25102.97793132.626103.1482
3155.002102.72633177.378102.89663199.754 103.615 3222.13104.07793244.506105.0889
3266.882105.34763289.258106.35863311.634106.6173 3334.01107.49433356.385 107.619
3378.761 108.4963401.137108.62073423.513109.27893445.889108.93683468.265109.1282
3490.641108.58343513.017108.77473535.393  108.233557.769108.62573580.145108.2852
3602.521108.68093647.273108.02823692.025108.80953714.401108.82133736.777 109.226
3759.153109.23783781.529110.41553803.905111.20033826.281 112.3783848.657113.1628
3871.033113.56283893.409114.34973982.913 115.9754072.417115.99174117.168116.8077
4139.544117.6153 4161.92117.71594184.296118.52354206.672118.62414229.048119.3501
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4475.184117.0864 4497.56116.05654519.936115.39684542.312114.58964564.688114.4321
4587.064114.1271 4609.44114.36934631.816114.06434654.192114.30644676.568113.5203
4698.944113.2814 4721.32112.49534743.696112.25634766.072113.14754788.448113.1278
4810.824114.2382  4833.2 115.0914855.576116.20154877.952117.05434900.328 117.398
4922.704117.4841 4945.08117.82784967.456117.91394989.832 118.3315012.208117.5421
5034.583117.08435056.959117.14945079.335116.69165101.711116.75675124.087114.9461
5146.463113.65845168.839111.84785191.215110.56025213.591109.04685235.967108.2623
5325.471104.15965437.351101.99845482.103 101.6755504.479101.66035526.855101.4977
5549.231 101.483 5566.56101.09775593.935100.71255648.684100.38565676.058100.4597
5703.433100.29635730.807100.58025758.182   101.2 5867.68      1026743.664     102
6825.788102.41226853.162102.88056907.911106.19526935.286106.6177 6962.66 108.275
7017.409107.54077099.53391.269047154.28283.257547236.40595.455097291.154105.2929
7318.529106.72387345.903107.39317373.278 108.8247455.401105.64367482.776     102
7893.394      1027948.143    101.87975.517    101.68057.641101.16678085.015  100.96
8167.139   100.58194.513100.41678249.261  100.088276.635      1008523.001     100
8741.99399.414288933.611   98.769179.978       989207.35297.470729289.47495.32076
9344.22294.69856 9398.9795.325839426.34495.466749453.71895.951249481.09296.28384
9617.96297.155329700.084 97.28519836.95497.560079864.32897.938589891.70298.06289
9919.07698.2598310028.57   98.1610083.32   98.3210138.0798.6933410165.4498.93333
10192.8298.8333410220.19    98.810247.56    99.210274.94    99.410302.31    99.8
10329.69     10010384.43      100 10521.392.1815910658.17103.603410685.55106.9757
10795.04  112.1510822.42112.190110931.92132.855310959.29135.895211068.79142.3728
11096.16144.389711123.53144.7793 11260.4142.587611342.53137.022111397.27135.9523
 11479.4130.983511506.77128.303311534.14128.972711561.52126.292511616.27129.0019
11698.39136.669211753.14138.065311835.26138.552711890.01136.438111917.38136.2374
11944.75138.4289 11999.5138.027412026.88138.034712136.37139.286812163.75139.8725
12273.24146.306812300.62147.471712327.99150.147912355.36155.179112437.49163.2075
12574.36158.138512711.23 160.79812765.97172.888512793.35174.3675 12848.1186.4579
12875.47191.534812984.97195.637813012.34196.522413121.84      19813395.58     198
13450.33197.680513532.45196.4805 13587.2      19613614.57      19613751.44     194
13888.31      19413943.06   193.214025.18192.862914052.55193.150514079.93193.3649
 14216.8193.929614326.29192.755214353.67192.825614435.79193.706414463.16193.7064
14490.54      19414627.41190.184214764.28188.4594 14846.4186.895214873.77186.8276
14901.15186.306214928.52185.881915038.02   187.615065.39187.328715174.89184.1119
15202.26183.616915257.01  181.2515284.38 180.88815311.76179.704615448.63179.1383
15503.38179.142815530.75178.4551

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .047017.409     .067373.278     .04
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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
     7017.4097373.278              7511    8475   11057              .1        .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)            106.04   Element                   Left OB    Channel   Right OB
  Vel Head (ft)               0.14   Wt. n-Val.                 0.040      0.060      0.040
  W.S. Elev (ft)            105.91   Reach Len. (ft)          7511.00    8475.00   11057.00
  Crit W.S. (ft)                     Flow Area (sq ft)        6815.29    3227.07   22076.06
  E.G. Slope (ft/ft)      0.000549   Area (sq ft)             6815.29    3227.07   22076.06
  Q Total (cfs)           93000.00   Flow (cfs)              14242.72    9532.49   69224.79
  Top Width (ft)           5397.71   Top Width (ft)           1892.21     277.24    3228.26
  Vel Total (ft/s)            2.90   Avg. Vel. (ft/s)            2.09       2.95       3.14
  Max Chl Dpth (ft)          22.65   Hydr. Depth (ft)            3.60      11.64       6.84
  Conv. Total (cfs)      3968344.0    Conv. (cfs)            607741.9   406754.7  2953847.0
  Length Wtd. (ft)        10339.26   Wetted Per. (ft)         1892.49     281.05    3229.42
  Min Ch El (ft)             83.26   Shear (lb/sq ft)            0.12       0.39       0.23
  Alpha                       1.06   Stream Power (lb/ft s)      0.26       1.16       0.73
  Frctn Loss (ft)             9.93   Cum Volume (acre-ft)    19071.92    6238.64   77236.32
  C & E Loss (ft)             0.01   Cum SA (acres)           3440.39     692.78   12078.26


Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 80000

INPUT
Description: 67317  70000  8000
Station Elevation Data    num=     443
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0117.5258 22.2967117.8687133.7802118.0742200.6703120.3875222.9671120.9213
245.2638121.6975267.5605122.1096289.8571122.7639312.1538 123.176334.4505123.6535
356.7472124.0655379.0439124.8515401.3406125.5719423.6373126.3579 445.934127.0557
468.2307127.8417490.5274 129.011512.8241130.2684579.7142133.8047646.6042138.5342
668.9009140.0682691.1976141.6541713.4943144.0708 735.791146.5394758.0877 148.956
780.3844150.2114802.6811152.6281824.9778152.5694847.2745 153.672869.5712153.6133
891.8679155.4833914.1646155.4246936.4612156.4757958.7579155.5981981.0546156.6492
1003.351156.14271025.648157.19381047.945156.69641070.242157.75661092.538157.2592
1114.835157.85441137.132 157.3571159.429158.50571181.725158.56171204.022159.7104
1226.319161.63551248.616162.78411270.912163.58261293.209163.60471315.506164.4031
1337.803 165.1491360.099165.94741382.396165.94741404.693       1661471.583     166
1516.177164.61561538.473164.3673 1560.77163.67511583.067163.42671605.364162.0979
 1627.66161.21281649.957 159.8841672.254158.99891694.551157.67161716.847156.5119
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 2965.46130.54632987.757129.83613010.054130.4027 3032.35129.84983054.647130.7431
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3210.723138.2071 3233.02138.78723255.317141.02453277.613139.7198 3299.91141.3224
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 3433.69140.77383455.986138.98833478.283140.1101 3500.58 137.0673522.876136.7798
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5529.589100.05435551.886100.56495574.183102.10865596.479102.61925618.776102.0898
5641.073100.5273 5663.3799.997975685.66798.435495707.96497.906145819.448      94
7023.479      947045.776     93.97068.073     93.9 7090.37     93.87112.667    93.6
7134.964     93.57313.339     92.47335.63692.533337357.933     92.47380.229      92
8004.542      928026.839     92.28049.13692.133338071.433   92.3758093.72992.48333
8116.026     92.88138.323     92.8 8160.62     92.98182.917     92.98205.214      93
8227.511      938249.808     93.18272.104     93.18294.401     93.28316.698    93.2
8338.995     93.38428.18393.244459052.495       929097.089       929119.38692.07566
9141.68391.328519163.97991.496389186.276       929364.651       929386.94891.47534
9409.24591.320159431.542 90.64039453.83990.125569476.13689.445729498.43388.93097
9520.729 88.61579543.02688.465549565.32388.150279609.91787.808719676.80888.70409
9699.10489.442679721.40189.528789810.58989.60732 9944.3789.8625610011.26      90
10256.5389.9995310278.8289.4173510301.1289.7751210323.4289.5508410345.7188.89709
10368.0188.6728110390.3188.01907 10412.689.58942 10434.990.73031 10457.292.30067
 10479.593.4415610501.7995.2751810524.0994.2289410546.3993.8754310568.6892.55949
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10970.03104.267510992.32104.284511014.62104.720911036.92104.737811059.21105.1742
11081.51104.973811103.81105.1929 11126.1104.9925 11148.4105.2116 11170.7105.0113
   11193104.542111215.29103.958911237.59103.489711259.89102.906611282.18102.4374
11304.48 102.11611326.78101.908611349.07101.587211371.37101.379811393.67101.0584
11415.96100.974411438.26101.162711460.56101.078711482.85 101.26711505.15 101.183
11527.45 101.34511549.75101.234811572.04101.396911594.34101.286611616.64101.4487
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11750.4299.0651411772.7198.5325711795.0198.5325711817.31       98 11861.9      98
 11884.2     97.6 11906.5     97.611928.79     97.211951.09     97.211973.39    96.8
11995.68     96.812017.98     96.412040.28     96.412084.87     95.612107.1795.63602
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 13266.699.59991 13288.9100.0963 13311.2100.9593 13333.5101.192813355.79102.0558
13378.09102.289413400.39103.152313422.68103.313513444.98104.919513467.28105.0807
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13824.03 108.74513846.32109.470113868.62110.366413890.92111.783113935.51113.5756
13957.81114.9923 13980.1115.6881 14002.4116.9044 14024.7117.6003  14047118.8166
14069.29118.795514091.59120.011914113.89119.990914136.18 120.36914158.48120.3479
14180.78 120.72614203.07 120.66914225.37 121.01114247.67 120.95414269.96 121.296
14292.26121.044914314.56121.249814336.85120.861414359.15 121.43214381.45121.0436
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14515.23124.095714537.53 125.19214559.82125.899614582.12127.772414604.42  128.48
14626.71130.352814649.01131.250514671.31133.3134

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
      0     .045150.542     .065596.479     .04

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
      5150.5425596.479              7193    6447    4790              .1        .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             96.10    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               0.25    Wt. n-Val.                  0.040      0.060      0.040
  W.S. Elev (ft)             95.85    Reach Len. (ft)           7193.00    6447.00    4790.00
  Crit W.S. (ft)             93.97    Flow Area (sq ft)         2089.15    1844.07   19413.32
  E.G. Slope (ft/ft)      0.002093    Area (sq ft)              2089.15    1844.07   19413.32
  Q Total (cfs)           93000.00    Flow (cfs)                9583.26    9450.03   73966.71
  Top Width (ft)           6811.25    Top Width (ft)             548.65     187.65    6074.95
  Vel Total (ft/s)            3.98    Avg. Vel. (ft/s)             4.59       5.12       3.81
  Max Chl Dpth (ft)          19.64    Hydr. Depth (ft)             3.81       9.83       3.20
  Conv. Total (cfs)      2032602.0     Conv. (cfs)             209451.1   206539.2  1616611.0
  Length Wtd. (ft)         5054.15    Wetted Per. (ft)           549.08     191.74    6075.60
  Min Ch El (ft)             76.21    Shear (lb/sq ft)             0.50       1.26       0.42
  Alpha                       1.03    Stream Power (lb/ft s)       2.28       6.44       1.59
  Frctn Loss (ft)             7.63    Cum Volume (acre-ft)     18304.22    5745.32   71970.62
  C & E Loss (ft)             0.02    Cum SA (acres)            3229.95     647.56   10897.52


Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 75000

INPUT
Description: 60870  65000  7500
Station Elevation Data    num=     374
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      0     114 360.187     114408.2119114.1307432.2243113.7307480.2492113.8614
504.2617  114.17528.2741114.9439552.2866115.5276 576.299115.8361600.3115116.4198
```

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624.3239116.3844648.3364116.0738672.3488115.8363696.3613115.7018744.3862114.9498
768.3986114.8358816.4235114.06331080.561     1141128.585   113.21152.598   113.2
1200.623   112.41224.635   112.41248.648     112 1272.66111.72661296.673111.7266
1320.685111.45321344.698111.0994 1368.71 111.0191416.735110.31131440.747110.2309
1488.772111.71161512.785112.3798 1560.81113.86041584.822113.58391608.834113.3796
1632.847112.66061656.859112.38411680.872111.66511704.884110.35831728.897109.4939
1776.922106.88031800.934106.01591848.959105.83041872.971105.83171920.996105.6461
1945.009105.33571969.021104.93122041.059104.02822161.121101.70482209.146100.9264
2233.158100.95122281.183100.17282305.19699.826182329.20899.065542401.24598.01539
2569.33398.020292593.34597.659842617.35797.66998 2641.3797.309522689.39597.70164
2713.40797.527112761.43298.269482785.445 98.34212833.46999.578832857.48299.65145
2881.494100.26982905.507101.02962929.519100.88812977.544102.40773001.557102.2662
3049.582102.88043073.594102.28613121.619 101.8743145.631102.45133193.656104.3824
3217.669104.95973241.681105.92533265.694106.30643289.706106.23013337.731106.9924
3361.743 106.9163409.768107.89863481.806107.96323601.868105.9334 3625.88104.7628
3649.893104.04033697.918101.6991 3721.93100.97663769.95598.597673793.96897.85635
3841.99297.098983866.00597.44885 3914.0398.873883938.04299.223753962.05599.93626
3986.067 100.749 4010.08 101.2394058.104102.86454082.117103.35454130.142103.7789
4154.155103.6683 4202.18103.58734226.193103.27734274.218102.79744298.231102.4874
4322.244102.24744346.256102.59794370.269102.61674418.294103.31774442.307103.3364
4490.333104.59854514.345104.89784562.371105.14254586.383105.77834634.409106.6962
4658.421 107.3324682.434107.79094802.498107.96354874.536 106.6024922.561103.3655
4946.574102.99574994.59999.911095018.61299.541275042.62597.998975066.63797.22491
 5090.6597.166445138.67595.618315162.68895.559845210.71394.013135234.72693.95535
5282.75192.610015306.76492.45695 5354.7990.921025378.80290.767965402.815      90
5787.018      905811.031    89.65835.043    89.75859.056    89.65883.069    89.6
5907.082      906051.158      90 6075.17    90.46099.183    90.66123.196      91
6147.208      916195.234    91.46219.247    91.46291.285      926483.386      92
6627.462    93.26651.475    93.3  6699.5    93.36747.52693.466676843.577      94
7203.767      94 7227.7895.172267275.80593.447557299.818 94.61987323.83193.75745
7347.84387.785197371.85683.847557395.86977.875297419.88174.786147443.894 70.8485
7491.91979.424987515.93282.864727563.95891.44121 7587.9791.556597635.99694.06604
7660.00894.181437684.02195.436157708.03495.443557732.04694.311627756.05994.31903
7780.07292.936497804.08491.80457 7852.1190.515847924.14890.043197948.16189.69546
7972.173    89.27996.186    89.258020.199    89.18044.211      89 8116.25    88.4
8140.262    88.48164.275      889124.782      889268.858    86.89292.871   86.84
9316.884    86.729340.896    86.49364.909      8610205.35      8610325.42    85.5
10349.43    85.310397.46    85.110421.47    84.910469.49    84.710493.51    84.5
10541.53    84.310565.54    84.110589.56      8411165.86      8411189.8784.18378
11213.8983.78378 11237.983.9675611285.9283.1675611309.9483.1675611357.96      82
11381.98      8211405.99 81.5264    1143081.8440311454.0182.6352811502.0483.27056
11526.05 82.865311550.0684.8342411646.1289.9487711742.1792.7243311766.1892.49152
11790.1991.68845 11814.291.7903411862.2390.1841911886.2490.7048911910.2589.90475
11934.2789.3929711958.2889.9166212006.3188.8930712030.3288.7453312078.3486.37902
12102.3686.2312912126.3785.5190212150.3884.7469612174.3984.5394212222.4282.99529
12246.4382.8292612270.4582.20965 12366.582.0621512462.5582.6278612510.5782.63902
12534.5882.8071312582.6182.8294312606.62  83.17312654.65 82.896512678.6683.11372
12726.6982.79115 12750.7 83.764712798.7284.9548312822.7485.9283812846.7586.69852
12870.7686.9417512894.78 87.3884 12942.887.8748612966.8188.4894512990.8388.38074
13014.8488.0983813038.8588.3610313086.8887.7963213110.8987.7607813158.9286.59967
13182.9386.5641313206.9485.7338613230.95 84.849713254.9784.7602913302.9982.99199
   1332782.4957913351.0282.0862713543.1282.0239813591.14    81.613639.17    80.8
13663.18    80.813711.21      8013903.31      8013927.32    79.613951.3379.78552
13999.3679.3565814023.3779.3565814047.38 79.1421 14071.478.7574714095.4178.58732
14143.4479.6099814167.4579.4398314215.4780.1409814239.4979.81007 14263.580.16064
14287.5180.5700114311.5280.1525214359.55 80.798114383.5680.4452814407.5880.76807
14431.5981.16455 14455.680.8854314503.6381.7805214527.64 81.501414575.66 81.6946
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14599.6881.0645314623.6981.16113 14647.781.0800814671.7180.8350814719.7481.44312
14743.75 81.336914767.7781.6409114791.7882.0409214815.7982.0306914863.8283.10899
14887.8383.0987714935.8583.9242614959.8783.7876314983.8884.2003815007.8985.18256
15031.9185.1104115079.9387.2037415103.9487.3884115127.9688.4350815151.9789.35049
15175.9889.4038915224.0193.3373315248.0293.3907415296.0496.8059315320.06 96.6002
15344.07 98.307815368.08 99.2627 15392.199.1983715440.12101.390915464.13101.3704
15488.15102.466715512.16103.266815608.21101.953715800.31     98.815824.32 98.8424
15848.34 98.442415872.3597.9359215896.3697.8718415944.3996.54294 15968.496.47886
16016.4392.5875516040.4491.2422716064.4589.2966216088.4687.8696416112.4888.02681
 16160.588.1777416184.5188.5830216208.5388.6584916232.5488.6193416256.5588.90999
16304.5891.0441216328.5991.3347816376.6293.0149216400.6393.0785916424.6493.91866
16448.6594.3741316472.6694.9599316520.6996.91512 16544.7 96.509116568.71 97.4867
16592.72 98.685416616.7398.5004916664.76100.586316688.77100.401416736.79103.3879
 16760.8103.653316784.82105.146516808.83106.325416832.84106.329316880.86108.1641
16904.88107.956816928.89108.8742 16952.9109.624916976.91 109.25117024.93110.0338
17048.95109.659917072.96110.252817096.97110.080417120.98110.6733

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
      0      .04 7227.78      .067708.034      .04

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
       7227.787708.034                 6233    4757    1316                .1        .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             88.45    Element                  Left OB     Channel    Right OB
  Vel Head (ft)               0.18    Wt. n-Val.                             0.060       0.040
  W.S. Elev (ft)             88.26    Reach Len. (ft)          6233.00     4757.00     1316.00
  Crit W.S. (ft)                      Flow Area (sq ft)                    1776.68    25170.74
  E.G. Slope (ft/ft)      0.001140    Area (sq ft)                         1776.68    25170.74
  Q Total (cfs)           93000.00    Flow (cfs)                           6302.81    86697.19
  Top Width (ft)           6772.14    Top Width (ft)                        200.21     6571.93
  Vel Total (ft/s)            3.45    Avg. Vel. (ft/s)                        3.55        3.44
  Max Chl Dpth (ft)          17.41    Hydr. Depth (ft)                        8.87        3.83
  Conv. Total (cfs)      2754327.0     Conv. (cfs)                        186666.8   2567660.0
  Length Wtd. (ft)         1576.61    Wetted Per. (ft)                      203.32     6572.68
  Min Ch El (ft)             70.85    Shear (lb/sq ft)                        0.62        0.27
  Alpha                       1.00    Stream Power (lb/ft s)                  2.21        0.94
  Frctn Loss (ft)             0.96    Cum Volume (acre-ft)    18131.74     5477.38    69519.31
  C & E Loss (ft)             0.03    Cum SA (acres)           3184.65      618.85    10202.18


Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                 RS: 70000

INPUT
Description: 56113  60000  7000
Station Elevation Data    num=     206
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
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      0      98129.8456 96.0901285.6604      96363.567795.81077441.475195.81077
597.289896.29276 649.22896.20531675.197196.63992753.104597.51983779.073697.93158
908.919297.963631038.765 96.02071220.54993.113771298.456      921428.30292.02833
1687.99395.931131713.96296.421591739.93196.712871817.83898.184261843.80799.08961
1947.684101.98851999.622102.72762025.591103.3289 2051.56103.6737 2077.53 104.275
2155.437105.60282207.376  105.982337.222104.80192467.068101.86442493.037101.4916
2596.91499.000952622.88498.600952648.85398.45071 2726.7697.223292778.69997.22329
2804.66897.482192856.60797.261862934.51496.061853116.299      963220.17697.99149
3246.14598.275143272.11598.747963375.99199.956473505.838100.06293583.745100.2865
3635.684101.04463687.622101.68153713.592101.68153739.561     1023843.438   100.4
3869.407   100.43973.284    98.83999.253 98.61344025.222 98.21344051.19298.00669
4284.915      984362.82298.109144804.299      984934.14699.862564986.08499.86256
5063.992      1005141.89999.637635193.83898.837635219.80799.628575297.715101.1638
5323.684101.63455349.653101.88585375.623102.4573 5453.53103.21135583.376103.8057
5609.346 103.0545635.315102.10325661.284 101.3475713.22399.445365765.16196.32155
5843.06992.188355920.97790.782265972.91589.908936076.79288.595056102.76188.83421
 6128.7388.780576232.60790.966326258.57791.573056284.54691.761836362.45493.58204
6388.42393.632426414.392 93.95496440.36193.58732  6492.394.232266544.23894.53518
6570.208 93.99666622.14694.993246700.05494.879626726.02393.804846751.99292.94796
6855.86992.106516881.83891.678257011.68590.084667037.65490.122127141.53180.15051
  7167.576.096377193.46974.572627271.37768.977657323.31574.020837349.28576.88364
7401.22387.046187453.16290.135357479.13189.46149  7505.191.006087531.06990.67159
7608.97794.374027634.946 95.26887660.91696.502947764.79286.500597790.76284.93089
7816.73183.988787920.60883.716447946.57783.703738076.42383.395848102.39383.39584
8258.20782.933338362.08282.755558517.89582.5333310076.02      8210179.89   81.92
10231.8381.9333310335.7181.7333310413.61   81.6810491.52   81.4410543.46   81.36
10647.33   81.04 10673.3   81.0410777.18   80.7210803.14   80.7210907.02    80.4
10958.9680.39304 11088.8      8012075.61      8012205.4673.2973312309.3379.06063
 12335.380.5491912361.2780.4011712439.1878.4297912465.1478.3294912517.0876.67242
12594.9978.3429312620.9678.3429312672.89      8012828.71      8012854.68    80.4
12906.6180.8275912932.5880.6413912984.5281.0689813062.43 80.565213114.3680.18347
13244.21 80.059113296.1481.3046913348.0882.7527813374.0583.3558713451.9685.41573
13503.8986.3723413529.8686.8107813633.74 88.230813659.7188.4959913685.6888.83286
13763.5889.6284613893.4391.4116914023.2794.0062314153.1195.9688214231.0295.04846
14256.9994.1973414282.9693.8801714386.8390.34888 14412.890.0238414542.6492.27921
14568.6194.6236614594.5895.3065514672.49102.339914698.46 104.78314724.43109.2609
14750.39110.042414802.33118.998114854.27124.013514880.24126.326214906.21125.1376
14932.18127.450215010.08 135.96115036.05135.296615062.02136.519515165.89144.4345
15191.86 144.52615321.71146.412715347.68145.887615451.55143.996915477.52142.7896
15503.49141.529915581.39143.696115633.33147.8444 15659.3147.936815711.24 148.873
15789.14     15015815.11      15015918.99148.369915944.96148.359915970.93147.9499
16100.77     148

Manning's n Values         num=       3
     Sta    n Val     Sta   n Val     Sta   n Val
       0     .046700.054     .067660.916     .04

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
      6700.0547660.916              2618    3993    6763              .1        .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              87.45    Element                  Left OB    Channel    Right OB
  Vel Head (ft)                0.09    Wt. n-Val.                            0.060       0.040
  W.S. Elev (ft)              87.36    Reach Len. (ft)          2618.00    3993.00     6763.00
  Crit W.S. (ft)                       Flow Area (sq ft)                   3452.24    35319.11
  E.G. Slope (ft/ft)       0.000381    Area (sq ft)                        3452.24    35319.11
```

```
 Q Total (cfs)            93000.00   Flow (cfs)                          7784.17    85215.83
 Top Width (ft)            6154.60   Top Width (ft)                       340.16     5814.44
 Vel Total (ft/s)             2.40   Avg. Vel. (ft/s)                       2.25        2.41
 Max Chl Dpth (ft)           18.39   Hydr. Depth (ft)                      10.15        6.07
 Conv. Total (cfs)       4766594.0    Conv. (cfs)                       398967.6   4367627.0
 Length Wtd. (ft)          6559.05   Wetted Per. (ft)                     342.46     5815.12
 Min Ch El (ft)              68.98   Shear (lb/sq ft)                       0.24        0.14
 Alpha                        1.00   Stream Power (lb/ft s)                 0.54        0.35
 Frctn Loss (ft)              4.12   Cum Volume (acre-ft)   18131.74     5191.86    68605.58
 C & E Loss (ft)              0.01   Cum SA (acres)          3184.65      589.35    10015.08
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Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
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CROSS SECTION

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RIVER: Cosumnes
REACH: 1                 RS: 65000
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INPUT
Description: 52120  55000  6500
Station Elevation Data    num=     150
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      8884.3809886.36261 140.63585.02579 225.016 84.5233  281.2783.46012
365.650985.47523421.904987.37497506.285887.93258562.539989.96942646.9209 90.9454
703.174991.26934 787.55690.60394  843.81 91.1239 928.19189.86147984.445187.03142
1068.82685.18185 1125.0884.031411265.715      841350.09684.250911378.22384.17046
1434.47684.17683 1490.7384.809561715.746    84.8    1772      841912.635      84
 2053.27      86 2137.65       862193.90486.314152334.53987.60962 2418.92      88
2475.17488.713512559.55590.308492615.80991.755632700.18996.132472756.44397.52634
2840.824 97.55452897.078       982981.45997.983583037.71397.447453122.09494.23798
3178.34889.972773262.729 84.47943318.98282.127383403.36380.046643459.61780.63074
3543.99882.235153600.252 83.20443684.63383.48937 3712.7683.319173825.268    85.6
3853.395      863994.029       864134.664       884162.79187.959874275.29987.08988
4303.42686.775684415.93486.045674500.31486.053764640.94988.115574697.20388.03852
 4725.3388.310034837.83889.910034865.96590.126494978.47390.44703  5006.690.72054
5119.10793.232215147.23493.201235259.74292.161035400.377 90.42865428.504 90.4286
5541.012      905569.13989.975235681.64689.362695709.77388.949855822.28187.94312
5850.40887.408695962.91683.542695991.04382.827296103.55181.440236131.67882.68151
6244.18686.286716272.31386.277896356.69385.443266380.56184.80321 6400.7984.52499
6501.93285.586856522.16185.724046542.38985.642946603.075 86.05456623.30386.54683
 6663.7687.229286683.98987.503326704.21787.844546744.67487.987356906.502      88
6987.41789.754417007.64589.898577048.10288.205257068.33187.653017108.78885.95967
7189.70272.56066 7209.9369.366957230.159 71.73017311.07380.836577331.30182.29036
 7351.5383.986737412.21585.782947452.672 82.15267513.358      808727.069      80
9192.325      799333.92578.666669637.353      78 9940.78      7810698.02    76.2
10853.14      7611318.51       7611473.63    75.211551.1973.8134711577.0473.68014
 11602.973.27588 11654.6 72.583211680.4671.9195311706.3171.4109611783.8773.10247
11835.5880.9742611861.4381.7953611938.99 92.957611964.8593.03578 11990.793.44813
12094.1192.1258412223.3893.9294412352.65      9412430.2193.7896312456.0693.35143
12533.62 92.344912559.4892.3261312585.3391.9906212611.1891.9774812740.4590.13268
12818.0191.2530712843.8791.2265312973.1393.1582612998.9993.1582613050.6993.95221
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13386.79      9413516.06      9213852.15      9213981.42      9414627.76      94

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .046987.417     .067412.215     .04

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
      6987.4177412.215               9525     8882     3320              .1          .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              83.31    Element                      Left OB     Channel    Right OB
  Vel Head (ft)                0.23    Wt. n-Val.                     0.040       0.060       0.040
  W.S. Elev (ft)              83.09    Reach Len. (ft)              9525.00     8882.00     3320.00
  Crit W.S. (ft)                       Flow Area (sq ft)             635.42     1418.74    22670.18
  E.G. Slope (ft/ft)       0.001227    Area (sq ft)                  635.42     1418.74    22670.18
  Q Total (cfs)            93000.00    Flow (cfs)                   1069.71     4309.73    87620.57
  Top Width (ft)            5103.89    Top Width (ft)                461.04      214.68     4428.16
  Vel Total (ft/s)             3.76    Avg. Vel. (ft/s)                1.68        3.04        3.87
  Max Chl Dpth (ft)           13.72    Hydr. Depth (ft)                1.38        6.61        5.12
  Conv. Total (cfs)       2654808.0     Conv. (cfs)                 30536.2    123026.8   2501245.0
  Length Wtd. (ft)          3865.24    Wetted Per. (ft)              461.16      216.53     4429.00
  Min Ch El (ft)              69.37    Shear (lb/sq ft)                0.11        0.50        0.39
  Alpha                        1.03    Stream Power (lb/ft s)          0.18        1.52        1.52
  Frctn Loss (ft)              1.19    Cum Volume (acre-ft)        18112.64     4968.61    64103.95
  C & E Loss (ft)              0.05    Cum SA (acres)               3170.79      563.92     9219.96

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                 RS: 60050

INPUT
Description: 43238  50000  6000
Station Elevation Data    num=      368
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       090.7535546.27625 91.507169.4143891.26709 92.552592.29581115.690692.70776
161.9669 94.9278 185.10595.33974208.243196.31246231.3812 96.5871277.657598.53253
300.795698.80717323.933799.50169347.0719    99.59  370.21100.2845393.3481100.3728
416.4862101.0673439.6244102.4116462.7625103.1497485.9006 104.494509.0387 105.232
532.1769107.1916 555.315108.3178601.5912113.0131624.7294113.8241647.8675116.1717
671.0056115.9434694.1437117.2518717.2819117.3686  740.42117.1403763.5581 117.257
786.6962117.1822809.8344117.4524832.9725117.3776879.2487117.9181902.3868 117.918
 925.525118.3344948.6631118.3343994.9393119.16711018.077 119.4261041.216120.1013
1064.354120.36021087.492121.0355 1110.63121.29441226.321     1221295.736121.0747
1318.874120.65681342.012120.3484 1365.15119.76631388.288119.29351434.565118.1292
1457.703118.03771480.841117.30241503.979117.05761550.256114.77261573.394114.5279
1596.532113.7196 1619.67113.80911642.808113.00091665.947113.09041689.085112.2822
1712.223111.70681735.361112.31951758.499111.74411781.637112.35681804.776111.7814
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1827.914112.2697 1874.19110.87011897.328111.35831920.467110.79691943.605111.5174
1989.881110.85922013.019111.56262036.157111.23352059.296111.94432082.434111.6227
2105.572112.33352151.848111.76872174.987111.26252198.125 109.7632221.263109.2568
2267.539106.25792290.677105.46692313.816103.81282336.954103.02172360.092101.3676
 2383.23100.57662429.50797.725652452.64597.163282475.78395.737812498.92195.17544
2545.19892.920462568.33692.309392591.47491.181912614.61290.57085 2637.7589.36456
2660.888 88.67472684.02787.468412707.16586.382042730.30385.692182753.44184.91897
2776.57984.542262845.99482.21157 2892.2781.356872915.40880.851262938.547 80.4184
2961.68579.912782984.82379.501133007.96179.162223031.09978.750563054.23878.41166
3077.376     783100.51478.30297 3146.7979.008353169.92879.311323193.067  79.664
3216.20579.711323262.48179.905373308.758      803355.03481.941933378.17282.43689
3424.44884.378813447.58785.223923470.72586.545043493.86387.390153540.13987.43983
3563.27886.844033586.41685.427963609.55484.83215 3655.8382.035293678.969    81.6
3702.107    81.63725.245    81.23748.383    81.23771.521    80.83817.798 81.5645
3840.93681.546753864.074  81.9293887.21281.911254002.903 79.65774072.31875.36828
4095.45674.495634118.59473.054754141.73273.90551 4164.8774.188054188.00875.03882
4211.14676.141514234.28576.992274257.42376.992274280.561 77.24424303.69977.25677
4326.83777.508714349.97677.521274373.11477.77626 4419.39 77.80754442.52878.06249
4488.80578.068924535.08178.837684558.21978.828484581.35779.212864604.49679.21286
4627.63479.606434650.77279.60643 4673.91      804697.048    79.64720.187    79.6
4812.73978.044015067.259      785090.397    77.85113.536    77.85136.674    77.6
5159.812    77.6 5182.95    77.25206.088      775252.365    76.25275.503      76
5298.641    76.45321.77976.916225344.91777.316225368.05677.832445391.19478.23244
5414.33278.54392 5437.4778.971625460.60879.283095483.74779.710785506.885 80.2025
5530.023 75.99155553.16171.716485576.29967.505485599.43865.005915622.576 60.7949
5645.71464.883735668.85267.26113 5691.9972.551465715.12876.640295738.26781.93062
5761.40579.223595807.68176.212555830.81973.505525853.958      726015.925      72
6039.06372.420466085.33972.840916108.47873.261376131.616 73.47166154.75473.89206
6177.89273.41592 6201.0372.875456224.16872.789976247.30772.648616270.44572.63773
6293.58372.489826316.72172.480716339.85972.366676501.82772.366676524.96572.33334
6548.10372.366676571.24172.333346594.37972.366676617.51872.333346640.65672.36667
6802.62372.323816941.45272.41904 6964.5972.397226987.72972.439227010.86772.40741
7034.00572.445767080.28172.411777149.69672.471117172.83472.433337427.35472.56667
7450.49272.533337705.01272.633337774.42772.566677797.56572.510647866.97972.47515
7890.11872.407557936.39472.374157959.53272.306388028.94772.266678075.22372.17117
8098.36172.16666  8121.572.103038190.91472.066678214.052      728607.39372.01905
 9232.11      7410041.9373.9851810065.0773.5177310088.2173.5029110111.3473.03546
10134.4873.0206410180.7671.9821210203.8971.9154810227.0371.3962210250.1771.32958
10273.3172.2636610296.4473.0054110342.7274.8735710365.8675.61532   1038975.80766
10412.1375.8076610435.27      7610481.55      7610550.96    77.2 10574.177.41103
10597.2377.8110410620.37      7810643.51      7810666.6578.2544710689.7978.25447
10736.0678.7394310782.3479.7093410805.4779.9398310828.6180.4247910851.75 81.1395
10898.0281.7695810921.1682.4842810967.4483.0964110990.5882.9938311013.7183.29091
11036.8583.1883211059.9983.5883311083.1383.5883311175.68      8411245.09      84
11268.2383.6604211291.3783.6604211337.6482.1944311360.7881.8010111383.9281.06801
11407.0581.0680111430.1980.5839811453.3380.83293 11499.680.6871311522.7480.93609
11545.8881.0201311569.0281.4260311615.29 81.594111638.43      8211661.5781.59413
11684.7181.9694711707.8481.5636111730.9881.9389511754.1281.5330811777.2681.05317
11800.3981.3544811823.5380.8745711846.6781.1758711869.8180.7817411892.9580.26682
11916.0880.4473311939.2279.9324111962.3679.83351 11985.579.3185912008.6379.91475
12031.7780.0948812054.9180.9577412078.0581.5538912101.1882.4167612124.3282.56705
 12170.683.4010612193.7483.5513712216.8783.9683712332.5685.7979112425.1186.04623
12448.2586.4445812471.3986.3418412494.5386.5982512517.6686.64613 12540.886.90255
12563.9486.9504212610.2187.6205112633.35  87.74712656.49 87.473512679.63    87.6
12702.7687.62457 12725.988.0491512772.1888.0982912795.3288.4502512818.4588.60281
12841.5989.0827512887.87 89.8336   1291190.3135412934.1490.2090312957.2890.20903
12980.4290.1045213003.5590.1045213026.69      9013049.83      9013072.9790.09475
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13096.1190.0947513119.24 90.189513142.38 90.189513165.5290.0947513188.6690.09475
13211.79      9013327.48      9013350.6290.2387513373.7690.23875 13396.990.63875
13420.03    90.813443.1790.9107413466.3191.3107413489.4591.4214813512.5891.71074
13535.7291.7107413558.86      9214414.95      92

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .045506.885     .065738.267     .04

Bank Sta: Left   Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
      5506.8855738.267               4038    5254    4975               .1        .3
Ineffective Flow     num=        1
   Sta L   Sta R     Elev  Permanent
   1280014414.95      70       T

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              82.07    Element                    Left OB    Channel   Right OB
  Vel Head (ft)                0.05    Wt. n-Val.                   0.040      0.060      0.040
  W.S. Elev (ft)              82.02    Reach Len. (ft)             10.00      10.00      10.00
  Crit W.S. (ft)              75.04    Flow Area (sq ft)          7898.33    2702.66   45102.61
  E.G. Slope (ft/ft)       0.000137    Area (sq ft)               7898.33    2702.66   45102.61
  Q Total (cfs)            93000.00    Flow (cfs)                 7831.74    3993.26   81175.01
  Top Width (ft)            8495.07    Top Width (ft)             2352.91     231.38    5910.78
  Vel Total (ft/s)             1.67    Avg. Vel. (ft/s)              0.99       1.48       1.80
  Max Chl Dpth (ft)           21.23    Hydr. Depth (ft)              3.36      11.68       7.63
  Conv. Total (cfs)       7940367.0     Conv. (cfs)               668676.3   340945.4  6930745.0
  Length Wtd. (ft)            10.00    Wetted Per. (ft)           2353.40     235.08    5911.56
  Min Ch El (ft)              60.79    Shear (lb/sq ft)              0.03       0.10       0.07
  Alpha                        1.08    Stream Power (lb/ft s)        0.03       0.15       0.12
  Frctn Loss (ft)              0.00    Cum Volume (acre-ft)      17179.63    4548.43   61521.24
  C & E Loss (ft)              0.00    Cum SA (acres)             2863.14     518.44    8825.96


Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

BRIDGE


RIVER: Cosumnes
REACH: 1                  RS: 60025

INPUT
Description:
Distance from Upstream XS =       10
Deck/Roadway Width        =       30
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0      86      81    14000      86      81

Upstream Bridge Cross Section Data
Station Elevation Data     num=      368
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
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     090.7535546.27625 91.507169.4143891.26709 92.552592.29581115.690692.70776
161.9669 94.9278 185.10595.33974208.243196.31246231.3812 96.5871277.657598.53253
300.795698.80717323.933799.50169347.0719   99.59  370.21100.2845393.3481100.3728
416.4862101.0673439.6244102.4116462.7625103.1497485.9006 104.494509.0387 105.232
532.1769107.1916 555.315108.3178601.5912113.0131624.7294113.8241647.8675116.1717
671.0056115.9434694.1437117.2518717.2819117.3686  740.42117.1403763.5581 117.257
786.6962117.1822809.8344117.4524832.9725117.3776879.2487117.9181902.3868 117.918
 925.525118.3344948.6631118.3343994.9393119.16711018.077 119.4261041.216120.1013
1064.354120.36021087.492121.0355 1110.63121.29441226.321     1221295.736121.0747
1318.874120.65681342.012120.3484 1365.15119.76631388.288119.29351434.565118.1292
1457.703118.03771480.841117.30241503.979117.05761550.256114.77261573.394114.5279
1596.532113.7196 1619.67113.80911642.808113.00091665.947113.09041689.085112.2822
1712.223111.70681735.361112.31951758.499111.74411781.637112.35681804.776111.7814
1827.914112.2697 1874.19110.87011897.328111.35831920.467110.79691943.605111.5174
1989.881110.85922013.019111.56262036.157111.23352059.296111.94432082.434111.6227
2105.572112.33352151.848111.76872174.987111.26252198.125 109.7632221.263109.2568
2267.539106.25792290.677105.46692313.816103.81282336.954103.02172360.092101.3676
 2383.23100.57662429.50797.725652452.64597.163282475.78395.737812498.92195.17544
2545.19892.920462568.33692.309392591.47491.181912614.61290.57085 2637.7589.36456
2660.888 88.67472684.02787.468412707.16586.382042730.30385.692182753.44184.91897
2776.57984.542262845.99482.21157 2892.2781.356872915.40880.851262938.547 80.4184
2961.68579.912782984.82379.501133007.96179.162223031.09978.750563054.23878.41166
3077.376       783100.51478.30297 3146.7979.008353169.92879.311323193.067  79.664
3216.20579.711323262.48179.905373308.758       803355.03481.941933378.17282.43689
3424.44884.378813447.58785.223923470.72586.545043493.86387.390153540.13987.43983
3563.27886.844033586.41685.427963609.55484.83215 3655.8382.035293678.969    81.6
3702.107    81.63725.245    81.23748.383    81.23771.521    80.83817.798 81.5645
3840.93681.546753864.074  81.9293887.21281.911254002.903 79.65774072.31875.36828
4095.45674.495634118.59473.054754141.73273.90551 4164.8774.188054188.00875.03882
4211.14676.141514234.28576.992274257.42376.992274280.561 77.24424303.69977.25677
4326.83777.508714349.97677.521274373.11477.77626 4419.39 77.80754442.52878.06249
4488.80578.068924535.08178.837684558.21978.828484581.35779.212864604.49679.21286
4627.63479.606434650.77279.60643 4673.91       804697.048     79.64720.187    79.6
4812.73978.044015067.259       785090.397     77.85113.536    77.85136.674    77.6
5159.812     77.6 5182.95    77.25206.088       775252.365    76.25275.503      76
5298.641     76.45321.77976.916225344.91777.316225368.05677.832445391.19478.23244
5414.33278.54392 5437.4778.971625460.60879.283095483.74779.710785506.885 80.2025
5530.023 75.99155553.16171.716485576.29967.505485599.43865.005915622.576 60.7949
5645.71464.883735668.85267.26113 5691.9972.551465715.12876.640295738.26781.93062
5761.40579.223595807.68176.212555830.81973.505525853.958       726015.925      72
6039.06372.420466085.33972.840916108.47873.261376131.616 73.47166154.75473.89206
6177.89273.41592 6201.0372.875456224.16872.789976247.30772.648616270.44572.63773
6293.58372.489826316.72172.480716339.85972.366676501.82772.366676524.96572.33334
6548.10372.366676571.24172.333346594.37972.366676617.51872.333346640.65672.36667
6802.62372.323816941.45272.41904 6964.5972.397226987.72972.439227010.86772.40741
7034.00572.445767080.28172.411777149.69672.471117172.83472.433337427.35472.56667
7450.49272.533337705.01272.633337774.42772.566677797.56572.510647866.97972.47515
7890.11872.407557936.39472.374157959.53272.306388028.94772.266678075.22372.17117
8098.36172.16666  8121.572.103038190.91472.066678214.052       728607.39372.01905
 9232.11       7410041.9373.9851810065.0773.5177310088.2173.5029110111.3473.03546
10134.4873.0206410180.7671.9821210203.8971.9154810227.0371.3962210250.1771.32958
10273.3172.2636610296.4473.0054110342.7274.8735710365.8675.61532   1038975.80766
10412.1375.8076610435.27       7610481.55       7610550.96    77.2 10574.177.41103
10597.2377.8110410620.37       7810643.51       7810666.6578.2544710689.7978.25447
10736.0678.7394310782.3479.7093410805.4779.9398310828.6180.4247910851.75 81.1395
10898.0281.7695810921.1682.4842810967.4483.0964110990.5882.9938311013.7183.29091
11036.8583.1883211059.9983.5883311083.1383.5883311175.68       8411245.09      84
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11268.2383.6604211291.3783.6604211337.6482.1944311360.7881.8010111383.9281.06801
11407.0581.0680111430.1980.5839811453.3380.83293 11499.680.6871311522.7480.93609
11545.8881.0201311569.0281.4260311615.29 81.594111638.43      8211661.5781.59413
11684.7181.9694711707.8481.5636111730.9881.9389511754.1281.5330811777.2681.05317
11800.3981.3544811823.5380.8745711846.6781.1758711869.8180.7817411892.9580.26682
11916.0880.4473311939.2279.9324111962.3679.83351 11985.579.3185912008.6379.91475
12031.7780.0948812054.9180.9577412078.0581.5538912101.1882.4167612124.3282.56705
 12170.683.4010612193.7483.5513712216.8783.9683712332.5685.7979112425.1186.04623
12448.2586.4445812471.3986.3418412494.5386.5982512517.6686.64613 12540.886.90255
12563.9486.9504212610.2187.6205112633.35  87.74712656.49 87.473512679.63    87.6
12702.7687.62457 12725.988.0491512772.1888.0982912795.3288.4502512818.4588.60281
12841.5989.0827512887.87 89.8336   1291190.3135412934.1490.2090312957.2890.20903
12980.4290.1045213003.5590.1045213026.69      9013049.83      9013072.9790.09475
13096.1190.0947513119.24 90.189513142.38 90.189513165.5290.0947513188.6690.09475
13211.79      9013327.48      9013350.6290.2387513373.7690.23875 13396.990.63875
13420.03    90.813443.1790.9107413466.3191.3107413489.4591.4214813512.5891.71074
13535.7291.7107413558.86      9214414.95      92

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val      Sta   n Val
       0     .045506.885     .065738.267     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      5506.8855738.267             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   1280014414.95      70       T

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      86      81   14000      86      81

Downstream Bridge Cross Section Data
Station Elevation Data    num=     368
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
       090.7535546.27625 91.507169.4143891.26709 92.552592.29581115.690692.70776
161.9669 94.9278 185.10595.33974208.243196.31246231.3812 96.5871277.657598.53253
300.795698.80717323.933799.50169347.0719   99.59  370.21100.2845393.3481100.3728
416.4862101.0673439.6244102.4116462.7625103.1497485.9006 104.494509.0387 105.232
532.1769107.1916 555.315108.3178601.5912113.0131624.7294113.8241647.8675116.1717
671.0056115.9434694.1437117.2518717.2819117.3686  740.42117.1403763.5581 117.257
786.6962117.1822809.8344117.4524832.9725117.3776879.2487117.9181902.3868 117.918
 925.525118.3344948.6631118.3343994.9393119.16711018.077 119.4261041.216120.1013
1064.354120.36021087.492121.0355 1110.63121.29441226.321      1221295.736121.0747
1318.874120.65681342.012120.3484 1365.15119.76631388.288119.29351434.565118.1292
1457.703118.03771480.841117.30241503.979117.05761550.256114.77261573.394114.5279
1596.532113.7196 1619.67113.80911642.808113.00091665.947113.09041689.085112.2822
1712.223111.70681735.361112.31951758.499111.74411781.637112.35681804.776111.7814
1827.914112.2697 1874.19110.87011897.328111.35831920.467110.79691943.605111.5174
1989.881110.85922013.019111.56262036.157111.23352059.296111.94432082.434111.6227
2105.572112.33352151.848111.76872174.987111.26252198.125 109.7632221.263109.2568
2267.539106.25792290.677105.46692313.816103.81282336.954103.02172360.092101.3676
 2383.23100.57662429.50797.725652452.64597.163282475.78395.737812498.92195.17544
2545.19892.920462568.33692.309392591.47491.181912614.61290.57085 2637.7589.36456
2660.888 88.67472684.02787.468412707.16586.382042730.30385.692182753.44184.91897
2776.57984.542262845.99482.21157 2892.2781.356872915.40880.851262938.547 80.4184
```

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2961.68579.912782984.82379.501133007.96179.162223031.09978.750563054.23878.41166
3077.376      783100.51478.30297 3146.7979.008353169.92879.311323193.067  79.664
3216.20579.711323262.48179.905373308.758      803355.03481.941933378.17282.43689
3424.44884.378813447.58785.223923470.72586.545043493.86387.390153540.13987.43983
3563.27886.844033586.41685.427963609.55484.83215 3655.8382.035293678.969    81.6
3702.107    81.63725.245    81.23748.383    81.23771.521    80.83817.798 81.5645
3840.93681.546753864.074  81.9293887.21281.911254002.903 79.65774072.31875.36828
4095.45674.495634118.59473.054754141.73273.90551 4164.8774.188054188.00875.03882
4211.14676.141514234.28576.992274257.42376.992274280.561 77.24424303.69977.25677
4326.83777.508714349.97677.521274373.11477.77626 4419.39 77.80754442.52878.06249
4488.80578.068924535.08178.837684558.21978.828484581.35779.212864604.49679.21286
4627.63479.606434650.77279.60643 4673.91      804697.048    79.64720.187    79.6
4812.73978.044015067.259      785090.397    77.85113.536    77.85136.674    77.6
5159.812    77.6 5182.95    77.25206.088      775252.365    76.25275.503      76
5298.641     76.45321.77976.916225344.91777.316225368.05677.832445391.19478.23244
5414.33278.54392 5437.4778.971625460.60879.283095483.74779.710785506.885 80.2025
5530.023 75.99155553.16171.716485576.29967.505485599.43865.005915622.576 60.7949
5645.71464.883735668.85267.26113 5691.9972.551465715.12876.640295738.26781.93062
5761.40579.223595807.68176.212555830.81973.505525853.958      726015.925      72
6039.06372.420466085.33972.840916108.47873.261376131.616 73.47166154.75473.89206
6177.89273.41592 6201.0372.875456224.16872.789976247.30772.648616270.44572.63773
6293.58372.489826316.72172.480716339.85972.366676501.82772.366676524.96572.33334
6548.10372.366676571.24172.333346594.37972.366676617.51872.333346640.65672.36667
6802.62372.323816941.45272.41904 6964.5972.397226987.72972.439227010.86772.40741
7034.00572.445767080.28172.411777149.69672.471117172.83472.433337427.35472.56667
7450.49272.533337705.01272.633337774.42772.566677797.56572.510647866.97972.47515
7890.11872.407557936.39472.374157959.53272.306388028.94772.266678075.22372.17117
8098.36172.16666  8121.572.103038190.91472.066678214.052      728607.39372.01905
 9232.11      7410041.9373.9851810065.0773.5177310088.2173.5029110111.3473.03546
10134.4873.0206410180.7671.9821210203.8971.9154810227.0371.3962210250.1771.32958
10273.3172.2636610296.4473.0054110342.7274.8735710365.8675.61532   1038975.80766
10412.1375.8076610435.27      7610481.55      7610550.96    77.2 10574.177.41103
10597.2377.8110410620.37      7810643.51      7810666.6578.2544710689.7978.25447
10736.0678.7394310782.3479.7093410805.4779.9398310828.6180.4247910851.75 81.1395
10898.0281.7695810921.1682.4842810967.4483.0964110990.5882.9938311013.7183.29091
11036.8583.1883211059.9983.5883311083.1383.5883311175.68      8411245.09      84
11268.2383.6604211291.3783.6604211337.6482.1944311360.7881.8010111383.9281.06801
11407.0581.0680111430.1980.5839811453.3380.83293 11499.680.6871311522.7480.93609
11545.8881.0201311569.0281.4260311615.29 81.594111638.43      8211661.5781.59413
11684.7181.9694711707.8481.5636111730.9881.9389511754.1281.5330811777.2681.05317
11800.3981.3544811823.5380.8745711846.6781.1758711869.8180.7817411892.9580.26682
11916.0880.4473311939.2279.9324111962.3679.83351 11985.579.3185912008.6379.91475
12031.7780.0948812054.9180.9577412078.0581.5538912101.1882.4167612124.3282.56705
 12170.683.4010612193.7483.5513712216.8783.9683712332.5685.7979112425.1186.04623
12448.2586.4445812471.3986.3418412494.5386.5982512517.6686.64613 12540.886.90255
12563.9486.9504212610.2187.6205112633.35  87.74712656.49 87.473512679.63    87.6
12702.7687.62457 12725.988.0491512772.1888.0982912795.3288.4502512818.4588.60281
12841.5989.0827512887.87 89.8336   1291190.3135412934.1490.2090312957.2890.20903
12980.4290.1045213003.5590.1045213026.69      9013049.83      9013072.9790.09475
13096.1190.0947513119.24 90.189513142.38 90.189513165.5290.0947513188.6690.09475
13211.79      9013327.48      9013350.6290.2387513373.7690.23875 13396.990.63875
13420.03     90.813443.1790.9107413466.3191.3107413489.4591.4214813512.5891.71074
13535.7291.7107413558.86      9214414.95      92

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .045506.885     .065738.267     .04
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Bank Sta: Left   Right    Coeff Contr.   Expan.
      5506.8855738.267             .1       .3
Ineffective Flow     num=        1
   Sta L    Sta R    Elev  Permanent
   1280014414.95      70       T

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream=   12779    Downstream=   12779
Upstream     num=       2
    Width   Elev    Width   Elev
       5     40       5      81
Downstream     num=       2
    Width   Elev    Width   Elev
       5     40       5      81

Pier Data
Pier Station     Upstream=   12829    Downstream=   12829
Upstream     num=       2
    Width   Elev    Width   Elev
       5     40       5      81
Downstream     num=       2
    Width   Elev    Width   Elev
       5     40       5      81

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #100-year

  E.G. US. (ft)              82.07    Element                Inside BR US  Inside BR DS
  W.S. US. (ft)              82.02    E.G. Elev (ft)               82.06         82.05
  Q Total (cfs)           93000.00    W.S. Elev (ft)               82.00         81.98
  Q Bridge (cfs)          93000.00    Crit W.S. (ft)               75.04         75.04
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 Q Weir (cfs)                           Max Chl Dpth (ft)          21.21        21.19
 Weir Sta Lft (ft)                      Vel Total (ft/s)            1.96         1.96
 Weir Sta Rgt (ft)                      Flow Area (sq ft)       47416.84     47416.84
 Weir Submerg                           Froude # Chl                0.08         0.08
 Weir Max Depth (ft)                    Specif Force (cu ft)   238315.30    237554.20
 Min El Weir Flow (ft)        86.01     Hydr Depth (ft)
 Min El Prs (ft)              81.00     W.P. Total (ft)         15392.97     15392.97
 Delta EG (ft)                 3.11     Conv. Total (cfs)      4020305.0    4020305.0
 Delta WS (ft)                 3.20     Top Width (ft)
 BR Open Area (sq ft)      47416.83     Frctn Loss (ft)             0.02         3.09
 BR Open Vel (ft/s)            1.96     C & E Loss (ft)             0.00         0.01
 Coef of Q                              Shear Total (lb/sq ft)      0.10         0.10
 Br Sel Method          Energy only     Power Total (lb/ft s)       0.20         0.20
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1 RS: 60000

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INPUT
Description: 43238  50000  6000
Station Elevation Data     num=      368
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       090.7535546.27625 91.507169.4143891.26709 92.552592.29581115.690692.70776
161.9669 94.9278 185.10595.33974208.243196.31246231.3812 96.5871277.657598.53253
300.795698.80717323.933799.50169347.0719    99.59  370.21100.2845393.3481100.3728
416.4862101.0673439.6244102.4116462.7625103.1497485.9006 104.494509.0387 105.232
532.1769107.1916 555.315108.3178601.5912113.0131624.7294113.8241647.8675116.1717
671.0056115.9434694.1437117.2518717.2819117.3686  740.42117.1403763.5581 117.257
786.6962117.1822809.8344117.4524832.9725117.3776879.2487117.9181902.3868 117.918
 925.525118.3344948.6631118.3343994.9393119.16711018.077 119.4261041.216120.1013
1064.354120.36021087.492121.0355 1110.63121.29441226.321      1221295.736121.0747
1318.874120.65681342.012120.3484 1365.15119.76631388.288119.29351434.565118.1292
1457.703118.03771480.841117.30241503.979117.05761550.256114.77261573.394114.5279
1596.532113.7196 1619.67113.80911642.808113.00091665.947113.09041689.085112.2822
1712.223111.70681735.361112.31951758.499111.74411781.637112.35681804.776111.7814
1827.914112.2697 1874.19110.87011897.328111.35831920.467110.79691943.605111.5174
1989.881110.85922013.019111.56262036.157111.23352059.296111.94432082.434111.6227
2105.572112.33352151.848111.76872174.987111.26252198.125 109.7632221.263109.2568
2267.539106.25792290.677105.46692313.816103.81282336.954103.02172360.092101.3676
 2383.23100.57662429.50797.725652452.64597.163282475.78395.737812498.92195.17544
2545.19892.920462568.33692.309392591.47491.181912614.61290.57085 2637.7589.36456
2660.888 88.67472684.02787.468412707.16586.382042730.30385.692182753.44184.91897
2776.57984.542262845.99482.21157 2892.2781.356872915.40880.851262938.547 80.4184
2961.68579.912782984.82379.501133007.96179.162223031.09978.750563054.23878.41166
3077.376       783100.51478.30297 3146.7979.008353169.92879.311323193.067  79.664
3216.20579.711323262.48179.905373308.758       803355.03481.941933378.17282.43689
3424.44884.378813447.58785.223923470.72586.545043493.86387.390153540.13987.43983
3563.27886.844033586.41685.427963609.55484.83215 3655.8382.035293678.969    81.6
3702.107    81.63725.245    81.23748.383    81.23771.521    80.83817.798 81.5645
3840.93681.546753864.074  81.9293887.21281.911254002.903 79.65774072.31875.36828
4095.45674.495634118.59473.054754141.73273.90551 4164.8774.188054188.00875.03882
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4211.14676.141514234.28576.992274257.42376.992274280.561 77.24424303.69977.25677
4326.83777.508714349.97677.521274373.11477.77626 4419.39 77.80754442.52878.06249
4488.80578.068924535.08178.837684558.21978.828484581.35779.212864604.49679.21286
4627.63479.606434650.77279.60643 4673.91      804697.048    79.64720.187    79.6
4812.73978.044015067.259      785090.397    77.85113.536    77.85136.674    77.6
5159.812    77.6 5182.95    77.25206.088      775252.365    76.25275.503      76
5298.641     76.45321.77976.916225344.91777.316225368.05677.832445391.19478.23244
5414.33278.54392 5437.4778.971625460.60879.283095483.74779.710785506.885 80.2025
5530.023 75.99155553.16171.716485576.29967.505485599.43865.005915622.576 60.7949
5645.71464.883735668.85267.26113 5691.9972.551465715.12876.640295738.26781.93062
5761.40579.223595807.68176.212555830.81973.505525853.958      726015.925      72
6039.06372.420466085.33972.840916108.47873.261376131.616 73.47166154.75473.89206
6177.89273.41592 6201.0372.875456224.16872.789976247.30772.648616270.44572.63773
6293.58372.489826316.72172.480716339.85972.366676501.82772.366676524.96572.33334
6548.10372.366676571.24172.333346594.37972.366676617.51872.333346640.65672.36667
6802.62372.323816941.45272.41904 6964.5972.397226987.72972.439227010.86772.40741
7034.00572.445767080.28172.411777149.69672.471117172.83472.433337427.35472.56667
7450.49272.533337705.01272.633337774.42772.566677797.56572.510647866.97972.47515
7890.11872.407557936.39472.374157959.53272.306388028.94772.266678075.22372.17117
8098.36172.16666  8121.572.103038190.91472.066678214.052      728607.39372.01905
 9232.11       7410041.9373.9851810065.0773.5177310088.2173.5029110111.3473.03546
10134.4873.0206410180.7671.9821210203.8971.9154810227.0371.3962210250.1771.32958
10273.3172.2636610296.4473.0054110342.7274.8735710365.8675.61532   1038975.80766
10412.1375.8076610435.27      7610481.55      7610550.96    77.2 10574.177.41103
10597.2377.8110410620.37      7810643.51      7810666.6578.2544710689.7978.25447
10736.0678.7394310782.3479.7093410805.4779.9398310828.6180.4247910851.75 81.1395
10898.0281.7695810921.1682.4842810967.4483.0964110990.5882.9938311013.7183.29091
11036.8583.1883211059.9983.5883311083.1383.5883311175.68      8411245.09      84
11268.2383.6604211291.3783.6604211337.6482.1944311360.7881.8010111383.9281.06801
11407.0581.0680111430.1980.5839811453.3380.83293 11499.680.6871311522.7480.93609
11545.8881.0201311569.0281.4260311615.29 81.594111638.43      8211661.5781.59413
11684.7181.9694711707.8481.5636111730.9881.9389511754.1281.5330811777.2681.05317
11800.3981.3544811823.5380.8745711846.6781.1758711869.8180.7817411892.9580.26682
11916.0880.4473311939.2279.9324111962.3679.83351 11985.579.3185912008.6379.91475
12031.7780.0948812054.9180.9577412078.0581.5538912101.1882.4167612124.3282.56705
 12170.683.4010612193.7483.5513712216.8783.9683712332.5685.7979112425.1186.04623
12448.2586.4445812471.3986.3418412494.5386.5982512517.6686.64613 12540.886.90255
12563.9486.9504212610.2187.6205112633.35  87.74712656.49 87.473512679.63    87.6
12702.7687.62457 12725.988.0491512772.1888.0982912795.3288.4502512818.4588.60281
12841.5989.0827512887.87 89.8336   1291190.3135412934.1490.2090312957.2890.20903
12980.4290.1045213003.5590.1045213026.69      9013049.83      9013072.9790.09475
13096.1190.0947513119.24 90.189513142.38 90.189513165.5290.0947513188.6690.09475
13211.79      9013327.48      9013350.6290.2387513373.7690.23875 13396.990.63875
13420.03    90.813443.1790.9107413466.3191.3107413489.4591.4214813512.5891.71074
13535.7291.7107413558.86      9214414.95      92

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .045506.885    .065738.267     .04

Bank Sta: Left   Right     Lengths: Left Channel   Right     Coeff Contr.   Expan.
      5506.8855738.267              4038    5254    4975              .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R     Elev  Permanent
   1280014414.95      70       T

CROSS SECTION OUTPUT  Profile #100-year
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E.G. Elev (ft)	78.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.040	0.060	0.040
W.S. Elev (ft)	78.82	Reach Len. (ft)	4038.00	5254.00	4975.00
Crit W.S. (ft)		Flow Area (sq ft)	1899.90	1987.88	28089.49
E.G. Slope (ft/ft)	0.000658	Area (sq ft)	1899.90	1987.88	28089.49
Q Total (cfs)	93000.00	Flow (cfs)	2531.92	5589.72	84878.36
Top Width (ft)	6469.51	Top Width (ft)	1287.12	210.17	4972.22
Vel Total (ft/s)	2.91	Avg. Vel. (ft/s)	1.33	2.81	3.02
Max Chl Dpth (ft)	18.02	Hydr. Depth (ft)	1.48	9.46	5.65
Conv. Total (cfs)	3626332.0	Conv. (cfs)	98726.6	217958.8	3309646.0
Length Wtd. (ft)	4913.73	Wetted Per. (ft)	1287.43	213.39	4972.68
Min Ch El (ft)	60.79	Shear (lb/sq ft)	0.06	0.38	0.23
Alpha	1.05	Stream Power (lb/ft s)	0.08	1.08	0.70
Frctn Loss (ft)	2.41	Cum Volume (acre-ft)	16721.47	4279.46	57452.27
C & E Loss (ft)	0.01	Cum SA (acres)	2785.84	505.84	8527.70

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1 RS: 55050

INPUT
Description: 37984 45000 5500
Station Elevation Data num= 192

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      821086.533      821113.69681.619831249.51381.619831276.676      82
2254.556      822308.882 81.60392336.04681.598952390.37281.168192417.53681.10877
2444.69981.108772471.86281.287022526.18980.945882580.516      812607.679    80.8
2662.006      803286.762      803313.926    79.83422.579    78.23449.742      78
3667.049      783775.70278.959523802.86579.359513911.519      803938.682      80
4074.49978.473364210.314      764264.64175.373334291.80475.75291 4346.1375.12624
4373.29374.736734481.94574.361084509.108 73.57444590.59873.664884617.76173.27554
4672.08773.441964753.57673.956944807.90274.663164916.55576.258454943.71876.09856
4970.88176.493595025.207 76.94725161.02276.771985242.51276.846425296.83876.15332
 5405.49 75.56035432.65375.121255541.30672.425455649.95870.861975657.99670.85936
5679.45970.478275700.92370.509995722.38770.075675872.634      705894.098    70.4
5915.56270.266675937.02670.217145979.95470.375386001.417  70.326022.881    70.4
6044.345  70.566130.201  70.956151.665    71.16173.128    71.26194.59271.25667
6216.056    71.4 6237.52   71.56258.98471.733336280.448    71.76301.912    71.8
6323.375      726559.478      726666.79775.714996688.261 71.77386709.725 67.8455
6731.18963.904326752.65359.976026774.11755.955396795.58158.600056817.04461.33704
6838.508 63.98176859.97266.626376881.43668.33502  6902.970.166126924.36471.06123
6945.82872.081736967.29273.102236988.75573.997327010.21973.109077031.68372.09541
7074.61170.318897096.07569.305247117.53969.690717139.00271.02969 7181.9371.80064
7203.39473.139637246.32272.345257310.71374.025947332.17773.611347353.641 73.2623
7375.10572.856667396.56972.552437418.033 72.4445 7460.9672.070027482.42471.99469
7503.88871.829357525.352 71.75247546.816   71.52 7568.2871.493337589.74471.40572
7632.67171.371437654.13571.287627697.06371.207627718.527    71.27782.91871.05539
7804.38270.971438061.94970.415098083.41370.34192 8126.3470.264718233.659      70
8426.834      708469.76270.514288512.689    70.68534.15371.066678555.617   71.12
```

```
8577.081       718620.009    70.28641.473       709886.377       709993.69669.93996
10101.02       6811047.95      68 11098.667.0249811149.2565.4604811174.5764.97297
11250.5468.2216411275.8669.5992711301.1972.4770311377.1676.1031811402.4875.81178
 11427.877.0204911478.4578.9929511503.7778.6087111579.7481.5482711605.0681.95795
11630.3981.5545911706.3682.7869711731.6882.3869711832.9783.98495 11858.383.59248
11908.9484.3924811934.27     84.411959.59       8412060.88       8412086.21    83.6
12162.18      83.6 12187.5    83.212238.15       8412567.35       8412617.9983.47202
12643.3283.4720212693.9682.9440312719.2982.7180912744.6182.7561312820.5882.33014
 12845.982.5560812871.2382.9620712896.5583.18802 12947.284.3367912972.52 84.5684
13048.4985.7683913073.81       8613453.66       8613554.95     87.613630.92    87.6
13656.25       8813706.89      8813757.54     87.213782.86     87.213833.51    86.4
13858.8386.3705313884.1686.7410713960.1386.7410713985.4586.3705314010.7786.37053
 14036.1       8614086.7486.7690614112.0786.7845314188.0487.9845314213.36      88
14339.97       90 14694.5      90

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .046666.797      .066988.755      .04

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
      6666.7976988.755                2746    3139    3633                .1       .3
Ineffective Flow      num=        1
   Sta L    Sta R    Elev  Permanent
   10400 14694.5      60       F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)               76.53    Element                     Left OB     Channel    Right OB
  Vel Head (ft)                 0.09    Wt. n-Val.                   0.040       0.060       0.040
  W.S. Elev (ft)               76.44    Reach Len. (ft)              10.00       10.00       10.00
  Crit W.S. (ft)               71.84    Flow Area (sq ft)          7497.23     3155.33    28791.36
  E.G. Slope (ft/ft)        0.000381    Area (sq ft)               7497.23     3155.33    28791.36
  Q Total (cfs)             93000.00    Flow (cfs)                13362.86     6942.92    72694.22
  Top Width (ft)             6922.45    Top Width (ft)             2173.59      321.96     4426.90
  Vel Total (ft/s)              2.36    Avg. Vel. (ft/s)              1.78        2.20        2.52
  Max Chl Dpth (ft)            20.49    Hydr. Depth (ft)              3.45        9.80        6.50
  Conv. Total (cfs)        4766985.0     Conv. (cfs)              684952.1    355879.6   3726153.0
  Length Wtd. (ft)             10.00    Wetted Per. (ft)           2173.78      324.65     4427.59
  Min Ch El (ft)               55.96    Shear (lb/sq ft)              0.08        0.23        0.15
  Alpha                         1.04    Stream Power (lb/ft s)        0.15        0.51        0.39
  Frctn Loss (ft)               0.00    Cum Volume (acre-ft)      16285.91     3969.28    54204.08
  C & E Loss (ft)               0.00    Cum SA (acres)             2625.43      473.74     7990.96

Warning: Divided flow computed for this cross-section.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

BRIDGE


RIVER: Cosumnes
REACH: 1                  RS: 55025

INPUT
Description:
Distance from Upstream XS =      10
```

```
Deck/Roadway Width          =      30
Weir Coefficient            =     2.6
Upstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0      85      80   14000      85      80

Upstream Bridge Cross Section Data
Station Elevation Data    num=     192
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
       0      821086.533      821113.69681.619831249.51381.619831276.676      82
2254.556      822308.882 81.60392336.04681.598952390.37281.168192417.53681.10877
2444.69981.108772471.86281.287022526.18980.945882580.516      812607.679    80.8
2662.006      803286.762      803313.926    79.83422.579    78.23449.742      78
3667.049      783775.70278.959523802.86579.359513911.519      803938.682      80
4074.49978.473364210.314      764264.64175.373334291.80475.75291 4346.1375.12624
4373.29374.736734481.94574.361084509.108 73.57444590.59873.664884617.76173.27554
4672.08773.441964753.57673.956944807.90274.663164916.55576.258454943.71876.09856
4970.88176.493595025.207 76.94725161.02276.771985242.51276.846425296.83876.15332
 5405.49 75.56035432.65375.121255541.30672.425455649.95870.861975657.99670.85936
5679.45970.478275700.92370.509995722.38770.075675872.634      705894.098    70.4
5915.56270.266675937.02670.217145979.95470.375386001.417   70.326022.881    70.4
6044.345   70.566130.201   70.956151.665    71.16173.128    71.26194.59271.25667
6216.056    71.4 6237.52    71.56258.98471.733336280.448    71.76301.912    71.8
6323.375      726559.478      726666.79775.714996688.261 71.77386709.725 67.8455
6731.18963.904326752.65359.976026774.11755.955396795.58158.600056817.04461.33704
6838.508 63.98176859.97266.626376881.43668.33502  6902.970.166126924.36471.06123
6945.82872.081736967.29273.102236988.75573.997327010.21973.109077031.68372.09541
7074.61170.318897096.07569.305247117.53969.690717139.00271.02969 7181.9371.80064
7203.39473.139637246.32272.345257310.71374.025947332.17773.611347353.641 73.2623
7375.10572.856667396.56972.552437418.033 72.4445 7460.9672.070027482.42471.99469
7503.88871.829357525.352 71.75247546.816   71.52 7568.2871.493337589.74471.40572
7632.67171.371437654.13571.287627697.06371.207627718.527    71.27782.91871.05539
7804.38270.971438061.94970.415098083.41370.34192 8126.3470.264718233.659      70
8426.834      708469.76270.514288512.689    70.68534.15371.066678555.617   71.12
8577.081      718620.009    70.28641.473      709886.377      709993.69669.93996
10101.02      6811047.95      68 11098.667.0249811149.2565.4604811174.5764.97297
11250.5468.2216411275.8669.5992711301.1972.4770311377.1676.1031811402.4875.81178
 11427.877.0204911478.4578.9929511503.7778.6087111579.7481.5482711605.0681.95795
11630.3981.5545911706.3682.7869711731.6882.3869711832.9783.98495 11858.383.59248
11908.9484.3924811934.27    84.411959.59      8412060.88      8412086.21    83.6
12162.18    83.6 12187.5    83.212238.15      8412567.35      8412617.9983.47202
12643.3283.4720212693.9682.9440312719.2982.7180912744.6182.7561312820.5882.33014
 12845.982.5560812871.2382.9620712896.5583.18802 12947.284.3367912972.52 84.5684
13048.4985.7683913073.81      8613453.66      8613554.95    87.613630.92    87.6
13656.25      8813706.89      8813757.54    87.213782.86    87.213833.51    86.4
13858.8386.3705313884.1686.7410713960.1386.7410713985.4586.3705314010.7786.37053
 14036.1      8614086.7486.7690614112.0786.7845314188.0487.9845314213.36      88
14339.97      90 14694.5      90

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .046666.797    .066988.755     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      6666.7976988.755            .1        .3
Ineffective Flow     num=       1
```

```
   Sta L   Sta R     Elev  Permanent
   10400 14694.5      60       F

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0      85      80   14000      85      80

Downstream Bridge Cross Section Data
Station Elevation Data    num=     192
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      821086.533       821113.69681.619831249.51381.619831276.676      82
2254.556      822308.882 81.60392336.04681.598952390.37281.168192417.53681.10877
2444.69981.108772471.86281.287022526.18980.945882580.516      812607.679    80.8
2662.006      803286.762      803313.926     79.83422.579    78.23449.742      78
3667.049      783775.70278.959523802.86579.359513911.519      803938.682      80
4074.49978.473364210.314      764264.64175.373334291.80475.75291 4346.1375.12624
4373.29374.736734481.94574.361084509.108 73.57444590.59873.664884617.76173.27554
4672.08773.441964753.57673.956944807.90274.663164916.55576.258454943.71876.09856
4970.88176.493595025.207 76.94725161.02276.771985242.51276.846425296.83876.15332
 5405.49 75.56035432.65375.121255541.30672.425455649.95870.861975657.99670.85936
5679.45970.478275700.92370.509995722.38770.075675872.634      705894.098    70.4
5915.56270.266675937.02670.217145979.95470.375386001.417   70.326022.881    70.4
6044.345   70.566130.201   70.956151.665     71.16173.128    71.26194.59271.25667
6216.056     71.4 6237.52    71.56258.98471.733336280.448    71.76301.912    71.8
6323.375      726559.478       726666.79775.714996688.261 71.77386709.725 67.8455
6731.18963.904326752.65359.976026774.11755.955396795.58158.600056817.04461.33704
6838.508 63.98176859.97266.626376881.43668.33502  6902.970.166126924.36471.06123
6945.82872.081736967.29273.102236988.75573.997327010.21973.109077031.68372.09541
7074.61170.318897096.07569.305247117.53969.690717139.00271.02969 7181.9371.80064
7203.39473.139637246.32272.345257310.71374.025947332.17773.611347353.641 73.2623
7375.10572.856667396.56972.552437418.033 72.4445 7460.9672.070027482.42471.99469
7503.88871.829357525.352 71.75247546.816   71.52 7568.2871.493337589.74471.40572
7632.67171.371437654.13571.287627697.06371.207627718.527    71.27782.91871.05539
7804.38270.971438061.94970.415098083.41370.34192 8126.3470.264718233.659      70
8426.834      708469.76270.514288512.689    70.68534.15371.066678555.617   71.12
8577.081      718620.009   70.28641.473      709886.377      709993.69669.93996
10101.02      6811047.95       68 11098.667.0249811149.2565.4604811174.5764.97297
11250.5468.2216411275.8669.5992711301.1972.4770311377.1676.1031811402.4875.81178
 11427.877.0204911478.4578.9929511503.7778.6087111579.7481.5482711605.0681.95795
11630.3981.5545911706.3682.7869711731.6882.3869711832.9783.98495 11858.383.59248
11908.9484.3924811934.27   84.411959.59      8412060.88      8412086.21    83.6
12162.18    83.6 12187.5   83.212238.15      8412567.35      8412617.9983.47202
12643.3283.4720212693.9682.9440312719.2982.7180912744.6182.7561312820.5882.33014
 12845.982.5560812871.2382.9620712896.5583.18802 12947.284.3367912972.52 84.5684
13048.4985.7683913073.81      8613453.66      8613554.95    87.613630.92    87.6
13656.25      8813706.89      8813757.54   87.213782.86    87.213833.51    86.4
13858.8386.3705313884.1686.7410713960.1386.7410713985.4586.3705314010.7786.37053
 14036.1      8614086.7486.7690614112.0786.7845314188.0487.9845314213.36      88
14339.97      90 14694.5      90

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .046666.797     .066988.755     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      6666.7976988.755            .1       .3
```

```
Ineffective Flow     num=       1
   Sta L   Sta R     Elev  Permanent
   10400 14694.5      60       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream=   10393    Downstream=   10393
Upstream     num=       2
    Width   Elev    Width   Elev
       5      40       5      80
Downstream     num=       2
    Width   Elev    Width   Elev
       5      40       5      80

Pier Data
Pier Station     Upstream=   10443    Downstream=   10433
Upstream     num=       2
    Width   Elev    Width   Elev
       5      40       5      80
Downstream     num=       2
    Width   Elev    Width   Elev
       5      40       5      80

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #100-year

  E.G. US. (ft)                 76.53    Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)                 76.44    E.G. Elev (ft)                 76.53         76.52
  Q Total (cfs)              93000.00    W.S. Elev (ft)                 76.44         76.42
  Q Bridge (cfs)             93000.00    Crit W.S. (ft)                 71.78         71.78
  Q Weir (cfs)                           Max Chl Dpth (ft)              20.48         20.47
  Weir Sta Lft (ft)                      Vel Total (ft/s)                2.36          2.37
  Weir Sta Rgt (ft)                      Flow Area (sq ft)           39329.09      39245.05
```

Weir Submerg		Froude # Chl	0.12	0.12
Weir Max Depth (ft)		Specif Force (cu ft)	144390.40	143927.50
Min El Weir Flow (ft)	85.01	Hydr Depth (ft)	5.69	5.68
Min El Prs (ft)	80.00	W.P. Total (ft)	6948.79	6946.03
Delta EG (ft)	3.63	Conv. Total (cfs)	4753452.0	4738792.0
Delta WS (ft)	4.60	Top Width (ft)	6911.47	6908.76
BR Open Area (sq ft)	66351.97	Frctn Loss (ft)	0.01	3.51
BR Open Vel (ft/s)	2.37	C & E Loss (ft)	0.00	0.10
Coef of Q		Shear Total (lb/sq ft)	0.14	0.14
Br Sel Method	Energy only	Power Total (lb/ft s)	0.32	0.32

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.
Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Cosumnes
REACH: 1   RS: 55000

INPUT
Description: 37984 45000 5500

```
Station Elevation Data    num=      192
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      821086.533      821113.69681.619831249.51381.619831276.676      82
2254.556      822308.882 81.60392336.04681.598952390.37281.168192417.53681.10877
2444.69981.108772471.86281.287022526.18980.945882580.516      812607.679    80.8
2662.006      803286.762      803313.926    79.83422.579    78.23449.742      78
3667.049      783775.70278.959523802.86579.359513911.519      803938.682      80
4074.49978.473364210.314      764264.64175.373334291.80475.75291 4346.1375.12624
4373.29374.736734481.94574.361084509.108 73.57444590.59873.664884617.76173.27554
4672.08773.441964753.57673.956944807.90274.663164916.55576.258454943.71876.09856
4970.88176.493595025.207 76.94725161.02276.771985242.51276.846425296.83876.15332
 5405.49 75.56035432.65375.121255541.30672.425455649.95870.861975657.99670.85936
5679.45970.478275700.92370.509995722.38770.075675872.634      705894.098    70.4
5915.56270.266675937.02670.217145979.95470.375386001.417   70.326022.881    70.4
6044.345   70.566130.201   70.956151.665    71.16173.128    71.26194.59271.25667
6216.056    71.4 6237.52    71.56258.98471.733336280.448    71.76301.912    71.8
6323.375      726559.478      726666.79775.714996688.261 71.77386709.725 67.8455
6731.18963.904326752.65359.976026774.11755.955396795.58158.600056817.04461.33704
6838.508 63.98176859.97266.626376881.43668.33502  6902.970.166126924.36471.06123
6945.82872.081736967.29273.102236988.75573.997327010.21973.109077031.68372.09541
7074.61170.318897096.07569.305247117.53969.690717139.00271.02969 7181.9371.80064
7203.39473.139637246.32272.345257310.71374.025947332.17773.611347353.641 73.2623
7375.10572.856667396.56972.552437418.033 72.4445 7460.9672.070027482.42471.99469
```

```
7503.88871.829357525.352 71.75247546.816   71.52 7568.2871.493337589.74471.40572
7632.67171.371437654.13571.287627697.06371.207627718.527    71.27782.91871.05539
7804.38270.971438061.94970.415098083.41370.34192 8126.3470.264718233.659      70
8426.834      708469.76270.514288512.689    70.68534.15371.066678555.617   71.12
8577.081      718620.009    70.28641.473      709886.377      709993.69669.93996
10101.02      6811047.95      68 11098.667.0249811149.2565.4604811174.5764.97297
11250.5468.2216411275.8669.5992711301.1972.4770311377.1676.1031811402.4875.81178
 11427.877.0204911478.4578.9929511503.7778.6087111579.7481.5482711605.0681.95795
11630.3981.5545911706.3682.7869711731.6882.3869711832.9783.98495 11858.383.59248
11908.9484.3924811934.27    84.411959.59      8412060.88      8412086.21    83.6
12162.18     83.6 12187.5    83.212238.15      8412567.35      8412617.9983.47202
12643.3283.4720212693.9682.9440312719.2982.7180912744.6182.7561312820.5882.33014
 12845.982.5560812871.2382.9620712896.5583.18802 12947.284.3367912972.52 84.5684
13048.4985.7683913073.81      8613453.66      8613554.95      87.613630.92    87.6
13656.25      8813706.89      8813757.54    87.213782.86    87.213833.51    86.4
13858.8386.3705313884.1686.7410713960.1386.7410713985.4586.3705314010.7786.37053
 14036.1      8614086.7486.7690614112.0786.7845314188.0487.9845314213.36      88
14339.97      90 14694.5      90

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val      Sta    n Val
      0     .046666.797     .066988.755     .04

Bank Sta: Left   Right    Lengths: Left Channel    Right     Coeff Contr.    Expan.
      6666.7976988.755             2746    3139    3633              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   10400 14694.5      60       F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              72.90    Element                  Left OB    Channel   Right OB
  Vel Head (ft)                1.07    Wt. n-Val.                 0.040      0.060      0.040
  W.S. Elev (ft)              71.84    Reach Len. (ft)          2746.00    3139.00    3633.00
  Crit W.S. (ft)              71.84    Flow Area (sq ft)         825.87    1767.86    9116.19
  E.G. Slope (ft/ft)       0.013912    Area (sq ft)              825.87    1767.86    9116.19
  Q Total (cfs)            93000.00    Flow (cfs)               3951.23   18771.78   70276.98
  Top Width (ft)            4913.92    Top Width (ft)            723.79     252.78    3937.36
  Vel Total (ft/s)             7.94    Avg. Vel. (ft/s)            4.78      10.62       7.71
  Max Chl Dpth (ft)           15.88    Hydr. Depth (ft)            1.14       6.99       2.32
  Conv. Total (cfs)        788475.9    Conv. (cfs)              33499.5   159151.6   595824.9
  Length Wtd. (ft)          3562.40    Wetted Per. (ft)          723.81     255.07    3937.77
  Min Ch El (ft)              55.96    Shear (lb/sq ft)            0.99       6.02       2.01
  Alpha                        1.09    Stream Power (lb/ft s)      4.74      63.92      15.50
  Frctn Loss (ft)              0.41    Cum Volume (acre-ft)    15984.26    3791.45   52834.91
  C & E Loss (ft)              0.30    Cum SA (acres)           2520.49     453.00    7689.74

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
```

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Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
         is not a valid subcritical answer.  The program defaulted to critical depth.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 50050

INPUT
Description: 34845  40000  5000
Station Elevation Data    num=     257
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       078.02666283.4256  78.725386.4894    78.9438.0214    79.1489.553378.79498
541.085378.35634566.851378.39487592.617278.24896618.383278.26395644.149278.18672
721.447278.33543747.213278.24668772.9792 78.2463798.745278.13333824.511278.22667
850.277278.13333953.341178.13333979.1071    78.21004.873      781391.363       78
1494.427    78.641520.19378.688231597.491    79.21649.023  79.4251726.321       80
3066.147       803117.679    79.23143.44578.851713169.21178.903413220.74378.20683
3246.50978.206833349.572      783375.338      783401.10477.92891 3426.8777.94669
3452.63578.328913478.40178.864463504.167    79.63529.933      804096.782       80
4122.548    80.44148.314    80.44174.08180.203694225.613 80.15584251.379 80.3595
4277.14580.335554380.20981.181564405.976 81.60554483.27480.48672 4509.0480.68398
4534.806 80.50834637.871    80.44663.637      804792.46779.980264818.23379.26336
4921.29877.273244947.064 76.2969 4972.8375.539925050.128 71.90815075.89572.39458
5127.42772.899035178.95974.118045204.72575.012445230.49175.783815282.02377.57259
 5307.7978.626755333.55678.957955359.32279.00637 5436.62      805462.38679.63631
5488.15279.632615565.45178.541555616.98377.701595642.74977.657935694.281 76.7853
5745.813       76 5771.58      765823.112    75.25874.64475.15523 5900.4175.53284
6029.24175.499626055.00775.873626080.77375.870016158.07174.931956183.83775.17628
6209.604 74.8636 6235.3774.645266286.90273.741716312.668 74.08046389.96672.78018
6441.49972.777766467.265  73.1446544.56373.104426570.32973.803636596.09574.15789
 6699.1676.443826853.75677.905626982.58771.899937034.119 66.18117111.417     54.6
7137.184    54.67188.716 70.60027240.24871.177787266.01471.20839 7291.7871.57359
7343.313 71.63487369.07973.082287394.84574.249547420.61174.334537497.90977.83633
7523.67577.748057549.44178.180797600.97478.00423 7626.7477.915967652.50677.47325
7678.272 75.63167704.038 75.70997729.80473.86824 7755.5772.026587781.33666.18601
7807.10360.345447832.86956.424837858.635 53.86767884.40151.310367910.16747.93044
7935.93344.550527961.69939.807227987.46536.427298013.23134.559948038.99834.26627
8064.764 33.9726 8090.5333.678938116.29630.509328142.06230.215658167.82830.17575
8193.59430.135858219.35930.095958245.12529.673368270.89129.633468296.65630.01199
8322.42230.405648348.188 30.79938373.95330.795138399.71931.188798425.48431.18562
 8451.2531.182468477.016 31.93668502.78131.535618528.54732.289758554.31332.69385
8580.07833.097958605.84433.502048631.60933.083778657.37532.332758683.14131.32268
8708.90630.312618734.67229.302558760.43828.292488786.20326.949668811.96928.77673
8837.734 30.6038  8863.532.430888889.26634.257958915.03136.406228940.79737.30036
8966.56341.624988992.32845.949619018.09450.274239043.85954.598869069.62558.30783
9095.39165.126099121.15667.197399146.92269.268699172.68871.339999198.45369.37248
9249.98462.162129301.51657.408159327.281 57.37229404.57856.03594     9688       56
9739.53156.869779816.82861.623949868.359 64.06369894.12564.133589945.65661.37186
9997.18864.4740110022.9567.4759310048.72  69.02710074.4872.8204310126.0272.08746
10151.7870.9294710203.31 70.196510280.6170.1248910306.3869.6671310332.1469.64326
10357.9169.3361610409.44 70.1053 10435.269.3643210460.9769.74889 10512.571.20804
10538.2770.6058210564.0370.2098410667.0967.7580310692.8666.7199910718.6366.30971
```

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10821.6965.7460710847.45 66.232910950.5267.6465810976.2868.5988311002.05    68.4
11105.1171.5264111130.8871.9448111156.6472.7448111233.94     72.8 11259.773.17535
11362.7773.1260311388.5373.5072411465.8373.5248511749.25      7811878.08      78
12006.91      8012109.9778.5416312264.56 76.057612341.8674.5762612367.6374.20959
12419.1673.2023312470.6971.8459212496.4571.4595512522.2270.7813512573.7570.11861
12599.5269.9554612625.2869.9159212651.0569.7527712754.1170.1666112779.8870.39195
12882.9471.58505 12908.7      7213011.7772.1177813037.5372.51778 13063.372.51778
13166.36      7413295.19      7413372.4873.8832913424.0273.3685513449.7873.17673
13527.0871.9458813552.8471.5000513578.6171.5788313604.3871.9116313681.6772.14796
13707.4472.11837 13733.272.48878 13810.5    72.413836.27      7213862.03      72
13939.3371.8183513965.09 72.1525

Manning's n Values        num=       3
     Sta    n Val      Sta   n Val      Sta   n Val
      0     .046853.756    .067497.909     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      6853.7567497.909             3166    4770    6283              .1       .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              68.57    Element                    Left OB    Channel    Right OB
  Vel Head (ft)                0.05    Wt. n-Val.                             0.060      0.040
  W.S. Elev (ft)              68.52    Reach Len. (ft)             10.00      10.00      10.00
  Crit W.S. (ft)              38.22    Flow Area (sq ft)                    1323.11   50114.15
  E.G. Slope (ft/ft)       0.000032    Area (sq ft)                         1323.11   50114.15
  Q Total (cfs)            93000.00    Flow (cfs)                            717.11   92282.89
  Top Width (ft)            2728.81    Top Width (ft)                        168.93    2559.89
  Vel Total (ft/s)             1.81    Avg. Vel. (ft/s)                        0.54       1.84
  Max Chl Dpth (ft)           41.57    Hydr. Depth (ft)                        7.83      19.58
  Conv. Total (cfs)       16557740.0     Conv. (cfs)                       127673.6  16430070.0
  Length Wtd. (ft)            10.00    Wetted Per. (ft)                      172.03    2567.31
  Min Ch El (ft)              54.60    Shear (lb/sq ft)                        0.02       0.04
  Alpha                        1.03    Stream Power (lb/ft s)                  0.01       0.07
  Frctn Loss (ft)              0.00    Cum Volume (acre-ft)     15958.23    3680.08   50364.95
  C & E Loss (ft)              0.00    Cum SA (acres)            2497.68     437.81    7418.80

Warning: Divided flow computed for this cross-section.

BRIDGE


RIVER: Cosumnes
REACH: 1                  RS: 50025

INPUT
Description:
Distance from Upstream XS =      10
Deck/Roadway Width         =      30
Weir Coefficient           =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0      74      69   12000      74      69

Upstream Bridge Cross Section Data
```

```
Station Elevation Data    num=      257
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
        078.02666283.4256  78.725386.4894    78.9438.0214    79.1489.553378.79498
541.085378.35634566.851378.39487592.617278.24896618.383278.26395644.149278.18672
721.447278.33543747.213278.24668772.9792 78.2463798.745278.13333824.511278.22667
850.277278.13333953.341178.13333979.1071    78.21004.873      781391.363       78
1494.427   78.641520.19378.688231597.491    79.21649.023  79.4251726.321       80
3066.147       803117.679    79.23143.44578.851713169.21178.903413220.74378.20683
3246.50978.206833349.572      783375.338      783401.10477.92891 3426.8777.94669
3452.63578.328913478.40178.864463504.167    79.63529.933      804096.782       80
4122.548    80.44148.314    80.44174.08180.203694225.613 80.15584251.379 80.3595
4277.14580.335554380.20981.181564405.976 81.60554483.27480.48672 4509.0480.68398
4534.806 80.50834637.871    80.44663.637      804792.46779.980264818.23379.26336
4921.29877.273244947.064 76.2969 4972.8375.539925050.128 71.90815075.89572.39458
5127.42772.899035178.95974.118045204.72575.012445230.49175.783815282.02377.57259
 5307.7978.626755333.55678.957955359.32279.00637 5436.62      805462.38679.63631
5488.15279.632615565.45178.541555616.98377.701595642.74977.657935694.281 76.7853
5745.813       76 5771.58      765823.112    75.25874.64475.15523 5900.4175.53284
6029.24175.499626055.00775.873626080.77375.870016158.07174.931956183.83775.17628
6209.604 74.8636 6235.3774.645266286.90273.741716312.668 74.08046389.96672.78018
6441.49972.777766467.265  73.1446544.56373.104426570.32973.803636596.09574.15789
 6699.1676.443826853.75677.905626982.58771.899937034.119 66.18117111.417     54.6
7137.184    54.67188.716 70.60027240.24871.177787266.01471.20839 7291.7871.57359
7343.313 71.63487369.07973.082287394.84574.249547420.61174.334537497.90977.83633
7523.67577.748057549.44178.180797600.97478.00423 7626.7477.915967652.50677.47325
7678.272 75.63167704.038 75.70997729.80473.86824 7755.5772.026587781.33666.18601
7807.10360.345447832.86956.424837858.635 53.86767884.40151.310367910.16747.93044
7935.93344.550527961.69939.807227987.46536.427298013.23134.559948038.99834.26627
8064.764 33.9726 8090.5333.678938116.29630.509328142.06230.215658167.82830.17575
8193.59430.135858219.35930.095958245.12529.673368270.89129.633468296.65630.01199
8322.42230.405648348.188 30.79938373.95330.795138399.71931.188798425.48431.18562
 8451.2531.182468477.016 31.93668502.78131.535618528.54732.289758554.31332.69385
8580.07833.097958605.84433.502048631.60933.083778657.37532.332758683.14131.32268
8708.90630.312618734.67229.302558760.43828.292488786.20326.949668811.96928.77673
8837.734 30.6038  8863.532.430888889.26634.257958915.03136.406228940.79737.30036
8966.56341.624988992.32845.949619018.09450.274239043.85954.598869069.62558.30783
9095.39165.126099121.15667.197399146.92269.268699172.68871.339999198.45369.37248
9249.98462.162129301.51657.408159327.281 57.37229404.57856.03594     9688       56
9739.53156.869779816.82861.623949868.359 64.06369894.12564.133589945.65661.37186
9997.18864.474011002.9567.4759310048.72  69.02710074.4872.8204310126.0272.08746
10151.7870.9294710203.31 70.196510280.6170.1248910306.3869.6671310332.1469.64326
10357.9169.3361610409.44 70.1053 10435.269.3643210460.9769.74889 10512.571.20804
10538.2770.6058210564.0370.2098410667.0967.7580310692.8666.7199910718.6366.30971
10821.6965.7460710847.45 66.232910950.5267.6465810976.2868.5988311002.05     68.4
11105.1171.5264111130.8871.9448111156.6472.7448111233.94     72.8 11259.773.17535
11362.7773.1260311388.5373.5072411465.8373.5248511749.25      7811878.08       78
12006.91       8012109.9778.5416312264.56 76.057612341.8674.5762612367.6374.20959
12419.1673.2023312470.6971.8459212496.4571.4595512522.2270.7813512573.7570.11861
12599.5269.9554612625.2869.9159212651.0569.7527712754.1170.1666112779.8870.39195
12882.9471.58505 12908.7      7213011.7772.1177813037.5372.51778 13063.372.51778
13166.36       7413295.19      7413372.4873.8832913424.0273.3685513449.7873.17673
13527.0871.9458813552.8471.5000513578.6171.5788313604.3871.9116313681.6772.14796
13707.4472.11837 13733.272.48878 13810.5    72.413836.27      7213862.03       72
13939.3371.8183513965.09 72.1525

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
```

```
     0     .046853.756     .067497.909     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      6853.7567497.909              .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      74      69   12000      74      69

Downstream Bridge Cross Section Data
Station Elevation Data    num=     257
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       078.02666283.4256 78.725386.4894    78.9438.0214    79.1489.553378.79498
541.085378.35634566.851378.39487592.617278.24896618.383278.26395644.149278.18672
721.447278.33543747.213278.24668772.9792 78.2463798.745278.13333824.511278.22667
850.277278.13333953.341178.13333979.1071    78.21004.873       781391.363      78
1494.427   78.641520.19378.688231597.491    79.21649.023  79.4251726.321      80
3066.147      803117.679    79.23143.44578.851713169.21178.903413220.74378.20683
3246.50978.206833349.572      783375.338      783401.10477.92891 3426.8777.94669
3452.63578.328913478.40178.864463504.167    79.63529.933       804096.782      80
4122.548    80.44148.314    80.44174.08180.203694225.613 80.15584251.379 80.3595
4277.14580.335554380.20981.181564405.976 81.60554483.27480.48672 4509.0480.68398
4534.806 80.50834637.871    80.44663.637      804792.46779.980264818.23379.26336
4921.29877.273244947.064 76.2969 4972.8375.539925050.128 71.90815075.89572.39458
5127.42772.899035178.95974.118045204.72575.012445230.49175.783815282.02377.57259
 5307.7978.626755333.55678.957955359.32279.00637 5436.62       805462.38679.63631
5488.15279.632615565.45178.541555616.98377.701595642.74977.657935694.281 76.7853
5745.813      76 5771.58      765823.112    75.25874.64475.15523 5900.4175.53284
6029.24175.499626055.00775.873626080.77375.870016158.07174.931956183.83775.17628
6209.604 74.8636 6235.3774.645266286.90273.741716312.668 74.08046389.96672.78018
6441.49972.777766467.265   73.1446544.56373.104426570.32973.803636596.09574.15789
 6699.1676.443826853.75677.905626982.58771.899937034.119 66.18117111.417    54.6
7137.184    54.67188.716 70.60027240.24871.177787266.01471.20839 7291.7871.57359
7343.313 71.63487369.07973.082287394.84574.249547420.61174.334537497.90977.83633
7523.67577.748057549.44178.180797600.97478.00423 7626.7477.915967652.50677.47325
7678.272 75.63167704.038 75.70997729.80473.86824 7755.5772.026587781.33666.18601
7807.10360.345447832.86956.424837858.635 53.86767884.40151.310367910.16747.93044
7935.93344.550527961.69939.807227987.46536.427298013.23134.559948038.99834.26627
8064.764 33.9726 8090.5333.678938116.29630.509328142.06230.215658167.82830.17575
8193.59430.135858219.35930.095958245.12529.673368270.89129.633468296.65630.01199
8322.42230.405648348.188 30.79938373.95330.795138399.71931.188798425.48431.18562
 8451.2531.182468477.016 31.93668502.78131.535618528.54732.289758554.31332.69385
8580.07833.097958605.84433.502048631.60933.083778657.37532.332758683.14131.32268
8708.90630.312618734.67229.302558760.43828.292488786.20326.949668811.96928.77673
8837.734 30.6038  8863.532.430888889.26634.257958915.03136.406228940.79737.30036
8966.56341.624988992.32845.949619018.09450.274239043.85954.598869069.62558.30783
9095.39165.126099121.15667.197399146.92269.268699172.68871.339999198.45369.37248
9249.98462.162129301.51657.408159327.281 57.37229404.57856.03594     9688      56
9739.53156.869779816.82861.623949868.359 64.06369894.12564.133589945.65661.37186
9997.18864.4740110022.9567.4759310048.72  69.02710074.4872.8204310126.0272.08746
10151.7870.9294710203.31 70.196510280.6170.1248910306.3869.6671310332.1469.64326
10357.9169.3361610409.44 70.1053 10435.269.3643210460.9769.74889 10512.571.20804
10538.2770.6058210564.0370.2098410667.0967.7580310692.8666.7199910718.6366.30971
10821.6965.7460710847.45 66.232910950.5267.6465810976.2868.5988311002.05    68.4
11105.1171.5264111130.8871.9448111156.6472.7448111233.94    72.8 11259.773.17535
11362.7773.1260311388.5373.5072411465.8373.5248511749.25      7811878.08      78
```

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12006.91      8012109.9778.5416312264.56 76.057612341.8674.5762612367.6374.20959
12419.1673.2023312470.6971.8459212496.4571.4595512522.2270.7813512573.7570.11861
12599.5269.9554612625.2869.9159212651.0569.7527712754.1170.1666112779.8870.39195
12882.9471.58505 12908.7      7213011.7772.1177813037.5372.51778 13063.372.51778
13166.36      7413295.19      7413372.4873.8832913424.0273.3685513449.7873.17673
13527.0871.9458813552.8471.5000513578.6171.5788313604.3871.9116313681.6772.14796
13707.4472.11837 13733.272.48878 13810.5    72.413836.27      7213862.03      72
13939.3371.8183513965.09 72.1525

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .046853.756     .067497.909     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      6853.7567497.909             .1       .3

Upstream Embankment side slope             =       0 horiz. to 1.0 vertical
Downstream Embankment side slope           =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins        =
Energy head used in spillway design        =
Spillway height used in design             =
Weir crest shape                           = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream=    7877    Downstream=    7877
Upstream     num=        2
    Width   Elev    Width   Elev
       5      40       5      69
Downstream     num=        2
    Width   Elev    Width   Elev
       5      40       5      69

Pier Data
Pier Station     Upstream=    7927    Downstream=    7927
Upstream     num=        2
    Width   Elev    Width   Elev
       5      40       5      69
Downstream     num=        2
    Width   Elev    Width   Elev
       5      40       5      69

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
```

```
        inside the bridge at the upstream end
      Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT   Profile #100-year

  E.G. US. (ft)                 68.57    Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)                 68.52    E.G. Elev (ft)                 68.57         68.57
  Q Total (cfs)              93000.00    W.S. Elev (ft)                 68.52         68.51
  Q Bridge (cfs)             93000.00    Crit W.S. (ft)                 38.27         38.27
  Q Weir (cfs)                           Max Chl Dpth (ft)              41.57         41.56
  Weir Sta Lft (ft)                      Vel Total (ft/s)                1.82          1.82
  Weir Sta Rgt (ft)                      Flow Area (sq ft)           51238.81      51236.23
  Weir Submerg                           Froude # Chl                    0.03          0.03
  Weir Max Depth (ft)                    Specif Force (cu ft)       774057.20     774008.90
  Min El Weir Flow (ft)         69.76    Hydr Depth (ft)                18.85         18.85
  Min El Prs (ft)               69.00    W.P. Total (ft)              2807.58       2807.31
  Delta EG (ft)                  0.15    Conv. Total (cfs)         16644250.0    16643370.0
  Delta WS (ft)                  0.15    Top Width (ft)               2718.60       2718.33
  BR Open Area (sq ft)       52576.91    Frctn Loss (ft)                 0.00          0.15
  BR Open Vel (ft/s)             1.82    C & E Loss (ft)                 0.00          0.00
  Coef of Q                              Shear Total (lb/sq ft)          0.04          0.04
  Br Sel Method           Energy only    Power Total (lb/ft s)           0.06          0.06


CROSS SECTION


RIVER: Cosumnes
REACH: 1                 RS: 50000

INPUT
Description: 34845  40000  5000
Station Elevation Data     num=      257
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       078.02666283.4256 78.725386.4894    78.9438.0214    79.1489.553378.79498
541.085378.35634566.851378.39487592.617278.24896618.383278.26395644.149278.18672
721.447278.33543747.213278.24668772.9792 78.2463798.745278.13333824.511278.22667
850.277278.13333953.341178.13333979.1071    78.21004.873     781391.363      78
1494.427   78.641520.19378.688231597.491    79.21649.023  79.4251726.321      80
3066.147      803117.679    79.23143.44578.851713169.21178.903413220.74378.20683
3246.50978.206833349.572      783375.338      783401.10477.92891 3426.8777.94669
3452.63578.328913478.40178.864463504.167    79.63529.933     804096.782      80
4122.548    80.44148.314    80.44174.08180.203694225.613 80.15584251.379 80.3595
4277.14580.335554380.20981.181564405.976 81.60554483.27480.48672 4509.0480.68398
4534.806 80.50834637.871    80.44663.637      804792.46779.980264818.23379.26336
4921.29877.273244947.064 76.2969 4972.8375.539925050.128 71.90815075.89572.39458
5127.42772.899035178.95974.118045204.72575.012445230.49175.783815282.02377.57259
 5307.7978.626755333.55678.957955359.32279.00637 5436.62     805462.38679.63631
5488.15279.632615565.45178.541555616.98377.701595642.74977.657935694.281 76.7853
5745.813      76 5771.58      765823.112    75.25874.64475.15523 5900.4175.53284
6029.24175.499626055.00775.873626080.77375.870016158.07174.931956183.83775.17628
6209.604 74.8636 6235.3774.645266286.90273.741716312.668 74.08046389.96672.78018
6441.49972.777766467.265  73.1446544.56373.104426570.32973.803636596.09574.15789
 6699.1676.443826853.75677.905626982.58771.899937034.119 66.18117111.417    54.6
7137.184    54.67188.716 70.60027240.24871.177787266.01471.20839 7291.7871.57359
7343.313 71.63487369.07973.082287394.84574.249547420.61174.334537497.90977.83633
7523.67577.748057549.44178.180797600.97478.00423 7626.7477.915967652.50677.47325
```

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7678.272 75.63167704.038 75.70997729.80473.86824 7755.5772.026587781.33666.18601
7807.10360.345447832.86956.424837858.635 53.86767884.40151.310367910.16747.93044
7935.93344.550527961.69939.807227987.46536.427298013.23134.559948038.99834.26627
8064.764 33.9726 8090.5333.678938116.29630.509328142.06230.215658167.82830.17575
8193.59430.135858219.35930.095958245.12529.673368270.89129.633468296.65630.01199
8322.42230.405648348.188 30.79938373.95330.795138399.71931.188798425.48431.18562
 8451.2531.182468477.016 31.93668502.78131.535618528.54732.289758554.31332.69385
8580.07833.097958605.84433.502048631.60933.083778657.37532.332758683.14131.32268
8708.90630.312618734.67229.302558760.43828.292488786.20326.949668811.96928.77673
8837.734 30.6038  8863.532.430888889.26634.257958915.03136.406228940.79737.30036
8966.56341.624988992.32845.949619018.09450.274239043.85954.598869069.62558.30783
9095.39165.126099121.15667.197399146.92269.268699172.68871.339999198.45369.37248
9249.98462.162129301.51657.408159327.281 57.37229404.57856.03594    9688      56
9739.53156.869779816.82861.623949868.359 64.06369894.12564.133589945.65661.37186
9997.18864.4740110022.9567.4759310048.72  69.02710074.4872.8204310126.0272.08746
10151.7870.9294710203.31 70.196510280.6170.1248910306.3869.6671310332.1469.64326
10357.9169.3361610409.44 70.1053 10435.269.3643210460.9769.74889 10512.571.20804
10538.2770.6058210564.0370.2098410667.0967.7580310692.8666.7199910718.6366.30971
10821.6965.7460710847.45 66.232910950.5267.6465810976.2868.5988311002.05    68.4
11105.1171.5264111130.8871.9448111156.6472.7448111233.94    72.8 11259.773.17535
11362.7773.1260311388.5373.5072411465.8373.5248511749.25     7811878.08      78
12006.91      8012109.9778.5416312264.56 76.057612341.8674.5762612367.6374.20959
12419.1673.2023312470.6971.8459212496.4571.4595512522.2270.7813512573.7570.11861
12599.5269.9554612625.2869.9159212651.0569.7527712754.1170.1666112779.8870.39195
12882.9471.58505 12908.7      7213011.7772.1177813037.5372.51778 13063.372.51778
13166.36      7413295.19      7413372.4873.8832913424.0273.3685513449.7873.17673
13527.0871.9458813552.8471.5000513578.6171.5788313604.3871.9116313681.6772.14796
13707.4472.11837 13733.272.48878 13810.5    72.413836.27      7213862.03      72
13939.3371.8183513965.09 72.1525
```

```
Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
      0     .046853.756     .067497.909     .04

Bank Sta: Left   Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
      6853.7567497.909              3166    4770     6283               .1        .3

CROSS SECTION OUTPUT  Profile #100-year
```

E.G. Elev (ft)	68.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.		0.060	0.040
W.S. Elev (ft)	68.36	Reach Len. (ft)	3166.00	4770.00	6283.00
Crit W.S. (ft)		Flow Area (sq ft)		1297.59	49728.30
E.G. Slope (ft/ft)	0.000032	Area (sq ft)		1297.59	49728.30
Q Total (cfs)	93000.00	Flow (cfs)		705.46	92294.54
Top Width (ft)	2691.40	Top Width (ft)		167.07	2524.33
Vel Total (ft/s)	1.82	Avg. Vel. (ft/s)		0.54	1.86
Max Chl Dpth (ft)	41.41	Hydr. Depth (ft)		7.77	19.70
Conv. Total (cfs)	16413810.0	Conv. (cfs)		124509.0	16289300.0
Length Wtd. (ft)	6190.53	Wetted Per. (ft)		170.14	2531.71
Min Ch El (ft)	54.60	Shear (lb/sq ft)		0.02	0.04
Alpha	1.03	Stream Power (lb/ft s)		0.01	0.07
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	15958.23	3536.60	44909.25
C & E Loss (ft)	0.00	Cum SA (acres)	2497.68	419.41	7140.99

Warning: Divided flow computed for this cross-section.

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Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                 RS: 45050

INPUT
Description: 30075  35000  4500
Station Elevation Data    num=     179
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      73105.227672.94413131.534572.54413157.841472.33295184.148371.93295
236.762171.40385 263.06971.21101315.682771.45314341.989671.38141368.296571.50247
499.8309    73.6526.1378    73.6578.7516      74894.4342      741289.037       76
1446.879      761473.186   75.921578.41375.333341762.56174.444441815.175   74.25
1841.48274.088891867.789      74 3972.3473.970334103.87572.022244130.18272.01482
4288.02469.507294314.33269.47639 4419.5668.021894445.86768.493844472.17468.52225
4498.48168.084164577.40368.169364656.32469.248734682.63168.878394708.93869.23817
4735.24669.141854840.47467.079994866.78166.001794893.08865.23457 4972.0162.17543
5024.62462.175435050.93162.116955103.545     62.85182.467      645366.617       64
5498.15264.536355629.688 65.91375655.995 65.91375734.91766.929065761.22466.95063
5787.53164.366975813.83861.783315840.14558.666435866.45255.549555892.75952.43268
5919.06655.136655945.37458.056965971.68160.760945997.98863.672016024.29566.58308
6050.60266.740476076.90966.897876103.21667.055266129.52367.221896155.831 67.3866
6287.366      646418.902      646760.89563.290677234.42362.208697313.344       62
7523.801      627576.416   61.867707.95161.333337760.565   61.197786.87361.06667
 7813.18      617839.487   60.88 7997.33 60.39138023.637   60.248049.94460.15556
8076.251      608891.759      608918.06559.918658996.98558.718659023.292     58.4
9049.599      5810733.22      5810759.5358.0324610891.0659.5197810969.9859.80791
10996.2959.13144 11022.659.22748 11048.9       6011233.05      6011259.3659.86666
11285.66   59.6411311.9759.3333311338.28  59.12511390.8958.89336 11417.258.70502
 11443.558.5867111469.8158.3755711496.1258.1066211522.4259.4481711548.7359.48371
11653.9668.5914211680.2670.0265611706.5769.3422911732.8868.19379 11811.866.14098
11890.7266.0349211917.0265.2727211943.3365.2373711969.6465.5713712074.8666.19612
12101.1767.2470912127.4868.84709 12206.4      7212285.32      7212337.9371.81361
12416.8570.6136212443.1670.3068112469.4669.7402612574.6969.74026   12601     69.6
 12627.3    69.612785.14    67.212811.4566.8686212864.0666.0686312890.37     65.6
12969.2965.9105512995.5965.5105513048.2167.1105513127.13      6813206.0569.20832
13258.6670.8083213337.58      7213521.7371.8693913653.26      7013679.57 69.8171
13705.87 69.817113784.79 69.2684 13811.1 68.868413916.33      6813995.25       68
14021.5568.2730714047.86    68.414074.17   68.3514126.78   68.514153.09     68.5
14179.3968.58334 14205.768.5714314232.01  68.67514258.31 68.562514284.6268.55556
14363.5468.7090914389.85    68.714416.15   68.7514442.46  68.62514468.77    68.64
14495.0768.8424114521.3868.8175414573.9967.6636514705.53      6814837.06       68
14889.6767.8653114942.2967.8653114968.5967.7979715047.51      6815626.26       68
15757.79      7015889.33      7015968.25    71.216020.8671.5717616047.1771.57176
16073.4771.7858816126.0871.7858816152.39      7216704.83      72

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045761.224    .066155.831    .04

Bank Sta: Left   Right    Lengths: Left Channel    Right     Coeff Contr.   Expan.
      5761.2246155.831             2902    5389    6335               .1       .3
Ineffective Flow     num=       1
```

```
   Sta L   Sta R    Elev  Permanent
   797016704.83      55       T

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              68.02   Element                  Left OB    Channel   Right OB
  Vel Head (ft)                0.06   Wt. n-Val.                 0.040      0.060      0.040
  W.S. Elev (ft)              67.96   Reach Len. (ft)            10.00      10.00      10.00
  Crit W.S. (ft)              61.49   Flow Area (sq ft)        3335.37    2295.80   43655.89
  E.G. Slope (ft/ft)       0.000193   Area (sq ft)             3335.37    2295.80   43655.89
  Q Total (cfs)            93000.00   Flow (cfs)               3937.11    2550.91   86511.98
  Top Width (ft)            7915.35   Top Width (ft)            965.53     394.61    6555.21
  Vel Total (ft/s)             1.89   Avg. Vel. (ft/s)            1.18       1.11       1.98
  Max Chl Dpth (ft)           15.52   Hydr. Depth (ft)            3.45       5.82       6.66
  Conv. Total (cfs)       6687502.0    Conv. (cfs)            283111.8   183432.0  6220958.0
  Length Wtd. (ft)            10.00   Wetted Per. (ft)          965.66     396.17    6555.85
  Min Ch El (ft)              52.43   Shear (lb/sq ft)            0.04       0.07       0.08
  Alpha                        1.05   Stream Power (lb/ft s)      0.05       0.08       0.16
  Frctn Loss (ft)              0.00   Cum Volume (acre-ft)    15837.02    3339.85   38174.48
  C & E Loss (ft)              0.00   Cum SA (acres)           2462.59     388.66    6486.18


Warning: Divided flow computed for this cross-section.

BRIDGE


RIVER: Cosumnes
REACH: 1                 RS: 45025

INPUT
Description:
Distance from Upstream XS =      10
Deck/Roadway Width        =      30
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0      76      69    16000      76      69

Upstream Bridge Cross Section Data
Station Elevation Data    num=      179
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      73105.227672.94413131.534572.54413157.841472.33295184.148371.93295
236.762171.40385 263.06971.21101315.682771.45314341.989671.38141368.296571.50247
499.8309    73.6526.1378    73.6578.7516      74894.4342      741289.037       76
1446.879      761473.186   75.921578.41375.333341762.56174.444441815.175   74.25
1841.48274.088891867.789      74 3972.3473.970334103.87572.022244130.18272.01482
4288.02469.507294314.33269.47639 4419.5668.021894445.86768.493844472.17468.52225
4498.48168.084164577.40368.169364656.32469.248734682.63168.878394708.93869.23817
4735.24669.141854840.47467.079994866.78166.001794893.08865.23457 4972.0162.17543
5024.62462.175435050.93162.116955103.545    62.85182.467      645366.617       64
5498.15264.536355629.688 65.91375655.995 65.91375734.91766.929065761.22466.95063
5787.53164.366975813.83861.783315840.14558.666435866.45255.549555892.75952.43268
5919.06655.136655945.37458.056965971.68160.760945997.98863.672016024.29566.58308
6050.60266.740476076.90966.897876103.21667.055266129.52367.221896155.831 67.3866
6287.366      646418.902      646760.89563.290677234.42362.208697313.344       62
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7523.801       627576.416   61.867707.95161.333337760.565   61.197786.87361.06667
 7813.18       617839.487   60.88 7997.33 60.39138023.637   60.248049.94460.15556
8076.251       608891.759      608918.06559.918658996.98558.718659023.292    58.4
9049.599       5810733.22      5810759.5358.0324610891.0659.5197810969.9859.80791
10996.2959.13144 11022.659.22748 11048.9      6011233.05      6011259.3659.86666
11285.66    59.6411311.9759.3333311338.28   59.12511390.8958.89336 11417.258.70502
 11443.558.5867111469.8158.3755711496.1258.1066211522.4259.4481711548.7359.48371
11653.9668.5914211680.2670.0265611706.5769.3422911732.8868.19379 11811.866.14098
11890.7266.0349211917.0265.2727211943.3365.2373711969.6465.5713712074.8666.19612
12101.1767.2470912127.4868.84709 12206.4      7212285.32      7212337.9371.81361
12416.8570.6136212443.1670.3068112469.4669.7402612574.6969.74026   12601    69.6
 12627.3    69.612785.14    67.212811.4566.8686212864.0666.0686312890.37    65.6
12969.2965.9105512995.5965.5105513048.2167.1105513127.13      6813206.0569.20832
13258.6670.8083213337.58      7213521.7371.8693913653.26      7013679.57 69.8171
13705.87 69.817113784.79 69.2684 13811.1 68.868413916.33      6813995.25      68
14021.5568.2730714047.86    68.414074.17   68.3514126.78   68.514153.09    68.5
14179.3968.58334 14205.768.5714314232.01  68.67514258.31 68.562514284.6268.55556
14363.5468.7090914389.85    68.714416.15   68.7514442.46  68.62514468.77   68.64
14495.0768.8424114521.3868.8175414573.9967.6636514705.53      6814837.06      68
14889.6767.8653114942.2967.8653114968.5967.7979715047.51      6815626.26      68
15757.79      7015889.33      7015968.25    71.216020.8671.5717616047.1771.57176
16073.4771.7858816126.0871.7858816152.39      7216704.83      72

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .045761.224     .066155.831     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      5761.2246155.831            .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    797016704.83      55        T

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      76      69   16000      76      69

Downstream Bridge Cross Section Data
Station Elevation Data    num=     179
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      73105.227672.94413131.534572.54413157.841472.33295184.148371.93295
236.762171.40385 263.06971.21101315.682771.45314341.989671.38141368.296571.50247
499.8309     73.6526.1378    73.6578.7516      74894.4342      741289.037      76
1446.879      761473.186    75.921578.41375.333341762.56174.444441815.175   74.25
1841.48274.088891867.789      74 3972.3473.970334103.87572.022244130.18272.01482
4288.02469.507294314.33269.47639 4419.5668.021894445.86768.493844472.17468.52225
4498.48168.084164577.40368.169364656.32469.248734682.63168.878394708.93869.23817
4735.24669.141854840.47467.079994866.78166.001794893.08865.23457 4972.0162.17543
5024.62462.175435050.93162.116955103.545    62.85182.467      645366.617      64
5498.15264.536355629.688 65.91375655.995 65.91375734.91766.929065761.22466.95063
5787.53164.366975813.83861.783315840.14558.666435866.45255.549555892.75952.43268
5919.06655.136655945.37458.056965971.68160.760945997.98863.672016024.29566.58308
6050.60266.740476076.90966.897876103.21667.055266129.52367.221896155.831 67.3866
6287.366      646418.902      646760.89563.290677234.42362.208697313.344      62
7523.801      627576.416   61.867707.95161.333337760.565   61.197786.87361.06667
 7813.18      617839.487   60.88 7997.33 60.39138023.637   60.248049.94460.15556
```

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8076.251      608891.759      608918.06559.918658996.98558.718659023.292    58.4
9049.599      5810733.22      5810759.5358.0324610891.0659.5197810969.9859.80791
10996.2959.13144 11022.659.22748 11048.9      6011233.05      6011259.3659.86666
11285.66   59.6411311.9759.3333311338.28  59.12511390.8958.89336 11417.258.70502
 11443.558.5867111469.8158.3755711496.1258.1066211522.4259.4481711548.7359.48371
11653.9668.5914211680.2670.0265611706.5769.3422911732.8868.19379 11811.866.14098
11890.7266.0349211917.0265.2727211943.3365.2373711969.6465.5713712074.8666.19612
12101.1767.2470912127.4868.84709 12206.4      7212285.32      7212337.9371.81361
12416.8570.6136212443.1670.3068112469.4669.7402612574.6969.74026  12601    69.6
 12627.3   69.612785.14    67.212811.4566.8686212864.0666.0686312890.37    65.6
12969.2965.9105512995.5965.5105513048.2167.1105513127.13      6813206.0569.20832
13258.6670.8083213337.58      7213521.7371.8693913653.26      7013679.57 69.8171
13705.87 69.817113784.79 69.2684 13811.1 68.868413916.33      6813995.25      68
14021.5568.2730714047.86    68.414074.17   68.3514126.78   68.514153.09    68.5
14179.3968.58334 14205.768.5714314232.01  68.67514258.31 68.562514284.6268.55556
14363.5468.7090914389.85    68.714416.15   68.7514442.46  68.62514468.77   68.64
14495.0768.8424114521.3868.8175414573.9967.6636514705.53      6814837.06      68
14889.6767.8653114942.2967.8653114968.5967.7979715047.51      6815626.26      68
15757.79      7015889.33      7015968.25   71.216020.8671.5717616047.1771.57176
16073.4771.7858816126.0871.7858816152.39      7216704.83      72

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
       0     .045761.224     .066155.831     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      5761.2246155.831            .1        .3
Ineffective Flow      num=       1
   Sta L    Sta R     Elev  Permanent
    797016704.83      55       T

Upstream Embankment side slope            =       0 horiz. to 1.0 vertical
Downstream Embankment side slope          =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins       =
Energy head used in spillway design       =
Spillway height used in design            =
Weir crest shape                          = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream=    8287    Downstream=    8287
Upstream     num=       2
    Width   Elev    Width   Elev
       5      40       5      69
Downstream     num=       2
    Width   Elev    Width   Elev
       5      40       5      69

Pier Data
Pier Station     Upstream=    8337    Downstream=    8337
Upstream     num=       2
    Width   Elev    Width   Elev
       5      40       5      69
Downstream     num=       2
    Width   Elev    Width   Elev
```

```
      5      40       5      69

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #100-year
```

E.G. US. (ft)	68.02	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	67.96	E.G. Elev (ft)	68.01	68.01
Q Total (cfs)	93000.00	W.S. Elev (ft)	67.96	67.95
Q Bridge (cfs)	93000.00	Crit W.S. (ft)	61.49	61.49
Q Weir (cfs)		Max Chl Dpth (ft)	15.52	15.52
Weir Sta Lft (ft)		Vel Total (ft/s)	1.89	1.89
Weir Sta Rgt (ft)		Flow Area (sq ft)	49188.91	49143.48
Weir Submerg		Froude # Chl	0.08	0.08
Weir Max Depth (ft)		Specif Force (cu ft)	201282.70	201005.10
Min El Weir Flow (ft)	71.43	Hydr Depth (ft)	6.22	6.23
Min El Prs (ft)	69.00	W.P. Total (ft)	7936.00	7927.41
Delta EG (ft)	1.41	Conv. Total (cfs)	6815842.0	6807008.0
Delta WS (ft)	1.45	Top Width (ft)	7901.85	7893.28
BR Open Area (sq ft)	58946.68	Frctn Loss (ft)	0.01	1.40
BR Open Vel (ft/s)	1.89	C & E Loss (ft)	0.00	0.00
Coef of Q		Shear Total (lb/sq ft)	0.07	0.07
Br Sel Method	Energy only	Power Total (lb/ft s)	0.14	0.14

```
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                 RS: 45000

INPUT
Description: 30075  35000  4500
Station Elevation Data    num=     179
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      73105.227672.94413131.534572.54413157.841472.33295184.148371.93295
236.762171.40385 263.06971.21101315.682771.45314341.989671.38141368.296571.50247
499.8309     73.6526.1378     73.6578.7516      74894.4342      741289.037      76
```

```
1446.879       761473.186   75.921578.41375.333341762.56174.444441815.175   74.25
1841.48274.088891867.789       74 3972.3473.970334103.87572.022244130.18272.01482
4288.02469.507294314.33269.47639 4419.5668.021894445.86768.493844472.17468.52225
4498.48168.084164577.40368.169364656.32469.248734682.63168.878394708.93869.23817
4735.24669.141854840.47467.079994866.78166.001794893.08865.23457 4972.0162.17543
5024.62462.175435050.93162.116955103.545    62.85182.467        645366.617      64
5498.15264.536355629.688 65.91375655.995 65.91375734.91766.929065761.22466.95063
5787.53164.366975813.83861.783315840.14558.666435866.45255.549555892.75952.43268
5919.06655.136655945.37458.056965971.68160.760945997.98863.672016024.29566.58308
6050.60266.740476076.90966.897876103.21667.055266129.52367.221896155.831 67.3866
6287.366       646418.902      646760.89563.290677234.42362.208697313.344      62
7523.801       627576.416   61.867707.95161.333337760.565   61.197786.87361.06667
 7813.18       617839.487   60.88 7997.33 60.39138023.637   60.248049.94460.15556
8076.251       608891.759      608918.06559.918658996.98558.718659023.292    58.4
9049.599       5810733.22      5810759.5358.0324610891.0659.5197810969.9859.80791
10996.2959.13144 11022.659.22748 11048.9       6011233.05      6011259.3659.86666
11285.66    59.6411311.9759.3333311338.28  59.12511390.8958.89336 11417.258.70502
 11443.558.5867111469.8158.3755711496.1258.1066211522.4259.4481711548.7359.48371
11653.9668.5914211680.2670.0265611706.5769.3422911732.8868.19379 11811.866.14098
11890.7266.0349211917.0265.2727211943.3365.2373711969.6465.5713712074.8666.19612
12101.1767.2470912127.4868.84709 12206.4       7212285.32      7212337.9371.81361
12416.8570.6136212443.1670.3068112469.4669.7402612574.6969.74026   12601    69.6
 12627.3    69.612785.14    67.212811.4566.8686212864.0666.0686312890.37    65.6
12969.2965.9105512995.5965.5105513048.2167.1105513127.13       6813206.0569.20832
13258.6670.8083213337.58      7213521.7371.8693913653.26       7013679.57 69.8171
13705.87 69.817113784.79 69.2684 13811.1 68.868413916.33       6813995.25      68
14021.5568.2730714047.86    68.414074.17   68.3514126.78    68.514153.09    68.5
14179.3968.58334 14205.768.5714314232.01  68.67514258.31 68.562514284.6268.55556
14363.5468.7090914389.85    68.714416.15   68.7514442.46  68.62514468.77   68.64
14495.0768.8424114521.3868.8175414573.9967.6636514705.53       6814837.06      68
14889.6767.8653114942.2967.8653114968.5967.7979715047.51       6815626.26      68
15757.79       7015889.33      7015968.25     71.216020.8671.5717616047.1771.57176
16073.4771.7858816126.0871.7858816152.39       7216704.83      72

Manning's n Values         num=       3
     Sta    n Val      Sta   n Val      Sta   n Val
      0     .045761.224     .066155.831     .04

Bank Sta: Left    Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
      5761.2246155.831               2902    5389    6335            .1         .3
Ineffective Flow      num=        1
   Sta L    Sta R      Elev  Permanent
    797016704.83       55        T

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              66.61    Element                   Left OB     Channel    Right OB
  Vel Head (ft)                0.09    Wt. n-Val.                  0.040       0.060       0.040
  W.S. Elev (ft)              66.51    Reach Len. (ft)           2902.00     5389.00     6335.00
  Crit W.S. (ft)                       Flow Area (sq ft)         2007.12     1788.09    34831.39
  E.G. Slope (ft/ft)       0.000392    Area (sq ft)              2007.12     1788.09    34831.39
  Q Total (cfs)            93000.00    Flow (cfs)                2621.51     3175.08    87203.41
  Top Width (ft)            7025.25    Top Width (ft)             848.21      257.97     5919.08
  Vel Total (ft/s)             2.41    Avg. Vel. (ft/s)             1.31        1.78        2.50
  Max Chl Dpth (ft)           14.08    Hydr. Depth (ft)             2.37        6.93        5.88
  Conv. Total (cfs)       4696619.0     Conv. (cfs)             132389.5    160345.5   4403884.0
  Length Wtd. (ft)          6192.16    Wetted Per. (ft)           848.32      259.51     5919.56
```

```
  Min Ch El (ft)              52.43   Shear (lb/sq ft)          0.06       0.17       0.14
  Alpha                        1.04   Stream Power (lb/ft s)    0.08       0.30       0.36
  Frctn Loss (ft)              1.33   Cum Volume (acre-ft)  15506.42    3087.20   33323.66
  C & E Loss (ft)              0.01   Cum SA (acres)         2350.37     348.23    5715.61
```

```
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
```

CROSS SECTION

```
RIVER: Cosumnes
REACH: 1                  RS: 40050

INPUT
Description: 24686  30000  4000
Station Elevation Data    num=     337
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0     7222.57616      7245.1523371.8213567.7284971.8213590.3046671.49821
112.880871.35371 135.45771.03056158.033171.03056180.609370.70742203.185570.98335
225.761770.93614248.337871.21207 270.91471.14389293.490271.41982316.066371.46703
338.642571.85836 406.371      72519.2519       72 790.166    70.4812.742170.53333
835.3183    70.4857.8945      70993.3515      701015.928    70.21038.504     70.2
 1061.08    70.41106.232   70.41128.808   70.21151.385    70.21173.961       70
1422.299      70 1535.18      72 1648.06      721760.941      701873.82268.85117
1986.703      682099.58468.008072212.46569.991872235.041      702257.617     70.1
2280.193    70.32302.769   70.42325.345   70.62347.922    70.72393.07471.06667
2551.107      722663.988      722754.293   70.42776.869    70.22799.445     70.2
2822.021      702980.054      703002.631   70.43025.207    70.63047.783       71
3070.359    71.23115.511      723363.849      723386.426    72.43409.002     72.4
3431.578    72.83454.154   72.8 3476.7373.018163499.30672.836313521.88373.05447
3544.45972.872633567.03573.090783589.61172.814243612.18772.196083634.76371.91954
 3657.3471.301383679.91671.024843702.49270.283233725.06869.883223747.64469.14162
 3770.2268.741623792.797      683815.37367.838243837.94967.838243860.52567.67648
3883.10167.676483905.67767.514723928.25467.27648 3950.8366.876483973.40666.63824
3995.98266.238244018.558      664131.439      66 4244.3264.238724289.47264.93057
4312.04864.882834334.62565.228754357.20165.181014379.77765.581014402.35365.58734
4424.92965.987344447.50565.993674470.08266.373314492.65866.386544515.23466.77308
 4537.8166.776424560.38667.162964582.96267.166314605.53967.501464628.11567.45341
4650.69167.788574673.26767.740524695.84367.361444718.41966.595854763.57264.40259
4786.14863.662294808.72462.56566  4831.362.318554853.876 61.71514876.45361.46798
4899.02961.749064921.60561.501944944.18162.039424966.757 62.04874989.33362.58618
 5011.9162.397345034.48662.934815057.06262.602595079.63862.996675102.21462.66445
5124.79162.085165147.367      625169.943   61.25192.519    60.85215.095     60.5
5260.24860.533335282.82460.66667  5305.460.666675327.976    60.85350.552     60.8
5373.12860.933335395.70560.933335418.28161.066675440.85761.066675463.433     61.2
5486.009    61.25508.58561.333335531.16261.333335553.73861.466675576.31461.33333
 5598.89    61.45621.46661.799355644.04262.398715666.61962.507245711.77162.54266
5734.34758.539525756.92357.41345  5779.553.410325802.07652.284245824.65248.28111
5847.22851.688665869.80452.21913 5892.3855.626685914.95756.157165937.533 59.5647
5960.10959.835495982.685 60.61276005.26160.372936027.83760.370186050.41460.25167
 6072.9960.370186095.56660.251676118.14259.422116140.71859.066586163.294       58
 6366.48      586682.54657.244456727.69957.113046998.61356.453337179.222       56
```

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9888.362      569956.09157.587999978.66757.8012110001.2458.3305410023.8258.42644
10114.1257.5308910159.2856.8070410204.4356.47253   1022756.1380210249.58 55.6272
10294.73      5510317.31    54.910339.89    54.910407.61    54.610430.19    54.6
10475.34    54.4 10520.554.2370410565.6554.2441910588.22 54.1729 10610.853.97951
10633.3853.9082210655.9553.7148310678.5353.64354 10701.153.3483710723.6852.71812
10746.2652.4229610768.8351.7927110791.4151.4975410813.99 51.655310836.5652.14813
10859.1452.3058910881.7152.7987310904.2952.9564810926.8753.2892210972.02 54.3721
10994.5954.7048311017.1755.1135311039.7555.3135311062.3255.45677 11084.955.65677
11107.48    55.811130.05      5611152.6356.80345 11175.256.8073411197.7857.61079
11220.3657.6146911242.9358.4181411265.5158.8146911288.0860.0107911310.6660.40734
11333.2461.6034511355.81      6211378.39 62.250511400.97 62.250511446.1262.75151
11468.6962.7515111491.2763.1515111513.8563.3010111536.4263.7010111581.58      64
11626.7365.25749 11649.365.2574911671.8865.8862311694.4665.8862311717.0366.48372
11739.6166.4524611762.1867.0499511784.7667.0186911807.3467.3868311829.91 66.9115
11852.4966.8355611875.0766.6380811920.2266.4862111942.7966.3646611965.3766.36466
11987.95 66.243112010.5266.18432 12033.166.0627712055.6766.0627712078.25      66
12484.62      6612529.77     65.212552.35    64.9612574.93    64.8 12597.564.53333
12620.08    64.512665.23      6412687.8164.1546212710.3864.2319312732.9664.18346
12755.5464.0576612823.2664.0288312845.8464.0612112868.42    64.412890.9964.46121
12913.57    64.812936.1564.8612112958.72    65.2 12981.365.2612213003.87    65.6
13026.4565.6612113049.03      66 13071.665.6699113094.1865.2699113116.7564.93983
13139.3364.5398313161.9164.2097513184.4864.1923513207.0664.2448713229.6464.22747
13252.2164.2799913274.79 64.262613297.3664.4731613342.5264.6166113365.0964.82716
13387.6764.8988913410.2565.1508513432.8265.26397 13455.465.5159313477.9765.62905
13500.5565.8810113523.1365.84346 13545.765.8672613568.2865.8297113590.8565.85351
13613.4365.8159613636.01 65.846513658.5865.8156913681.1665.8462313703.7465.81542
13726.3165.8459613748.8965.8270613771.4665.8767713816.6265.8389513839.1965.88867
13861.7765.8697613884.3465.9194813906.9265.9005713952.07      6614629.36      66
14697.0964.9304714719.6664.9304714764.8264.1739514855.12      6415080.88      64
15126.0364.7051815171.1965.8419815238.9265.82223 15351.865.4170415374.3765.42889
15464.68    65.115532.4164.9866615554.9865.0222215577.5664.9777815600.1365.02857
15622.7164.9857215645.29      6515667.8664.9333315690.44   64.9515713.01  64.875
15735.5964.7466715780.7464.35555

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0     .045711.771     .065982.685     .04

Bank Sta: Left   Right     Lengths: Left Channel   Right     Coeff Contr.   Expan.
      5711.7715982.685               5191   5120    3182             .1       .3
Ineffective Flow      num=        1
   Sta L   Sta R     Elev  Permanent
    771015780.74      55        T

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             65.27    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.05    Wt. n-Val.                 0.040      0.060      0.040
  W.S. Elev (ft)             65.22    Reach Len. (ft)           10.00      10.00      10.00
  Crit W.S. (ft)             58.24    Flow Area (sq ft)       3405.62    2619.57   49001.29
  E.G. Slope (ft/ft)      0.000135    Area (sq ft)            3405.62    2619.57   49933.68
  Q Total (cfs)           93000.00    Flow (cfs)              3305.12    3402.11   86292.77
  Top Width (ft)           8631.18    Top Width (ft)          1137.77     270.91    7222.50
  Vel Total (ft/s)            1.69    Avg. Vel. (ft/s)           0.97       1.30       1.76
  Max Chl Dpth (ft)          16.94    Hydr. Depth (ft)           2.99       9.67       6.78
  Conv. Total (cfs)      8011438.0     Conv. (cfs)            284717.5   293072.9  7433647.0
  Length Wtd. (ft)           10.00    Wetted Per. (ft)        1137.93     272.82    7223.72
```

```
 Min Ch El (ft)              48.28    Shear (lb/sq ft)          0.03        0.08        0.06
 Alpha                        1.04    Stream Power (lb/ft s)    0.02        0.10        0.10
 Frctn Loss (ft)              0.00    Cum Volume (acre-ft)  15326.12     2814.55    27159.89
 C & E Loss (ft)              0.00    Cum SA (acres)         2284.22      315.52     4760.01


Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

BRIDGE


RIVER: Cosumnes
REACH: 1                 RS: 40025

INPUT
Description:
Distance from Upstream XS =      10
Deck/Roadway Width        =      30
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0      70      64    16000      70      64

Upstream Bridge Cross Section Data
Station Elevation Data    num=     337
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0     7222.57616      7245.1523371.8213567.7284971.8213590.3046671.49821
112.880871.35371 135.45771.03056158.033171.03056180.609370.70742203.185570.98335
225.761770.93614248.337871.21207 270.91471.14389293.490271.41982316.066371.46703
338.642571.85836 406.371      72519.2519      72 790.166     70.4812.742170.53333
835.3183    70.4857.8945      70993.3515      701015.928    70.21038.504     70.2
 1061.08    70.41106.232    70.41128.808    70.21151.385    70.21173.961       70
1422.299      70 1535.18      72 1648.06      721760.941      701873.82268.85117
1986.703      682099.58468.008072212.46569.991872235.041      702257.617     70.1
2280.193    70.32302.769    70.42325.345    70.62347.922    70.72393.07471.06667
2551.107      722663.988      722754.293    70.42776.869    70.22799.445     70.2
2822.021      702980.054      703002.631    70.43025.207    70.63047.783       71
3070.359    71.23115.511      723363.849      723386.426    72.43409.002     72.4
3431.578    72.83454.154    72.8 3476.7373.018163499.30672.836313521.88373.05447
3544.45972.872633567.03573.090783589.61172.814243612.18772.196083634.76371.91954
 3657.3471.301383679.91671.024843702.49270.283233725.06869.883223747.64469.14162
 3770.2268.741623792.797      683815.37367.838243837.94967.838243860.52567.67648
3883.10167.676483905.67767.514723928.25467.27648 3950.8366.876483973.40666.63824
3995.98266.238244018.558      664131.439      66 4244.3264.238724289.47264.93057
4312.04864.882834334.62565.228754357.20165.181014379.77765.581014402.35365.58734
4424.92965.987344447.50565.993674470.08266.373314492.65866.386544515.23466.77308
 4537.8166.776424560.38667.162964582.96267.166314605.53967.501464628.11567.45341
4650.69167.788574673.26767.740524695.84367.361444718.41966.595854763.57264.40259
4786.14863.662294808.72462.56566  4831.362.318554853.876 61.71514876.45361.46798
4899.02961.749064921.60561.501944944.18162.039424966.757 62.04874989.33362.58618
 5011.9162.397345034.48662.934815057.06262.602595079.63862.996675102.21462.66445
5124.79162.085165147.367      625169.943    61.25192.519    60.85215.095     60.5
5260.24860.533335282.82460.66667  5305.460.666675327.976    60.85350.552     60.8
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5373.12860.933335395.70560.933335418.28161.066675440.85761.066675463.433    61.2
5486.009     61.25508.58561.333335531.16261.333335553.73861.466675576.31461.33333
 5598.89     61.45621.46661.799355644.04262.398715666.61962.507245711.77162.54266
5734.34758.539525756.92357.41345  5779.553.410325802.07652.284245824.65248.28111
5847.22851.688665869.80452.21913 5892.3855.626685914.95756.157165937.533 59.5647
5960.10959.835495982.685 60.61276005.26160.372936027.83760.370186050.41460.25167
 6072.9960.370186095.56660.251676118.14259.422116140.71859.066586163.294      58
 6366.48       586682.54657.244456727.69957.113046998.61356.453337179.222      56
9888.362       569956.09157.587999978.66757.8012110001.2458.3305410023.8258.42644
10114.1257.5308910159.2856.8070410204.4356.47253   1022756.1380210249.58 55.6272
10294.73       5510317.31    54.910339.89    54.910407.61    54.610430.19    54.6
10475.34     54.4 10520.554.2370410565.6554.2441910588.22 54.1729 10610.853.97951
10633.3853.9082210655.9553.7148310678.5353.64354 10701.153.3483710723.6852.71812
10746.2652.4229610768.8351.7927110791.4151.4975410813.99 51.655310836.5652.14813
10859.1452.3058910881.7152.7987310904.2952.9564810926.8753.2892210972.02 54.3721
10994.5954.7048311017.1755.1135311039.7555.3135311062.3255.45677 11084.955.65677
11107.48     55.811130.05       5611152.6356.80345 11175.256.8073411197.7857.61079
11220.3657.6146911242.9358.4181411265.5158.8146911288.0860.0107911310.6660.40734
11333.2461.6034511355.81       6211378.39 62.250511400.97 62.250511446.1262.75151
11468.6962.7515111491.2763.1515111513.8563.3010111536.4263.7010111581.58      64
11626.7365.25749 11649.365.2574911671.8865.8862311694.4665.8862311717.0366.48372
11739.6166.4524611762.1867.0499511784.7667.0186911807.3467.3868311829.91 66.9115
11852.4966.8355611875.0766.6380811920.2266.4862111942.7966.3646611965.3766.36466
11987.95 66.243112010.5266.18432 12033.166.0627712055.6766.0627712078.25      66
12484.62       6612529.77    65.212552.35    64.9612574.93    64.8 12597.564.53333
12620.08     64.512665.23       6412687.8164.1546212710.3864.2319312732.9664.18346
12755.5464.0576612823.2664.0288312845.8464.0612112868.42    64.412890.9964.46121
12913.57     64.812936.1564.8612112958.72    65.2 12981.365.2612213003.87    65.6
13026.4565.6612113049.03       66 13071.665.6699113094.1865.2699113116.7564.93983
13139.3364.5398313161.9164.2097513184.4864.1923513207.0664.2448713229.6464.22747
13252.2164.2799913274.79 64.262613297.3664.4731613342.5264.6166113365.0964.82716
13387.6764.8988913410.2565.1508513432.8265.26397 13455.465.5159313477.9765.62905
13500.5565.8810113523.1365.84346 13545.765.8672613568.2865.8297113590.8565.85351
13613.4365.8159613636.01 65.846513658.5865.8156913681.1665.8462313703.7465.81542
13726.3165.8459613748.8965.8270613771.4665.8767713816.6265.8389513839.1965.88867
13861.7765.8697613884.3465.9194813906.9265.9005713952.07       6614629.36      66
14697.0964.9304714719.6664.9304714764.8264.1739514855.12       6415080.88      64
15126.0364.7051815171.1965.8419815238.9265.82223 15351.865.4170415374.3765.42889
15464.68     65.115532.4164.9866615554.9865.0222215577.5664.9777815600.1365.02857
15622.7164.9857215645.29       6515667.8664.9333315690.44   64.9515713.01  64.875
15735.5964.7466715780.7464.35555

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0     .045711.771     .065982.685     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      5711.7715982.685              .1        .3
Ineffective Flow      num=        1
   Sta L   Sta R     Elev  Permanent
    771015780.74       55        T

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0      70      64   16000      70      64
```

```
Downstream Bridge Cross Section Data
Station Elevation Data    num=      337
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
       0      7222.57616      7245.1523371.8213567.7284971.8213590.3046671.49821
112.880871.35371 135.45771.03056158.033171.03056180.609370.70742203.185570.98335
225.761770.93614248.337871.21207 270.91471.14389293.490271.41982316.066371.46703
338.642571.85836 406.371      72519.2519      72 790.166     70.4812.742170.53333
835.3183     70.4857.8945      70993.3515      701015.928     70.21038.504     70.2
 1061.08     70.41106.232     70.41128.808     70.21151.385     70.21173.961       70
1422.299       70 1535.18      72 1648.06      721760.941       701873.82268.85117
1986.703       682099.58468.008072212.46569.991872235.041       702257.617     70.1
2280.193     70.32302.769     70.42325.345     70.62347.922     70.72393.07471.06667
2551.107       722663.988      722754.293     70.42776.869     70.22799.445     70.2
2822.021       702980.054      703002.631     70.43025.207     70.63047.783       71
3070.359     71.23115.511      723363.849      723386.426     72.43409.002     72.4
3431.578     72.83454.154     72.8 3476.7373.018163499.30672.836313521.88373.05447
3544.45972.872633567.03573.090783589.61172.814243612.18772.196083634.76371.91954
 3657.3471.301383679.91671.024843702.49270.283233725.06869.883223747.64469.14162
 3770.2268.741623792.797      683815.37367.838243837.94967.838243860.52567.67648
3883.10167.676483905.67767.514723928.25467.27648 3950.8366.876483973.40666.63824
3995.98266.238244018.558      664131.439      66 4244.3264.238724289.47264.93057
4312.04864.882834334.62565.228754357.20165.181014379.77765.581014402.35365.58734
4424.92965.987344447.50565.993674470.08266.373314492.65866.386544515.23466.77308
 4537.8166.776424560.38667.162964582.96267.166314605.53967.501464628.11567.45341
4650.69167.788574673.26767.740524695.84367.361444718.41966.595854763.57264.40259
4786.14863.662294808.72462.56566  4831.362.318554853.876 61.71514876.45361.46798
4899.02961.749064921.60561.501944944.18162.039424966.757 62.04874989.33362.58618
 5011.9162.397345034.48662.934815057.06262.602595079.63862.996675102.21462.66445
5124.79162.085165147.367      625169.943     61.25192.519     60.85215.095     60.5
5260.24860.533335282.82460.66667  5305.460.666675327.976     60.85350.552     60.8
5373.12860.933335395.70560.933335418.28161.066675440.85761.066675463.433     61.2
5486.009     61.25508.58561.333335531.16261.333335553.73861.466675576.31461.33333
 5598.89     61.45621.46661.799355644.04262.398715666.61962.507245711.77162.54266
5734.34758.539525756.92357.41345  5779.553.410325802.07652.284245824.65248.28111
5847.22851.688665869.80452.21913 5892.3855.626685914.95756.157165937.533 59.5647
5960.10959.835495982.685 60.61276005.26160.372936027.83760.370186050.41460.25167
 6072.9960.370186095.56660.251676118.14259.422116140.71859.066586163.294       58
 6366.48       586682.54657.244456727.69957.113046998.61356.453337179.222       56
9888.362       569956.09157.587999978.66757.8012110001.2458.3305410023.8258.42644
10114.1257.5308910159.2856.8070410204.4356.47253    1022756.1380210249.58 55.6272
10294.73       5510317.31     54.910339.89     54.910407.61     54.610430.19     54.6
10475.34     54.4 10520.554.2370410565.6554.2441910588.22 54.1729 10610.853.97951
10633.3853.9082210655.9553.7148310678.5353.64354 10701.153.3483710723.6852.71812
10746.2652.4229610768.8351.7927110791.4151.4975410813.99 51.655310836.5652.14813
10859.1452.3058910881.7152.7987310904.2952.9564810926.8753.2892210972.02 54.3721
10994.5954.7048311017.1755.1135311039.7555.3135311062.3255.45677 11084.955.65677
11107.48     55.811130.05      5611152.6356.80345 11175.256.8073411197.7857.61079
11220.3657.6146911242.9358.4181411265.5158.8146911288.0860.0107911310.6660.40734
11333.2461.6034511355.81      6211378.39 62.250511400.97 62.250511446.1262.75151
11468.6962.7515111491.2763.1515111513.8563.3010111536.4263.7010111581.58       64
11626.7365.25749 11649.365.2574911671.8865.8862311694.4665.8862311717.0366.48372
11739.6166.4524611762.1867.0499511784.7667.0186911807.3467.3868311829.91 66.9115
11852.4966.8355611875.0766.6380811920.2266.4862111942.7966.3646611965.3766.36466
11987.95 66.243112010.5266.18432 12033.166.0627712055.6766.0627712078.25       66
12484.62       6612529.77     65.212552.35     64.9612574.93     64.8 12597.564.53333
12620.08     64.512665.23      6412687.8164.1546212710.3864.2319312732.9664.18346
12755.5464.0576612823.2664.0288312845.8464.0612112868.42     64.412890.9964.46121
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12913.57    64.812936.1564.8612112958.72    65.2 12981.365.2612213003.87    65.6
13026.4565.6612113049.03      66 13071.665.6699113094.1865.2699113116.7564.93983
13139.3364.5398313161.9164.2097513184.4864.1923513207.0664.2448713229.6464.22747
13252.2164.2799913274.79 64.262613297.3664.4731613342.5264.6166113365.0964.82716
13387.6764.8988913410.2565.1508513432.8265.26397 13455.465.5159313477.9765.62905
13500.5565.8810113523.1365.84346 13545.765.8672613568.2865.8297113590.8565.85351
13613.4365.8159613636.01 65.846513658.5865.8156913681.1665.8462313703.7465.81542
13726.3165.8459613748.8965.8270613771.4665.8767713816.6265.8389513839.1965.88867
13861.7765.8697613884.3465.9194813906.9265.9005713952.07      6614629.36      66
14697.0964.9304714719.6664.9304714764.8264.1739514855.12      6415080.88      64
15126.0364.7051815171.1965.8419815238.9265.82223 15351.865.4170415374.3765.42889
15464.68    65.115532.4164.9866615554.9865.0222215577.5664.9777815600.1365.02857
15622.7164.9857215645.29      6515667.8664.9333315690.44   64.9515713.01  64.875
15735.5964.7466715780.7464.35555

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .045711.771     .065982.685     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      5711.7715982.685             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    771015780.74      55       T

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream=    7675    Downstream=    7675
Upstream     num=       2
    Width   Elev    Width   Elev
       5     40       5      64
Downstream     num=       2
    Width   Elev    Width   Elev
       5     40       5      64

Pier Data
Pier Station     Upstream=    7725    Downstream=    7725
Upstream     num=       2
    Width   Elev    Width   Elev
       5     40       5      64
Downstream     num=       2
    Width   Elev    Width   Elev
       5     40       5      64

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
```

Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #100-year

E.G. US. (ft)	65.27	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	65.22	E.G. Elev (ft)	65.26	65.24
Q Total (cfs)	93000.00	W.S. Elev (ft)	65.19	65.18
Q Bridge (cfs)	93000.00	Crit W.S. (ft)	58.24	58.24
Q Weir (cfs)		Max Chl Dpth (ft)	16.91	16.89
Weir Sta Lft (ft)		Vel Total (ft/s)	2.05	2.05
Weir Sta Rgt (ft)		Flow Area (sq ft)	45404.71	45404.70
Weir Submerg		Froude # Chl	0.09	0.09
Weir Max Depth (ft)		Specif Force (cu ft)	233034.80	232239.10
Min El Weir Flow (ft)	70.01	Hydr Depth (ft)		
Min El Prs (ft)	64.00	W.P. Total (ft)	13625.78	13625.78
Delta EG (ft)	3.07	Conv. Total (cfs)	3847635.0	3847634.0
Delta WS (ft)	3.16	Top Width (ft)		
BR Open Area (sq ft)	45404.70	Frctn Loss (ft)	0.02	3.05
BR Open Vel (ft/s)	2.05	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.12	0.12
Br Sel Method	Energy only	Power Total (lb/ft s)	0.25	0.25

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1 RS: 40000

INPUT
Description: 24686 30000 4000
Station Elevation Data num= 337

```
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0     7222.57616     7245.1523371.8213567.7284971.8213590.3046671.49821
112.880871.35371 135.45771.03056158.033171.03056180.609370.70742203.185570.98335
225.761770.93614248.337871.21207 270.91471.14389293.490271.41982316.066371.46703
338.642571.85836 406.371     72519.2519      72 790.166     70.4812.742170.53333
835.3183     70.4857.8945     70993.3515     701015.928     70.21038.504     70.2
 1061.08     70.41106.232     70.41128.808     70.21151.385     70.21173.961       70
1422.299       70 1535.18       72 1648.06       721760.941       701873.82268.85117
1986.703       682099.58468.008072212.46569.991872235.041       702257.617     70.1
2280.193     70.32302.769     70.42325.345     70.62347.922     70.72393.07471.06667
2551.107       722663.988       722754.293     70.42776.869     70.22799.445     70.2
2822.021       702980.054       703002.631     70.43025.207     70.63047.783       71
```

```
3070.359    71.23115.511     723363.849     723386.426     72.43409.002     72.4
3431.578    72.83454.154    72.8 3476.7373.018163499.30672.836313521.88373.05447
3544.45972.872633567.03573.090783589.61172.814243612.18772.196083634.76371.91954
 3657.3471.301383679.91671.024843702.49270.283233725.06869.883223747.64469.14162
 3770.2268.741623792.797      683815.37367.838243837.94967.838243860.52567.67648
3883.10167.676483905.67767.514723928.25467.27648 3950.8366.876483973.40666.63824
3995.98266.238244018.558      664131.439      66 4244.3264.238724289.47264.93057
4312.04864.882834334.62565.228754357.20165.181014379.77765.581014402.35365.58734
4424.92965.987344447.50565.993674470.08266.373314492.65866.386544515.23466.77308
 4537.8166.776424560.38667.162964582.96267.166314605.53967.501464628.11567.45341
4650.69167.788574673.26767.740524695.84367.361444718.41966.595854763.57264.40259
4786.14863.662294808.72462.56566  4831.362.318554853.876 61.71514876.45361.46798
4899.02961.749064921.60561.501944944.18162.039424966.757 62.04874989.33362.58618
 5011.9162.397345034.48662.934815057.06262.602595079.63862.996675102.21462.66445
5124.79162.085165147.367      625169.943    61.25192.519     60.85215.095    60.5
5260.24860.533335282.82460.66667  5305.460.666675327.976     60.85350.552    60.8
5373.12860.933335395.70560.933335418.28161.066675440.85761.066675463.433    61.2
5486.009    61.25508.58561.333335531.16261.333335553.73861.466675576.31461.33333
 5598.89    61.45621.46661.799355644.04262.398715666.61962.507245711.77162.54266
5734.34758.539525756.92357.41345  5779.553.410325802.07652.284245824.65248.28111
5847.22851.688665869.80452.21913 5892.3855.626685914.95756.157165937.533 59.5647
5960.10959.835495982.685 60.61276005.26160.372936027.83760.370186050.41460.25167
 6072.9960.370186095.56660.251676118.14259.422116140.71859.066586163.294      58
 6366.48      586682.54657.244456727.69957.113046998.61356.453337179.222      56
9888.362      569956.09157.587999978.66757.8012110001.2458.3305410023.8258.42644
10114.1257.5308910159.2856.8070410204.4356.47253    1022756.1380210249.58 55.6272
10294.73     5510317.31     54.910339.89     54.910407.61     54.610430.19    54.6
10475.34    54.4 10520.554.2370410565.6554.2441910588.22 54.1729 10610.853.97951
10633.3853.9082210655.9553.7148310678.5353.64354 10701.153.3483710723.6852.71812
10746.2652.4229610768.8351.7927110791.4151.4975410813.99 51.655310836.5652.14813
10859.1452.3058910881.7152.7987310904.2952.9564810926.8753.2892210972.02 54.3721
10994.5954.7048311017.1755.1135311039.7555.3135311062.3255.45677 11084.955.65677
11107.48    55.811130.05     5611152.6356.80345 11175.256.8073411197.7857.61079
11220.3657.6146911242.9358.4181411265.5158.8146911288.0860.0107911310.6660.40734
11333.2461.6034511355.81     6211378.39 62.250511400.97 62.250511446.1262.75151
11468.6962.7515111491.2763.1515111513.8563.3010111536.4263.7010111581.58      64
11626.7365.25749 11649.365.2574911671.8865.8862311694.4665.8862311717.0366.48372
11739.6166.4524611762.1867.0499511784.7667.0186911807.3467.3868311829.91 66.9115
11852.4966.8355611875.0766.6380811920.2266.4862111942.7966.3646611965.3766.36466
11987.95 66.243112010.5266.18432 12033.166.0627712055.6766.0627712078.25      66
12484.62     6612529.77     65.212552.35    64.9612574.93     64.8 12597.564.53333
12620.08    64.512665.23     6412687.8164.1546212710.3864.2319312732.9664.18346
12755.5464.0576612823.2664.0288312845.8464.0612112868.42    64.412890.9964.46121
12913.57    64.812936.1564.8612112958.72     65.2 12981.365.2612213003.87    65.6
13026.4565.6612113049.03     66 13071.665.6699113094.1865.2699113116.7564.93983
13139.3364.5398313161.9164.2097513184.4864.1923513207.0664.2448713229.6464.22747
13252.2164.2799913274.79 64.262613297.3664.4731613342.5264.6166113365.0964.82716
13387.6764.8988913410.2565.1508513432.8265.26397 13455.465.5159313477.9765.62905
13500.5565.8810113523.1365.84346 13545.765.8672613568.2865.8297113590.8565.85351
13613.4365.8159613636.01 65.846513658.5865.8156913681.1665.8462313703.7465.81542
13726.3165.8459613748.8965.8270613771.4665.8767713816.6265.8389513839.1965.88867
13861.7765.8697613884.3465.9194813906.9265.9005713952.07      6614629.36      66
14697.0964.9304714719.6664.9304714764.8264.1739514855.12      6415080.88      64
15126.0364.7051815171.1965.8419815238.9265.82223 15351.865.4170415374.3765.42889
15464.68    65.115532.4164.9866615554.9865.0222215577.5664.9777815600.1365.02857
15622.7164.9857215645.29     6515667.8664.9333315690.44   64.9515713.01  64.875
15735.5964.7466715780.7464.35555
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Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      0     .045711.771     .065982.685     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
      5711.7715982.685             5191    5120    3182              .1       .3
Ineffective Flow      num=        1
   Sta L    Sta R    Elev  Permanent
    771015780.74      55      T

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              62.19    Element                    Left OB    Channel   Right OB
  Vel Head (ft)                0.13    Wt. n-Val.                  0.040      0.060      0.040
  W.S. Elev (ft)              62.06    Reach Len. (ft)            5191.00    5120.00    3182.00
  Crit W.S. (ft)                       Flow Area (sq ft)           530.91    1765.03   30373.92
  E.G. Slope (ft/ft)       0.000615    Area (sq ft)                530.91    1765.03   31306.31
  Q Total (cfs)            93000.00    Flow (cfs)                  463.56    3789.91   88746.53
  Top Width (ft)            6274.01    Top Width (ft)              627.05     268.21    5378.76
  Vel Total (ft/s)             2.85    Avg. Vel. (ft/s)              0.87       2.15       2.92
  Max Chl Dpth (ft)           13.78    Hydr. Depth (ft)              0.85       6.58       5.65
  Conv. Total (cfs)       3749427.0     Conv. (cfs)               18689.2   152795.4  3577943.0
  Length Wtd. (ft)          3324.94    Wetted Per. (ft)            627.09     270.07    5379.04
  Min Ch El (ft)              48.28    Shear (lb/sq ft)              0.03       0.25       0.22
  Alpha                        1.03    Stream Power (lb/ft s)        0.03       0.54       0.63
  Frctn Loss (ft)              1.32    Cum Volume (acre-ft)      15166.22    2576.01   22853.39
  C & E Loss (ft)              0.03    Cum SA (acres)             2247.52     299.85    4445.54


Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 35050

INPUT
Description: 19566  25000  3500
Station Elevation Data    num=      199
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       064.0870397.9020464.43515146.853164.26109171.328664.54897220.279664.37491
244.7551      64513.9858      64538.4614   64.12562.9369    64.4587.412464.53333
611.8879   64.75636.363565.06667 660.839    65.2685.3145    65.4  709.7965.73333
734.2656      66783.2166      66807.692165.93244832.167765.93244905.594264.73244
930.0698    64.4954.5453      64979.020864.133331003.496    64.21027.972    64.4
1076.923    64.61101.398   64.81125.87464.888891174.825    65.2  1199.365.28333
1223.77665.466671248.251   65.61272.726   65.681297.20265.866671321.677      66
1493.006      661541.957   65.81566.432    65.61615.383    65.41639.858    65.2
1933.564      642178.319      642202.795   63.82227.27163.466672251.74663.33333
2276.222    63.12300.697   62.82325.17362.666672349.64862.428572374.12462.13334
  2398.6      622496.50261.930182520.97861.860352569.92961.060352594.40461.02544
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2643.35560.330182692.30760.344352716.78260.239262741.25860.583612790.20960.37344
2814.68559.94684 2839.1659.969672863.63659.543072888.11158.848152912.58758.87098
2986.01456.717743010.48956.717743034.965      563181.81856.027733206.294      56
 3230.77 56.07813255.245 56.07813304.19656.234313328.67256.234313402.09956.59993
3524.47756.630983573.42856.564643646.854 56.1828 3671.3354.410453720.28150.68294
3744.75748.910583769.23245.353133793.70847.262373818.184 50.9567 3891.6156.68439
3916.08656.657733965.03755.530913989.51355.504254013.98854.940834062.93956.45917
4087.41557.755094136.36658.898644160.842 58.75344209.79357.014634234.26956.86938
4258.744      564430.07355.533334454.549   55.524601.40255.066674625.878   55.05
4772.731    54.64993.012      545751.755      545996.51153.803926045.46253.83688
 6167.8453.772366216.791    53.86339.16953.74194 6388.1253.766676510.49853.71429
6559.44953.733336657.35253.666676706.303   53.686730.778   53.646755.25453.66667
6853.15653.466678174.838      52 8664.35      528762.25249.347158786.72848.74707
8811.20349.74715 8884.6352.936798909.10553.947078933.581      549398.617      54
9472.04453.306019520.99552.742429545.471 52.63179569.94652.571439618.89752.34998
9765.751      529888.129 53.472410010.51 55.985310108.41    57.610132.8857.59044
10157.3657.9833410206.3157.1806210230.7957.1639610279.7456.3792610304.2156.38062
10328.6955.9972810377.6455.9842210500.0257.8377710524.4957.5170710548.97 57.5278
 10622.456.5657210646.8756.8413110695.8256.74658 10720.357.0221710744.7756.98327
10793.73 57.8108 10818.258.5390610842.6858.9528210867.1559.6119910891.6359.67577
 10916.159.6704710940.5859.6013811038.4859.6013811185.3359.7777111209.8159.88946
11234.2959.9212211283.2460.1764911356.6660.2857111527.99   60.1511552.47    60.1
11576.9460.13334 11625.9   60.1211650.37   60.0611699.3260.05714 11723.8      60
12409.11      6012458.07   60.1612482.54   60.1212531.49    60.212555.97   60.16
12604.92   60.2512629.3960.2111112653.8760.2666712702.8260.22857 12727.360.17143
12776.2560.1916712800.7260.1333412874.15  60.19212898.63   60.1612947.5860.22667
12972.05  60.195   13021   60.2413045.48    60.213118.9160.2666713143.38   60.24
13192.3360.2933313265.76   60.2813290.24   60.2413363.66   60.2413461.56   60.16
13534.9960.1714313681.8460.0533313706.32      6014954.58     60

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .043524.477     .064136.366     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      3524.4774136.366             4629    4288    1850             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    781014954.58      50       F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             60.84    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               0.04    Wt. n-Val.                  0.040      0.060      0.040
  W.S. Elev (ft)             60.80    Reach Len. (ft)            10.00      10.00      10.00
  Crit W.S. (ft)             55.21    Flow Area (sq ft)        2867.96    3882.80   49175.50
  E.G. Slope (ft/ft)      0.000279    Area (sq ft)             2867.96    3882.80   49175.50
  Q Total (cfs)           93000.00    Flow (cfs)               3812.55    5495.90   83691.55
  Top Width (ft)          12344.06    Top Width (ft)            913.96     611.89   10818.21
  Vel Total (ft/s)            1.66    Avg. Vel. (ft/s)            1.33       1.42       1.70
  Max Chl Dpth (ft)          15.44    Hydr. Depth (ft)            3.14       6.35       4.55
  Conv. Total (cfs)      5569940.0     Conv. (cfs)            228340.5   329159.3  5012440.0
  Length Wtd. (ft)           10.00    Wetted Per. (ft)          914.03     613.08   10819.35
  Min Ch El (ft)             45.35    Shear (lb/sq ft)            0.05       0.11       0.08
  Alpha                       1.01    Stream Power (lb/ft s)      0.07       0.16       0.13
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)    14963.70    2244.09   19913.85
  C & E Loss (ft)             0.00    Cum SA (acres)           2155.70     248.12    3853.96
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Warning: The cross-section end points had to be extended vertically for the computed water surface.

BRIDGE


RIVER: Cosumnes
REACH: 1                 RS: 35025

INPUT
Description:
Distance from Upstream XS =      10
Deck/Roadway Width        =      30
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      66      61   14000      66      61

Upstream Bridge Cross Section Data
Station Elevation Data    num=     199
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       064.0870397.9020464.43515146.853164.26109171.328664.54897220.279664.37491
244.7551      64513.9858      64538.4614   64.12562.9369    64.4587.412464.53333
611.8879   64.75636.363565.06667 660.839    65.2685.3145    65.4  709.7965.73333
734.2656      66783.2166      66807.692165.93244832.167765.93244905.594264.73244
930.0698   64.4954.5453      64979.020864.133331003.496    64.21027.972    64.4
1076.923   64.61101.398    64.81125.87464.888891174.825    65.2  1199.365.28333
1223.77665.466671248.251    65.61272.726   65.681297.20265.866671321.677      66
1493.006      661541.957    65.81566.432   65.61615.383    65.41639.858    65.2
1933.564      642178.319      642202.795   63.82227.27163.466672251.74663.33333
2276.222   63.12300.697    62.82325.17362.666672349.64862.428572374.12462.13334
  2398.6      622496.50261.930182520.97861.860352569.92961.060352594.40461.02544
2643.35560.330182692.30760.344352716.78260.239262741.25860.583612790.20960.37344
2814.68559.94684 2839.1659.969672863.63659.543072888.11158.848152912.58758.87098
2986.01456.717743010.48956.717743034.965       563181.81856.027733206.294      56
 3230.77 56.07813255.245 56.07813304.19656.234313328.67256.234313402.09956.59993
3524.47756.630983573.42856.564643646.854 56.1828 3671.3354.410453720.28150.68294
3744.75748.910583769.23245.353133793.70847.262373818.184 50.9567 3891.6156.68439
3916.08656.657733965.03755.530913989.51355.504254013.98854.940834062.93956.45917
4087.41557.755094136.36658.898644160.842 58.75344209.79357.014634234.26956.86938
4258.744      564430.07355.533334454.549   55.524601.40255.066674625.878   55.05
4772.731   54.64993.012      545751.755      545996.51153.803926045.46253.83688
 6167.8453.772366216.791    53.86339.16953.74194 6388.1253.766676510.49853.71429
6559.44953.733336657.35253.666676706.303   53.686730.778   53.646755.25453.66667
6853.15653.466678174.838      52 8664.35      528762.25249.347158786.72848.74707
8811.20349.74715 8884.6352.936798909.10553.947078933.581      549398.617      54
9472.04453.306019520.99552.742429545.471 52.63179569.94652.571439618.89752.34998
9765.751      529888.129 53.472410010.51 55.985310108.41     57.610132.8857.59044
10157.3657.9833410206.3157.1806210230.7957.1639610279.7456.3792610304.2156.38062
10328.6955.9972810377.6455.9842210500.0257.8377710524.4957.5170710548.97 57.5278
 10622.456.5657210646.8756.8413110695.8256.74658 10720.357.0221710744.7756.98327
10793.73 57.8108 10818.258.5390610842.6858.9528210867.1559.6119910891.6359.67577
 10916.159.6704710940.5859.6013811038.4859.6013811185.3359.7777111209.8159.88946
11234.2959.9212211283.2460.1764911356.6660.2857111527.99   60.1511552.47    60.1
11576.9460.13334 11625.9   60.1211650.37   60.0611699.3260.05714 11723.8      60
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12409.11       6012458.07   60.1612482.54   60.1212531.49    60.212555.97    60.16
12604.92   60.2512629.3960.2111112653.8760.2666712702.8260.22857 12727.360.17143
12776.2560.1916712800.7260.1333412874.15  60.19212898.63    60.1612947.5860.22667
12972.05  60.195    13021    60.2413045.48    60.213118.9160.2666713143.38    60.24
13192.3360.2933313265.76   60.2813290.24   60.2413363.66   60.2413461.56    60.16
13534.9960.1714313681.8460.0533313706.32       6014954.58      60

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .043524.477     .064136.366     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      3524.4774136.366            .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
    781014954.58      50       F

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      66      61   14000      66      61

Downstream Bridge Cross Section Data
Station Elevation Data    num=     199
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       064.0870397.9020464.43515146.853164.26109171.328664.54897220.279664.37491
244.7551      64513.9858      64538.4614   64.12562.9369    64.4587.412464.53333
611.8879   64.75636.363565.06667 660.839    65.2685.3145    65.4  709.7965.73333
734.2656      66783.2166      66807.692165.93244832.167765.93244905.594264.73244
930.0698   64.4954.5453      64979.020864.133331003.496    64.21027.972    64.4
1076.923   64.61101.398    64.81125.87464.888891174.825    65.2  1199.365.28333
1223.77665.466671248.251    65.61272.726   65.681297.20265.866671321.677      66
1493.006      661541.957    65.81566.432    65.61615.383    65.41639.858    65.2
1933.564      642178.319      642202.795    63.82227.27163.466672251.74663.33333
2276.222   63.12300.697    62.82325.17362.666672349.64862.428572374.12462.13334
  2398.6      622496.50261.930182520.97861.860352569.92961.060352594.40461.02544
2643.35560.330182692.30760.344352716.78260.239262741.25860.583612790.20960.37344
2814.68559.94684 2839.1659.969672863.63659.543072888.11158.848152912.58758.87098
2986.01456.717743010.48956.717743034.965      563181.81856.027733206.294      56
 3230.77 56.07813255.245 56.07813304.19656.234313328.67256.234313402.09956.59993
3524.47756.630983573.42856.564643646.854 56.1828 3671.3354.410453720.28150.68294
3744.75748.910583769.23245.353133793.70847.262373818.184 50.9567 3891.6156.68439
3916.08656.657733965.03755.530913989.51355.504254013.98854.940834062.93956.45917
4087.41557.755094136.36658.898644160.842 58.75344209.79357.014634234.26956.86938
4258.744      564430.07355.533334454.549   55.524601.40255.066674625.878   55.05
4772.731   54.64993.012      545751.755      545996.51153.803926045.46253.83688
 6167.8453.772366216.791    53.86339.16953.74194 6388.1253.766676510.49853.71429
6559.44953.733336657.35253.666676706.303   53.686730.778   53.646755.25453.66667
6853.15653.466678174.838      52 8664.35      528762.25249.347158786.72848.74707
8811.20349.74715 8884.6352.936798909.10553.947078933.581      549398.617      54
9472.04453.306019520.99552.742429545.471 52.63179569.94652.571439618.89752.34998
9765.751      529888.129 53.472410010.51 55.985310108.41    57.610132.8857.59044
10157.3657.9833410206.3157.1806210230.7957.1639610279.7456.3792610304.2156.38062
10328.6955.9972810377.6455.9842210500.0257.8377710524.4957.5170710548.97 57.5278
 10622.456.5657210646.8756.8413110695.8256.74658 10720.357.0221710744.7756.98327
10793.73 57.8108 10818.258.5390610842.6858.9528210867.1559.6119910891.6359.67577
 10916.159.6704710940.5859.6013811038.4859.6013811185.3359.7777111209.8159.88946
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11234.2959.9212211283.2460.1764911356.6660.2857111527.99   60.1511552.47    60.1
11576.9460.13334 11625.9   60.1211650.37   60.0611699.3260.05714 11723.8      60
12409.11      6012458.07   60.1612482.54   60.1212531.49    60.212555.97   60.16
12604.92   60.2512629.3960.2111112653.8760.2666712702.8260.22857 12727.360.17143
12776.2560.1916712800.7260.1333412874.15  60.19212898.63   60.1612947.5860.22667
12972.05  60.195   13021   60.2413045.48    60.213118.9160.2666713143.38   60.24
13192.3360.2933313265.76   60.2813290.24   60.2413363.66   60.2413461.56   60.16
13534.9960.1714313681.8460.0533313706.32      6014954.58      60

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0     .043524.477     .064136.366     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      3524.4774136.366             .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
    781014954.58      50       F

Upstream Embankment side slope             =       0 horiz. to 1.0 vertical
Downstream Embankment side slope           =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins        =
Energy head used in spillway design        =
Spillway height used in design             =
Weir crest shape                           = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream=    7902    Downstream=    7902
Upstream     num=       2
    Width   Elev    Width   Elev
       5     40       5      61
Downstream     num=       2
    Width   Elev    Width   Elev
       5     40       5      61

Pier Data
Pier Station     Upstream=    7952    Downstream=    7952
Upstream     num=       2
    Width   Elev    Width   Elev
       5     40       5      61
Downstream     num=       2
    Width   Elev    Width   Elev
       5     40       5      61

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
```

```
     Add Friction component to Momentum
     Do not add Weight component to Momentum
     Class B flow critical depth computations use critical depth
         inside the bridge at the upstream end
     Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #100-year

  E.G. US. (ft)                 60.84   Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)                 60.80   E.G. Elev (ft)                 60.84         60.83
  Q Total (cfs)              93000.00   W.S. Elev (ft)                 60.79         60.79
  Q Bridge (cfs)             92628.66   Crit W.S. (ft)                 55.21         55.21
  Q Weir (cfs)                          Max Chl Dpth (ft)              15.44         15.43
  Weir Sta Lft (ft)                     Vel Total (ft/s)                1.67          1.67
  Weir Sta Rgt (ft)                     Flow Area (sq ft)           55801.05      55710.47
  Weir Submerg                          Froude # Chl                    0.07          0.07
  Weir Max Depth (ft)                   Specif Force (cu ft)       194996.70     194595.20
  Min El Weir Flow (ft)         60.01   Hydr Depth (ft)                 4.52          4.52
  Min El Prs (ft)               61.00   W.P. Total (ft)             12371.09      12370.53
  Delta EG (ft)                  1.30   Conv. Total (cfs)          6031299.0     6016757.0
  Delta WS (ft)                  1.34   Top Width (ft)              12333.83      12333.32
  BR Open Area (sq ft)       57396.81   Frctn Loss (ft)                 0.01          1.29
  BR Open Vel (ft/s)             1.69   C & E Loss (ft)                 0.00          0.00
  Coef of Q                             Shear Total (lb/sq ft)          0.07          0.07
  Br Sel Method           Energy only   Power Total (lb/ft s)           0.11          0.11

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                 RS: 35000

INPUT
Description: 19566  25000  3500
Station Elevation Data    num=      199
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       064.0870397.9020464.43515146.853164.26109171.328664.54897220.279664.37491
244.7551      64513.9858      64538.4614   64.12562.9369    64.4587.412464.53333
611.8879   64.75636.363565.06667 660.839    65.2685.3145    65.4  709.7965.73333
734.2656      66783.2166      66807.692165.93244832.167765.93244905.594264.73244
930.0698    64.4954.5453      64979.020864.133331003.496    64.21027.972    64.4
1076.923    64.61101.398    64.81125.87464.888891174.825    65.2  1199.365.28333
1223.77665.466671248.251    65.61272.726   65.681297.20265.866671321.677      66
1493.006      661541.957    65.81566.432    65.61615.383    65.41639.858    65.2
1933.564      642178.319      642202.795    63.82227.27163.466672251.74663.33333
2276.222    63.12300.697    62.82325.17362.666672349.64862.428572374.12462.13334
  2398.6        622496.50261.930182520.97861.860352569.92961.060352594.40461.02544
2643.35560.330182692.30760.344352716.78260.239262741.25860.583612790.20960.37344
2814.68559.94684 2839.1659.969672863.63659.543072888.11158.848152912.58758.87098
2986.01456.717743010.48956.717743034.965       563181.81856.027733206.294      56
 3230.77 56.07813255.245 56.07813304.19656.234313328.67256.234313402.09956.59993
3524.47756.630983573.42856.564643646.854 56.1828 3671.3354.410453720.28150.68294
3744.75748.910583769.23245.353133793.70847.262373818.184 50.9567 3891.6156.68439
```

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3916.08656.657733965.03755.530913989.51355.504254013.98854.940834062.93956.45917
4087.41557.755094136.36658.898644160.842 58.75344209.79357.014634234.26956.86938
4258.744       564430.07355.533334454.549    55.524601.40255.066674625.878   55.05
4772.731    54.64993.012       545751.755        545996.51153.803926045.46253.83688
 6167.8453.772366216.791     53.86339.16953.74194 6388.1253.766676510.49853.71429
6559.44953.733336657.35253.666676706.303    53.686730.778   53.646755.25453.66667
6853.15653.466678174.838        52 8664.35       528762.25249.347158786.72848.74707
8811.20349.74715 8884.6352.936798909.10553.947078933.581      549398.617       54
9472.04453.306019520.99552.742429545.471 52.63179569.94652.571439618.89752.34998
9765.751       529888.129 53.472410010.51 55.985310108.41     57.610132.8857.59044
10157.3657.9833410206.3157.1806210230.7957.1639610279.7456.3792610304.2156.38062
10328.6955.9972810377.6455.9842210500.0257.8377710524.4957.5170710548.97 57.5278
 10622.456.5657210646.8756.8413110695.8256.74658 10720.357.0221710744.7756.98327
10793.73 57.8108 10818.258.5390610842.6858.9528210867.1559.6119910891.6359.67577
 10916.159.6704710940.5859.6013811038.4859.6013811185.3359.7777111209.8159.88946
11234.2959.9212211283.2460.1764911356.6660.2857111527.99   60.1511552.47    60.1
11576.9460.13334 11625.9    60.1211650.37   60.0611699.3260.05714 11723.8       60
12409.11       6012458.07    60.1612482.54   60.1212531.49    60.212555.97   60.16
12604.92    60.2512629.3960.2111112653.8760.2666712702.8260.22857 12727.360.17143
12776.2560.1916712800.7260.1333412874.15   60.19212898.63   60.1612947.5860.22667
12972.05  60.195    13021    60.2413045.48    60.213118.9160.2666713143.38   60.24
13192.3360.2933313265.76    60.2813290.24    60.2413363.66   60.2413461.56   60.16
13534.9960.1714313681.8460.0533313706.32        6014954.58      60

Manning's n Values         num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
       0     .043524.477     .064136.366     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      3524.4774136.366              4629    4288    1850              .1       .3
Ineffective Flow      num=       1
   Sta L    Sta R     Elev  Permanent
    781014954.58      50       F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             59.54   Element                   Left OB    Channel   Right OB
  Vel Head (ft)               0.08   Wt. n-Val.                  0.040      0.060      0.040
  W.S. Elev (ft)             59.46   Reach Len. (ft)           4629.00    4288.00    1850.00
  Crit W.S. (ft)             55.21   Flow Area (sq ft)         1856.21    3065.38   37134.45
  E.G. Slope (ft/ft)      0.000397   Area (sq ft)              1856.21    3065.38   37134.45
  Q Total (cfs)           93000.00   Flow (cfs)                2742.15    4421.43   85836.42
  Top Width (ft)           7995.00   Top Width (ft)             657.94     611.89    6725.17
  Vel Total (ft/s)            2.21   Avg. Vel. (ft/s)             1.48       1.44       2.31
  Max Chl Dpth (ft)          14.11   Hydr. Depth (ft)             2.82       5.01       5.52
  Conv. Total (cfs)      4669014.0    Conv. (cfs)              137668.1   221975.4  4309371.0
  Length Wtd. (ft)         2621.26   Wetted Per. (ft)           657.99     613.08    6725.50
  Min Ch El (ft)             45.35   Shear (lb/sq ft)             0.07       0.12       0.14
  Alpha                       1.04   Stream Power (lb/ft s)       0.10       0.18       0.32
  Frctn Loss (ft)             0.55   Cum Volume (acre-ft)     14731.19    1902.04   15670.04
  C & E Loss (ft)             0.02   Cum SA (acres)            2078.25     187.89    2989.10

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION
```

```
RIVER: Cosumnes
REACH: 1                  RS: 30050

INPUT
Description: 15278  20000  3000
Station Elevation Data    num=     198
     Sta    Elev     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       058.6666754.00158    58.481.00237   58.45108.0032   58.4189.0055    58.7
216.006358.86666243.0071    58.9324.0095   59.44378.011159.71111405.011959.91667
432.0127      60729.0214      60756.0222    59.6783.0229    59.4810.0237    59.4
837.0245    59.2918.0269      581134.03357.970131323.03857.761091350.03957.41053
 1377.0457.11813 1404.0457.000241431.04156.758741458.042 57.01911485.04257.74853
1539.04455.934311566.04555.480761620.04655.480761674.048  54.7121701.048    54.6
1782.051    54.61809.051   54.641836.052   54.751863.053    54.81890.05354.91667
1971.056  55.1252025.05755.384622052.058   55.442079.059    55.552106.059    55.6
2160.061      562214.062      562268.06455.892752295.06455.892752376.06754.83287
2430.06850.87029 2511.0745.147192538.07144.799982565.07244.573912673.07546.85791
2700.07548.083482835.07951.98815 2862.0851.988152970.083      543105.086 54.8102
3132.08754.826293159.08854.66425 3240.09 54.71253267.09154.994873375.09454.55873
3402.09454.315293429.095 53.84623456.09653.816043510.09752.877863564.09952.16054
3645.10152.160543699.103      524212.118      524239.11952.357964293.12153.43183
4320.12253.789794455.12648.977054617.132    50.24644.133      504806.13950.15067
4860.14151.817164887.14251.762874914.14352.162874995.146      52 5670.17      52
5805.175      54 5940.1839.193016021.18346.107416048.18448.336146075.18550.64094
6102.18650.97361 6210.19      526534.202      526615.20550.833446642.20651.05479
6696.208 50.71986750.20951.497516831.212 51.56966885.214 50.76966912.21550.51307
6939.21650.513076993.218      507020.21950.381727128.22350.443877155.22450.34055
7182.22550.369747209.22650.136077290.22950.223637425.234      507479.23651.99973
7506.23752.020247560.23954.01997 7587.2455.557877695.24458.019287722.24556.67286
7776.24754.234057803.24852.830837830.24951.61143 7884.2551.122637965.25351.13519
8019.255      528100.258      528181.26150.594788235.26349.752968316.26649.24793
8343.26749.668848370.26849.453018478.271      528775.282      528910.28750.44304
8937.28850.639788964.28950.488929045.29251.079169072.29351.541429180.297      52
9315.302      529369.30452.575119450.30753.779819504.30955.42899 9531.3156.13956
9585.312 57.98149666.31459.444979720.31659.754269801.31957.79584 9828.32 57.2659
9855.32156.588779963.325      569990.32655.7500310098.3355.7500310125.33      56
10260.34 54.320410395.3448.4478310422.3448.3831110530.3550.5281910557.3551.53976
10611.3553.2565710665.3554.3837210692.35 54.646910719.3555.2104810746.3555.62778
10800.3655.6843510827.36 55.663310854.3655.6969710881.36 55.663310935.36      56
11070.37      5611205.37      5812177.41      5812447.42    58.612609.42    58.4
12690.42    58.212852.4358.2266712933.43      5813257.44      5813284.4557.92889
13311.45      5813338.4557.9333313419.4557.8666613446.45    57.813527.4557.77143
13581.46    57.813608.4657.8666613743.4657.8666613878.4757.8363613905.4757.88889
14013.47    57.914040.47      5815147.51      5815255.52    56.415282.52    56.2
15309.52    56.215336.52    56.315417.5256.2666715471.52      5615660.53      56
15768.5456.1302215795.5455.5909215903.5454.5191115930.5454.8230116065.55      56
16335.56      5616362.5655.8112316497.5655.78136

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
       0    .045805.175     .06 6210.19     .04

Bank Sta: Left   Right    Lengths: Left Channel    Right      Coeff Contr.   Expan.
      5805.175 6210.19              4196    4551    5233              .1       .3
Ineffective Flow     num=      1
```

```
  Sta L   Sta R    Elev  Permanent
  800016497.56      50       F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              58.97   Element                    Left OB    Channel   Right OB
  Vel Head (ft)                0.03   Wt. n-Val.                  0.040      0.060      0.040
  W.S. Elev (ft)              58.94   Reach Len. (ft)             10.00      10.00      10.00
  Crit W.S. (ft)              52.84   Flow Area (sq ft)        28725.84    4583.48   37962.75
  E.G. Slope (ft/ft)       0.000131   Area (sq ft)             28725.84    4583.48   37962.75
  Q Total (cfs)            93000.00   Flow (cfs)               39264.63    6537.04   47198.33
  Top Width (ft)           15777.41   Top Width (ft)            5200.33     405.02   10172.06
  Vel Total (ft/s)             1.30   Avg. Vel. (ft/s)             1.37       1.43       1.24
  Max Chl Dpth (ft)           19.75   Hydr. Depth (ft)             5.52      11.32       3.73
  Conv. Total (cfs)       8122594.0    Conv. (cfs)            3429362.0   570942.8  4122289.0
  Length Wtd. (ft)            10.00   Wetted Per. (ft)          5201.33     406.32   10176.03
  Min Ch El (ft)              39.19   Shear (lb/sq ft)             0.05       0.09       0.03
  Alpha                        1.01   Stream Power (lb/ft s)       0.06       0.13       0.04
  Frctn Loss (ft)              0.00   Cum Volume (acre-ft)     13106.26    1525.57   14075.35
  C & E Loss (ft)              0.00   Cum SA (acres)            1766.98     137.84    2630.28
```

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

BRIDGE

```
RIVER: Cosumnes
REACH: 1                  RS: 30025

INPUT
Description:
Distance from Upstream XS =      10
Deck/Roadway Width        =      30
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      63      58   16000      63      58

Upstream Bridge Cross Section Data
Station Elevation Data    num=     198
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta    Elev
       058.6666754.00158    58.481.00237    58.45108.0032    58.4189.0055     58.7
216.006358.86666243.0071    58.9324.0095    59.44378.011159.71111405.011959.91667
432.0127       60729.0214      60756.0222    59.6783.0229    59.4810.0237     59.4
837.0245    59.2918.0269       581134.03357.970131323.03857.761091350.03957.41053
 1377.0457.11813 1404.0457.000241431.04156.758741458.042 57.01911485.04257.74853
1539.04455.934311566.04555.480761620.04655.480761674.048  54.7121701.048     54.6
1782.051    54.61809.051   54.641836.052    54.751863.053    54.81890.05354.91667
1971.056  55.1252025.05755.384622052.058    55.442079.059    55.552106.059     55.6
2160.061       562214.062      562268.06455.892752295.06455.892752376.06754.83287
2430.06850.87029 2511.0745.147192538.07144.799982565.07244.573912673.07546.85791
2700.07548.083482835.07951.98815 2862.0851.988152970.083       543105.086 54.8102
```

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3132.08754.826293159.08854.66425 3240.09 54.71253267.09154.994873375.09454.55873
3402.09454.315293429.095 53.84623456.09653.816043510.09752.877863564.09952.16054
3645.10152.160543699.103       524212.118       524239.11952.357964293.12153.43183
4320.12253.789794455.12648.977054617.132    50.24644.133       504806.13950.15067
4860.14151.817164887.14251.762874914.14352.162874995.146       52 5670.17       52
5805.175       54 5940.1839.193016021.18346.107416048.18448.336146075.18550.64094
6102.18650.97361 6210.19       526534.202       526615.20550.833446642.20651.05479
6696.208 50.71986750.20951.497516831.212 51.56966885.214 50.76966912.21550.51307
6939.21650.513076993.218       507020.21950.381727128.22350.443877155.22450.34055
7182.22550.369747209.22650.136077290.22950.223637425.234       507479.23651.99973
7506.23752.020247560.23954.01997 7587.2455.557877695.24458.019287722.24556.67286
7776.24754.234057803.24852.830837830.24951.61143 7884.2551.122637965.25351.13519
8019.255       528100.258       528181.26150.594788235.26349.752968316.26649.24793
8343.26749.668848370.26849.453018478.271       528775.282       528910.28750.44304
8937.28850.639788964.28950.488929045.29251.079169072.29351.541429180.297       52
9315.302       529369.30452.575119450.30753.779819504.30955.42899 9531.3156.13956
9585.312 57.98149666.31459.444979720.31659.754269801.31957.79584 9828.32 57.2659
9855.32156.588779963.325       569990.32655.7500310098.3355.7500310125.33       56
10260.34 54.320410395.3448.4478310422.3448.3831110530.3550.5281910557.3551.53976
10611.3553.2565710665.3554.3837210692.35 54.646910719.3555.2104810746.3555.62778
10800.3655.6843510827.36 55.663310854.3655.6969710881.36 55.663310935.36       56
11070.37       5611205.37       5812177.41       5812447.42    58.612609.42     58.4
12690.42    58.212852.4358.2266712933.43       5813257.44       5813284.4557.92889
13311.45       5813338.4557.9333313419.4557.8666613446.45    57.813527.4557.77143
13581.46    57.813608.4657.8666613743.4657.8666613878.4757.8363613905.4757.88889
14013.47    57.914040.47       5815147.51       5815255.52    56.415282.52     56.2
15309.52    56.215336.52    56.315417.5256.2666715471.52       5615660.53       56
15768.5456.1302215795.5455.5909215903.5454.5191115930.5454.8230116065.55       56
16335.56       5616362.5655.8112316497.5655.78136

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .045805.175     .06 6210.19     .04

Bank Sta: Left   Right    Coeff Contr.    Expan.
      5805.175 6210.19              .1        .3
Ineffective Flow      num=        1
   Sta L   Sta R    Elev  Permanent
    800016497.56      50        F

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      63      58   16000      63      58

Downstream Bridge Cross Section Data
Station Elevation Data     num=      198
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
       058.6666754.00158    58.481.00237    58.45108.0032    58.4189.0055     58.7
216.006358.86666243.0071    58.9324.0095    59.44378.011159.71111405.011959.91667
432.0127      60729.0214      60756.0222    59.6783.0229    59.4810.0237     59.4
837.0245     59.2918.0269      581134.03357.970131323.03857.761091350.03957.41053
 1377.0457.11813 1404.0457.000241431.04156.758741458.042 57.01911485.04257.74853
1539.04455.934311566.04555.480761620.04655.480761674.048  54.7121701.048     54.6
1782.051     54.61809.051   54.641836.052    54.751863.053     54.81890.05354.91667
1971.056  55.1252025.05755.384622052.058    55.442079.059    55.552106.059     55.6
2160.061       562214.062       562268.06455.892752295.06455.892752376.06754.83287
```

```
2430.06850.87029 2511.0745.147192538.07144.799982565.07244.573912673.07546.85791
2700.07548.083482835.07951.98815 2862.0851.988152970.083      543105.086 54.8102
3132.08754.826293159.08854.66425 3240.09 54.71253267.09154.994873375.09454.55873
3402.09454.315293429.095 53.84623456.09653.816043510.09752.877863564.09952.16054
3645.10152.160543699.103       524212.118       524239.11952.357964293.12153.43183
4320.12253.789794455.12648.977054617.132    50.24644.133       504806.13950.15067
4860.14151.817164887.14251.762874914.14352.162874995.146       52 5670.17       52
5805.175      54 5940.1839.193016021.18346.107416048.18448.336146075.18550.64094
6102.18650.97361 6210.19       526534.202       526615.20550.833446642.20651.05479
6696.208 50.71986750.20951.497516831.212 51.56966885.214 50.76966912.21550.51307
6939.21650.513076993.218       507020.21950.381727128.22350.443877155.22450.34055
7182.22550.369747209.22650.136077290.22950.223637425.234       507479.23651.99973
7506.23752.020247560.23954.01997 7587.2455.557877695.24458.019287722.24556.67286
7776.24754.234057803.24852.830837830.24951.61143 7884.2551.122637965.25351.13519
8019.255       528100.258       528181.26150.594788235.26349.752968316.26649.24793
8343.26749.668848370.26849.453018478.271       528775.282       528910.28750.44304
8937.28850.639788964.28950.488929045.29251.079169072.29351.541429180.297       52
9315.302       529369.30452.575119450.30753.779819504.30955.42899 9531.3156.13956
9585.312 57.98149666.31459.444979720.31659.754269801.31957.79584 9828.32 57.2659
9855.32156.588779963.325       569990.32655.7500310098.3355.7500310125.33       56
10260.34 54.320410395.3448.4478310422.3448.3831110530.3550.5281910557.3551.53976
10611.3553.2565710665.3554.3837210692.35 54.646910719.3555.2104810746.3555.62778
10800.3655.6843510827.36 55.663310854.3655.6969710881.36 55.663310935.36       56
11070.37       5611205.37       5812177.41       5812447.42    58.612609.42    58.4
12690.42    58.212852.4358.2266712933.43       5813257.44       5813284.4557.92889
13311.45       5813338.4557.9333313419.4557.8666613446.45    57.813527.4557.77143
13581.46    57.813608.4657.8666613743.4657.8666613878.4757.8363613905.4757.88889
14013.47    57.914040.47       5815147.51       5815255.52    56.415282.52    56.2
15309.52    56.215336.52    56.315417.5256.2666715471.52       5615660.53       56
15768.5456.1302215795.5455.5909215903.5454.5191115930.5454.8230116065.55       56
16335.56       5616362.5655.8112316497.5655.78136

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .045805.175     .06 6210.19     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
      5805.175 6210.19             .1       .3
Ineffective Flow     num=      1
   Sta L   Sta R    Elev  Permanent
    800016497.56      50       F

Upstream Embankment side slope             =      0 horiz. to 1.0 vertical
Downstream Embankment side slope           =      0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =    .95
Elevation at which weir flow begins        =
Energy head used in spillway design        =
Spillway height used in design             =
Weir crest shape                           = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream=    8076    Downstream=    8076
Upstream     num=       2
    Width    Elev     Width    Elev
       5      40        5      58
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Downstream     num=       2
    Width   Elev    Width   Elev
       5      40       5      58

Pier Data
Pier Station     Upstream=    8126    Downstream=    8126
Upstream     num=       2
    Width   Elev    Width   Elev
       5      40       5      58
Downstream     num=       2
    Width   Elev    Width   Elev
       5      40       5      58

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line
```

BRIDGE OUTPUT Profile #100-year

E.G. US. (ft)	58.97	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	58.94	E.G. Elev (ft)	58.97	58.95
Q Total (cfs)	93000.00	W.S. Elev (ft)	58.93	58.91
Q Bridge (cfs)	90320.60	Crit W.S. (ft)	52.84	52.84
Q Weir (cfs)		Max Chl Dpth (ft)	19.73	19.72
Weir Sta Lft (ft)		Vel Total (ft/s)	1.62	1.63
Weir Sta Rgt (ft)		Flow Area (sq ft)	57237.24	57229.25
Weir Submerg		Froude # Chl	0.06	0.06
Weir Max Depth (ft)		Specif Force (cu ft)	246704.80	245785.20
Min El Weir Flow (ft)	55.44	Hydr Depth (ft)	115.04	115.02
Min El Prs (ft)	58.00	W.P. Total (ft)	23944.66	23944.63
Delta EG (ft)	3.24	Conv. Total (cfs)	4019229.0	4018209.0
Delta WS (ft)	3.35	Top Width (ft)	497.56	497.56
BR Open Area (sq ft)	55733.07	Frctn Loss (ft)	0.02	3.21
BR Open Vel (ft/s)	1.62	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.08	0.08
Br Sel Method	Energy only	Power Total (lb/ft s)	0.13	0.13

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes

```
REACH: 1                 RS: 30000

INPUT
Description: 15278  20000  3000
Station Elevation Data    num=     198
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       058.6666754.00158   58.481.00237   58.45108.0032   58.4189.0055    58.7
216.006358.86666243.0071   58.9324.0095   59.44378.011159.71111405.011959.91667
432.0127     60729.0214     60756.0222    59.6783.0229    59.4810.0237    59.4
837.0245    59.2918.0269     581134.03357.970131323.03857.761091350.03957.41053
 1377.0457.11813 1404.0457.000241431.04156.758741458.042 57.01911485.04257.74853
1539.04455.934311566.04555.480761620.04655.480761674.048  54.7121701.048    54.6
1782.051    54.61809.051   54.641836.052   54.751863.053    54.81890.05354.91667
1971.056  55.1252025.05755.384622052.058   55.442079.059   55.552106.059    55.6
2160.061     562214.062     562268.06455.892752295.06455.892752376.06754.83287
2430.06850.87029 2511.0745.147192538.07144.799982565.07244.573912673.07546.85791
2700.07548.083482835.07951.98815 2862.0851.988152970.083      543105.086 54.8102
3132.08754.826293159.08854.66425 3240.09 54.71253267.09154.994873375.09454.55873
3402.09454.315293429.095 53.84623456.09653.816043510.09752.877863564.09952.16054
3645.10152.160543699.103     524212.118      524239.11952.357964293.12153.43183
4320.12253.789794455.12648.977054617.132    50.24644.133     504806.13950.15067
4860.14151.817164887.14251.762874914.14352.162874995.146      52 5670.17      52
5805.175      54 5940.1839.193016021.18346.107416048.18448.336146075.18550.64094
6102.18650.97361 6210.19     526534.202      526615.20550.833446642.20651.05479
6696.208 50.71986750.20951.497516831.212 51.56966885.214 50.76966912.21550.51307
6939.21650.513076993.218     507020.21950.381727128.22350.443877155.22450.34055
7182.22550.369747209.22650.136077290.22950.223637425.234      507479.23651.99973
7506.23752.020247560.23954.01997 7587.2455.557877695.24458.019287722.24556.67286
7776.24754.234057803.24852.830837830.24951.61143 7884.2551.122637965.25351.13519
8019.255      528100.258     528181.26150.594788235.26349.752968316.26649.24793
8343.26749.668848370.26849.453018478.271      528775.282      528910.28750.44304
8937.28850.639788964.28950.488929045.29251.079169072.29351.541429180.297      52
9315.302      529369.30452.575119450.30753.779819504.30955.42899 9531.3156.13956
9585.312 57.98149666.31459.444979720.31659.754269801.31957.79584 9828.32 57.2659
9855.32156.588779963.325     569990.32655.7500310098.3355.7500310125.33       56
10260.34 54.320410395.3448.4478310422.3448.3831110530.3550.5281910557.3551.53976
10611.3553.2565710665.3554.3837210692.35 54.646910719.3555.2104810746.3555.62778
10800.3655.6843510827.36 55.663310854.3655.6969710881.36 55.663310935.36      56
11070.37     5611205.37     5812177.41      5812447.42    58.612609.42    58.4
12690.42    58.212852.4358.2266712933.43      5813257.44      5813284.4557.92889
13311.45     5813338.4557.9333313419.4557.8666613446.45    57.813527.4557.77143
13581.46    57.813608.4657.8666613743.4657.8666613878.4757.8363613905.4757.88889
14013.47    57.914040.47     5815147.51      5815255.52    56.415282.52    56.2
15309.52    56.215336.52   56.315417.5256.2666715471.52      5615660.53      56
15768.5456.1302215795.5455.5909215903.5454.5191115930.5454.8230116065.55      56
16335.56     5616362.5655.8112316497.5655.78136

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .045805.175     .06 6210.19     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
      5805.175 6210.19              4196    4551    5233              .1       .3
Ineffective Flow      num=        1
   Sta L   Sta R    Elev  Permanent
    800016497.56      50        F
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CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              55.73    Element                    Left OB     Channel    Right OB
  Vel Head (ft)                0.13    Wt. n-Val.                  0.040       0.060      0.040
  W.S. Elev (ft)              55.60    Reach Len. (ft)           4196.00     4551.00    5233.00
  Crit W.S. (ft)              52.84    Flow Area (sq ft)        13586.49     3228.03   15145.17
  E.G. Slope (ft/ft)       0.000993    Area (sq ft)             13586.49     3228.03   15145.17
  Q Total (cfs)            93000.00    Flow (cfs)               38143.11    10028.49   44828.41
  Top Width (ft)            8391.60    Top Width (ft)            4032.60      405.02    3953.98
  Vel Total (ft/s)             2.91    Avg. Vel. (ft/s)             2.81        3.11       2.96
  Max Chl Dpth (ft)           16.40    Hydr. Depth (ft)             3.37        7.97       3.83
  Conv. Total (cfs)       2951737.0     Conv. (cfs)              1210628.0   318295.2   1422814.0
  Length Wtd. (ft)          4678.78    Wetted Per. (ft)          4033.27      406.32    3954.58
  Min Ch El (ft)              39.19    Shear (lb/sq ft)             0.21        0.49       0.24
  Alpha                        1.00    Stream Power (lb/ft s)       0.59        1.53       0.70
  Frctn Loss (ft)              4.06    Cum Volume (acre-ft)     11137.61     1136.98   11760.29
  C & E Loss (ft)              0.00    Cum SA (acres)            1557.58      116.82    2398.22


Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 25000

INPUT
Description: 10727  15000  2500
Station Elevation Data    num=     148
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       052.3627727.9386852.3627755.8773652.4836983.8160452.88369195.5707       54
363.2029      54502.8963      561033.731      56 1061.67     55.81145.486    54.6
1173.424    54.41201.363      541452.812      541508.689     53.61620.444    53.6
1732.199      522011.586      522039.525    51.82095.40251.73333 2151.2851.73333
2179.218    51.82207.157      522290.973      522374.78952.117382514.483       54
2849.748      542989.441      523073.25750.932213129.13550.000933212.95150.69551
3268.82850.947073352.64553.569613408.52254.953823436.46155.001583520.27753.95224
3548.21653.98829 3659.9751.916873687.90950.823763799.66447.422833827.60347.05318
3939.35846.125523967.296      464386.375      464498.12845.866664554.00545.11341
4581.94445.099994665.759      444721.636      444749.575   44.054861.32944.48333
4889.26744.628575084.83645.388895140.713   45.655224.529      465922.991       46
5978.86846.133346034.745    46.4 6481.76      486900.837      486956.71448.08599
 7040.5349.407847096.40752.367087180.22252.245237236.09944.467517319.91540.74237
7375.79246.799777459.60750.472617515.48449.212477543.42248.662757571.36148.37169
7655.17648.274527683.11548.170817711.053      487794.869      487878.68447.65714
7906.623    47.648018.376    47.28046.31547.183338074.253   47.048102.192       47
 8130.13      47.68158.069 47.78688241.88545.228418269.82345.536828297.76246.29514
8381.577 48.02758437.454 47.1018 8521.27 46.25448660.962      468856.531       46
8940.34746.627098996.22448.017179080.03946.333749107.97844.940659135.91643.89349
 9247.6745.301949275.60845.722919331.48545.568739359.424 45.60979387.36245.80727
9415.30146.163889443.23946.313759471.17846.53333 9610.8746.603519638.80946.69162
9694.68647.025629722.62447.066679778.50147.236369862.31647.46667 9974.07       48
10393.15      4810672.53      5210812.22      52 11231.357.8969611398.93       58
11510.6955.9387311538.6355.5387311650.3855.4583411678.3255.3669111790.0754.30856
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11818.01      5411929.76      54 11957.754.1654312069.4654.1654312097.39      54
12963.49      54 13047.3    55.213103.1855.73582   1318755.7358213242.87      56
13969.27      5614025.1555.8294414108.9654.6294414164.84      5414528.04      54
14667.73      5615058.87      5615170.63    55.215282.3854.6666715310.32    54.6
15422.07    54.615450.0154.5333315561.77      5415701.4653.9076815841.15      56
15980.84      5616120.54      5416148.47      54

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0    .047096.407    .067459.607    .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      7096.4077459.607             7416    6117    1229              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   1421716148.47     45       F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)               51.66    Element                    Left OB    Channel   Right OB
  Vel Head (ft)                 0.13    Wt. n-Val.                   0.040      0.060      0.040
  W.S. Elev (ft)               51.53    Reach Len. (ft)            7416.00    6117.00    1229.00
  Crit W.S. (ft)               48.47    Flow Area (sq ft)         17448.80    1604.25   13664.93
  E.G. Slope (ft/ft)        0.000765    Area (sq ft)              17448.80    1604.25   13664.93
  Q Total (cfs)             93000.00    Flow (cfs)                52327.95    3559.50   37112.55
  Top Width (ft)             7127.00    Top Width (ft)             3672.39     274.27    3180.33
  Vel Total (ft/s)              2.84    Avg. Vel. (ft/s)              3.00       2.22       2.72
  Max Chl Dpth (ft)            10.79    Hydr. Depth (ft)              4.75       5.85       4.30
  Conv. Total (cfs)        3361803.0     Conv. (cfs)             1891573.0   128670.4  1341560.0
  Length Wtd. (ft)           5549.90    Wetted Per. (ft)           3672.58     275.25    3180.58
  Min Ch El (ft)               40.74    Shear (lb/sq ft)              0.23       0.28       0.21
  Alpha                         1.01    Stream Power (lb/ft s)        0.68       0.62       0.56
  Frctn Loss (ft)               0.90    Cum Volume (acre-ft)       9642.84     884.55   10029.77
  C & E Loss (ft)               0.03    Cum SA (acres)             1186.48      81.34    1969.68


Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Cosumnes
REACH: 1                  RS: 20000

INPUT
Description: 4610  10000  2000
Station Elevation Data    num=      237
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       046.4511365.17924      46195.5377 43.6179217.264142.84229238.990542.44876
260.716941.67315282.443441.27963304.169841.25296325.8962 40.8442347.622640.81752
391.075440.004231586.029      401694.66240.768311738.11540.860981759.84141.10732
1781.56741.153661803.294    41.4 1825.02    41.41846.74741.46667  1890.2    41.2
1933.652    41.21955.37941.333331977.10541.333331998.83241.481482042.285   41.52
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2064.01141.762962085.73741.766672107.464      422237.822      422259.54841.86565
    230341.865652324.727 41.73132368.179 41.73132389.90641.865652411.63241.86565
2433.358      422498.537      422520.26441.68365 2541.9941.683652563.71641.36731
2607.169      422694.074      422715.801 41.65762759.25341.315212780.97939.78453
2802.70637.599222824.43234.054442867.88530.651772889.61127.106982911.33727.87095
2933.06426.79146 2954.7927.555432976.51626.475952998.24327.239923019.96929.31131
3041.69532.483483063.42234.554873085.14837.727053106.87439.798443128.60141.23749
3150.32741.575773172.05341.08443 3193.7840.864283215.50640.372953237.23241.58648
3258.95842.528823280.685    42.83324.137    42.83345.864    42.43389.316      42
 3606.58      423628.306    41.83650.032    41.43671.759    41.43693.485    41.2
3715.211    41.23758.664      424193.191      424301.824      444323.551    43.6
4345.27743.526724367.00443.12672 4388.7343.053454410.45742.65345 4453.9142.65345
4475.63742.326734497.36342.32673 4519.09      424844.988      424866.715    42.4
4888.441    42.44910.168    42.54931.895    42.74953.621    42.84975.348      43
5018.801    43.25040.527    43.45062.254    43.5 5083.98    43.75105.707    43.8
5127.434      445388.152      445431.605 44.20045475.05944.613395496.78544.92618
5518.51242.178065540.23839.536235561.96536.788115583.69135.802355605.41833.05422
5627.145 33.80185648.87136.311735670.59838.973575692.324 41.48355714.05144.14534
5735.77744.02513 5779.2344.088525800.95743.968317473.902      447495.62944.53333
7517.35544.866667539.082    45.47560.809    45.67582.53545.613957669.44144.05578
7734.621 44.35487778.07445.026767799.80145.076837821.52745.367867843.25445.41794
 7864.9845.708977886.70744.438017908.434    45.6 7995.3443.938368103.973      46
8125.69945.939048147.426 46.33758190.87946.215598212.60546.614058234.33246.21559
8256.05946.276558277.78545.878098321.23846.010838386.418      468429.87146.03944
8473.32446.512068495.05146.512068516.77746.76809 8560.2346.768098581.95746.51206
8603.68446.512068647.137      46 8755.77      468864.402      488973.035      48
9038.215    49.29059.94149.400089081.66849.800089103.39549.800089125.121      50
9537.926      509559.652    50.19603.105    50.4 9950.73      52   10168      52
10276.63      5010385.26      5010428.7150.1408210450.4450.1408210493.8950.28165
10515.6250.6112410537.3551.0112410602.53      5211580.22      5211688.86 53.0472
11710.5852.9890911732.3152.7796511775.7652.6634311797.4952.4539911819.2152.85399
11840.9453.1026611862.6753.5026611906.12      5412058.21      5412079.9354.34169
12101.6654.3416912123.3954.6833912145.1154.3416912166.8454.3416912188.57      54
13101.08      5413187.99  51.99713231.4451.2002213253.1750.9041813274.8950.97525
13296.6250.6792113318.3550.75027 13361.850.1242613383.5350.1783513405.2550.57513
13426.9850.6292313448.7150.9719213470.4350.9719213513.8951.6573113535.6151.72057
13557.34 51.129213579.0750.2583913600.7950.2583913622.5249.3875913644.2549.38759
13665.9750.10537 13687.749.9523513709.4350.6701413731.1550.5171213752.8851.23491
13774.6151.4560613818.0652.5620913839.7952.7832413861.5153.3362613883.2452.98413
13926.69 52.943613948.4252.5914713991.8752.5914714078.78      5415708.27      54
   1573053.6952415751.7253.6761915773.4553.4122515795.1853.37959 15816.953.28571
15882.0852.6857115990.71    52.416055.8952.4268416077.6252.4746316121.0752.41956
 16142.852.4748316164.5352.44504

Manning's n Values       num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045496.785    .065714.051    .04

Bank Sta: Left   Right    Lengths: Left Channel    Right     Coeff Contr.   Expan.
      5496.7855714.051             4755    2383    2062              .1       .3
Ineffective Flow     num=        1
   Sta L    Sta R     Elev  Permanent
   1264016164.53       54       F

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)           50.73    Element                    Left OB    Channel   Right OB
```

Vel Head (ft)	0.03	Wt. n-Val.	0.040	0.060	0.040
W.S. Elev (ft)	50.71	Reach Len. (ft)	4755.00	2383.00	2062.00
Crit W.S. (ft)	42.71	Flow Area (sq ft)	52484.77	2707.08	19830.71
E.G. Slope (ft/ft)	0.000068	Area (sq ft)	52484.77	2707.08	19971.50
Q Total (cfs)	93000.00	Flow (cfs)	72417.86	2963.77	17618.37
Top Width (ft)	10241.89	Top Width (ft)	5496.79	217.27	4527.84
Vel Total (ft/s)	1.24	Avg. Vel. (ft/s)	1.38	1.09	0.89
Max Chl Dpth (ft)	24.23	Hydr. Depth (ft)	9.55	12.46	4.68
Conv. Total (cfs)	11260540.0	Conv. (cfs)	8768435.0	358856.3	2133252.0
Length Wtd. (ft)	3214.77	Wetted Per. (ft)	5503.04	218.59	4238.34
Min Ch El (ft)	33.05	Shear (lb/sq ft)	0.04	0.05	0.02
Alpha	1.09	Stream Power (lb/ft s)	0.06	0.06	0.02
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	3689.82	581.84	9555.26
C & E Loss (ft)	0.00	Cum SA (acres)	405.97	46.82	1860.95

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Cosumnes
REACH: 1 RS: 15000

INPUT
Description: 2227 5000 1500
Station Elevation Data num= 309

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       041.7748825.2108541.6542650.4216941.5858875.6325441.46526100.843441.40298
226.897641.53098252.108541.98942 327.74141.64782352.951842.10626403.373542.17698
453.795237.78407479.006138.39174554.638528.47742579.849427.97678605.060229.91909
655.481834.52496680.692634.38494731.114338.99081781.535939.50431806.746739.82277
882.379240.61965 907.5940.96474983.2224     40.81008.433     40.81058.855      40
2717.178      402823.07638.126192844.25637.582742865.436 37.95752886.61537.41405
2907.79537.788812928.97537.245372950.15536.636972971.33436.946782992.51436.33839
3013.694 36.85663034.87337.166423077.23337.583213098.41237.583213140.772      38
3161.951      383204.31137.32053 3225.4937.32053 3246.6736.98079 3267.8536.98079
 3289.0337.320533310.20937.320533352.569      383437.28736.594113458.46736.19411
3479.64736.194113564.365      363649.084      363670.26436.405153691.44436.52562
3712.62336.240943754.98336.481883776.16236.481883797.34236.551863818.52236.50138
3860.88136.851673882.06136.80118 3924.4237.00232 3945.636.87725 3966.7836.97782
3987.95936.971344009.139 36.68224051.498 36.34114072.67836.570554093.858   36.4
4115.037    36.44136.217    36.84178.57637.353974199.75637.753974242.11537.75397
4263.29537.876984284.47537.876984305.654      384348.01439.639554369.19339.63955
4411.553 41.27914432.732 40.66474475.09241.085384496.27140.470984517.45140.68629
4538.63141.038044559.811 40.5601 4602.1741.26361 4623.3540.785674665.70942.88488
4686.88943.439474729.24845.538694750.42845.650074771.60746.256484792.78746.36786
4856.32647.546664898.68648.894974919.86549.287254941.04549.961414962.22549.96913
4983.40449.395725025.76449.411165046.94348.837755089.303       505152.842      50
 5258.7449.42566 5279.9249.591125322.27949.718325343.45949.883785364.63949.94738
5385.81849.944535406.99850.043555449.35750.066345470.53750.165365491.71750.19099
5576.436      505597.61550.377225639.97550.377225661.15450.754445703.51450.79438
5745.87350.119855788.23250.159795894.131      505915.31150.07288 5936.4950.07288
 5957.6750.145756000.02950.145756021.20950.191296063.56850.136626084.74850.18215
```

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6105.92850.182156127.10750.136626148.28750.136626211.826      506254.18649.25842
6296.54549.258426317.72548.887626360.08449.629216381.26449.629216402.443      50
6847.217       506889.57649.711036910.75649.711036931.93649.566556953.11549.56655
6974.29549.711036995.47549.711037037.834       507080.193      507101.37350.33413
7143.73250.334137164.91250.668277207.271 50.00257376.709      507397.889 49.7102
7419.06849.984777461.42849.405167482.60749.679737524.96749.596757546.14650.11964
7567.32650.009457588.50650.532337630.86550.049547652.04550.441237694.40449.95844
7715.58450.164527757.94350.015267779.12350.221347800.30350.146717821.48250.31621
7842.66250.766417863.84250.935917885.02150.632247906.20151.082447948.56150.36666
 7969.7450.76265 7990.9250.40475  8012.149.326578033.27949.638078054.45949.82146
8075.63949.412668117.99849.779468139.17849.922868181.53751.394078202.71751.53747
8223.896 50.94478245.07650.620628266.25651.032728308.61550.384568329.79549.64839
8350.97549.250038372.15449.464698393.33448.654248435.69349.083558456.87349.21522
8478.053  50.3728499.23250.503678520.41251.660458541.59251.497168562.77151.81385
8605.13151.857328626.31151.09889 8668.6751.12062 8689.8550.340478732.20949.68482
8753.38948.904668795.74849.604228816.92849.501668838.10749.851448859.28750.35533
8880.46750.195498922.826 51.08878944.00650.738938965.18651.185538986.36550.38915
9007.54550.389159028.72550.118829049.90449.322449071.084 49.05219092.26449.13057
9113.44348.682989155.803 48.83999176.982 48.39239219.34249.827479240.52150.20854
9282.881 51.64379304.06151.49646 9325.2451.68573 9346.4251.68969  9367.651.54244
9388.779 51.54649409.95951.158489452.31850.685039473.49850.297119494.67850.06038
9515.857 50.42419537.03750.412039579.39651.139479642.93651.127399664.11550.75159
9706.475    50.89727.654    50.49770.014    50.49791.193      509812.373      50
9833.55350.154839854.73250.154839875.91250.309659897.09250.309659918.27150.46448
9939.45150.464489960.63150.309659981.81150.3096510002.9950.5548210024.17    50.4
10066.53    50.410087.71      5010235.9750.0605210299.5151.2403510320.6951.55864
10341.8751.9384610363.0451.8646110384.2251.8522910426.5851.7045810447.7651.30458
10468.9451.3045810553.6650.0783210638.3850.1626810659.5650.6518410680.74 50.6177
10701.9250.1024310765.46      5010807.82      5010850.1850.2497710913.7250.24977
 10934.950.1248910977.2650.1669410998.44      5011040.79      5011061.9750.77439
11083.1550.7743911104.33    50.411125.51    50.811167.8751.4099711189.0551.80997
11231.4151.8632411252.59 51.984911273.7752.0115411294.95 52.133211337.3152.07992
11358.4952.3713111422.0352.3180311443.21      5211506.75      5211612.65      54
11951.52      54 11972.753.2004912015.0653.2004912036.2452.40097 12078.653.25811
12099.7852.8871612142.1452.8871612163.3252.48716 12184.552.4581112205.6852.05811
12248.04      5212353.94 51.588312459.83      5212502.1952.37947

Manning's n Values       num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
      0     .04403.3735     .06  907.59     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      403.3735  907.59             4829    2227   11611              .1       .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)             50.46    Element                Left OB    Channel   Right OB
  Vel Head (ft)               0.04    Wt. n-Val.              0.040      0.060      0.040
  W.S. Elev (ft)             50.42    Reach Len. (ft)       4829.00    2227.00   11611.00
  Crit W.S. (ft)                      Flow Area (sq ft)     3522.74    7084.34   46785.67
  E.G. Slope (ft/ft)      0.000105    Area (sq ft)          3522.74    7084.34   46785.67
  Q Total (cfs)           93000.00    Flow (cfs)            5603.31   10442.75   76953.95
  Top Width (ft)           9524.09    Top Width (ft)         403.37     504.22    8616.50
  Vel Total (ft/s)            1.62    Avg. Vel. (ft/s)         1.59       1.47       1.64
  Max Chl Dpth (ft)          22.44    Hydr. Depth (ft)         8.73      14.05       5.43
  Conv. Total (cfs)      9081444.0     Conv. (cfs)         547162.6  1019733.0   7514548.0
  Length Wtd. (ft)         8721.15    Wetted Per. (ft)       412.03     505.57    8617.27
```

Min Ch El (ft)	27.98	Shear (lb/sq ft)	0.06	0.09	0.04
Alpha	1.00	Stream Power (lb/ft s)	0.09	0.14	0.06
Frctn Loss (ft)	2.09	Cum Volume (acre-ft)	632.94	314.01	7975.22
C & E Loss (ft)	0.02	Cum SA (acres)	83.94	27.09	1549.84

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Cosumnes
REACH: 1 RS: 10000

INPUT
Description: 0 0 1000

```
Station Elevation Data    num=     221
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
3266.872 43.7674 3287.68 43.53213308.48942.590263329.29742.354973350.10542.11967
3370.91342.119673391.72141.413123412.52941.413123433.33740.232383454.14539.52582
3474.95340.279883495.76141.03395 3516.5741.788023537.37843.016263544.60343.01626
3565.96743.01626 3587.33 42.26223608.69441.508133630.05740.754073651.421      40
3672.784      403694.148      403715.511      403736.875      403758.239      40
3779.602      403800.966      403822.329      403843.693      403865.056      40
 3886.42      403907.783      403929.147      40 3950.51      403971.874      40
3993.237      404014.601      404035.964      404057.328      404078.691      40
4100.055      404121.419      404142.783      404164.146      40 4185.51      40
4206.874 40.63524228.23841.249114249.602 41.88434270.96542.498214292.32943.11213
4313.69343.417824335.05743.70224 4356.4243.986654377.78444.292344399.14844.23007
4420.51243.002374441.87541.406714463.23939.811044484.60336.293044505.96734.69737
4527.33136.650084548.69436.680444570.05834.990844591.42235.021214612.786 33.3316
4634.14933.977294655.51336.342954676.87736.988644698.24137.634334719.604      40
4740.968      404762.33239.763884783.69639.76388 4805.0639.763884826.42339.52776
4847.787 40.22354869.15140.919244890.51541.378864911.87842.401094933.24242.86071
4954.60642.80109 4975.9742.741474997.33342.119245018.69742.059625040.061      42
5061.425      425082.789      425104.152      425125.516      42 5146.88      42
5168.244      425189.607      425210.971      425232.335      425253.69942.20194
5275.063      425296.426      42 5317.79      425339.154      425360.518      42
5381.881      425403.245      425424.609      425445.973      425467.336      42
  5488.7      425510.064    42.25531.428    42.45552.792    42.65574.155      43
5595.519    43.25616.883    43.45638.247    43.6 5659.61    43.85680.974      44
5702.338      445723.702      445745.065      445766.429      445787.793      44
5809.157      445830.521      445851.884      445873.248      445894.612      44
5915.976      445937.339      445958.703      445980.067      446001.431      44
6022.79444.374476044.15844.748936065.52245.123396086.88645.49786 6108.2545.89786
6129.61345.897866150.97745.923396172.34145.948936193.70545.974466215.068      46
6236.432      466257.796      46 6279.16    45.66300.523    45.66321.887    45.2
6343.251    44.86364.615    44.86385.979    44.46407.342    44.46428.706      44
 6450.07      446471.434    44.46492.797    44.46514.161    44.46535.525    44.8
6556.88944.602816578.25244.805636599.61644.60844 6620.9844.608446642.34444.81126
6663.70844.608446685.07144.405636706.43544.405636727.79944.202826749.163      44
6770.526      44 6791.89      446813.254      446834.618      446855.981      44
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6877.345      446898.709     446920.073     446941.437     44  6962.8       44
6984.164      447005.528     447026.892     447048.255     447069.619       44
7090.983      447112.347     44 7133.71     447155.074     447176.438       44
7197.802      447219.166     447240.529     447261.893     447283.257       44
7304.621      447325.984     447347.348     447368.712     447390.076       44
7411.439      447432.803     447454.167     447475.531     447496.895       44
7518.258      447539.622     447560.986     44 7582.35     447603.713       44
7625.077      447646.441     447667.805     447689.168     447710.532       44
7731.896      44 7753.26     447774.624     447795.987     447817.351       44
7838.71543.923087860.07943.846157881.44243.769237902.806   43.68 7924.17   43.6
7945.534   43.52

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
3266.872     .044377.784     .064933.242     .04

Bank Sta: Left   Right    Lengths: Left Channel    Right     Coeff Contr.    Expan.
      4377.7844933.242                0       0       0                .1       .3

CROSS SECTION OUTPUT  Profile #100-year

  E.G. Elev (ft)              48.35    Element                    Left OB    Channel    Right OB
  Vel Head (ft)                0.21    Wt. n-Val.                  0.040      0.060      0.040
  W.S. Elev (ft)              48.14    Reach Len. (ft)
  Crit W.S. (ft)              44.89    Flow Area (sq ft)         7896.09    5199.72   13054.23
  E.G. Slope (ft/ft)       0.001000    Area (sq ft)              7896.09    5199.72   13054.23
  Q Total (cfs)            93000.00    Flow (cfs)               34202.69   18068.25   40729.07
  Top Width (ft)            4678.66    Top Width (ft)            1110.91     555.46    3012.29
  Vel Total (ft/s)             3.56    Avg. Vel. (ft/s)             4.33       3.47       3.12
  Max Chl Dpth (ft)           14.81    Hydr. Depth (ft)             7.11       9.36       4.33
  Conv. Total (cfs)       2940244.0     Conv. (cfs)            1081336.0   571237.1   1287671.0
  Length Wtd. (ft)                     Wetted Per. (ft)          1115.56     556.53    3016.99
  Min Ch El (ft)              33.33    Shear (lb/sq ft)             0.44       0.58       0.27
  Alpha                        1.07    Stream Power (lb/ft s)       1.91       2.03       0.84
  Frctn Loss (ft)                      Cum Volume (acre-ft)
  C & E Loss (ft)                      Cum SA (acres)
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SUMMARY OF MANNING'S N VALUES

River:Cosumnes

Reach	River Sta.	n1	n2	n3
1	90000	.04	.06	.04
1	80000	.04	.06	.04
1	75000	.04	.06	.04
1	70000	.04	.06	.04
1	65000	.04	.06	.04
1	60050	.04	.06	.04
1	60025	Bridge		
1	60000	.04	.06	.04
1	55050	.04	.06	.04
1	55025	Bridge		
1	55000	.04	.06	.04

1	50050	.04	.06	.04
1	50025	Bridge		
1	50000	.04	.06	.04
1	45050	.04	.06	.04
1	45025	Bridge		
1	45000	.04	.06	.04
1	40050	.04	.06	.04
1	40025	Bridge		
1	40000	.04	.06	.04
1	35050	.04	.06	.04
1	35025	Bridge		
1	35000	.04	.06	.04
1	30050	.04	.06	.04
1	30025	Bridge		
1	30000	.04	.06	.04
1	25000	.04	.06	.04
1	20000	.04	.06	.04
1	15000	.04	.06	.04
1	10000	.04	.06	.04

SUMMARY OF REACH LENGTHS

River: Cosumnes

Reach	River Sta.	Left	Channel	Right
1	90000	7511	8475	11057
1	80000	7193	6447	4790
1	75000	6233	4757	1316
1	70000	2618	3993	6763
1	65000	9525	8882	3320
1	60050	4038	5254	4975
1	60025	Bridge		
1	60000	4038	5254	4975
1	55050	2746	3139	3633
1	55025	Bridge		
1	55000	2746	3139	3633
1	50050	3166	4770	6283
1	50025	Bridge		
1	50000	3166	4770	6283
1	45050	2902	5389	6335
1	45025	Bridge		
1	45000	2902	5389	6335
1	40050	5191	5120	3182
1	40025	Bridge		
1	40000	5191	5120	3182
1	35050	4629	4288	1850
1	35025	Bridge		
1	35000	4629	4288	1850
1	30050	4196	4551	5233
1	30025	Bridge		
1	30000	4196	4551	5233
1	25000	7416	6117	1229
1	20000	4755	2383	2062

1	15000	4829	2227	11611
1	10000	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Cosumnes

Reach	River Sta.		Contr.	Expan.
1	90000		.1	.3
1	80000		.1	.3
1	75000		.1	.3
1	70000		.1	.3
1	65000		.1	.3
1	60050		.1	.3
1	60025	Bridge		
1	60000		.1	.3
1	55050		.1	.3
1	55025	Bridge		
1	55000		.1	.3
1	50050		.1	.3
1	50025	Bridge		
1	50000		.1	.3
1	45050		.1	.3
1	45025	Bridge		
1	45000		.1	.3
1	40050		.1	.3
1	40025	Bridge		
1	40000		.1	.3
1	35050		.1	.3
1	35025	Bridge		
1	35000		.1	.3
1	30050		.1	.3
1	30025	Bridge		
1	30000		.1	.3
1	25000		.1	.3
1	20000		.1	.3
1	15000		.1	.3
1	10000		.1	.3

Profile Output Table - Standard Table 1

Reach Top Width (ft)	River Sta Froude # Chl	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)
1 5397.71	90000 0.15	100-year	93000.00	83.26	105.91		106.04	0.000549	2.95	32118.43
1 6811.25	80000 0.29	100-year	93000.00	76.21	95.85	93.97	96.10	0.002093	5.12	23346.54

1	75000	100-year	93000.00	70.85	88.26		88.45	0.001140	3.55	26947.42
6772.14	0.21									
1	70000	100-year	93000.00	68.98	87.36		87.45	0.000381	2.25	38771.35
6154.60	0.12									
1	65000	100-year	93000.00	69.37	83.09		83.31	0.001227	3.04	24724.34
5103.89	0.21									
1	60050	100-year	93000.00	60.79	82.02	75.04	82.07	0.000137	1.48	55703.61
8495.07	0.08									
1	60025		Bridge							
1	60000	100-year	93000.00	60.79	78.82		78.96	0.000658	2.81	31977.27
6469.51	0.16									
1	55050	100-year	93000.00	55.96	76.44	71.84	76.53	0.000381	2.20	39443.92
6922.45	0.12									
1	55025		Bridge							
1	55000	100-year	93000.00	55.96	71.84	71.84	72.90	0.013912	10.62	11709.92
4913.92	0.71									
1	50050	100-year	93000.00	54.60	68.52	38.22	68.57	0.000032	0.54	51437.26
2728.81	0.03									
1	50025		Bridge							
1	50000	100-year	93000.00	54.60	68.36		68.42	0.000032	0.54	51025.89
2691.40	0.03									
1	45050	100-year	93000.00	52.43	67.96	61.49	68.02	0.000193	1.11	49287.06
7915.35	0.08									
1	45025		Bridge							
1	45000	100-year	93000.00	52.43	66.51		66.61	0.000392	1.78	38626.61
7025.25	0.12									
1	40050	100-year	93000.00	48.28	65.22	58.24	65.27	0.000135	1.30	55026.48
8631.18	0.07									
1	40025		Bridge							
1	40000	100-year	93000.00	48.28	62.06		62.19	0.000615	2.15	32669.86
6274.01	0.15									
1	35050	100-year	93000.00	45.35	60.80	55.21	60.84	0.000279	1.42	55926.26
12344.06	0.10									
1	35025		Bridge							
1	35000	100-year	93000.00	45.35	59.46	55.21	59.54	0.000397	1.44	42056.04
7995.00	0.11									
1	30050	100-year	93000.00	39.19	58.94	52.84	58.97	0.000131	1.43	71272.07
15777.41	0.07									
1	30025		Bridge							
1	30000	100-year	93000.00	39.19	55.60	52.84	55.73	0.000993	3.11	31959.68
8391.60	0.19									
1	25000	100-year	93000.00	40.74	51.53	48.47	51.66	0.000765	2.22	32717.98
7127.00	0.16									
1	20000	100-year	93000.00	33.05	50.71	42.71	50.73	0.000068	1.09	75022.57
10241.89	0.05									
1	15000	100-year	93000.00	27.98	50.42		50.46	0.000105	1.47	57392.75
9524.09	0.07									
1	10000	100-year	93000.00	33.33	48.14	44.89	48.35	0.001000	3.47	26150.04
4678.66	0.20									

Appendix E
Scour Analysis

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	0.82	6.06	3.83
	Approach Velocity (ft/s):	1.59	3.73	4.15
	Br Average Depth (ft):	2.00	10.11	6.62
	BR Opening Flow (cfs):	3450.75	3837.25	67212.01
	BR Top WD (ft):	1863.16	221.83	5137.06
	Grain Size D50 (mm):	.15	.15	.15
	Approach Flow (cfs):	286.82	4300.58	69912.60
	Approach Top WD (ft):	220.09	189.95	4397.12
	K1 Coefficient:	0.690	0.690	0.690
Results				
	Scour Depth Ys (ft):	0.00	0.00	0.00
	Critical Velocity (ft/s):	0.86	1.19	1.11
	Equation:	Live	Live	Live

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Round nose
	Pier Width (ft):	5.00
	Grain Size D50 (mm):	0.15000
	Depth Upstream (ft):	6.63
	Velocity Upstream (ft/s):	1.97
	K1 Nose Shape:	1.00
	Pier Angle:	0.00
	Pier Length (ft):	30.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.15000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	5.13
	Froude #:	0.14
	Equation:	CSU equation

Appendix H
Alternatives Screening

Appendix H
Alternatives Screening and Selection of a Preferred Alternative for the Capital SouthEast Connector Program EIR

Overview

In February, 2010, the Capital SouthEast Connector Joint Powers Authority (JPA) published a notice of preparation (NOP) of a program EIR for the proposed Capital SouthEast Connector project (proposed project), located in the counties of Sacramento and El Dorado, and the cities of Elk Grove, Rancho Cordova, and Folsom, California. The NOP included a range of preliminary alternatives developed from an initial environmental screening process prepared in the fall of 2009 and previous studies, including SACOG's Elk Grove-Rancho Cordova–El Dorado Connector Concept Plan (2005) and Environmental Phase 1 Studies final technical report (2006).

Following the close of the NOP for the program EIR in March 2010, the Capital SouthEast Connector JPA re-initiated the environmental screening process in April, along with further definition of the alternatives and options identified to date. The updated design information on the alternatives and options was entered into a Geographic Information System (GIS) format, which was used to generate updated impact calculations for each alternative and option. This information, along with the results of ongoing operational analyses and engineering and design feasibility studies, has been used to update the preliminary screening information matrix presented to the JPA Board in November 2009.

Information used in the screening process was based on preliminary studies and evaluations, including traffic forecast modeling, field studies and mapping, literature and data reviews, and discussions with federal, state, and local agency officials.

Alternatives Screening Requirements

Because a lead agency must identify ways in an EIR to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives in the EIR must focus on alternatives to the project or its location that are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. An EIR need not consider every conceivable alternative to a project. However, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives that are infeasible. The lead agency, in this case, the JPA, is responsible for selecting a range of project alternatives for examination and must disclose its reasoning for selecting those alternatives.

State CEQA Guidelines Section 15126.6 provides specific direction for the consideration and discussion of alternatives to the proposed project:

- An EIR shall describe a range of reasonable alternatives to the project, or to the location of a project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." (15126.6[a])
- An EIR is governed by a "rule of reason", which requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision making. (15126.6[f])
- Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent). No one of these factors establishes a fixed limit on the scope of reasonable alternatives. (15126.6[f][1])
- When considering alternative locations to a project, only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR. (15126.6[f][2][A])

Approach to Alternatives Screening

The alternative screening analysis will select the preferred alternative to be evaluated in detail in the EIR and identify a reasonable range of alternatives to the preferred alternative. The alternative screening analysis ensures that only the alternatives that meet the provisions of Guidelines Section 15126.6 are evaluated and compared in the EIR.

As described above, this screening methodology uses the *rule of reason* approach to alternatives (State CEQA Guidelines Section 15126.6[f]). The rule of reason approach has been defined to require that EIRs address a range of feasible alternatives that have the potential to diminish or avoid adverse environmental impacts. The State CEQA Guidelines state:

> The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. (State CEQA Guidelines Section 15126.6 [f])

In defining feasibility of alternatives, the State CEQA Guidelines state:

> Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site. (State CEQA Guidelines Section 15126.6(f)(1))

The use of a screening analysis for the alternatives ensures that the full range of environmental concerns is adequately represented, and that a reasonable range of alternatives is selected for further evaluation in the EIR. The screening criteria are used as a tool for focusing the environmental review process and limiting the amount of detailed analysis (i.e., eliminating potential alternatives that are technically infeasible, do not reduce the environmental impacts, or do not satisfy the basic objectives of the proposed project).

Project Objectives

The overall objectives for the project is to improve mobility, access, and connections between residential and nonresidential land uses, which have been compromised by increasing congestion, and to assist in preservation of open space and threatened habitats. The project would link employment centers and residential areas in the corridor and contribute to the remedy for current and future deficiencies in transportation capacity, safety, and land use compatibility. The project would serve both regional and local travel needs, and would relieve congestion on heavily used local roadways that currently serve the corridor. During Phase 1, extensive comments by project sponsors and other stakeholders identified the following four purposes of the proposed project:

Enhance mobility options within the project corridor (and the greater Sacramento region) to serve and support sustainable planned growth and development patterns and principles from the approved General Plans and MTP, while minimizing impacts to the livability of residences and communities along the Project corridor.

The communities in the Project corridor reflect a range of development types, historical attributes, and local activities. The Project should not detract from the quality of life established by these communities and expected by their residents. Several defined communities exist along the corridor, including the small unincorporated community of Franklin, the Sheldon area of Elk Grove, the former military housing community on the Mather Air Force Base site, and the El Dorado Hills area of unincorporated El Dorado County.

- Franklin. The unincorporated community of Franklin is located approximately two miles south of Elk Grove and is centered on Franklin Boulevard. The community consists of several stores, a few rural residences, and a California Historical Landmark cemetery.
- Sheldon. The Sheldon community is a largely “exurban,” rural area within the city of Elk Grove that straddles Grant Line Road, with mostly large-lot residential uses and a small cluster of commercial uses centered near the intersection of Grant Line and Wilton Roads. The historical two-lane configuration of Grant Line and the relative isolation of the area have fostered a sense of community that long-time residents passionately embrace.
- Mather. The site of the former Mather Air Force Base includes approximately 1,300 single family housing units in the central portion of the base. When the base was active, this housing supported a community of approximately 4,000 people, including military personnel and their families. The units were vacated in 1993 when the base closed. The on-base housing area has been redeveloped. The residential subdivision “Independence at Mather” opened in 1999 and has been well-received by the community. The area accommodates new homes, schools, several parks, mature vegetation, and open space on all four sides. Mature vegetation is embedded within the development. Mather Commerce Center, a 250-acre commercial office complex, is

located in close proximity to the residential housing site and provides opportunities for employment within a short distance from the homes.

- El Dorado Hills. The community of El Dorado Hills is located in the lower Sierra Nevada foothills in western El Dorado County, about 25 miles east of Sacramento. US-50 is the primary route through the community. The community, which sits immediately inside the El Dorado County line, has developed steadily over the past three decades. In the last few years, it has seen tremendous growth in both facilities and activities available to residents and businesses in the area. Most recently, development has focused south of US-50 on both the two-and four-lane segments of the White Rock Road alignment, with residential development (e.g., Four Seasons, Stonebriar, Cresleigh, A Fuller Sunset, and Valley View), and commercial development (Town Center) directly abutting the roadway.

In addition to the incorporated areas and established communities present in the Project corridor, several single residences and residential communities are located in the project corridor. The main residential communities include:

- **The Sunridge Specific Plan area of Rancho Cordova**, which includes the existing Anatolia development as well as other approved residential projects.
- **The Vineyard Area**, which includes the Vineyard Specific Plan Area and the North Vineyard Station Specific Plan Area
- **Elk Grove residential developments along Bradshaw Road**, which include the following subdivisions:
    - Fieldstone Subdivision
    - Clarke Farms Subdivision
    - Tributary Pointe Subdivision
    - Remington Estates Subdivision
    - Bishop Ranch Subdivision
    - Char-Lyn Acres Subdivision
    - Meadowlark Ranch Subdivision
    - Bradshaw Ranch Estates Subdivision

Under certain circumstances, improvements in mobility can result in making land more attractive for development. In such cases, transportation projects can contribute to inducement of growth which fosters “economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment.” (State CEQA Guidelines, 14 Cal. Code Regs. § 15126.2, subdivision[d].) This issue is of particular relevance in areas where local plans do not call for urban development, as is the case in several sections of the alternative corridors under consideration.

While implementation of the Project would not involve any changes in land use plans, it could make some areas more attractive for development by improving access to those areas. Recognizing this effect, strategically applied access control and capacity characteristics would preserve the regional functionality of the proposed project and, in part, relieve direct growth pressure on adjacent properties not designated for growth. Second, the project includes $15 million in funds to serve as seed money for a larger program to preserve open space and critical wildlife habitat. Strategically programmed, these funds could effectively inhibit development in areas that are not planned for urban growth.

Aid economic vitality by improving accessibility to existing and planned job centers and commercial areas, facilitating goods movement, and enhancing the attractiveness of existing and planned employment and commercial areas.

Rancho Cordova is the largest employment center in the corridor, with about 77,000 jobs in 2007. By 2045, employment in Rancho Cordova is expected to more than double, when its job total will be more than the current employment in the Sacramento Central City. The El Dorado Hills Business Park will also become a major employment center, growing from 9,000 jobs in 2007 to more than 33,000 jobs in 2045. Additionally, Elk Grove is expected to grow as an employment center in the region, with an estimated increase in jobs from 25,000 in 2007 to more than 84,000 jobs in 2045.

The Project is a part of the overall regional transportation system, and its ability to improve access and provide connectivity among these communities and throughout the region complements other new or improved roadways identified in MTP 2035 as strategies to serve this focused residential and employment growth. The project would facilitate diversified employment opportunities for residents of the region and provide a larger reservoir of skilled workers to businesses in the corridor by creating a more direct connection between residential areas and employment centers.

Provide a multi-modal facility that limits access to the extent possible to afford efficient transportation options within the corridor that balance transportation needs between local access and shorter trips and regional needs for longer trips; enable flexibility among automobile, transit service, bicycle, and pedestrian uses, while incorporating ITS elements where possible.

The Project is being proposed to achieve the following improvements in transportation operations:

- Reduced total vehicle-hours traveled (VHT) during morning and evening peak commute periods on Corridor roadways, especially time spent in congested conditions;
- Reduced travel times between key origins and destinations (e.g., between the Elk Grove and Rancho Cordova, Elk Grove and El Dorado County, and Rancho Cordova and El Dorado County);
- Evidence of fewer short trips on I-5, SR 99, and US 50, and fewer long trips on local/residential streets; and
- Reduced transit travel times and improved service frequencies in the corridor – evidence of viable options to automobile travel.

To achieve these improvements in transportation operations, the project will need to be designed for higher travel speeds, have a higher capacity, and have less delay at intersections than a typical arterial or thoroughfare facility. The Project will need to be designed primarily to an expressway standard, which will have more limited access than a thoroughfare and will include grade-separated interchanges instead of at-grade intersections at locations where level of service C or better conditions cannot be provided. To achieve the desired transportation operations, the portions of the Project with intersection spacing of less than a half mile will be minimized.

Preserve open space, wildlife habitat, and productive agricultural uses in the corridor and minimize growth inducement via sound transportation facility improvements and implementation.

Among the key features of the Project is a $15 million (minimum) allocation to preserve open space, wildlife habitat, and valuable agricultural lands in the project corridor already secured through the current primary funding source. The preservation would be supported by an active, funded program for open space protection in conjunction with the transportation improvements. The program would also strategically target those areas that are most susceptible to growth-inducement pressures associated with enhanced access.

The manner in which this program will be administered is dependent on the adoption of JPA policies and procedures that will accompany the development of the overall administration of the Project. The new funding likely would augment existing programs rather than support new efforts or initiatives, although this has not yet been determined. In this respect, an important function of the program would be to coordinate and support the efforts of the participants to secure outside funding from grants and private donations for their overall efforts. The Project's open space program could provide a significant source of local matching funds, providing leverage for securing competitive grant funding. Program participants could submit joint multi-purpose applications that would enhance chances for securing grants. The combined transportation/land use/habitat protection/recreation features of the overall project would provide a greater range of potential grant sources, as well.

In addition to the open space preservation program, the project will include design features that are intended to relieve potential impacts on sensitive natural resources. This will include access management techniques to minimize direct exposure of natural resources to increased activity. It will also include a commitment to alternative modes of transportation, including enhanced transit services and non-motorized facilities. In addition to preserving open space and habitat, the corridor should continue to accommodate agricultural uses through the consideration of the regional need to transport agricultural products to market and to move agricultural equipment. In general, the project should support the overall region's growth and sustainability objectives (including economic and environmental) from a rural perspective.

Sustainable "green highways" design principles also will be incorporated into the project design. These may include preservation strategies for wetlands, farmland, and other ecologically sensitive areas affected by the alignment of the corridor; recycling and reuse of construction materials to reduce energy consumption and construction costs; source controls and other best management practices to decrease the rate of discharge caused by any increase in impervious surfaces, and to capture and reduce pollutant loads generated primarily from roadway usage; and innovative design to reduce noise pollution and light pollution.

Alternatives Considered and Eliminated

This section describes the preliminary alternatives that were considered and the screening process and criteria that were used to eliminate alternatives from further consideration. The screening of alternatives occurred as part of the concept design process conducted for the Conceptual connector project. Through this planning and concept design work which was completed in 2005, consensus was established for the type of facility; and for its overall program needs, criteria, and goals. These elements provided the basis for the development of alternatives and, subsequently, after additional analyses, the basis for their screening.

The JPA and SACOG received extensive public comment and participation in developing the alternatives that are analyzed in the draft program EIR. During the public input process, all comments were considered in developing alternatives for future environmental review. The following narrative provides a summary of the scoping process starting with the initial concept plan to the current set of alternatives and design options.

The Sacramento Area Council of Governments' (SACOG) Metropolitan Transportation Plan 2025 (MTP 2025) included a multi-modal transportation corridor that would connect Elk Grove, Rancho Cordova, and El Dorado Hills. The Final Elk Grove-Rancho Cordova-El Dorado Connector Concept Plan (Connector Concept Plan) was prepared in response to SACOG's MTP 2025, in order to define a set of conceptual project alternatives to be considered in the environmental review process (DKS Associates 2005). Numerous alternatives were developed in response to agency and stakeholder input but eliminated from further consideration for constraints related to design, technical, environmental, or cost-prohibitive reasons, or because they did not adequately meet the project objectives . These alternatives and the reasons for eliminating them are described below.

Tunnel through Sheldon: Conceptual Alternative III B

The main alignment for this alternative would follow Hood-Franklin Road, Kammerer Road, Grant Line Road, and White Rock Road. This alternative included a two-land tunnel through the community of Sheldon. This design option in conjunction with Conceptual Alternative III was estimated to cost $1.3 to $1.4 billion and would create significant constraints with respect to phasing and construction, which would pose substantially greater construction complexity, risk, time, and cost (URS Corporation 2006). Therefore, Alternative IIIB was removed from further environmental review.

Stand-Alone Transit-Oriented Alternative

A stand-alone transit option was considered in the initial set of alternatives. A number of robust transit service concepts along the proposed Connector alignment and parallel roadways were tested and that analysis was presented to PDT members. It was found that robust transit concepts would not attract enough ridership to 1) be cost-effective or 2) substantially reduce the need to widen roadways.

This alternative, therefore, as stand-alone alternative, was determined insufficient to meet the project objectives of aiding economic vitality via improved accessibility and goods movement, providing a reduced-access, multimodal road. However, transit-oriented and non-traditional forms of transportation alternatives are integrated as components into the proposed project. The Connector JPA has adopted transit policies, as part of its Integrated Modes Policy, to provide capital funding for cost-effective transit facilities along the project alignment and provide funding for strategic, cost-effective capital improvements on routes parallel to the project alignment that can demonstrate strong potential for high-use service. As such, the proposed project includes considerations for expanded transit service in the project area. Providing integrated multi-modal connections would help reduce the necessity to travel by single-occupancy vehicles in the project corridor.

Transportation System Management (TSM) Alternative

The objective of TSM is to reduce congestion using existing infrastructure, thereby reducing the need to construct new facilities. A stand-alone TSM alternative would typically involve construction of auxiliary lanes, reversible HOV lanes, or bus rapid transit lanes to improve the efficiency of the existing facilities without increasing the number of through lanes on the roadway. Similar to a transit alternative, TSM concepts along the proposed Connector alignment were tested and that analysis was presented to PDT members. It was found that TSM concepts would not attract enough ridership to 1) be cost-effective or 2) substantially reduce the need to widen roadways. As a result, TSM measures would not be effective as a stand-alone alternative to meet the project objectives to reduce congestion and improve safety within the corridor. However, the proposed project includes specific TSM components such as opportunities for exclusive high-occupancy vehicle (HOV)/transit lanes and bicycle and pedestrian facilities within the project limits. The member agencies also will continue to implement TSM strategies within their respective jurisdictions guided by plans and programs regardless of the proposed project. Based on this assessment, the TSM alternative as a stand-alone solution to meet the project objectives was withdrawn from further consideration.

Transportation Demand Management (TDM) Alternative

A stand-alone TDM alternative would consist of programs and projects to improve mass transit systems (e.g., bus) by providing incentives for using alternate forms of transportation to reduce the number of vehicle trips and reduce vehicle miles traveled within the project area. Similar to a transit alternative, TDM strategies along the proposed Connector alignment were tested and that analysis was presented to PDT members. It was found that TDM concepts would not attract enough ridership to 1) be cost-effective or 2) substantially reduce the need to widen roadways. Agencies in the region are already implementing numerous TDM strategies as part of their ongoing programs and projects. In addition, there are existing transit options available to the public in the project area and plans to continue to improve and expand these services. Finally, a stand-alone TDM alternative would not be able to meet key elements of the project objectives, particularly the need to reduce congestion and improve safety. For these reasons, a stand-alone TDM alternative was withdrawn from further study.

Combined Transit/TSM/TDM Alternative

The JPA considered a combined Transit/TSM/TDM Alternative, which would involve strategies associated with all three concepts. Similar to the stand alone Transit, TSM, and TDM alternatives, a combined strategy along the proposed Connector alignment was tested. It was found that even with the combined strategy, this alternative would not attract enough ridership to 1) be cost-effective or 2) substantially reduce the need to widen roadways. Finally, a combined alternative would not be able to meet key elements of the project objectives, particularly the need to reduce congestion and improve safety. For these reasons, a stand-alone combined alternative was withdrawn from further study.

Dillard Road Alignment

An alternate connector route along Dillard Road in the southern portion of Sacramento County was considered but determined to be too remote in location to serve the travel needs of the user, serve the JPA communities, or meet the project objectives. In addition, the proposed route alignment would be located entirely outside of Sacramento County's urban service boundary (USB), which is established to limit and manage growth in the county. This route would introduce new significant environmental impacts that the proposed project would avoid.

Shingle Springs Road Alignment to US 50

The JPA considered an alternative that would extend from Douglas Road eastward to Shingle Springs Road near the El Dorado County line. The alignment would then follow Shingle Springs Road until it becomes Ponderosa Road and connects to US 50. This alternative would avoid running through the community of El Dorado Hills. However, this alignment was removed from further consideration because it would not meet the objectives to reduce travel times between communities along the project alignment in the eastern portion of the alignment, and would introduce additional significant impacts related to unplanned growth outside of the USB that would be avoided with the proposed project.

Truncate Eastern End: Empire Ranch Road Connection to US 50

The JPA considered truncating the Connector before reaching the El Dorado County Line. This route would follow the existing proposed alignment on the eastern end on White Rock Road up to Scott Road, Prairie City Road, or another future road in the Folsom SOI, and then connect with US 50 potentially at Empire Ranch Road. This alternative was considered because of comments received by groups in communities El Dorado County concerned about traffic on White Rock Road through El Dorado Hills. This alternative was removed from further consideration because it would not address the objective of reducing travel times between key origins and destinations with respect to El Dorado County, the proposed Connector project would not change the planned improvements to White Rock Road in El Dorado County from those anticipated in the County's General Plan and numerous other improvements (e.g., improvements on White Rock Road through El Dorado County would proceed without the Connector, and improvements to area roads such as the West Access Road and the extension of Empire Ranch Road would proceed), and numerous potential design and geometric constraints associated with site topography at US 50. Therefore, this alternative would not avoid impacts associated with the proposed project and would introduce new significant impacts associated with access to US 50. Preliminary

Alternatives included in the EIR Screening

The project limits extend from Interstate 5 (I-5)/Hood-Franklin Road interchange in southwest Sacramento County east and north approximately 35 miles, terminating at U.S. Highway 50 (US 50) in the vicinity of Silva Valley Parkway approximately 3 miles past the El Dorado County line. A wide range of alternatives for the Connector Project was initially considered to address potential alternatives to the proposed project. These alternatives and described below.

- No-Project Alternative
- Alternative 1. Sunrise Alignment
- Alternative 2. Grant Line Alignment
- Alternative 3. Grant Line Alignment with Off-Corridor Multi-Use Trail
- Sheldon Community Options for Alternatives 1, 2, and 3

  - Sheldon Reduced Access Road Option for Alternatives 1, 2, 3
  - Sheldon Deer Creek Causeway Options 1 and 2
  - Sheldon High Access Roadway Option
- Alternative 4. Bradshaw Alignment

Given the CEQA requirements identified above, this section covers: (1) a description of a range of reasonable alternatives to the project, including the No-Project Alternative; (2) a screening analysis that summarizes and compares the alternatives' abilities to meet the project objectives and lessen the significant environmental effects; and (3) the selection of alternatives chosen for further evaluation in the EIR. The EIR must contain a No-Project alternative; therefore, the no-project alternatives are not discussed in this screening analysis and are assumed to be screened through for further environmental review in the EIR.

No-Project Alternative

The No-Project Alternative represents the transportation system as envisioned under general plans, with widening of the existing roadways along the Connector alignments to 4 or 6 lanes. Access along the roadways within the study area under the No-Project Alternative represents "business as usual," with only minor limitations on new driveways. The No-Project Alternative is also assumed to have numerous at-grade intersections with their locations based on adopted and proposed General Plans and Specific Plans. For the Sheldon Area, the Elk Grove Rural Roadway Standards would apply with improvements made as traffic volume thresholds warrant.

Selected Alternatives

Four preliminary alternatives were proposed (in addition to a No-Project) alternative for initial screening and ultimate selection of a preferred alternative. These alternatives contained four elements—roadway, non-motorized trails; transit services and facilities; and open space acquisition—and each had a mix of transit services and facilities both along and off the alignment based on the transit policy. The preliminary alternatives are described below.

Alternative 1. Sunrise Alignment

The Alternative 1 concept utilizes existing Sunrise Boulevard for a portion of the alignment. This alternative, originating at the I-5/Hood-Franklin Road interchange, follows the common Connector alignment to SR99 along Kammerer Road. From the Grant Line/SR99 interchange, the alignment would proceed along Grant Line Road to Calvine Road, continuing as a thoroughfare except in the Sheldon area which has several options that are defined below for the Sheldon Community Options for Alternatives 1, 2, and 3. The Connector then continues from Calvine Road to Sunrise Boulevard as an expressway.

From there, the alignment follows Sunrise Boulevard north as an expressway from Grant Line Road to just north of State Route 16 (Jackson Highway) and then a thoroughfare segment north of State Road 16 (Jackson Highway) to Douglas Road. North of Douglas Road, the alignment would be east of and parallel to Sunrise Boulevard, requiring an undefined new thoroughfare segment to provide a connection to White Rock Road. Alternative 1 continues east as a thoroughfare, utilizing the White Rock Road alignment through Rancho Cordova. East of Grant Line Road, the Connector then follows the common Connector alignment along White Rock Road and the southern boundary of the Folsom sphere of influence to the El Dorado County with an expressway. In El Dorado County, the Connector is proposed to be a thoroughfare segment along White Rock Road to the terminus at US 50.

Alternative 2. Grant Line Alignment

The Alternative 2 alignment follows Kammerer Road, Grant Line Road, and White Rock Road. The non-motorized facilities follow the main alignment. This concept is located primarily on Grant Line Road. Similar to the Alternative 1, the alignment would proceed from I-5 to SR 99 along Kammerer Road . From the Grant Line/SR 99 interchange, the Connector would remain on Grant Line Road through Elk Grove and Sacramento County to White Rock Road in Rancho Cordova. On Grant Line Road, from Bradshaw Road to Calvine Road, several options are being considered for the Sheldon Community under Alternatives 1, 2, and 3 . From Calvine Road to White Rock Road, the Connector is proposed to be an expressway. This expressway continues on White Rock Road following the common alignment to the El Dorado County line. In El Dorado County, the Connector is proposed to be a thoroughfare segment along White Rock Road to the terminus at US 50.

Alternative 3. Grant Line Alignment with Off-Corridor Multi-Use Trail

The Alternative 3 alignment is the same as under Alternative 2 except in the design of the non-motorized facilities. The on-corridor bike/pedestrian component under this alternative would be restricted to one side of the roadway and would have limited connections to local streets and few enhancements to intersection and interchange access. However, this alternative would include an additional multi-use trail component aligned off the Connector route. This multi-use path would be constructed along Laguna Creek, the Folsom South Canal, Folsom Boulevard, Alder Creek, and Union Pacific Railroad right-of-way to White Rock Road. The multi-use trail location is consistent with the bicycle master plans of the local jurisdictions, and portions of a trail system is already in existence along Laguna Creek and the Folsom South Canal and would be utilized for this alternative.

Sheldon Community Options for Alternatives 1, 2, and 3

Several options are being evaluated for the portion of the Connector alignment through the Sheldon community as part of Alternatives 1, 2, and 3. These options include various alignments for a bypass that would take the Connector route off of the Grant Line Road alignment or that would realignment local street and access points.

Deer Creek Causeway Options 1 and 2

These options would construct a bypass of Grant Line Road south of the central part of the Sheldon community. Either bypass would be constructed above grade through the Cosumnes River floodplain, just east of Grant Line Road, from Waterman Road to Eagles Nest (Option 1) or Bradshaw Road to Eagles Nest (Option 2). No access would be provided along the bypass through the floodplain, including at Wilton Road. Under this option, bicycle and pedestrians access would not be accommodated along the bypass because of the need to limit project footprint and alignment widths within the floodplain. Instead, bicycle and pedestrians would be accommodated along Grant Line Road. With a Bypass, the segment of Grant Line Road running through the Sheldon area would not be incorporated into the Project but would remain a rural roadway under the jurisdiction of the City of Elk Grove. This road would be managed in accordance with the Rural Road Guidelines adopted by the City, which anticipate adjustments in capacity as warranted by traffic demand.

Sheldon Reduced Access Roadway Option

This option proposes to construct a rural road segment, with a raised center median along Grant Line Road thorough the Sheldon Area. This option would eliminate direct driveway access, increasing the capacity of the road while minimizing the right of way impact as much as possible. Controlled spacing of signalized intersections and frontage roads would need to be developed to access businesses and residences at selected locations. An effort will be undertaken to investigate the feasibility of this option and provide sufficient detail for analysis in the EIR.

Sheldon High Access Option

This option proposes the segment of Grant Line Road running through the Sheldon area would not be incorporated into the Project but would remain a rural roadway under the jurisdiction of the City of Elk Grove. This road would be managed in accordance with the Rural Road Guidelines adopted by the City, which anticipate adjustments in capacity as warranted by traffic demand.

Alternative 4. Bradshaw Alignment

The Alternative 4 concept utilizes existing Bradshaw Road for a segment of the Connector. As with all other alternatives, this concept originates at I-5/Hood–Franklin Road interchange, and the first segment, up to Bradshaw Road, matches that of the previously described Alternatives 1 and 2. At Grant Line Road and Bradshaw Road, the Connector would be aligned to the north along a widened Bradshaw Road up to State Route 16 (Jackson Highway) as a thoroughfare, with access limited and consolidated where feasible. Signalized intersection spacing of a half mile may not be feasible in this area due to the existing and approved development, therefore minimal a quarter mile spacing may be allowed for this stretch. From Jackson Highway, a new expressway would be constructed in a predominantly easterly direction, along the southern boundary of Mather Airport, to the intersection of Sunrise Boulevard and Douglas Road. The alignment would then follow Douglas Road, as a thoroughfare segment to Grant Line Road where it then follows Grant Line Road as an expressway. East of Grant Line Road, the Connector continues as an expressway and follows the common Connector alignment along White Rock Road to El Dorado County. In El Dorado County the Connector is proposed to be a thoroughfare along White Rock Road to the terminus at US 50. The additional non-motorized trail alignment is the same as in Alternative 3.

Screening Criteria and Results

The screening process involved examining the initial alternatives for fatal flaws against screening criteria, including ability to meet most of the proposed project's defined objectives (described above), including the ability to provide adequate traffic operation improvements, potential for substantially reducing the significant environmental impacts of the project, and overall project cost. These elements provided the basis for the development of alternatives and, subsequently, after additional analyses, the basis for their screening. The results of the process are listed in Table H-1 (i.e., the screening matrix). A discussion of the impacts of each alternative and the alternative's ability to meet basic project objectives and operational criteria is provided below, along with a recommendation for selecting a preferred alternative for more detailed evaluation in the Program EIR.

Alternatives Comprising the Proposed Project

State CEQA Guidelines focus the selection of alternatives that can avoid or reduce the impacts of the proposed project. (i.e., "The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project." (State CEQA Guidelines Section 15126.6[f]). In addition to the No-Project alternative, which is required to be evaluated in and EIR, the following alternatives are recommended for further review in the EIR.

Based on the screening matrix, Alternatives 2/3 best meet the overall project objectives while minimizing or avoiding the potential impacts of the project. Therefore it is recommended that Alternatives 2/3 be selected as the preferred alternative for analysis in the Program EIR and Alternatives 1 and 4, along with the options for the Grant Line Road alignment passing through the Sheldon Community, be analyzed as alternatives to the preferred alternative.

Alternative 2. Grant Line Alignment

Alternative 2 avoids or lessens the extent of numerous environmental impacts associated with Alternatives 1 and 4, while still meeting some of the basic objectives of the proposed project. Alternative 2 best reduces the VHD and improves traffic and pedestrian safety in the project corridor, minimizing exposure to sensitive areas that are integral to community services because no schools, parks, or other sensitive receptors/land uses are located along the proposed corridor. After the Bypass option, this alternative also bests removes heavy trucks and thru-traffic from local streets by providing a more direct route. Like Alternative 1, this alternative best connects to I-5 and would provide critical access during emergencies; improvements along Grant Line Road and proximity to floodplain provide for improved evacuation route during flood event.

This alternative reduces travel times for goods movement in the corridor compared to No Build and significantly reduces potential for heavy trucks on local streets. This alternative also Reduces travel times from residential areas to large employment and commercial areas in the corridor compared to the No-Build alternative.

The existing Grant Line Road currently bifurcates two reaches of Laguna Creek surrounded by high-density vernal pool landscape. Expansion of the road in this corridor could result in impacts on vernal pools; however, project designs that include low bridging in these areas present otherwise unavailable opportunities to reconnect the vernal pool habitat on either side of the existing roadway. The total estimated impact on wetlands and seasonal waters for Alternative 2/3 (69) is less than that for Alternative 1 (86 acres) the least compared to the other alternatives but slightly more than that for Alternative 4 (68).

Construction costs associated with Alternative 2 are estimated at $650 million and would be the least expensive behind Alternative 1 (the estimate does not include right-of-way and acquisition costs).

Alternative 3. Grant Line Alignment with Off-Corridor Multi-Use Trail

The Alternative 3 alignment is the same as under Alternative 2 except in the design of the non-motorized facilities. The on-corridor bike/pedestrian component under this alternative would be restricted to one side of the roadway and would have limited connections to local streets and few enhancements to intersection and interchange access. However, this alternative would include an additional multi-use trail component aligned off the Connector route. This multi-use path would be constructed along Laguna Creek, the Folsom South Canal, Folsom Boulevard, Alder Creek, and Union Pacific Railroad right-of-way to White Rock Road. Operational improvements associated with this alternative are generally identical to those described for Alternative 2. This alternative would provide the benefits of Alternative 2 but with greater connectivity in the region for alternative modes of transportation. Impacts associated with this alternative are generally the same as those under Alternative 2, but with some minor additional impacts associated with the off-trail construction.

Costs to construct this alternative would be approximately $6 million more than Alternative 2 to construct the remaining segments in the off-corridor trail (therefore, total construction costs are estimated to be approximately $676 million). Right-of-way estimates are not included in the cost estimates.

Additional Alternatives Recommended to be included in Program EIR Evaluation

Based on the alternatives screening, the following alternatives met most of the project objectives, and generally result in new or more extensive impacts than Alternative 2/3. However, these alternatives were identified to reduce or avoid one or more environmental of the environmental impacts identified for Alternative 2/3. A discussion of these alternatives is provided below.

Alternative 1. Sunrise Alignment

Alternative 1 is estimated to result in the least construction costs (right-or-way acquisition and displacement costs are not included) and could avoid some of the environmental impacts associated with Alternative 4. Although Alternative 1 would have the least increase in VMT of all the alternatives, it would generally have the least benefit in reduction in travel times along the most project segments of the alternatives. Alternative 1 could avoid some of the driveway access issues that Alternative 4 causes, but it would still have a significant impact on driveway access in approved or planned development areas. Alternative 1 also would be inconsistent with general plan build out assumptions. However, based on its location alone (and not taking design into account), Alternative 1 has the least potential for growth inducement beyond the anticipated growth shown in local jurisdiction’s General Plans.

Alternative 1 (without the Sheldon Bypass) does not avoid or minimize the amount of 100-year FEMA-designated acreage of floodplain impacts that Alternative 2 or 3 would cause, but would also result in the greatest amount of DWR-designated 100-year floodplain (up to 113 acres) due to the crossing on south Sunrise Blvd.

Alternative 4. Bradshaw Alignment

As shown in Table H-1, Alternative 4, Bradshaw Alignment provides the least benefit to improving traffic operations (in terms of congested vehicle miles traveled, and vehicle-hours of delay—or the amount of delay that would be encountered while travelling) of the 4 main alternatives, generally would not reduce or avoid many of the impacts caused by the other alternatives and would also result new or worsened environmental impacts than the other alternatives. However, the screening matrix shoes that this alternative could result in slightly less impacts on seasonal wetlands and vernal pools than either Alternative 2/3 or Alternative 1 and it would minimize potential impacts from growth inducement that could occur under Alternative 2/3.

All of the alternatives could result in the impacts on existing access points, including removal of driveways serving residential and commercial uses. Removal of residential or commercial driveways could result in the need to acquire properties, or construct new driveways in alternative locations, potentially outside the project footprint, substantially adding to the project costs and enlarging the area of disturbance. However, Alternative 4 would impact the most existing driveways (154 as compared to 91 for Alternatives 1 and 2, and 3).

Alternative 4 would provide the least amount of access control on the Connector and have the highest impact on existing, approved and planned driveways and minor roadways. Because of the schools along the Alternative 4 alignment, there would be more potential for conflict with existing sensitive uses with Alternative 4. Alternative 4 would also provide the least opportunity for emergency vehicle access and routes because it would not provide a flood evacuation route.

Alternative 4 would also have substantially more potential for impacts related to drainage crossings (33 crossings), compared to Alternatives 1 (20 crossings) and 2/3 (21 crossings) (without the Sheldon bypass). Alternative 4 crosses or is adjacent to designated critical habitat (CH) for vernal pool tadpole shrimp. The CH designation prohibits any adverse modification to primary constituent elements that define the critical habitat in these designated areas. Impacts must be offset within designated critical habitat. Available mitigation within the designated area is extremely limited.

Alternative 4 has the highest potential for total acres of floodplain encroachment (up to 411 acres on 100-year and 524 acres on 500-year FEMA floodplain and up to 62 acres of DWR floodplain—totaling more than 1,000 acres of potential encroachment). It is the only alternative impacting the 500 yr floodplain.

With estimated construction costs at $720 million (right-of-way acquisition costs are not included), Alternative 4 is neither the least expensive nor most costly of the build alternatives.

Sheldon Community Options for Alternatives 1, 2, and 3

The JPA has developed numerous options for the Sheldon community that could reduce or avoid the impacts of the proposed alignment through the Sheldon area. To allow for direct comparison of the options to the proposed alignment under consideration for Alternatives 1, 2, and 3, these alternatives to the Grant Line Road alignment are compared below.

Alternative 2/3: Sheldon Reduced Access Roadway Option

This option alignment is similar to Alternative 2/3, with the exception of a segment running through the community of Sheldon. In response to concerns expressed by the community, Elk Grove, the CWG, and the Connector JPA collaborated to formulate basic criteria to develop a range of access controls for options along this segment of Grant Line Road. Based on those discussions, design and performance criteria were identified for a Reduced Access Roadway option that represents a range of access control that can meet the objectives of the Connector and address community concerns. These criteria are described below. A precise design for an acceptable access-control option for the Connector along Grant Line Road through the Sheldon area will require additional project-level design and further community involvement and thus will not be prepared until subsequent project-level design and environmental review are completed in the segment of the Connector. This option generally performs less effectively than Alternative 2/3 in traffic operations, but avoids some of the impacts on natural resources (vernal pools, floodplains) in the Sheldon area that the Bypass option would cause. Because additional work is currently underway to further define this alternative, it is recommended that this alternative remain under consideration until additional information is available for review.

Sheldon Deer Creek Causeway Options 1 and 2 for Alternatives 1, 2, and 3

Alternatives 1, 2, and 3, with the Sheldon Deer Creek Causeway Options would result in the greatest construction costs of $900 million (right-or-way acquisition and displacement costs are not included). This alternative's ability to meet the basic project objectives and traffic operations criteria are mixed. This alternative would have the greatest increase in daily VMT (0.38 to 0.35%), as compared to Alternatives 1, 2, and 4 (.17% to .32%). However, because of its restricted access, it would result in the greatest reduction in future congested VMT of the alternatives. This alternative also would provide the fastest travel times along most of the project segments and along the overall Connector alignment. For response times during potential catastrophic events, the connection to I-5 for this alternative would provide critical access during emergencies; the Bypass segment would provide for alternative flood event evacuation route, but it would provide only limited access to the Sheldon area during flooding.

Under this alternative, travel times for goods movement in the corridor is reduced compared to the other alternatives, and the bypass option significantly reduces the potential for heavy trucks on local streets, especially in the Sheldon area.

With the Sheldon Bypass, Alternative 2/3 would have the most potential for biological impacts because the bypass would cross Deer Creek and the Cosumnes River floodplain. Location of the bypass on a new alignment within the watershed would also result in substantially greater potential for direct and indirect effects on other sensitive species, including Swainson's hawk, valley elderberry longhorn beetle, tricolored blackbird, western spadefoot, Bogg's Lake hyssop, and Sanford's arrowhead.

The Cosumnes River is the only remaining undammed river between the eastern Sierra Nevada and the Sacramento–San Joaquin Delta. It supports a rich aquatic ecosystem and is considered by resource agencies to be a prime river for restoration. The watershed historically supported fall-run Chinook salmon and restorations efforts are underway in the upper watershed as part of the USFWS's Anadromous Fish Restoration Program. Additionally, the Sacramento–San Joaquin Basin Plan identifies numerous beneficial uses, such as fish habitat and water quality, for upper Deer Creek. Uses within these watersheds, particularly construction of new roadway as would occur with the Bypass option, are likely to be restricted. Also, with the Sheldon Bypass, Alternative 1 would have substantially more acres of impact on FEMA-designated floodplains because of the location of the bypass within the Cosumnes River floodplain.

The Bypass alignment is outside of the county USB and therefore is not consistent with the Sacramento County General Plans. Also, the Bypass would construct a roadway within open space habitat protected under various state and federal regulations for watersheds, habitat, and floodplains.

This alternative would avoid displacement/right-of-way acquisition of approximately 44 driveways impacts identified through the Sheldon/Wilton communities that are associated with Alternatives 1, 2, and 3. Under this alternative, travel times for goods movement in the corridor are reduced compared to the other alternatives, and the bypass option significantly reduces the potential for heavy trucks on local streets, especially in the Sheldon area.

This option/alternative would involve construction of a bypass in the floodplain, and it would result in substantially more impacts on wetlands, vernal pools, and floodplains than any other alternative. This alternative presents some advantages over other alternatives by avoiding right-of-way takes through a built community. It does, however, introduce new significant impacts to biological and flood-protected resources that would be avoided under other alternatives and is the most expensive to build.

						Alternative 1, 2&3 Options for the Sheldon Community					
Screening Criteria	**Existing Conditions**	**Future No Build***	**Alt 1 Sunrise Alignment**	**Alt 2 & 3 Grant Line Alignment**	**Off-Corridor Multi-Use Path Option**	**Sheldon "No Build" Option**	**Limited Access Roadway Option**	**Bypass Option 1**	**Bypass Option 2**	**Alt 4 Bradshaw Alignment**	**Comments**
GREEN (best performance)			3	7				9	9	2	Scores not weighted.
YELLOW								1	1		
RED (worst performance)			9	1				8	7	13	
1. Improves mobility and provides cost-effective, efficient multimodal travel options											
a. Demonstrates cost-effectiveness by minimizing capital and operating expenses while offering strong performance benefits		Varies from $310-$360 million per alignment assuming widening existing road	Construction cost estimated at $610 million For performance benefits, see criteria 1b-1j.	Construction cost estimated at $685 million For performance benefits, see criteria 1b-1j.	Construction cost estimated at $6 million (based on Phase 1 estimate; does not include grade separations or special intersection treatments.	Construction cost estimated at $670 million.	Construction cost estimated at $685 million. For performance benefits, see criteria 1b-1j. Additional cost for redevelopment yet to be determined and therefore not accounted for in the cost estimate.	Construction cost estimated at $900 million (longest bypass option) For performance benefits, see criteria 1b-1j.	Construction cost estimated at $840 million (shortest bypass option) For performance benefits, see criteria 1b-1j	Construction cost estimated at $720 million. For performance benefits, see criteria 1b-1j.	Alternative 2/3 with the bypass has the highest estimated construction cost. However, these estimates do not include the cost of additional property acquisition that may be required under Alternative 1 & 4 to address loss of driveway access to existing residential and commercial driveways.
b. Reduces total VHD during morning and evening peak commute periods on Corridor roadways	<u>Existing VHD (PM Peak 3 hr Period)</u> 6,340	<u>2045 VHD (PM Peak 3 hr Period)</u> 17,614	<u>% Change from 2045 No Build</u> -9.4 %	<u>% Change from 2045 No Build</u> - 11.2 %		Would result in less of a reduction in VHD than Alt 2/3	Would result in less of a reduction in VHD than Alt 2/3 with change dependent on definition of LAR	<u>% Change from 2045 No Build</u> - 9.8 %	Similar to Sheldon Bypass Option 1	<u>% Change from 2045 No Build</u> -7.3%	Alternative 4 would have the least benefit to reduction in future (2045) VHD (7.3% reduction), as compared to Alternatives 1 and 2/3 (9.4% to 11.2%). Morning peak hour estimates are similar for all alternatives.
c. Reduces peak period VMT on congested (LOS F) roadways in study area	<u>Existing Congested VMT</u> 575,800	<u>2045 Congested VMT</u> 1,576,700	<u>% Change in Congested VMT from 2045 No Build</u> -7.3%	<u>% Change in Congested VMT from 2045 No Build</u> -5.7%		Less reduction in Congested VMT than Alt 2/3	Less reduction in congested VMT than Alt 2/3 with change dependent on definition of LAR	<u>% Change in Congested VMT from 2045 No Build</u> -12.0%	Similar to Sheldon Bypass Option 1	<u>% Change in Congested VMT from 2045 No Build</u> -5.2%	Alternative 4 would have the least benefit to reduction in future congested VMT (5.2% reduction), as compared to Alternatives 1 and 2/3 (5.7% to 12.0%).

Screening Criteria	Existing Conditions	Future No Build*	Alt 1 Sunrise Alignment	Alt 2 & 3 Grant Line Alignment	Off-Corridor Multi-Use Path Option	Alternative 1, 2&3 Options for the Sheldon Community: Sheldon "No Build" Option	Limited Access Roadway Option	Bypass Option 1	Bypass Option 2	Alt 4 Bradshaw Alignment	Comments
d. Contributes to the reduction of daily VMT in the region	Existing VMT 55,83,400	VMT 2025 = 75,403,700 2045 = 93,795,500	% Change in VMT from Future No Build 2025 = 0.24% 2045 = 0.17%	% Change in VMT from Future No Build 2025 = 0.29% 2045 = 0.22%		Less increase in VMT than Alt 2/3	Less increase in VMT than Alt 2/3 with change dependent on definition of LAR	% Change in VMT from Future No Build 2025 = 0.38% 2045 = 0.35%	Similar to Sheldon Bypass Option 1	% Change in VMT from Future No Build 2025 = 0.32% 2045 = 0.30%	No alternative would reduce VMT. Alternative 1/2/3 with either Bypass option would have the greatest increase in VMT (0.38 to 0.35%), as compared to Alternatives 1 and 2/3 without the bypass and Alternative 4 (.17% to .32%)
e. Reduces travel times between key origins and destinations Travel on quick-est travel path: El Dorado Hills—Rancho Cordova So. Elk Grove—El Dorado Hills Sunridge—El Dorado Hills So. Elk Grove—Rancho Cordova Travel along Con-nector Alignment Grant Line Rd at Bradshaw Rd--Grant Line at White Rock Rd		Peak hour Travel Time 24.7 min 53.4 min 20.6 min 38.8 min 36 min	Peak hour Travel Time (% Change in time from Future No Build) 23.0 (-6.7%) 49.4 (-7.6%) 19.4 (-16.0%) 36.7 (-5.4%) 41 min	Peak hour Travel Time (% Change in time from Future No Build) 22.9 (-6.9%) 47.1(-11.8%) 18.2 (-21.5%) 37.0 (-4.5%) 26 min		Peak hour Travel Time (% Change in time from Future No Build) Less reduction in travel time than Alt 2/3	Peak hour Travel Time (% Change in time from Future No Build) Less reduction in travel time than Alt 2/3 with change dependent on definition of LAR	Peak hour Travel Time (% Change in time from Future No Build) 23.0 (-6.7%) 46.1 (-10.9%) 18.5 (-20.9%) 35.8 (-5.5%) 24 min	Peak hour Travel Time (% Change in time from Future No Build) Similar to Sheldon Bypass Option 1	Peak hour Travel Time (% Change in time from Future No Build) 22.8 (-7.5%) 48.2 (-9.7%)I 18.4 (-21.2%)I 37.3 (-3.7%)I 39 min	Grant Line Road would provide the quickest route between the common points along the alternative Connector alignments (that is between Grant Line Rd at Bradshaw Rd and Grant Line at White Rock Rd) and the future "build" versions of Alignments 1 and 4 would be slower than travel along Grant Line Road under the No Build Alternative. Therefore, under Alternative 4, the quickest route for travel between south Elk Grove and El Dorado Hills would be along Grant Line Road, not along Bradshaw Road. Alternative 2/3 with the Sheldon bypass would have the fastest travel time followed by Alternative 2/3 without the Sheldon Bypass. Alternative 4 would have the slowest travel time. Despite a major investment in either Alternative 1 or 4 alignments, travel between the common points would continue to use Grant Line Road.
f. Increases the mode share of transit and non-motorized trips in the study area in	Very limited transit service and non-motorized facilities in	Significant increase in transit service and non-motorized	Number of transit and non-motorized trips will increase	Number of transit and non-motorized trips will increase compared to No		Number of transit and non-motorized trips will increase compared to	Number of transit and non-motorized trips will increase	Number of transit and non-motorized trips will increase	Number of transit and non-motorized trips will increase	Number of transit and non-motorized trips will increase	No appreciable differences between alternatives have been identified

Screening Criteria	Existing Conditions	Future No Build*	Alt 1 Sunrise Alignment	Alt 2 & 3 Grant Line Alignment	Off-Corridor Multi-Use Path Option	Alternative 1, 2&3 Options for the Sheldon Community				Alt 4 Bradshaw Alignment	Comments
						Sheldon "No Build" Option	Limited Access Roadway Option	Bypass Option 1	Bypass Option 2		
a cost-effective and productive manner	Corridor	facilities expected	compared to No Build	Build		No Build	compared to No Build	compared to No Build	compared to No Build	compared to No Build	
g. Provides access control while minimizing impacts to existing driveways and local streets. Such methods include limiting access via directional access control or restricting development outside approved local agency general plans or the MTP2035	Existing Driveways: Alt 1: 91 Alt 2/3: 91 Alt 4: 154 Existing Minor/Major Road Intersections: Alt 1: 34/25 Alt2/3: 35/24 Alt 4: 28/30	Driveways Significant number of new driveways may be allowed on roads with approved or planned development without significant access controls, including: • Bradshaw Rd from Calvine Rd to Florin Rd • Rancho Cordova Pkwy from Rio del Oro to White Rock Rd • Rio del Oro Rd from Sunrise Blvd to Rancho Cordova Pkwy Future Minor/ Major Road Intersections: Alt 1: 42/42 Alt2/3: 37/37 Alt 4: 38/47	Future No Build Minor/Major Road Intersections: 42/42 Future Build: Will strive to limit number of new driveways and eliminate some existing driveways Would impact new driveway access in planned or approved development areas that do not have significant access controls, including: • Rancho Cordova Pkwy from Rio del Oro to White Rock Rd • Rio del Oro Rd from Sunrise Blvd to Rancho Cordova Pkwy Minor/Major	Future No Build Minor/Major Road Intersections: 37/37 Future Build: Will strive to limit number of new driveways and eliminate some existing driveways Minor/Major Road Intersections – 20/24 Interchanges – 13		Future No Build Minor/Major Road Intersections: 37/37 Future Build: Similar to Alt 1/2/3 but would not eliminate existing driveways and minor intersections in Sheldon	Future No Build Minor/Major Road Intersections: 37/37 Future Build: Similar to Alt 1/2/3 but would eliminate more existing driveways and minor intersections in Sheldon	Future No Build Minor/Major Road Intersections – 37/37 Future Build: Will strive to limit number of new driveways and eliminate some existing driveways Bypass avoids impacts on about 44 existing driveways Minor/Major Road Intersections – 13/19 Interchanges – 13	Build Minor/Major Road Intersections – 37/37 Future Build: Similar to Sheldon Bypass Option 1	Future No Build Minor/Major Road Intersections – 38/47 Future Build: Will strive to limit number of new driveways and eliminate some existing driveways Would impact new driveway access in planned or approved development areas that do not have significant access controls, including: • Bradshaw Rd from Calvine Rd to Florin Rd Minor/Major Road Intersections – 35/33 Interchanges – 15	All of the alternatives could result in the impacts on existing access points, including removal of driveways serving residential and commercial uses. Removal of residential or commercial driveways could result in the need to acquire properties, or construct new driveways in alternative locations, potentially outside the project footprint, substantially adding to the project costs and enlarging the area of disturbance. Alternative 4 would impact the most existing driveways (154 as compared to 91 for Alternatives 1 and 2/3). The exact number of new driveways that would be impacted cannot be determined because precise plans (tentative maps) are not approved for most areas. However, Alternatives 1 and 4 would have a significant impact on driveway access in approved or planned development areas. Elimination of existing driveways and restricting new driveways in approved development areas will be costly and difficult to implement and thus providing an access controlled will not feasible in some areas. Alternative 2/3 with the Sheldon Bypass would provide the best

Screening Criteria	Existing Conditions	Future No Build*	Alt 1 Sunrise Alignment	Alt 2 & 3 Grant Line Alignment	Off-Corridor Multi-Use Path Option	Alternative 1, 2&3 Options for the Sheldon Community				Alt 4 Bradshaw Alignment	Comments
						Sheldon "No Build" Option	Limited Access Roadway Option	Bypass Option 1	Bypass Option 2		
			Road Intersections: 39/33 Interchanges: 10								access-controlled Connector facility with the least impact on existing, approved and planned driveways and minor roadways followed by Alternative 2/3 without the Sheldon Bypass. Alternative 4 would provide the worst access control on the Connector and have the highest impact on existing, approved and planned driveways and minor roadways.
h. Improves traffic and pedestrian safety in the project corridor, minimizing exposure to sensitive areas that are integral to community services (schools, parks, hospitals, etc.)		Local road configurations will have numerous intersections with x-walks, sidewalks and front on uses that will likely include parks, schools, etc.	There are two parks and a church within 800 ft. of centerline along Grant Line Rd. and Sunrise Blvd.	No schools adjacent to the alignment. One park and one church within 800 ft. of centerline on Grant Line Rd. Removes heavy trucks and thru traffic from local streets by providing more direct route	Five parks, one school and one church within 100 ft.			No parks or schools adjacent to the alignment. Removes heavy trucks and thru traffic from local streets by providing more direct route	Similar to Sheldon Bypass Option 1	There are five schools, six churches, and two parks within 800 ft. of centerline mostly located along Bradshaw Rd.	Because of the five schools along the Alternative 4 alignment, there would be more potential for conflict with existing sensitive uses with Alternative 4. Alternative 2 would have the least potential for conflicts with existing sensitive uses. The comparative potential for conflicts with planned sensitive uses cannot be estimated at this time.
i. Improves response times during catastrophic floods or other public safety emergencies and facilitates rapid response and evacuations in the case of emergencies	Existing alignment and profile is within floodplain.	Local road configurations will reduce response time with additional intersections and signals and slow evacuations	Connection to I-5 would provide critical access during emergencies; improvements along Grant Line Road and proximity to floodplain provide for improved evacuation route during flood event.	Connection to I-5 would provide critical access during emergencies; improvements along Grant Line Road and proximity to floodplain provide for improved evacuation route during flood event.	Not anticipated to affect response times	Effects likely to be similar to Future No Build in the Sheldon Area	Limited access along Grant Line Road in the Sheldon area would provide some improved response time along the corridor during emergencies.	Connection to I-5 would provide critical access during emergencies; Bypass would provide for alternative flood event evacuation route, but provide limited access to Sheldon area during flooding.	Similar to Sheldon Bypass Option 1	Connection to I-5 would provide critical access during emergencies;	Alternative 2/3 would provide for the quickest response time due to the improved travel time along the corridor.

						Alternative 1, 2&3 Options for the Sheldon Community					
Screening Criteria	**Existing Conditions**	**Future No Build***	**Alt 1 Sunrise Alignment**	**Alt 2 & 3 Grant Line Alignment**	**Off-Corridor Multi-Use Path Option**	**Sheldon "No Build" Option**	**Limited Access Roadway Option**	**Bypass Option 1**	**Bypass Option 2**	**Alt 4 Bradshaw Alignment**	**Comments**
j. Provides a sense of community enhancement through the establishment of unique, functional, and attractive features		Planned local road configs. likely not consistent thru 5 jurisdictions. Aesthetics discontinuous based on jurisdictions preference	JPA to enhance aesthetics thru continuous theme and common features	JPA to enhance aesthetics thru continuous theme and common features	Project would provide beneficial linkages to existing trail systems	Effects likely to be similar to Future No Build	Alternative not defined but intended to ensure community of Sheldon remains intact	JPA to enhance aesthetics thru continuous theme and common features	Similar to Sheldon Bypass Option 1	JPA to enhance aesthetics thru continuous theme and common features	Off-Corridor Multi-Use Path Option would enhance existing multi-modal systems, create new linkages, and provide opportunities for habitat restoration, context sensitive design elements, and other sustainable design features to benefit communities
2. Supports economic development											
a. Facilitates goods movement and provides the necessary facilities to remove heavy vehicles from community streets			Reduces travel times for goods movement in Corridor compared to No Build	Reduces travel times for goods movement in Corridor compared to No Build Significantly reduces potential for heavy trucks on local streets.	.	Would result in less of a reduction in travel time than Alt 2/3	Would result in less of a reduction in travel time than Alt 2/3 with change dependent on definition of LAR	Reduces travel times for goods movement in Corridor compared to No Build Significantly reduces potential for heavy trucks on local streets.	Similar to Sheldon Bypass Option 1	Reduces travel times for goods movement in Corridor compared to No Build	Goods movement in the project area is primarily accomplished via trucking. As noted in I., e. above, based on travel times, the alternative alignments along Grant Line Road provide the highest potential to reduce heavy traffic, although these estimates are not specific to trucks but account for all traffic. Road geometry is also important in selection and use of truck travel routes, and therefore a straighter alignment best accommodates heavy trucks. Therefore, Alternative 2/3, would likely have the greatest potential to reduce travel time for goods movement.
b. Improves accessibility to existing and planned employee and commercial centers			Reduces travel times from residential areas to large employment and commercial areas in Corridor compared to No Build	Reduces travel times from residential areas to large employment and commercial areas in Corridor compared to No Build		Would result in less of a reduction in travel time than Alt 2/3	Would result in less of a reduction in travel time than Alt 2/3 with change dependent on definition of LAR	Reduces travel times from residential areas to large employment and commercial areas in Corridor compared to No Build	Similar to Sheldon Bypass Option 1	Reduces travel times from residential areas to large employment and commercial areas in Corridor compared to No Build	As noted in I., e. above, based on travel times, the alternative alignments along Grant Line Road provide the highest potential to reduce heavy traffic, although these estimates are not specific to residential traffic but account for all traffic. There are a number of existing and planned employment and

Screening Criteria	Existing Conditions	Future No Build*	Alt 1 Sunrise Alignment	Alt 2 & 3 Grant Line Alignment	Off-Corridor Multi-Use Path Option	Alternative 1, 2&3 Options for the Sheldon Community				Alt 4 Bradshaw Alignment	Comments
						Sheldon "No Build" Option	Limited Access Roadway Option	Bypass Option 1	Bypass Option 2		
											commercial centers in the greater study area that will draw employees and customers from residential areas throughout a wide area. Alternatives 1 and 4 serve some specific commercial centers best (i.e. the Rancho Cordova employment center), but Alternative 2/3 serves the widest range of centers located in all five JPA jurisdictions.
3. Considers the environment											
a. Minimizes impacts on wetlands, species habitat, and other ecologically sensitive areas* **Ranges given for a 400 to 800 foot wide corridor (except 30 feet assumed for off-corridor path option), based on GIS mapping of alignments in May 2010*	Numerous vernal pools, seasonal waters, and wetlands throughout the corridor, designated vernal pool recovery units, critical habitat for Sacramento & Slender Orcutt Grass Numerous streams and creeks, including the Cosumnes River and Laguna Creek, Morrison Creek, Elder Creek, and Alder Creek watersheds	Potentially impacts more than 27 acres of vernal pools Potentially impacts more than 74 acres of seasonal waters Potentially impacts more than 32 creek/stream crossings	Potentially impacts 11-24 acres of vernal pools Potentially impacts 17-63 acres of seasonal waters Potentially impacts 20 creek/stream crossings	Potentially impacts 11-27 acres of vernal pools Potentially impacts 21-43 acres of seasonal waters Potentially impacts 21 creek/stream crossings The limited access roadway reduces the potential for growth outside the USB and keeps growth confined to the currently planned growth areas.	Potential Impacts to <.5 acre of vernal pool Potentially impact 3 acres of seasonal waters Would not impact and creek/stream crossings	Effects likely to be similar to Future No Build	Impacts cannot be quantified until option is defined	(Additive to Alts 1,2, 3) Potentially impact <0.5 to <1.3 acres of vernal pools Potentially impacts <3-<8 acres of seasonal waters Potentially impacts 13 stream crossings *Note: These acreage estimates assume bypass on fill and will be updated with CAD data on pier locations*	(Additive to Alts 1,2, 3) Potentially impacts <0.5 to <1.5 acres of vernal pools Potentially impacts 4-9 acres of seasonal waters Potentially impacts 11 stream crossings *Note: These acreage estimates assume bypass on fill and will be updated with CAD data on pier locations*	Potentially impacts 10-22 acres of vernal pools Potentially impacts 22-47 acres of seasonal waters Potentially impacts 32 stream crossings Potentially impacts critical habitat	All Alternatives are situated within the S.E. Sacramento Valley VP Recovery Unit. Sufficient area to recover the species must be preserved within in the unit. Alternative 4 crosses or is adjacent to designated critical habitat (CH) for vernal pool tadpole shrimp. The CH designation prohibits any adverse modification to primary constituent elements that define the critical habitat in these designated areas. Impacts must be offset within designated critical habitat. Available mitigation within the designated area is extremely limited. Alternative 1 would have slightly more potential for impacts on wetlands and seasonal waters (up to 86 acres) compared to up to 69 and 68, respectively, for Alternatives 2/3 (without either Sheldon bypass option) or

Screening Criteria	Existing Conditions	Future No Build*	Alt 1 Sunrise Alignment	Alt 2 & 3 Grant Line Alignment	Off-Corridor Multi-Use Path Option	Alternative 1, 2&3 Options for the Sheldon Community				Alt 4 Bradshaw Alignment	Comments
						Sheldon "No Build" Option	Limited Access Roadway Option	Bypass Option 1	Bypass Option 2		
											Alternative 4. Alternatives 2&3 follow the existing Grant Line Road, which currently bisects several areas of high-quality vernal pool complexes. Road widening would result in high levels of direct and indirect impacts. Bridging the roadway in selected areas may provide opportunities to reconnect important segment of the Laguna Creek watershed, and avoid waters and vernal pool complexes—project level engineering would be required to permit calculation of the precise benefits of improving the hydrological connection of the creek and vernal pool habitat connectivity, and offsetting the direct and indirect impacts resulting from the road widening. Alternative 4 has the highest number of water crossings (32 crossings), compared to Alternatives 1 (20 crossings) and 2/3 (21 crossings) (without the Sheldon bypass), all of which must be bridged, or culverted. Impacts to waters in the Bypass options are calculated using the actual sq ft of each pier. If the density of pier placement effectively 'acts like fill'; the entire width of each row of piers may be used to fill and would result in higher impacts. Both Bypass Options encroach

Screening Criteria	Existing Conditions	Future No Build*	Alt 1 Sunrise Alignment	Alt 2 & 3 Grant Line Alignment	Off-Corridor Multi-Use Path Option	Alternative 1, 2&3 Options for the Sheldon Community				Alt 4 Bradshaw Alignment	Comments
						Sheldon "No Build" Option	Limited Access Roadway Option	Bypass Option 1	Bypass Option 2		
											on prime foraging, spawning, and aquatic, and riparian habitat in the Deer Creek and the Cosumnes River waters and floodplain. Either bypass would also potentially result in direct and indirect effects on other sensitive species, including Swainson's hawk, valley elderberry longhorn beetle, tricolored blackbird, western spadefoot, Bogg's Lake hyssop, and Sanford's arrowhead. The Cosumnes River is the last undammed river between the eastern Sierra Nevada and the Sacramento/San Joaquin Delta, and supports a rich aquatic ecosystem considered by resource agencies to be a prime river for spawning habitat restoration. The watershed historically supported fall-run Chinook salmon and restorations efforts are underway in the upper watershed as part of the USFWS's Anadromous Fish Restoration Program. Additionally, the Sacramento/San Joaquin Basin Plan identifies numerous beneficial uses, such as fish habitat and water quality, for upper Deer Creek. Uses within these watersheds, particularly construction of new roadway as would occur with the Bypass option, are likely to be restricted.
b. Minimizes impacts to air quality	TBD	Not evaluated in Phase 1 study;	Not evaluated in Phase 1 study;	Not evaluated in Phase 1 study; insufficient data	Not evaluated in Phase 1	Not evaluated in Phase 1 study; insufficient data	Not evaluated in Phase 1 study;	Not evaluated in Phase 1 study;	Not evaluated in Phase 1 study;	Not evaluated in Phase 1 study;	Air quality analysis will be based on traffic data and construction assumptions to be developed

Screening Criteria	Existing Conditions	Future No Build*	Alt 1 Sunrise Alignment	Alt 2 & 3 Grant Line Alignment	Off-Corridor Multi-Use Path Option	Alternative 1, 2&3 Options for the Sheldon Community				Alt 4 Bradshaw Alignment	Comments
						Sheldon "No Build" Option	Limited Access Roadway Option	Bypass Option 1	Bypass Option 2		
		insufficient data to quantify at this time	insufficient data to quantify at this time	to quantify at this time	study; insufficient data to quantify at this time	to quantify at this time	insufficient data to quantify at this time	insufficient data to quantify at this time	insufficient data to quantify at this time	insufficient data to quantify at this time	
c. Avoids/minimizes construction in the 100-year floodplain* **Ranges given for a 400 to 800 foot wide corridor, based on GIS mapping of alignments in May 2010 (except 30 feet assumed for off-corridor path option)*	FEMA 100-year floodplain FEMA 500-year floodplain DWR 100-year floodplain	Potential for floodplain encroachment similar to that of build alternatives.	Potential encroachment on 57-120 acres of 100-year floodplain Potential encroachment on 0 acres of 500-year floodplain Potential encroachment on 48-113 acres of DWR 100-year floodplain	Potential encroachment on 57-120 acres of 100-year floodplain Potential encroachment on 0 acres of 500-year floodplain Potential encroachment on 29-75 acres of DWR 100-year floodplain	Potential encroachment on 28 acres of 100-year floodplain Potential encroachment on 16 acres of 500-year floodplain Potential encroachment on 16 acres of DWR 100-year floodplain	Effects anticipated to be similar to Future No Build	Impacts cannot be quantified until alternative is defined	Potential encroachment on 260-517 acres of 100-year floodplain Potential encroachment on 0 acres of 500-year floodplain Potential encroachment on <2.5 acres of DWR 100-year floodplain	Potential encroachment on 204-405 acres of 100-year floodplain Potential encroachment on 0 acres of 500-year floodplain Potential encroachment on 4 acres of DWR 100-year floodplain	Potential encroachment on 207-411 acres of 100-year floodplain Potential encroachment on 259-524 acres of 500-year floodplain Potential encroachment on 26-62 acres of DWR 100-year floodplain	Either Sheldon bypass option would add from 204 to 517 additional acres of FEMA floodplain encroachment to Alternative 1 or 2/3 because the bypass is located within the Cosumnes River floodplain. Under Title 23, the mass of new structures located within the floodplain cannot diminish the flow capacity more than 0.05%; pier structures may slow flows, cause back up, or catch debris. 1 Alternative 4 has the highest potential for total acres of floodplain encroachment (up to 411 acres on 100-year and 524 acres on 500-year FEMA floodplain and up to 62 acres of DWR floodplain—totaling more than 1,000 acres of potential encroachment). It is the only alternative impacting the 500 yr floodplain. Alternatives 1 and II & III have the same impacts to FEMA 100 yr, but Alt 1 impacts more DWR 100-yr because Sunrise Blvd crosses the Laguna Creek watershed. The Multi-use trail encroaches upon a disproportionate amount of floodplain because the pathway design follows Laguna

						Alternative 1, 2&3 Options for the Sheldon Community					
Screening Criteria	**Existing Conditions**	**Future No Build***	**Alt 1 Sunrise Alignment**	**Alt 2 & 3 Grant Line Alignment**	**Off-Corridor Multi-Use Path Option**	**Sheldon "No Build" Option**	**Limited Access Roadway Option**	**Bypass Option 1**	**Bypass Option 2**	**Alt 4 Bradshaw Alignment**	**Comments**
											Creek; however, the impacts are not comparable due to the level of improvements.
d. Minimizes noise pollution in existing or developing communities		Not evaluated in Phase 1 study; insufficient data to quantify at this time	Not evaluated in Phase 1 study; insufficient data to quantify at this time	Not evaluated in Phase 1 study; insufficient data to quantify at this time	Not evaluated in Phase 1 study; insufficient data to quantify at this time	Not evaluated in Phase 1 study; insufficient data to quantify at this time	Not evaluated in Phase 1 study; insufficient data to quantify at this time	Not evaluated in Phase 1 study; insufficient data to quantify at this time	Not evaluated in Phase 1 study; insufficient data to quantify at this time	Not evaluated in Phase 1 study; insufficient data to quantify at this time	Sensitive receptors will include hospitals, churches, schools, residential areas. Alternative 2/3 would have a lower potential of impact due to noise pollution relative to residential communities as it traverses through less residential density than Alternatives 1 & 4.
4. Considers cultural resources *Note: Data based on Information Center Record Search of a 0.25 mi. area surrounding the alignments; no field studies were conducted*		Potentially impacts more than 9 archaeological resources	Potentially impacts 30 prehistoric cultural resources	Potentially impacts 26 prehistoric cultural resources	Potentially impacts 30 prehistoric cultural resources	Effects likely to be similar to Future No Build	Alternative not yet defined	No previously recorded cultural resources within the Sheldon options	No previously recorded cultural resources within the Sheldon options	Potentially impacts 26 prehistoric cultural resources	Based on the Information Center record search, all the alternatives would have similar impacts on cultural resources. *Note: Reconnaissance level surveys for the draft PEIR may identify additional potential archaeological sites not currently listed in the Information Center Record Search files.*
a. Minimizes impacts on historical sites and historic buildings *Note: Data based on Information Center Record Search of a 0.25 mi. area surrounding the alignments; no field studies were conducted*	Recorded historic architectural resources, including portions of Old Placerville Road, Western Pacific Railroad, and Central California Traction Company Railroad Recorded archaeological	Potentially impacts more than 48 historic architectural resources	Potentially impacts 48 historic resources	Potentially impacts 49 historic resources	Potentially impacts 121 historic resources *(note: many "sites" identified in the Info Center files may represent related scatters and/or isolates)	Effects likely to be similar to Future No Build	Alternative not yet defined	No previously recorded cultural resources	No previously recorded cultural resources	Potentially impacts 47 historic resources	All the alternatives would have similar impacts on cultural resources. *Note: Reconnaissance level surveys for the draft PEIR may identify additional potential historic sites or buildings not currently listed in the Information Center Record Search files.*

Screening Criteria	Existing Conditions	Future No Build*	Alt 1 Sunrise Alignment	Alt 2 & 3 Grant Line Alignment	Off-Corridor Multi-Use Path Option	Alternative 1, 2&3 Options for the Sheldon Community: Sheldon "No Build" Option	Limited Access Roadway Option	Bypass Option 1	Bypass Option 2	Alt 4 Bradshaw Alignment	Comments
	resources, including Murphy's Ranch/Lent Ranch Mormon Hill Historic District and American River Mining District										
5. Minimize impacts to existing and planned development		TBD	Expressway portions of the alignment are limited to minimize impacts to planned development. Access will be limited.	Impact to planned development is minimized. Existing access will be impacted.	Not anticipated to affect development	Effects anticipated to be similar to (undefined) Future No build	Alternative not yet defined	Existing access impacts in Sheldon area will be minimized, but will still require some access control.	Similar to Sheldon Bypass Option 1	Potential impacts to planned Mather redevelopment. Expressway portions of the alignment are limited to reduce impacts to existing and planned development. Access will be limited, which may impact existing development.	Alternative 1 would not minimize impacts on planned development and would be inconsistent with general plan build out assumptions.
6. Minimizes inconsistencies with local jurisdiction's General Plans			City of Rancho Cordova GP roadway # of lanes is based on LOS D, Connector interchange locations based on maintaining LOS C where feasible. Therefore a higher service facility and more lanes are	Consistent with land use and circulation elements in the general plans.	Consistent with general plans	Consistent with land use and circulation elements in the general plans.	Alternative not yet defined	Bypass is outside USB and therefore is not consistent with the Sacramento County General Plans	Similar to Sheldon Bypass Option 1	City of Rancho Cordova GP roadway # of lanes is based on LOS D, Connector interchange locations based on maintaining LOS C where feasible. Therefore more lanes are shown on Douglas from	Alternative 1 & 4 would have the most impact on planned development along the corridor.

Screening Criteria	Existing Conditions	Future No Build*	Alt 1 Sunrise Alignment	Alt 2 & 3 Grant Line Alignment	Off-Corridor Multi-Use Path Option	Alternative 1, 2&3 Options for the Sheldon Community				Alt 4 Bradshaw Alignment	Comments
						Sheldon "No Build" Option	Limited Access Roadway Option	Bypass Option 1	Bypass Option 2		
			shown on Sunrise Blvd from Jackson to Douglas than may be required by R.C. GP. Segment of Sunrise Blvd from Douglas to WRR is in direct conflict with the land use and circulation plans for the Rio del Oro project.							Sunrise to Grant Line Road than may be required by R.C. GP.	
7. Minimizes the potential for growth inducement beyond the anticipated growth shown in local jurisdiction's General Plans	Areas abutting the alternative corridors that are currently in agricultural and open space use include areas south of Kammerer Road (common to all alternatives), east of Grant Line Road, and south of White Rock Road (common to all alternatives	Construction of improvements contained in currently adopted City and County general plans would provide additional access to currently undeveloped areas south of the alignment, east of the Grant Line Road, and south of White Rock Road and make these areas more attractive for development.	Access controls would limit access to undeveloped areas not planned for development	Access controls would limit access to undeveloped areas not planned for development Portions of the area east of Grant Line Road and west of the Cosumnes River floodplain are designated vernal pool recovery units, which are important for preservation. The existing Grant Line Road currently bifurcates two reaches of Laguna Creek	Not anticipated to induce growth	Effects similar to future no build	Alternative not defined	The Bypass would construct a roadway within open space habitat protected under various state and federal regulations for watersheds, habitat, and floodplains Access controls would limit access to undeveloped areas not planned for development Portions of the area east of	Similar to Sheldon Bypass Option 1	Access controls would limit access to undeveloped areas not planned for development Much of the alignment along Bradshaw Road is not included within vernal pool recovery unit boundaries, and several large-scale developments and specific plans are currently in planning. However, the connection	While Alternative 2/3 could have the greatest potential for growth inducement, access controls would limit access to undeveloped areas not planned for development. Alternatives 2 & 3 are located closest to the UDA and USA limits and are the outermost alignments. However, there are several large-scale developments and specific plans in review with the County that are located between the Alternatives 2 & 3 and the UDA/USA boundaries that would push the limits for growth beyond the Connector if they go to build out.

Screening Criteria	Existing Conditions	Future No Build*	Alt 1 Sunrise Alignment	Alt 2 & 3 Grant Line Alignment	Off-Corridor Multi-Use Path Option	Alternative 1, 2&3 Options for the Sheldon Community: Sheldon "No Build" Option	Limited Access Roadway Option	Bypass Option 1	Bypass Option 2	Alt 4 Bradshaw Alignment	Comments
				surrounded by high-density vernal pool landscape. Project designs that include low bridging in these areas present otherwise unavailable opportunities to reconnect vernal pool habitat.				Grant Line Road and west of the Cosumnes River floodplain are designated vernal pool recovery units, which would place restrictions on development		from Bradshaw Road eastward would cross critical habitat (see above) and the South Mather Master Plan.	
8. Minimizes displacement of existing residences and businesses		Existing businesses and residences may be impacted due to widening of existing roadway.	Existing businesses and residences may be displaced due to widening of existing roadway and access control.	Existing businesses and residences may be displaced due to widening of existing roadway and access control.	Not anticipated to result in displacements	Effects similar to future no build	Alternative not defined	Existing rural properties may be impacted due to new alignment.	Similar to Sheldon Bypass Option 1	Existing business and residences may be displaced due to widening of existing roadway and access control.	At the program level of design, it is not possible to identify the existing businesses and residences that could be displaced. Removal of driveways serving residential and commercial uses and other impacts on existing access points could result in displacements. Based on the criteria developed for 1., g, above, Alternative 4 has the most potential for impact because there are more existing driveways along this alignment (154), as compared to Alternatives 1 and 2/3 (91) (and associated costs
9. Minimizes cost prohibitive alternatives and impractical transportation improvements	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	
10. Minimizes features that encourage growth in areas not designated for growth in	No access is currently available for undeveloped areas south of Kammerer	There are no access restrictions identified for these areas in the currently	Access controls would limit access to undeveloped areas not planned for	Access controls would limit access to undeveloped areas not planned for	Not anticipated to affect growth	Effects similar to future no build	Alternative not defined	The Bypass would construct a roadway within open space habitat	Similar to Sheldon Bypass Option 1	Access controls would limit access to undeveloped areas not planned for	

Screening Criteria	Existing Conditions	Future No Build*	Alt 1 Sunrise Alignment	Alt 2 & 3 Grant Line Alignment	Off-Corridor Multi-Use Path Option	Alternative 1, 2&3 Options for the Sheldon Community				Alt 4 Bradshaw Alignment	Comments
						Sheldon "No Build" Option	Limited Access Roadway Option	Bypass Option 1	Bypass Option 2		
adopted local jurisdiction's general plan or the MTP2035** ***Source: 2006 Phase 1 report*	Road, east of Grant Line Road, and south of White Rock Road	adopted general plans	development	development Portions of the area east of Grant Line Road and west of the Cosumnes River floodplain are designated vernal pool recovery units, which could place further restrictions on development				protected under various state and federal regulations for watersheds, habitat, and floodplains Access controls would limit access to undeveloped areas not planned for development Portions of the area east of Grant Line Road and west of the Cosumnes River floodplain are designated vernal pool recovery units, which could place further restrictions on development		development Much of the alignment along Bradshaw Road is not included within vernal pool recovery unit boundaries and thus could have fewer restrictions on development	

[1] Note that fastest travel time route under Alternative 4 follows Grant Line Road, not Bradshaw Road

ALTERNATIVES DESCRIPTIONS (figures referenced are from the NOP):

No-Project Alternative

The No-Project Alternative represents the transportation system in SACOG's adopted 2035 MTP, with widening of the existing roadways along the Connector alignments to 4 or 6 lanes. Access along the roadways within the study area under the No-Project Alternative represents "business as usual," with only minor limitations on new driveways. The No-Project Alternative is also assumed to have numerous at-grade intersections with their locations based on adopted and proposed General Plans and Specific Plans. For the Sheldon Area, the Elk Grove Rural Roadway Standards would apply with improvements made as traffic volume thresholds warrant.

Proposed Preliminary Alternatives

Four preliminary build alternatives are proposed, in addition to a no-build (no project) alternative. The build alternatives contain four elements—roadway, non-motorized trails; transit services and facilities; and open space acquisition—and each have a mix of transit services and facilities both along and off the alignment based on the transit policy. The no-build and build alternatives are described below and illustrated in Figure 2 and Figure 5-typical section segments.

Alternative 1. Sunrise Alignment

The Alternative 1 concept utilizes existing Sunrise Boulevard for a portion of the alignment. This alternative, originating at the I-5/Hood-Franklin Road interchange, follows the common Connector alignment to SR99 along Kammerer Road. From the Grant Line/SR99 interchange, the alignment would proceed along Grant Line Road to Calvine Road, continuing as a thoroughfare except in the Sheldon area which has several options that are defined below for the Sheldon Community Options for Alternatives 1, 2, and 3. The Connector then continues from Calvine Road to Sunrise Boulevard as an expressway.

From there, the alignment follows Sunrise Boulevard north as an expressway from Grant Line Road to just north of State Route 16 (Jackson Highway) and then a thoroughfare segment north of State Road 16 (Jackson Highway) to Douglas Road. North of Douglas Road, the alignment would be east of and parallel to Sunrise Boulevard, requiring an undefined new thoroughfare segment to provide a connection to White Rock Road. Alternative 1 continues east as a thoroughfare, utilizing the White Rock Road alignment through Rancho Cordova. East of Grant Line Road, the Connector then follows the common Connector alignment along White Rock Road and the southern boundary of the Folsom sphere of influence to the El Dorado County with an expressway. In El Dorado County, the Connector is proposed to be a thoroughfare segment along White Rock Road to the terminus at U.S. 50. (See Figure 2 and Figure 5)

Alternative 2/3. Grant Line Alignment

The Alternative 2 alignment follows Kammerer Road, Grant Line Road, and White Rock Road. The non-motorized facilities follow the main alignment. This concept is located primarily on Grant Line Road. Similar to the Alternative 1, the alignment would proceed from I-5 to SR99 along Kammerer Road. From the Grant Line/SR99 interchange, the Connector would remain on Grant Line Road through Elk Grove and Sacramento County to White Rock Road in Rancho Cordova. On Grant Line Road, from Bradshaw Road to Calvine Road, several options are being considered for the Sheldon Community under Alternatives 1, 2, and 3 . From Calvine Road to White Rock Road, the Connector is proposed to be an expressway. This expressway continues on White Rock Road following the common alignment to the El Dorado County line. In El Dorado County, the Connector is proposed to be a thoroughfare segment along White Rock Road to the terminus at U.S. 50. (See Figure 2 and Figure 5)

Off-Corridor Multi-Use Trail

The Alternative 3 alignment is the same as under Alternative 2 except in the design of the non-motorized facilities. The on-corridor bike/pedestrian component under this alternative would be restricted to one side of the roadway and would have limited connections to local streets and few enhancements to intersection and interchange access. However, this alternative would include an additional multi-use trail component aligned off the Connector route. This multi-use path would be constructed along Laguna Creek, the Folsom South Canal, Folsom Boulevard, Alder Creek, and Union Pacific Railroad right-of-way to White Rock Road. The multi-use trail location is consistent with the bicycle master plans of the local jurisdictions, and portions of a trail system is already in existence along Laguna Creek and the Folsom South Canal and would be utilized for this alternative. (See Figure 2)

Sheldon Community Options for Alternatives 1, 2, and 3

Several options are being evaluated for the portion of the Connector alignment through the Sheldon community as part of Alternatives 1, 2, and 3. These options include various alignments for a bypass that would take the Connector route off of the Grant Line Road alignment or that would realignment local street and access points.

Sheldon Bypass Options 1 and 2

These options would construct a bypass of Grant Line Road south of the central part of the Sheldon community. Either bypass would be constructed above grade through the Cosumnes River floodplain, just east of Grant Line Road, from Waterman Road to Eagles Nest (Option 1) or Bradshaw Road to Eagles Nest (Option 2). No access would be provided along the bypass through the floodplain, including at Wilton Road. Under this option, bicycle and pedestrians access would not be accommodated along the bypass because of the need to limit project footprint and alignment widths within the floodplain. Instead, bicycle and pedestrians would be accommodated along Grant Line Road. (See Figure 2 and Figure 4) With a Bypass, the segment of Grant Line Road running through the Sheldon area would not be incorporated into the Project but would remain a rural roadway under the jurisdiction of the City of Elk Grove. This road would be managed in accordance with the Rural Road Guidelines adopted by the City, which anticipate adjustments in capacity as warranted by traffic demand.

Sheldon Limited Access Roadway (LAR) Option

This option proposes to construct a rural road segment, with a raised center median along Grant Line Road thorough the Sheldon Area. This option would eliminate direct driveway access, increasing the capacity of the road while minimizing the right of way impact as much as possible. Controlled spacing of signalized intersections and frontage roads would need to be developed to access businesses and residences at selected locations. An effort will be undertaken to investigate the feasibility of this option and provide sufficient detail for analysis in the EIR. (See Figure 3)

Sheldon No-Build Option

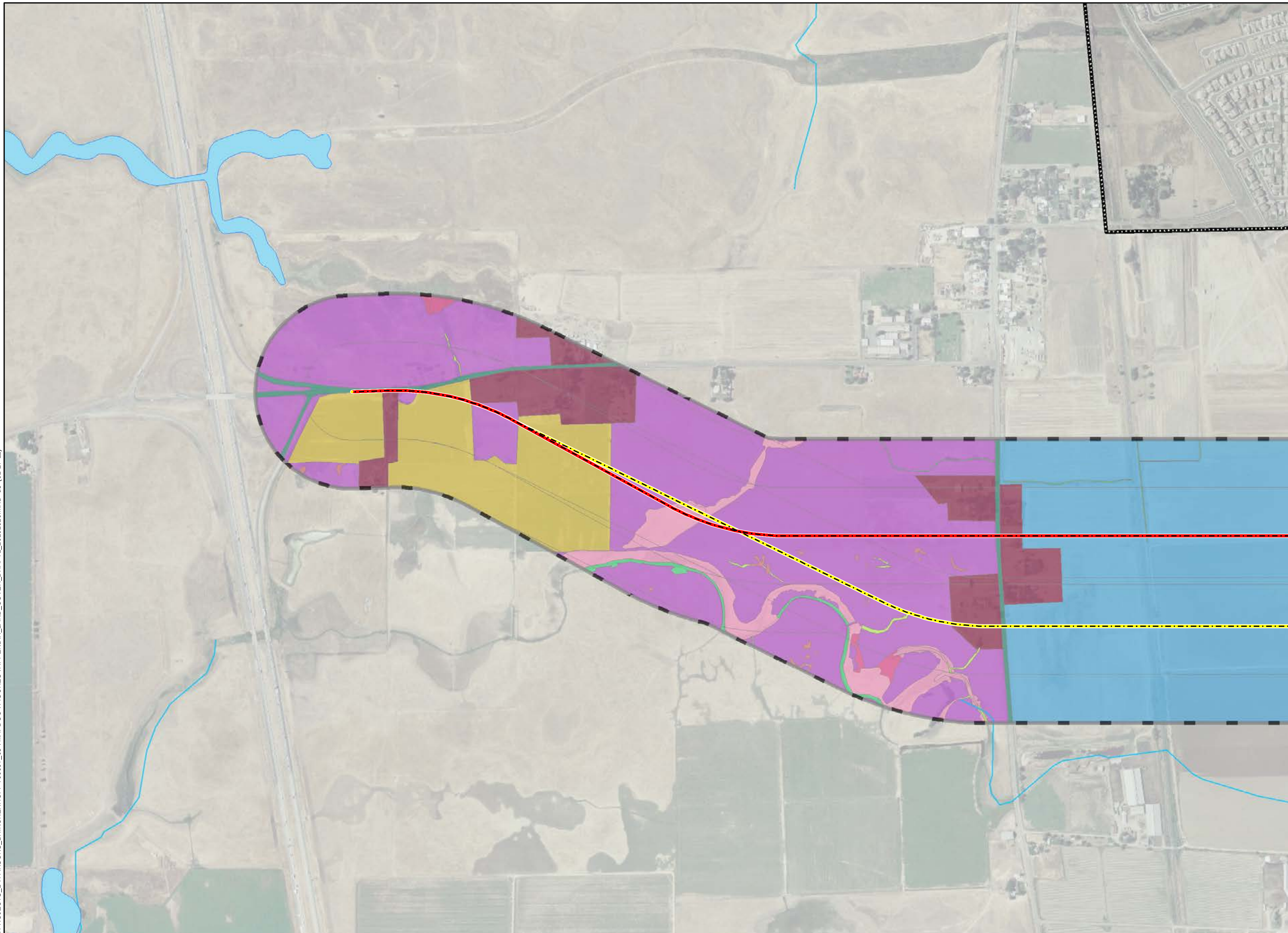
This option proposes the segment of Grant Line Road running through the Sheldon area would not be incorporated into the Project but would remain a rural roadway under the jurisdiction of the City of Elk Grove. This road would be managed in accordance with the Rural Road Guidelines adopted by the City, which anticipate adjustments in capacity as warranted by traffic demand.

Alternative 4. Bradshaw Alignment

The Alternative 4 concept utilizes existing Bradshaw Road for a segment of the Connector. As with all other alternatives, this concept originates at I-5/Hood-Franklin Road interchange, and the first segment, up to Bradshaw Road, matches that of the previously described Alternatives 1 and 2. At Grant Line Road and Bradshaw Road, the Connector would be aligned to the north along a widened Bradshaw Road up to State Route 16 (Jackson Highway) as a thoroughfare, with access limited and consolidated where feasible. Signalized intersection spacing of ½ mile may not be feasible in this area due to the existing and approved development, therefore minimal ¼ mile spacing may be allowed for this stretch. From Jackson Highway, a new expressway would be constructed in a predominantly easterly direction, along the southern boundary of Mather Airport, to the intersection of Sunrise Boulevard and Douglas Road. The alignment would then follow Douglas Road, as a thoroughfare segment to Grant Line Road where it then follows Grant Line Road as an expressway. East of Grant Line Road, the Connector continues as an expressway and follows the common Connector alignment along White Rock Road to El Dorado County. In El Dorado County the Connector is proposed to be a thoroughfare along White Rock Road to the terminus at U.S. 50. The additional non-motorized trail alignment is the same as in Alternative 3. (See Figure 2 and Figure 5)

Appendix I

Biological Resources in the Project Area



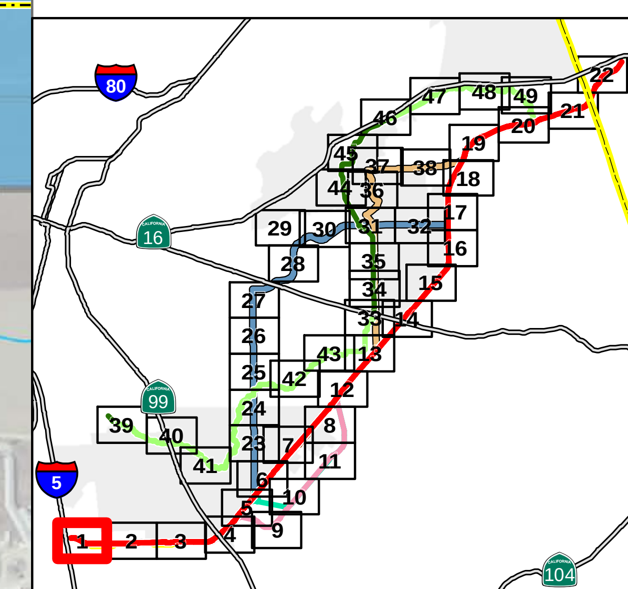
Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
Sheldon High Access Roadway
Sheldon Reduced Access Roadway Option
Proposed Off-Corridor Multi-Use Path
Existing Off-Corridor Multi-Use Path
Sunrise Boulevard Alignment
Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
Disturbed
Dredge Tailings
Freshwater Marsh
High Density Development
Irrigated Pasture
Landscaped
Low Density Development
Major Roads
Mine Tailings
Mixed Riparian Scrub
Mixed Riparian Woodland
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 1

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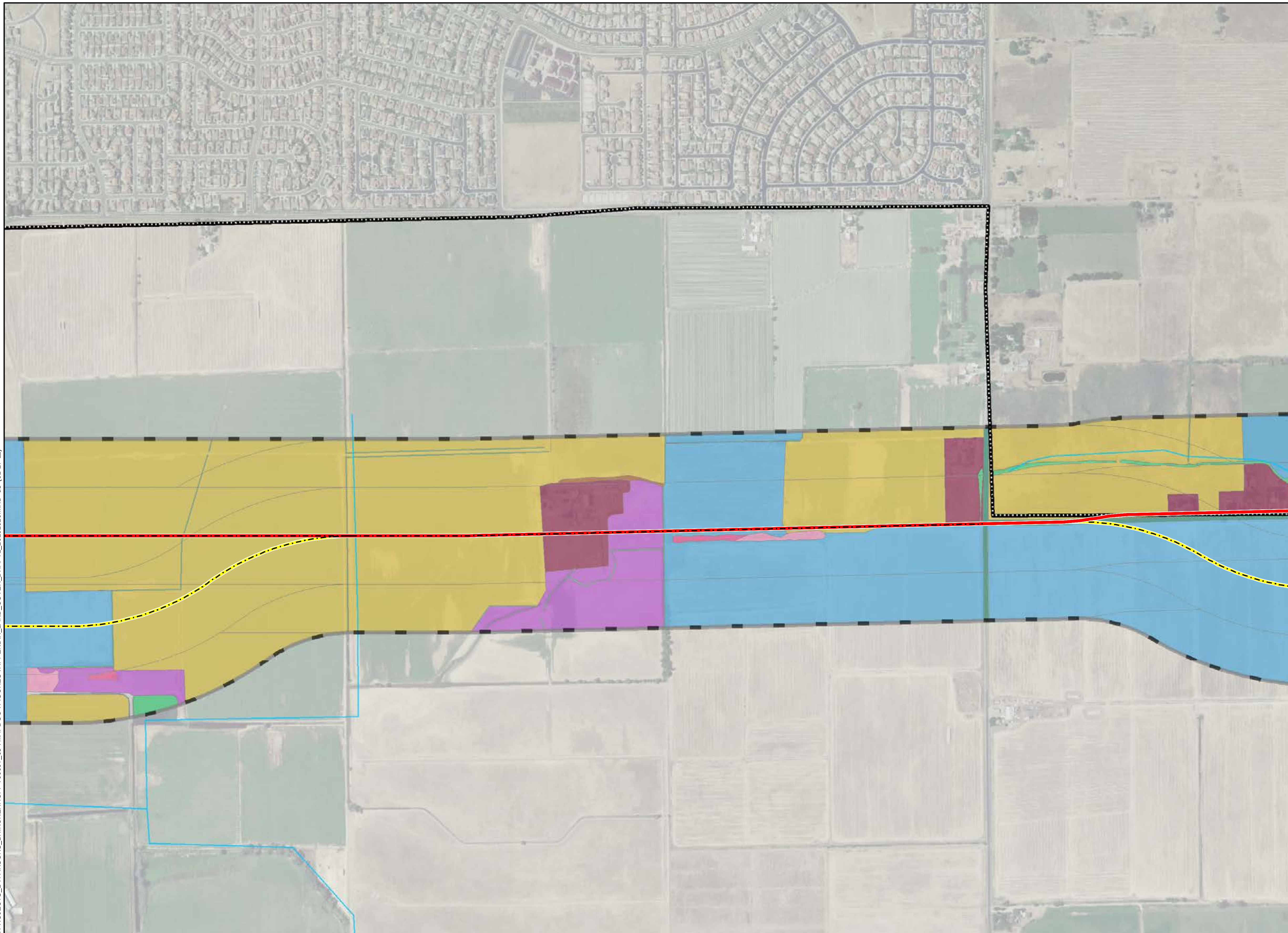

Highway
Major Road
Road
Study Area
New Road Construction

Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
Sheldon High Access Roadway
Sheldon Reduced Access Roadway Option
Proposed Off-Corridor Multi-Use Path
Existing Off-Corridor Multi-Use Path
Sunrise Boulevard Alignment
Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
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Irrigated Pasture
Landscaped
Low Density Development
Major Roads
Mine Tailings
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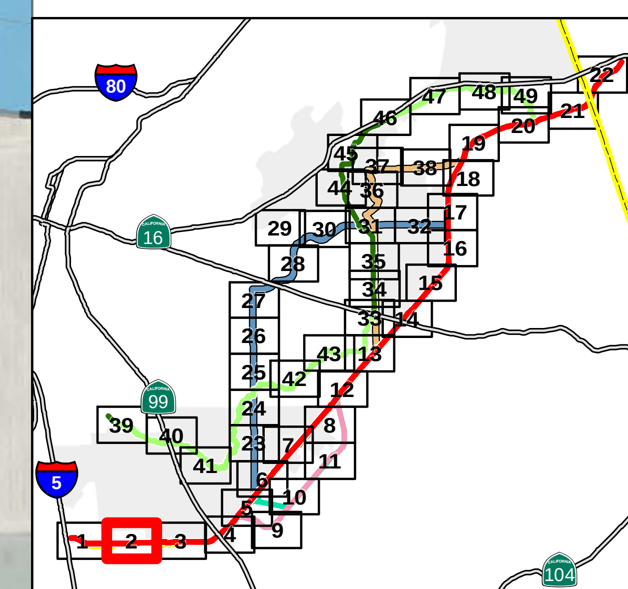
Mixed Riparian Woodland
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 2

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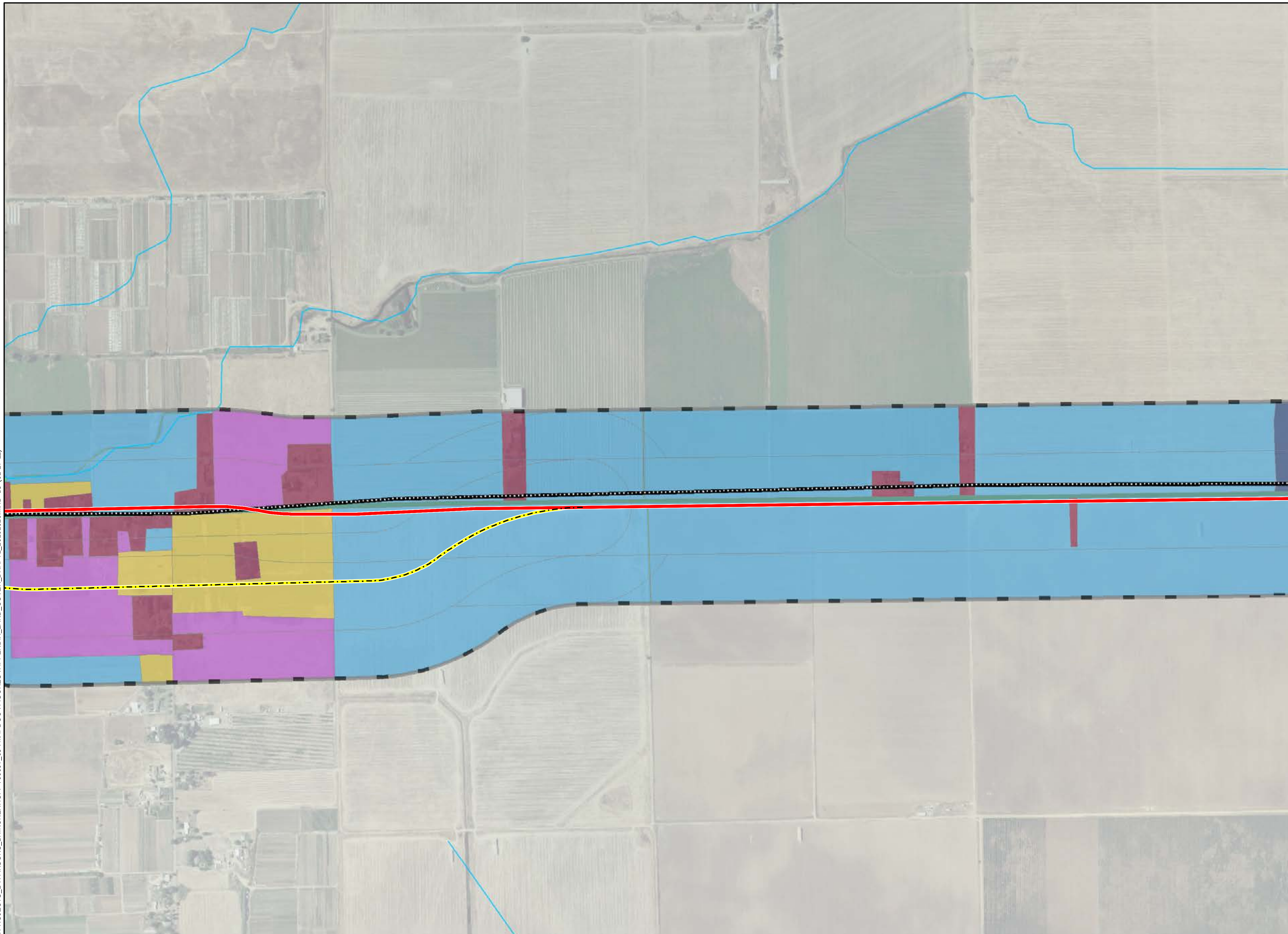

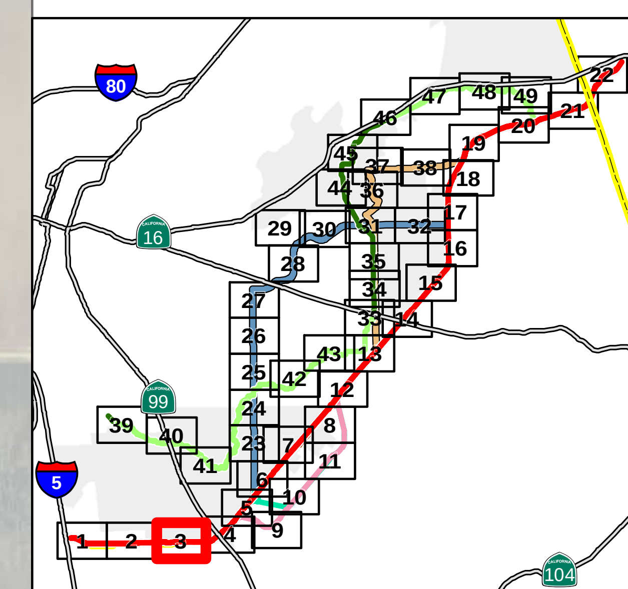

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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

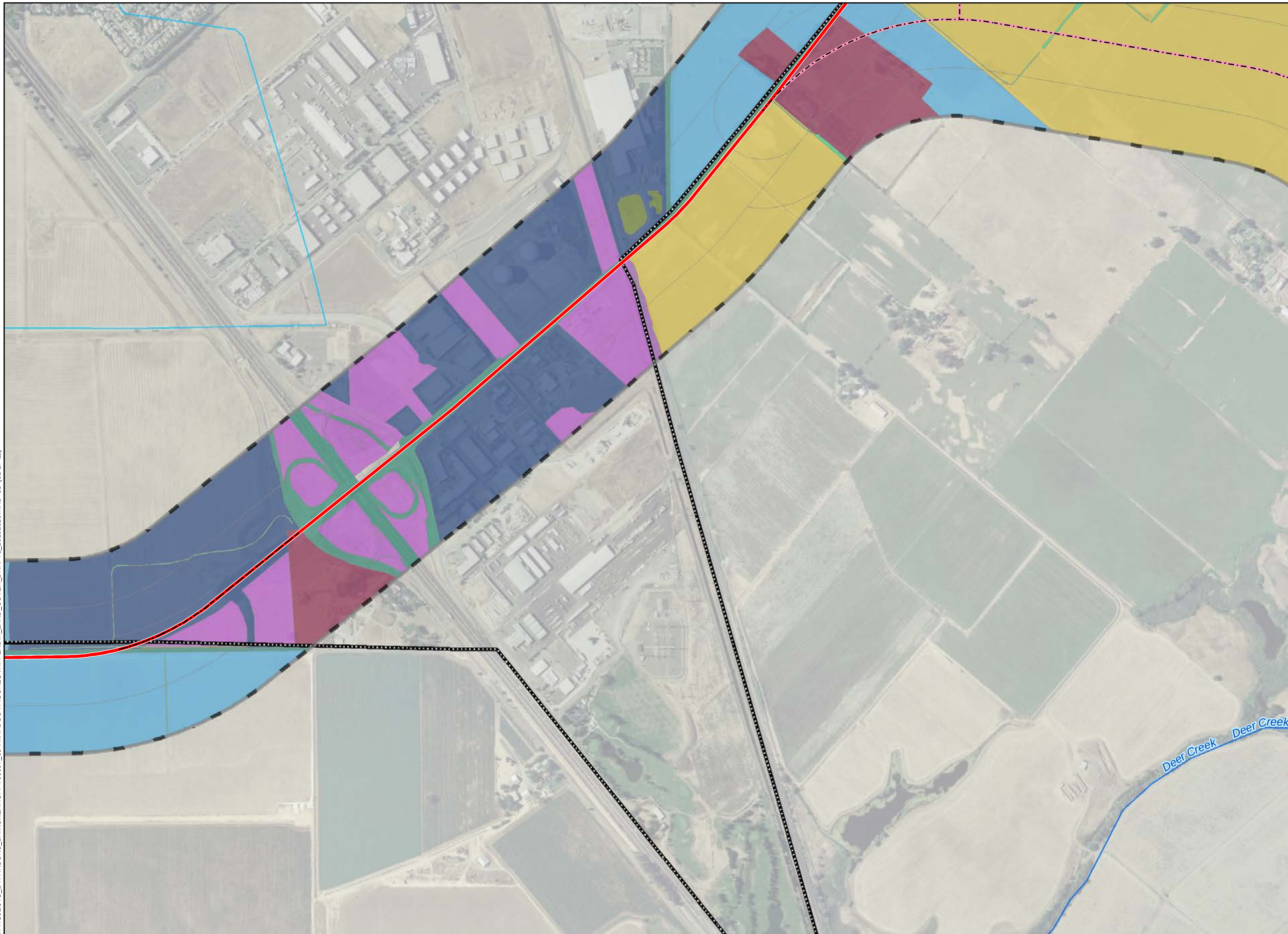
Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 3



- Highway
- Major Road
- Road
- Study Area
- New Road Construction
- Water Bodies
- Streams
- Major Streams

Project Description

- Proposed Project
- Kammerer Road Bypass Option
- Deer Creek Causeway Option 1
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- Sheldon Reduced Access Roadway Option
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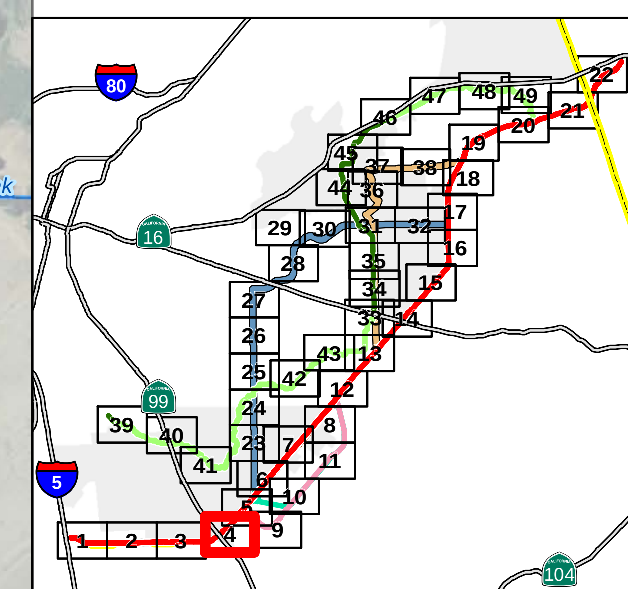
- Existing Off-Corridor Multi-Use Path
- Sunrise Boulevard Alignment
- Bradshaw Road Alignment

Land Cover Type

- Annual Grassland
- Aqueduct
- Blue Oak Woodland
- Cropland
- Disturbed
- Dredge Tailings
- Freshwater Marsh
- High Density Development
- Irrigated Pasture
- Landscaped
- Low Density Development
- Major Roads
- Mine Tailings
- Mixed Riparian Scrub
- Mixed Riparian Woodland
- Open Water
- Orchard
- Riparian Woodland
- Seasonal Pond
- Seasonal Wetland
- Stream
- Swale
- Valley Oak Riparian Woodland
- Vernal Pool
- Vineyard



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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

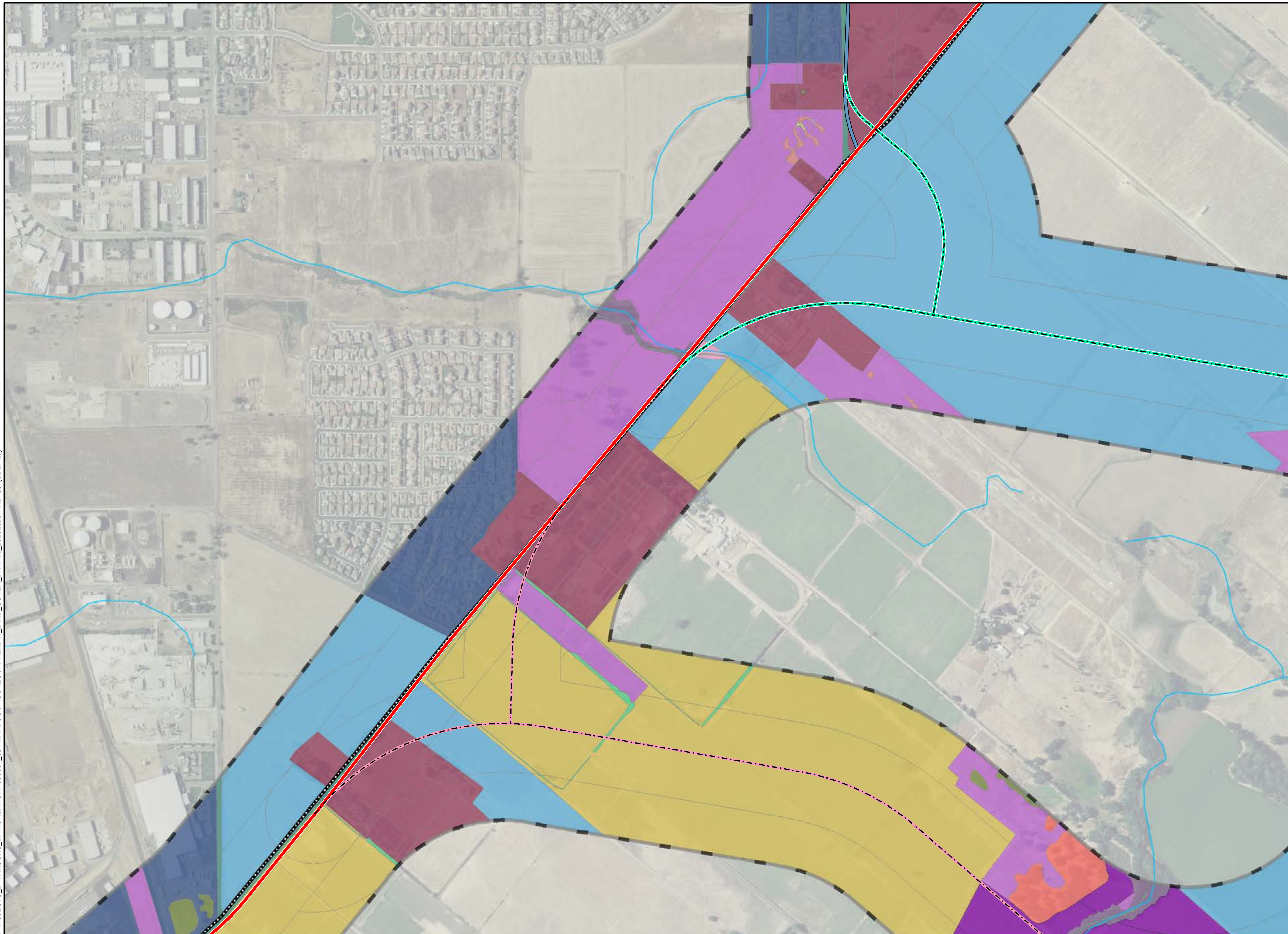
Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 4



- Highway
- Major Road
- Road
- Study Area
- New Road Construction
- Water Bodies
- Streams
- Major Streams

Project Description

- Proposed Project
- Kammerer Road Bypass Option
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- Bradshaw Road Alignment

Land Cover Type

- Annual Grassland
- Aqueduct
- Blue Oak Woodland
- Cropland
- Disturbed
- Dredge Tailings
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- High Density Development
- Irrigated Pasture
- Landscaped
- Low Density Development
- Major Roads
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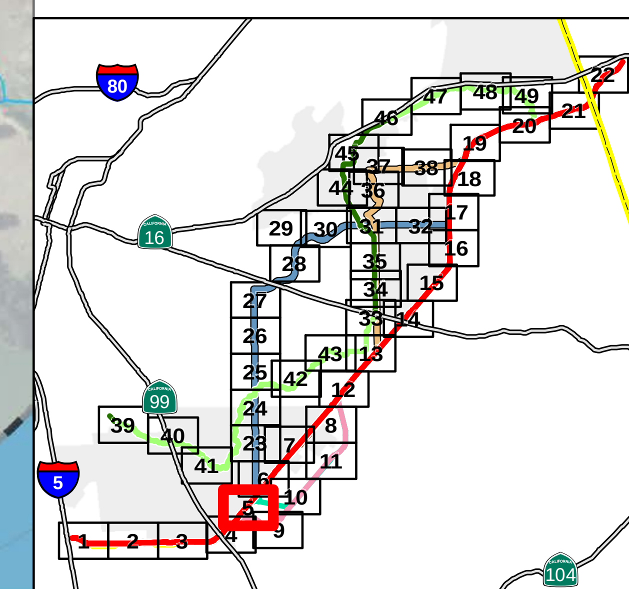
- Open Water
- Orchard
- Riparian Woodland
- Seasonal Pond
- Seasonal Wetland
- Stream
- Swale
- Valley Oak Riparian Woodland
- Vernal Pool
- Vineyard



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Plot Date
January 27, 2011

CAPITAL SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

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Sheet 5

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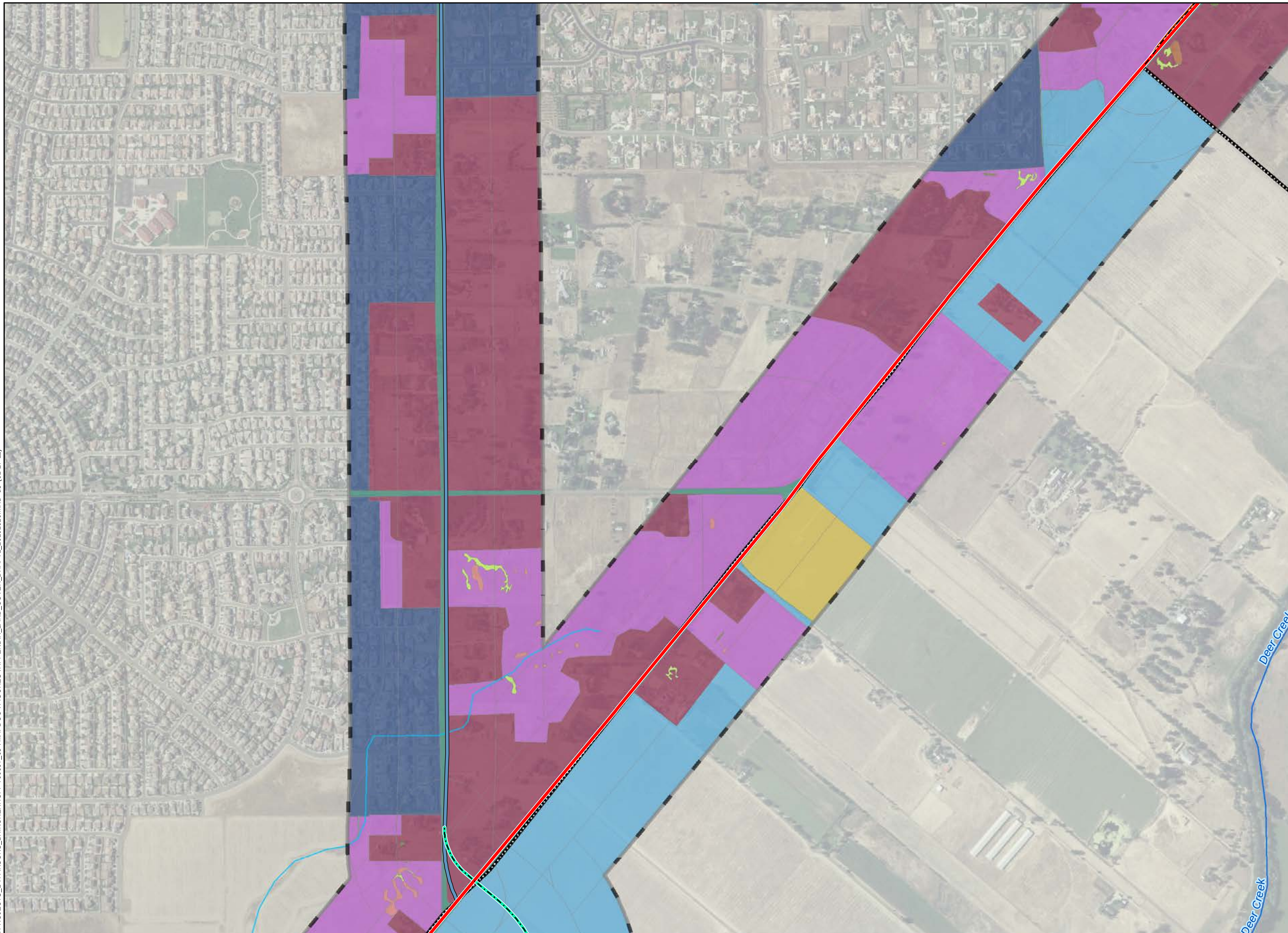


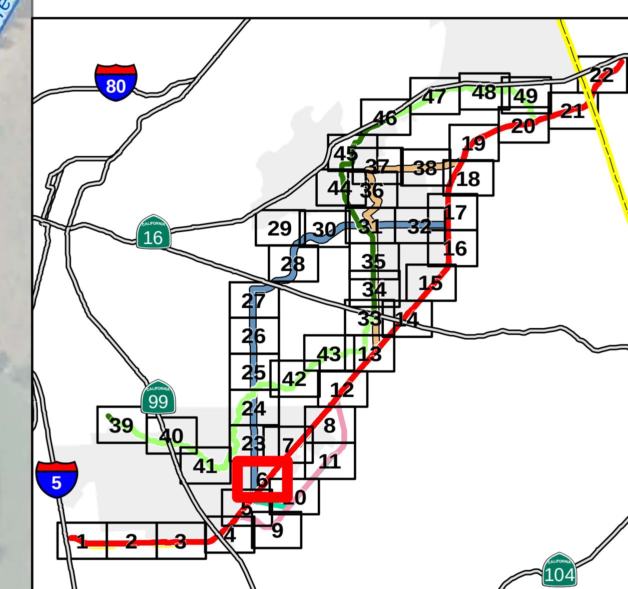
Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
Sheldon High Access Roadway
Sheldon Reduced Access Roadway Option
Proposed Off-Corridor Multi-Use Path
Existing Off-Corridor Multi-Use Path
Sunrise Boulevard Alignment
Bradshaw Road Alignment

Land Cover Type

Annual Grassland	Mine Tailings
Aqueduct	Mixed Riparian Scrub
Blue Oak Woodland	Mixed Riparian Woodland
Cropland	Open Water
Disturbed	Orchard
Dredge Tailings	Riparian Woodland
Freshwater Marsh	Seasonal Pond
High Density Development	Seasonal Wetland
Irrigated Pasture	Stream
Landscaped	Swale
Low Density Development	Valley Oak Riparian Woodland
Major Roads	Vernal Pool
	Vineyard



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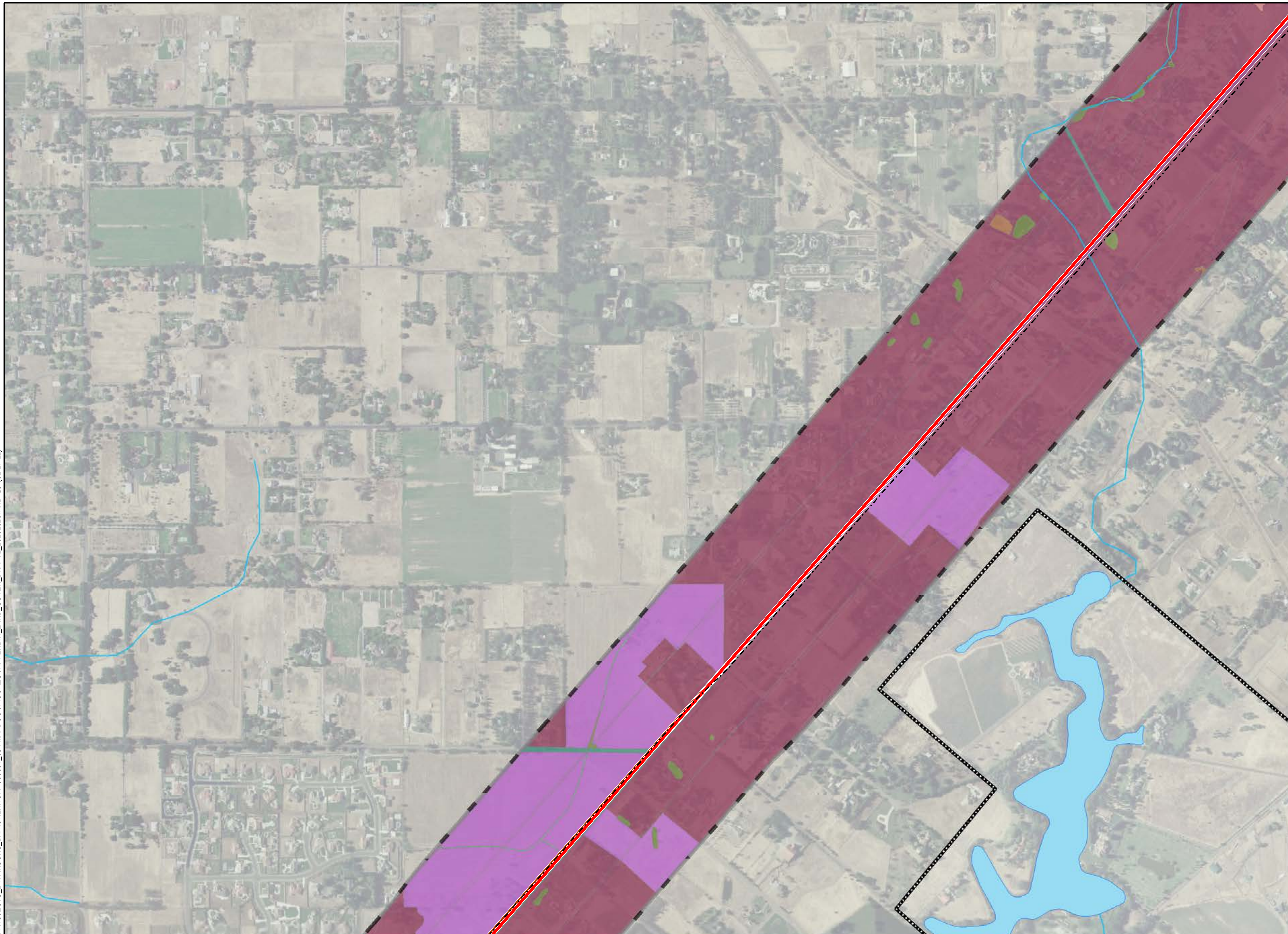
Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 6



Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
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Land Cover Type

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Aqueduct
Blue Oak Woodland
Cropland
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Irrigated Pasture
Landscaped
Low Density Development
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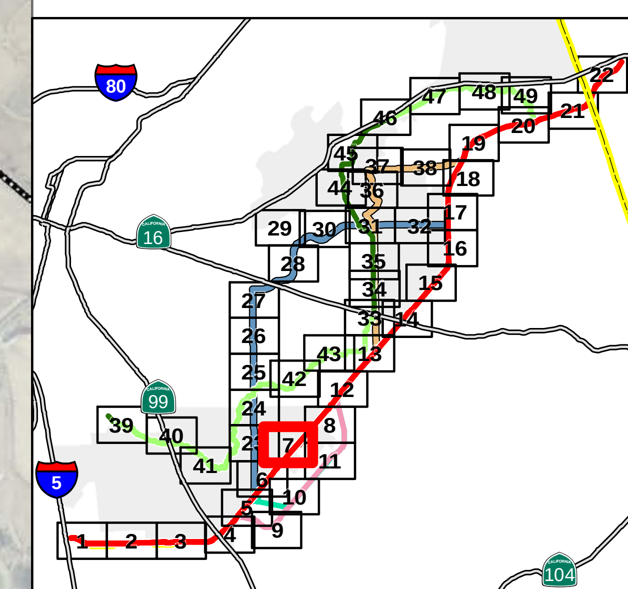
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 7

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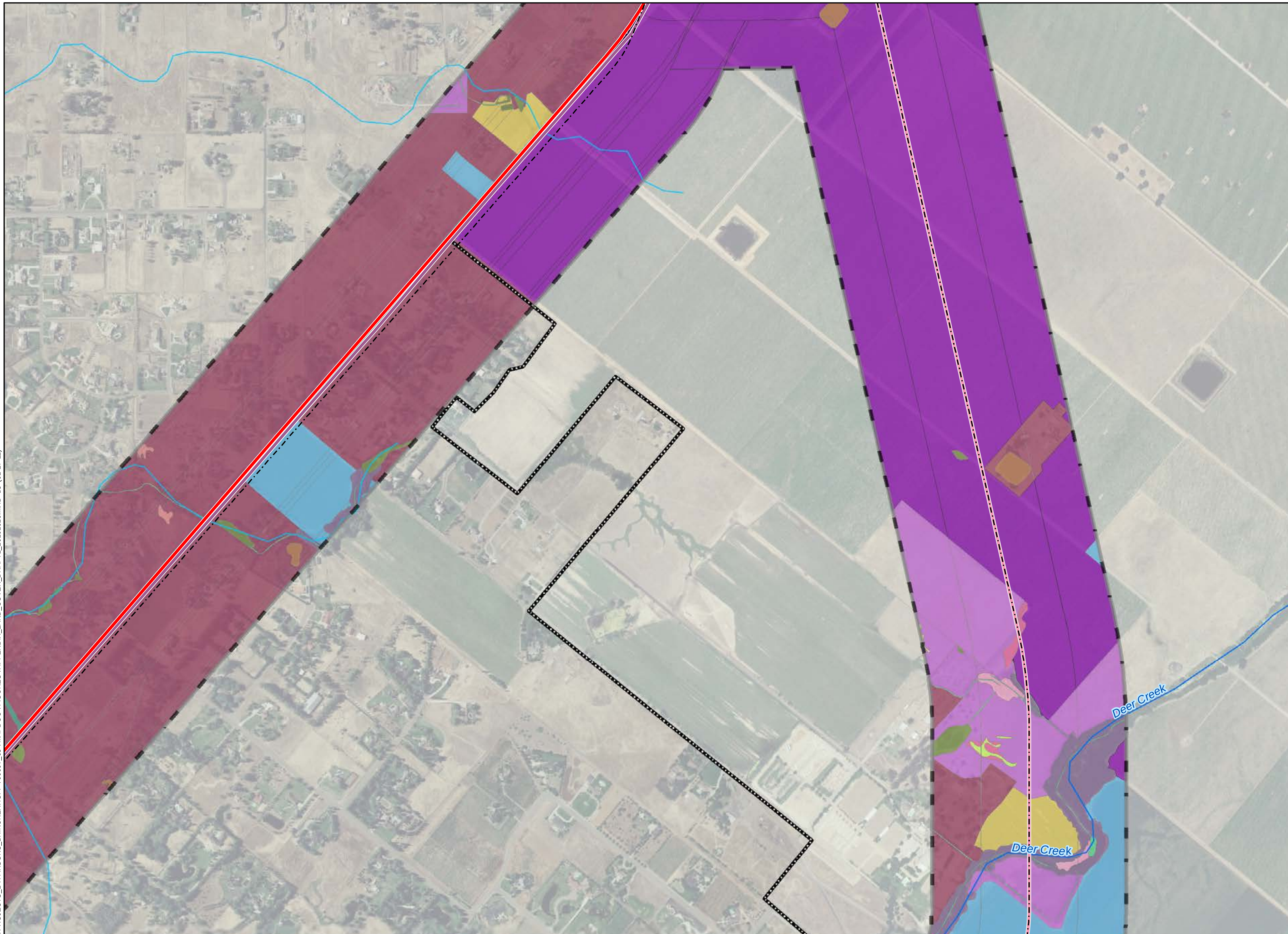

- Highway
- Major Road
- Road
- Study Area
- New Road Construction
- Water Bodies
- Streams
- Major Streams

Project Description

- Proposed Project
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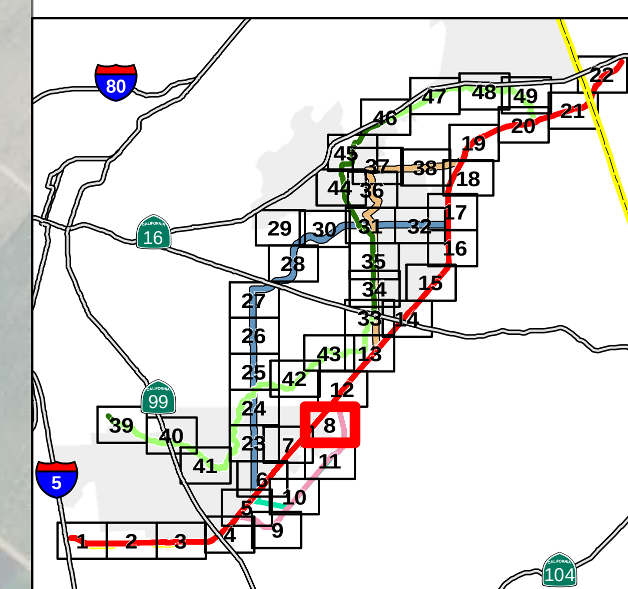

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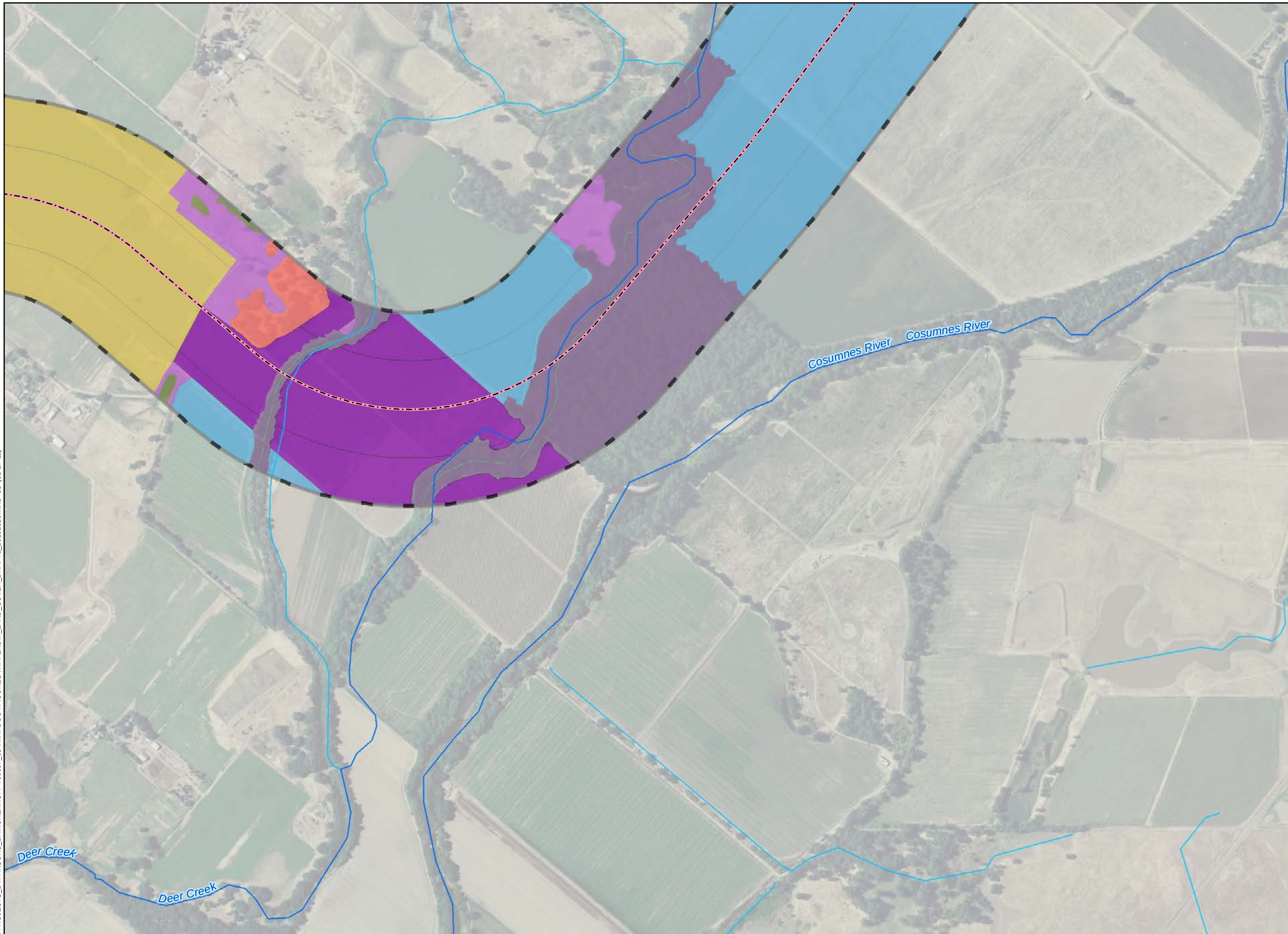
Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 8



Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
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Bradshaw Road Alignment

Land Cover Type

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Aqueduct
Blue Oak Woodland
Cropland
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Irrigated Pasture
Landscaped
Low Density Development
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Mine Tailings
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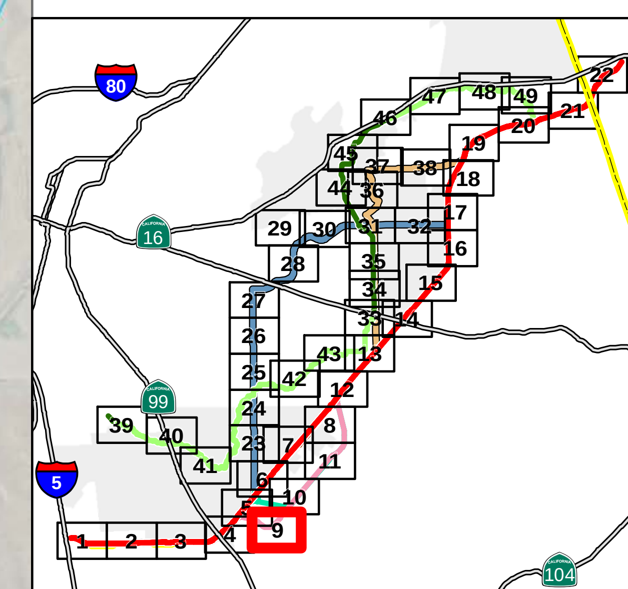
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Plot Date
January 27, 2011

CAPITAL SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 9

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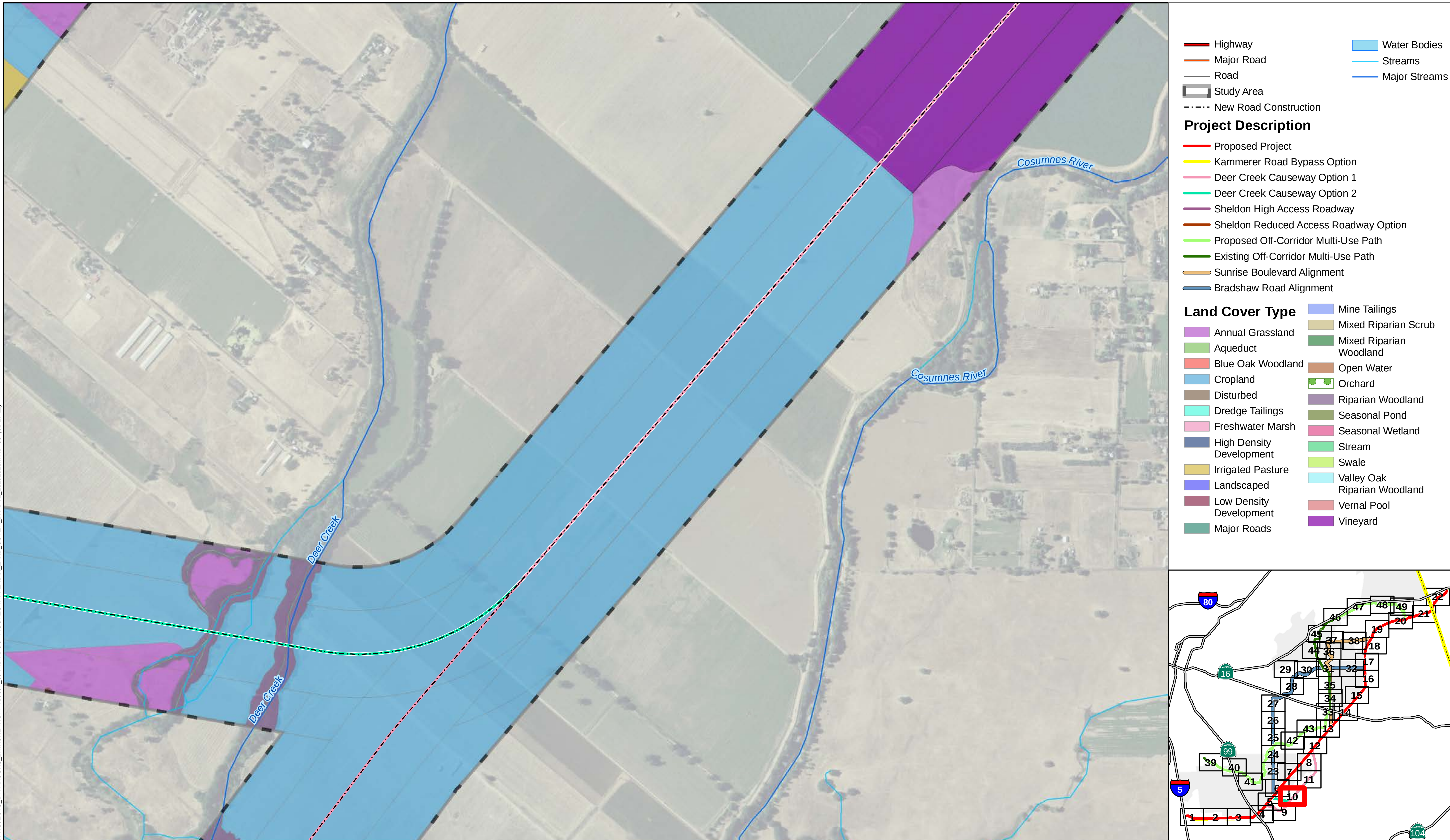

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Feet

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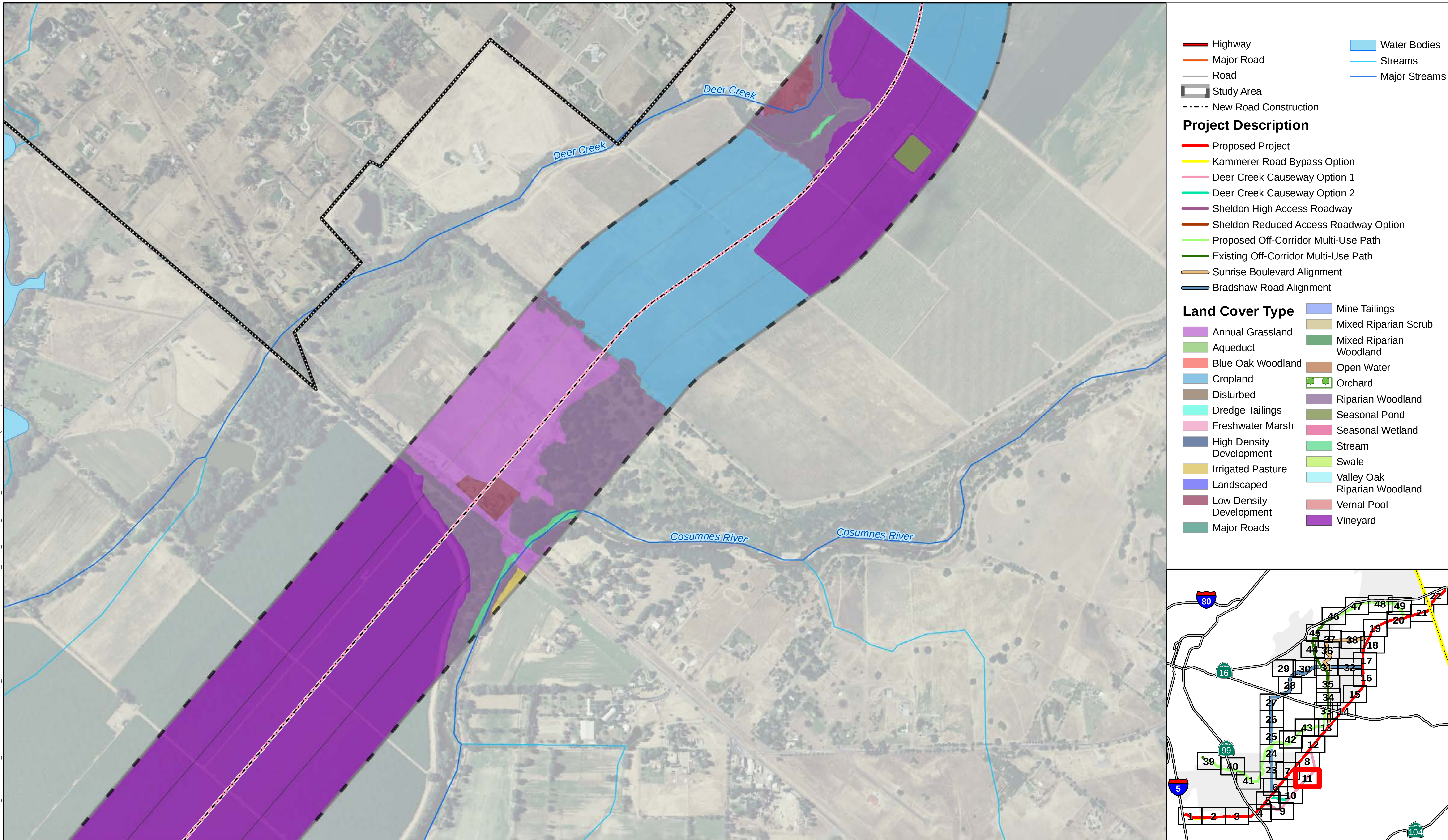
Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 10



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CAPITAL | SOUTHEAST CONNECTOR Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 11

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Feet

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Plot Date
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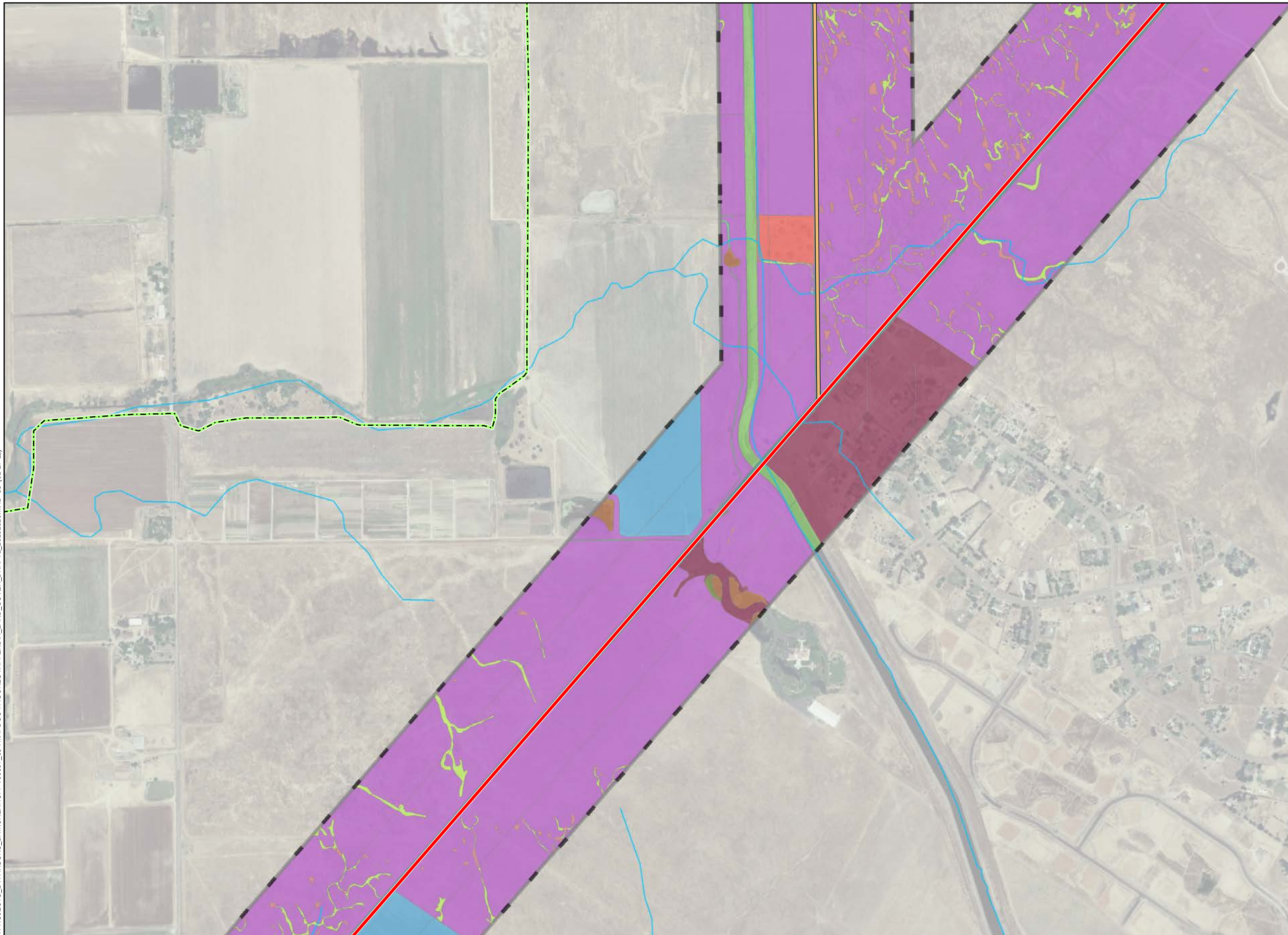
CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 12



Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
Sheldon High Access Roadway
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Existing Off-Corridor Multi-Use Path
Sunrise Boulevard Alignment
Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
Disturbed
Dredge Tailings
Freshwater Marsh
High Density Development
Irrigated Pasture
Landscaped
Low Density Development
Major Roads
Mine Tailings
Mixed Riparian Scrub
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Open Water
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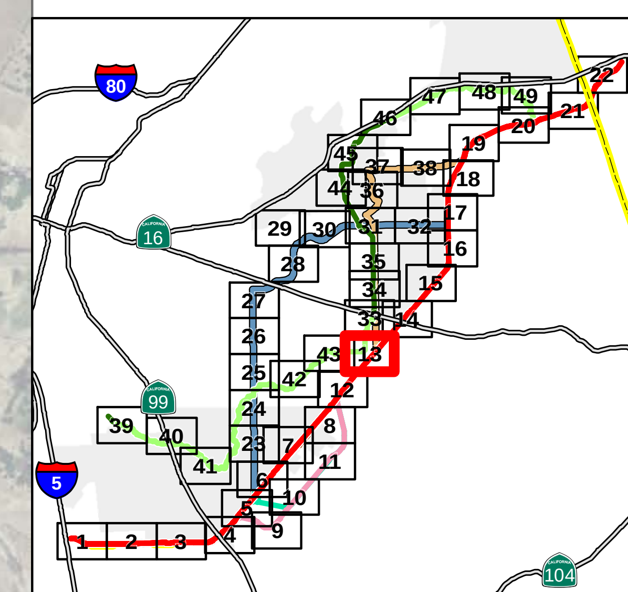
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Feet

Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

Plot Date
January 27, 2011

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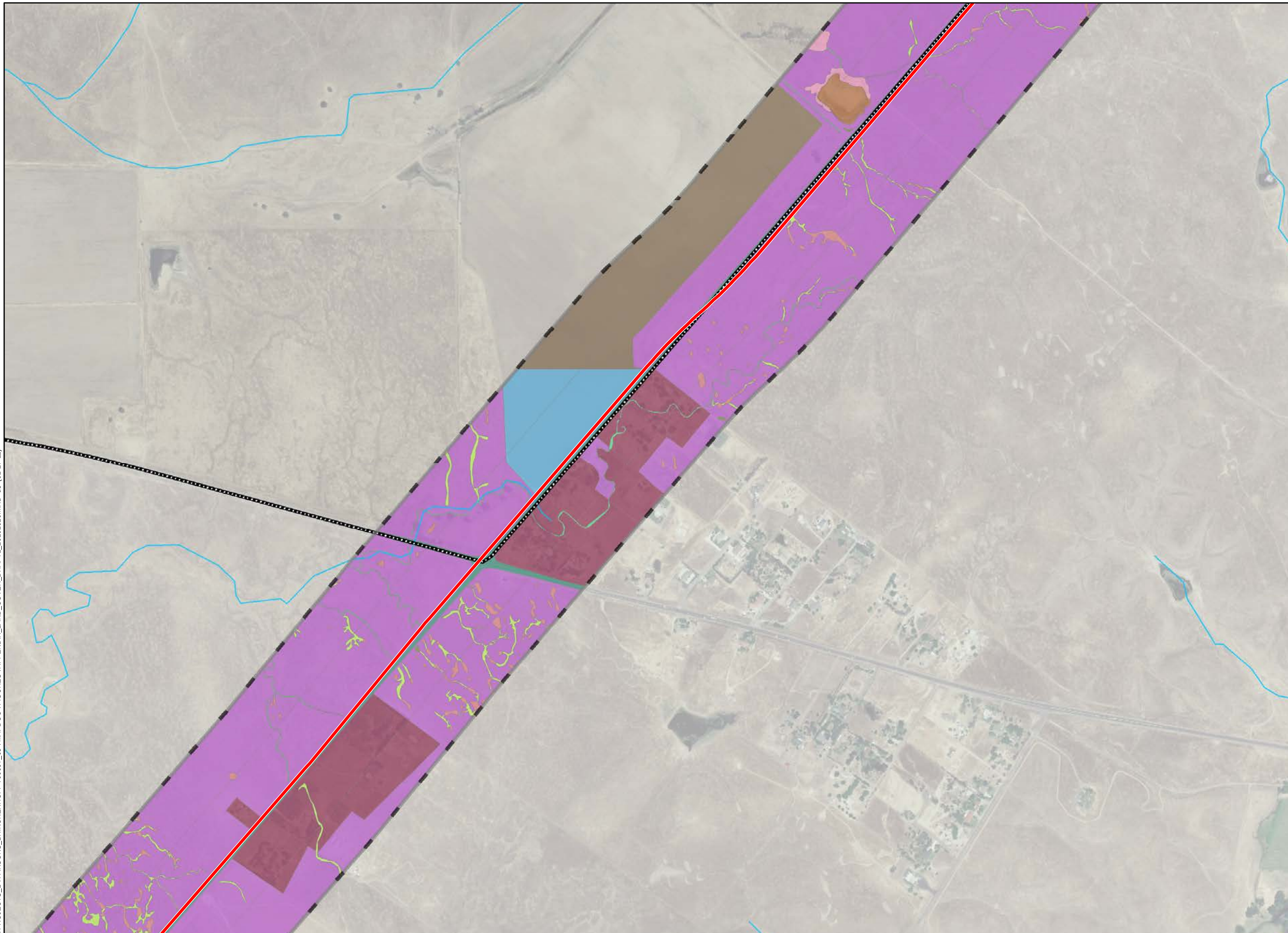
CAPITAL SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 13

K:\PROJECTS_1\PARSONS_BRINCKERHOFF\00907_08\MAPDOC\FIGURES\APPENDIX_LAND_COVER_DRAFT1_20101020.MXD ds (01-27-11)



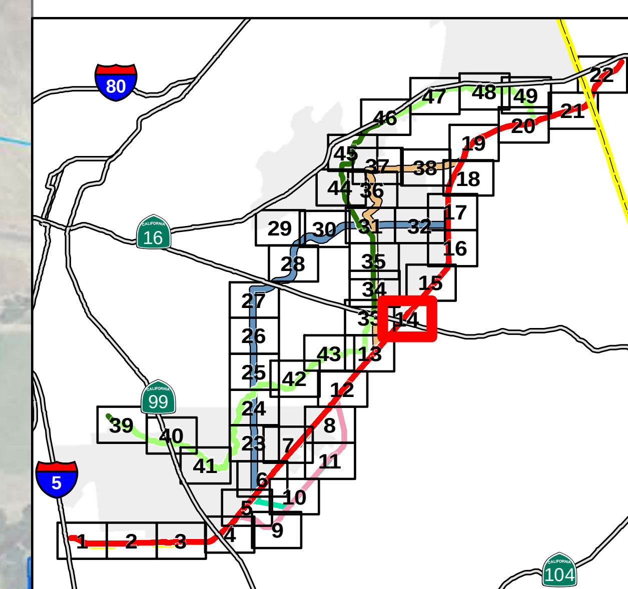
- Highway
- Major Road
- Road
- Study Area
- New Road Construction
- Water Bodies
- Streams
- Major Streams

Project Description

- Proposed Project
- Kammerer Road Bypass Option
- Deer Creek Causeway Option 1
- Deer Creek Causeway Option 2
- Sheldon High Access Roadway
- Sheldon Reduced Access Roadway Option
- Proposed Off-Corridor Multi-Use Path
- Existing Off-Corridor Multi-Use Path
- Sunrise Boulevard Alignment
- Bradshaw Road Alignment

Land Cover Type

- Annual Grassland
- Aqueduct
- Blue Oak Woodland
- Cropland
- Disturbed
- Dredge Tailings
- Freshwater Marsh
- High Density Development
- Irrigated Pasture
- Landscaped
- Low Density Development
- Major Roads
- Mine Tailings
- Mixed Riparian Scrub
- Mixed Riparian Woodland
- Open Water
- Orchard
- Riparian Woodland
- Seasonal Pond
- Seasonal Wetland
- Stream
- Swale
- Valley Oak Riparian Woodland
- Vernal Pool
- Vineyard



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Feet

Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 14

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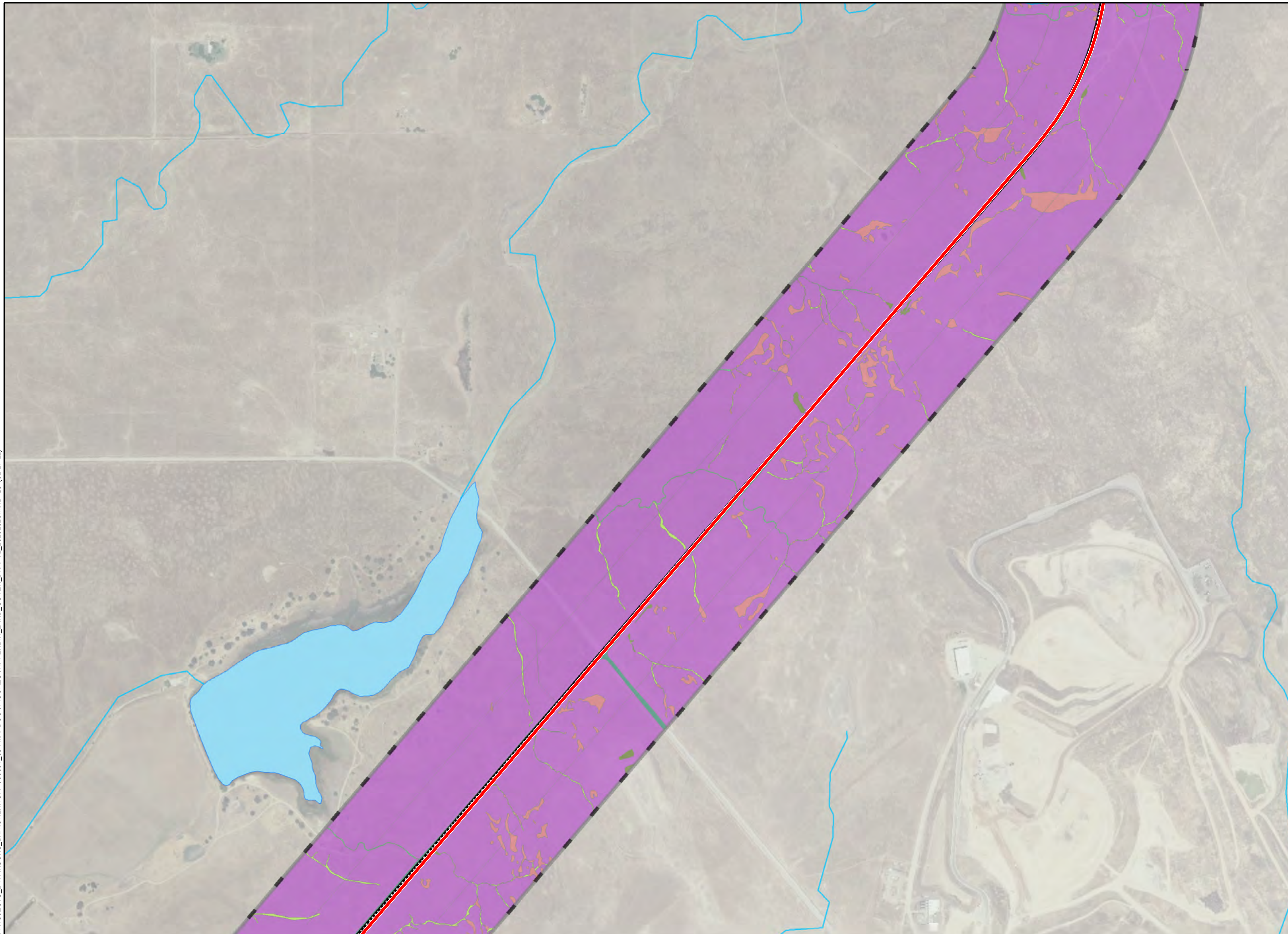


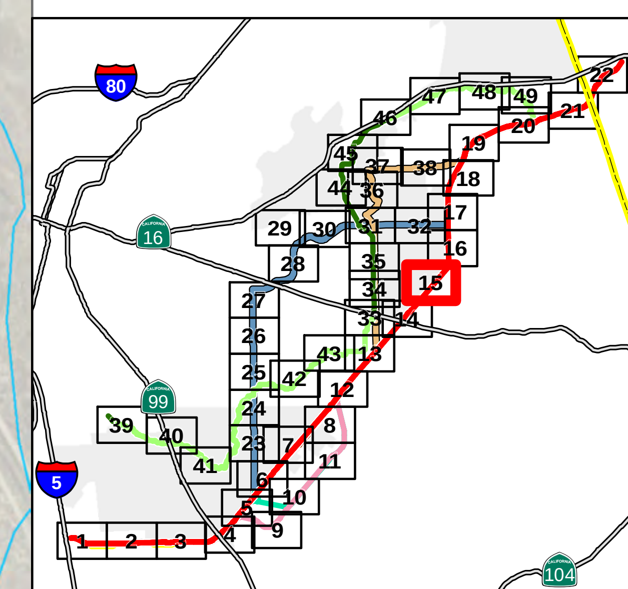
Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
Sheldon High Access Roadway
Sheldon Reduced Access Roadway Option
Proposed Off-Corridor Multi-Use Path
Existing Off-Corridor Multi-Use Path
Sunrise Boulevard Alignment
Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
Disturbed
Dredge Tailings
Freshwater Marsh
High Density Development
Irrigated Pasture
Landscaped
Low Density Development
Major Roads
Mine Tailings
Mixed Riparian Scrub
Mixed Riparian Woodland
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

Plot Date
January 27, 2011

PB PSOMAS ICF INTERNATIONAL

CAPITAL SOUTHEAST CONNECTOR Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 15

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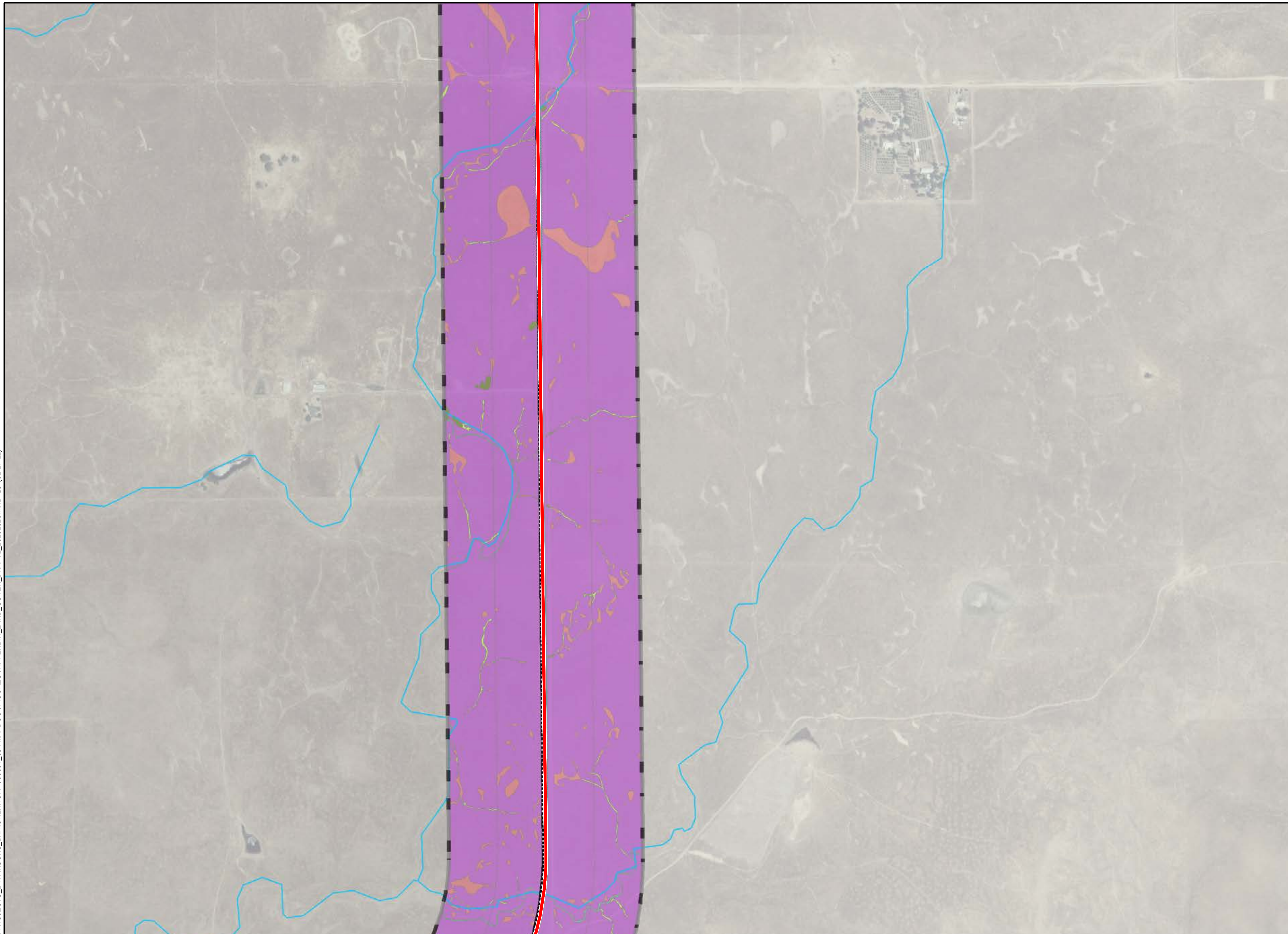


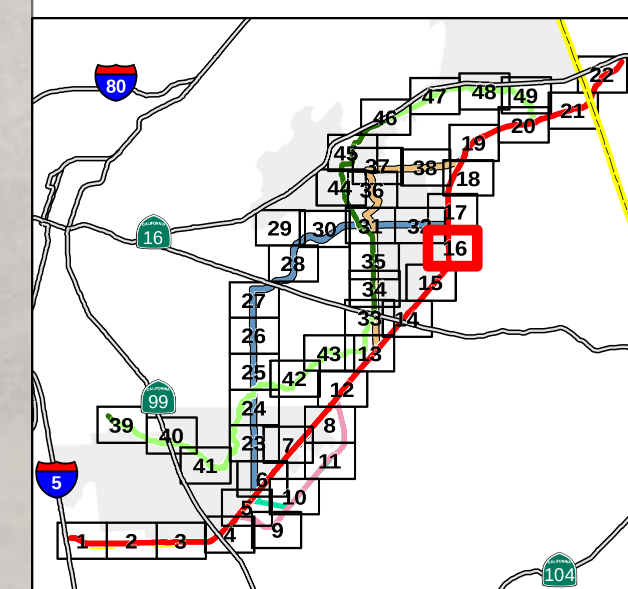
Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
Sheldon High Access Roadway
Sheldon Reduced Access Roadway Option
Proposed Off-Corridor Multi-Use Path
Existing Off-Corridor Multi-Use Path
Sunrise Boulevard Alignment
Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
Disturbed
Dredge Tailings
Freshwater Marsh
High Density Development
Irrigated Pasture
Landscaped
Low Density Development
Major Roads
Mine Tailings
Mixed Riparian Scrub
Mixed Riparian Woodland
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



PB PSOMAS ICF INTERNATIONAL

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Feet

Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 16

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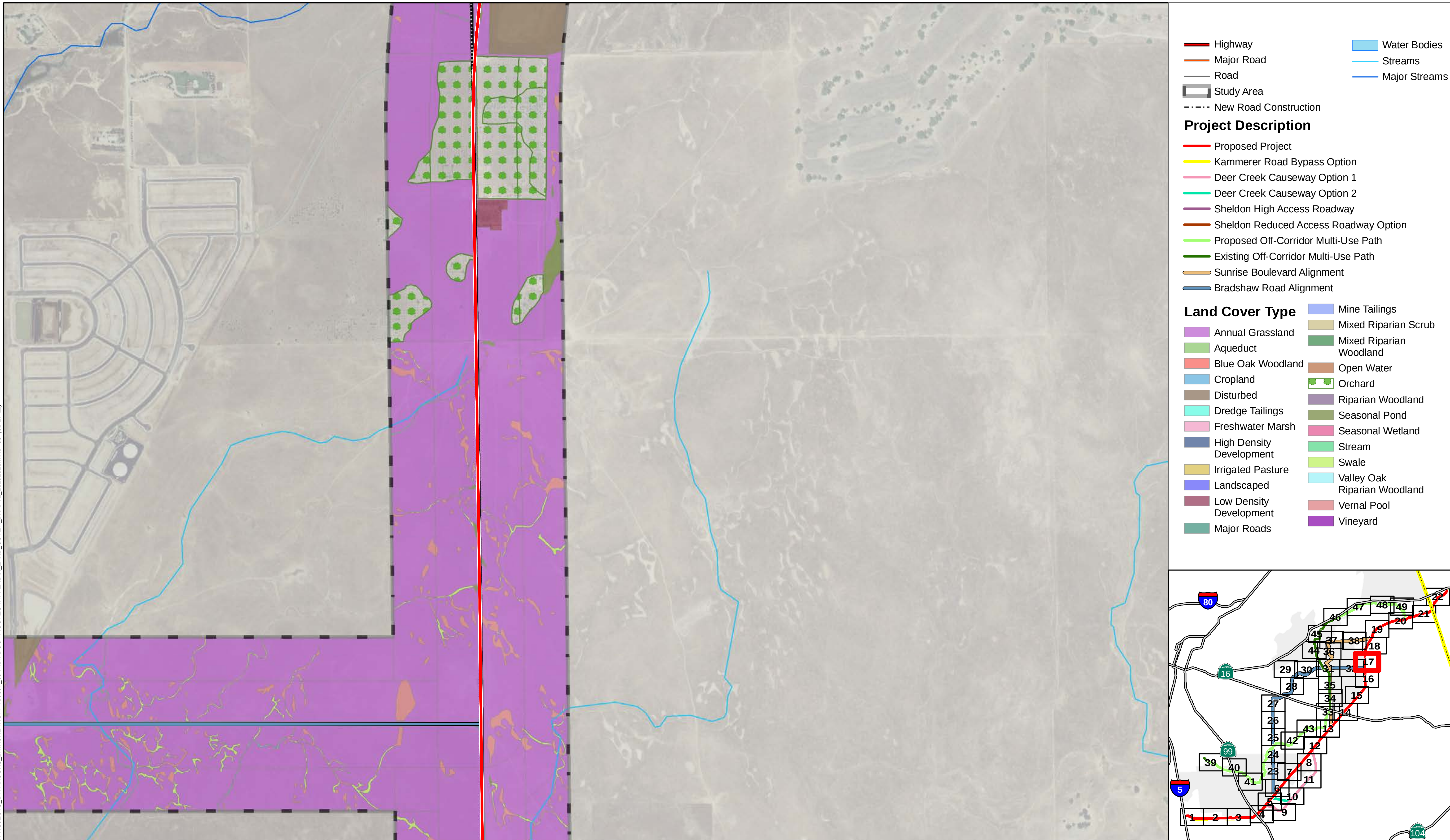

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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

Plot Date
January 27, 2011

CAPITAL SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 17

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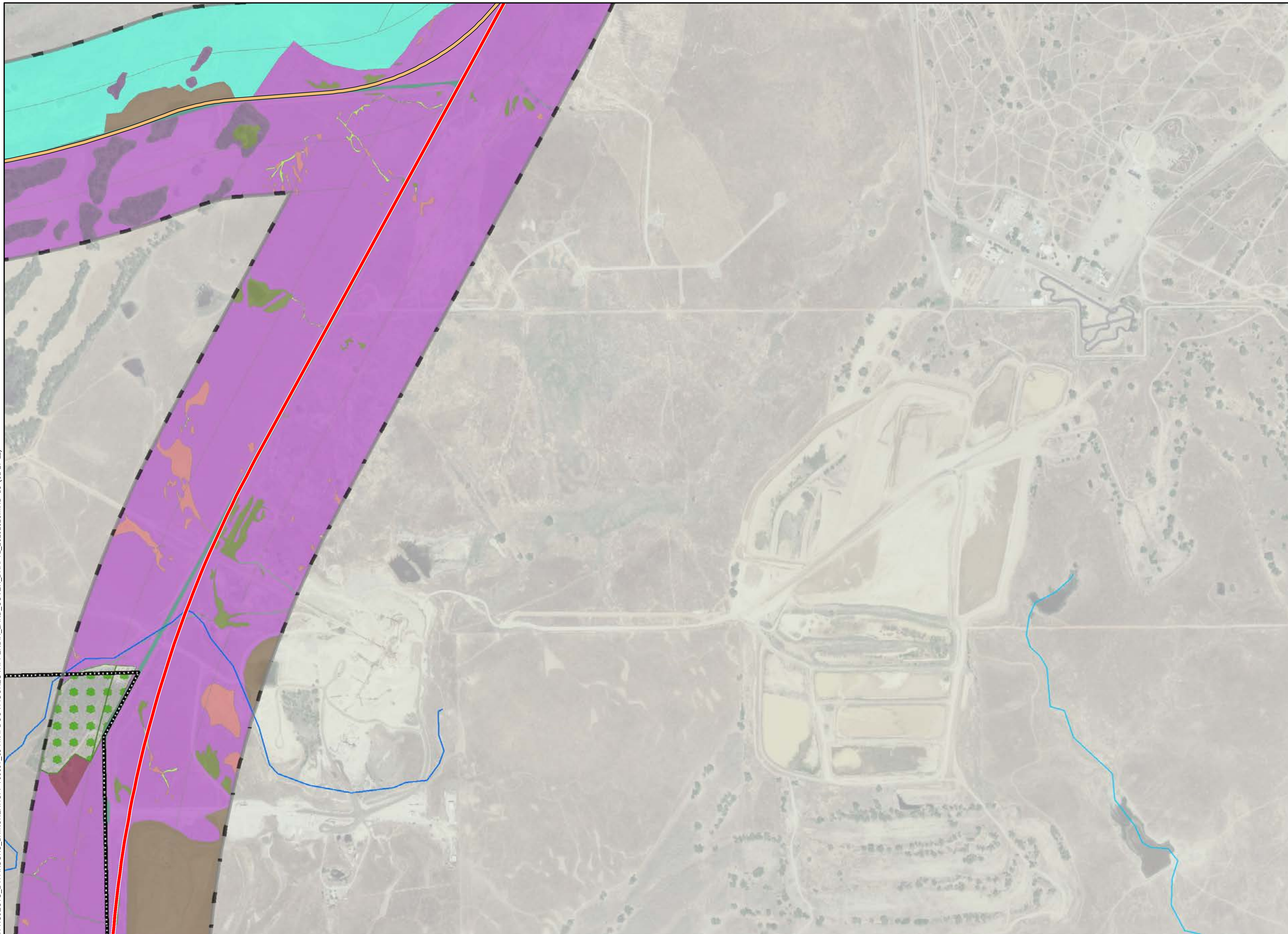


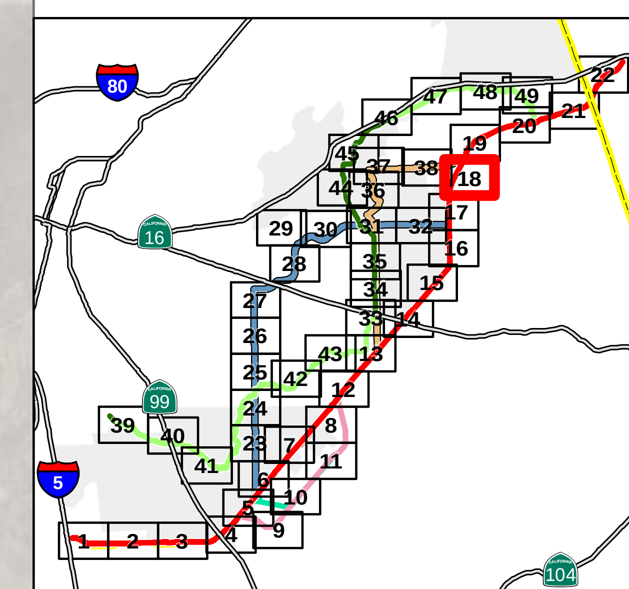
- Highway
- Major Road
- Road
- Study Area
- New Road Construction
- Water Bodies
- Streams
- Major Streams

Project Description

- Proposed Project
- Kammerer Road Bypass Option
- Deer Creek Causeway Option 1
- Deer Creek Causeway Option 2
- Sheldon High Access Roadway
- Sheldon Reduced Access Roadway Option
- Proposed Off-Corridor Multi-Use Path
- Existing Off-Corridor Multi-Use Path
- Sunrise Boulevard Alignment
- Bradshaw Road Alignment

Land Cover Type

- Annual Grassland
- Aqueduct
- Blue Oak Woodland
- Cropland
- Disturbed
- Dredge Tailings
- Freshwater Marsh
- High Density Development
- Irrigated Pasture
- Landscaped
- Low Density Development
- Major Roads
- Mine Tailings
- Mixed Riparian Scrub
- Mixed Riparian Woodland
- Open Water
- Orchard
- Riparian Woodland
- Seasonal Pond
- Seasonal Wetland
- Stream
- Swale
- Valley Oak Riparian Woodland
- Vernal Pool
- Vineyard



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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR *Connecting Communities*

Land Use and Biological Resources

Appendix I

Sheet 18

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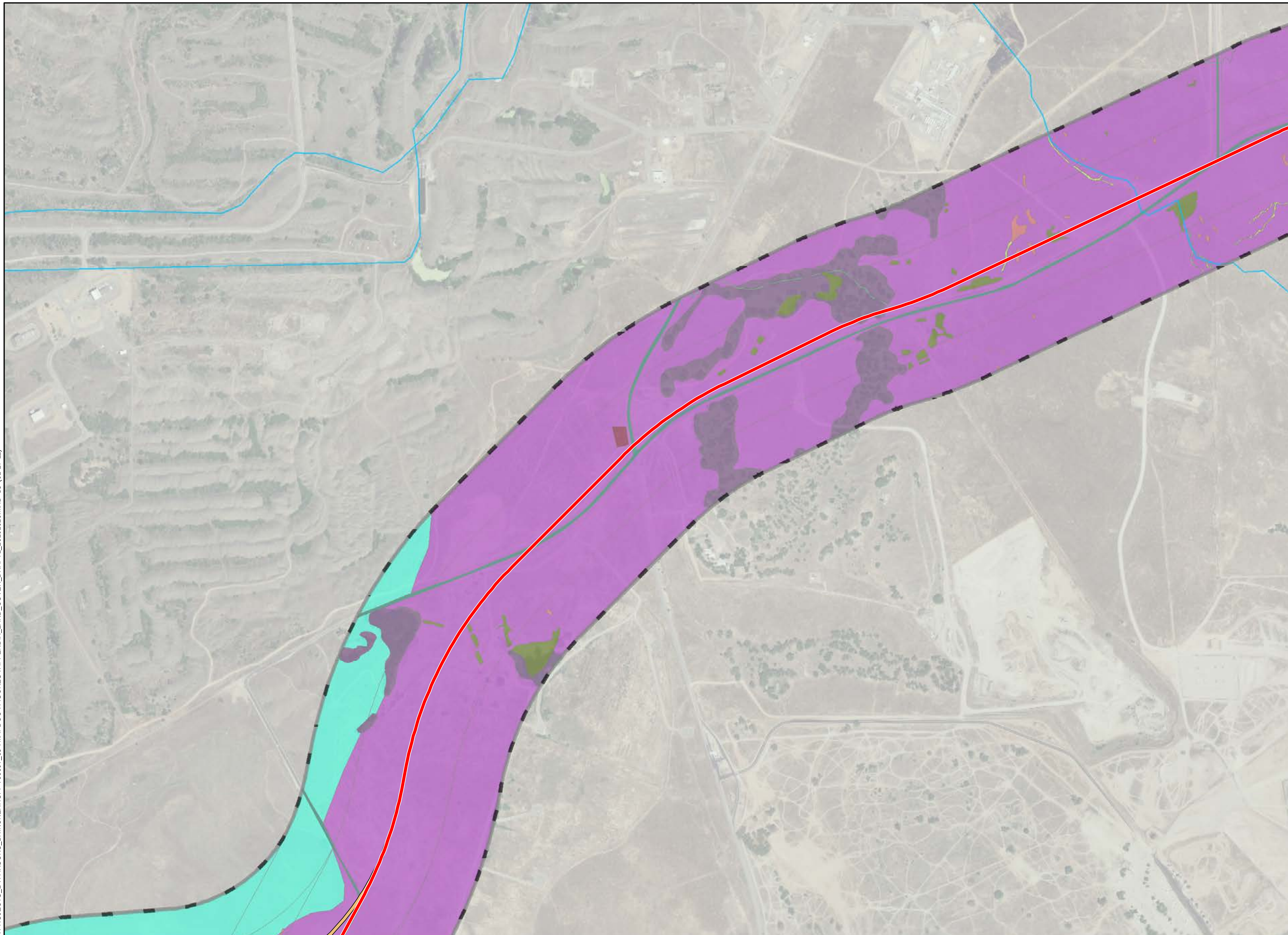


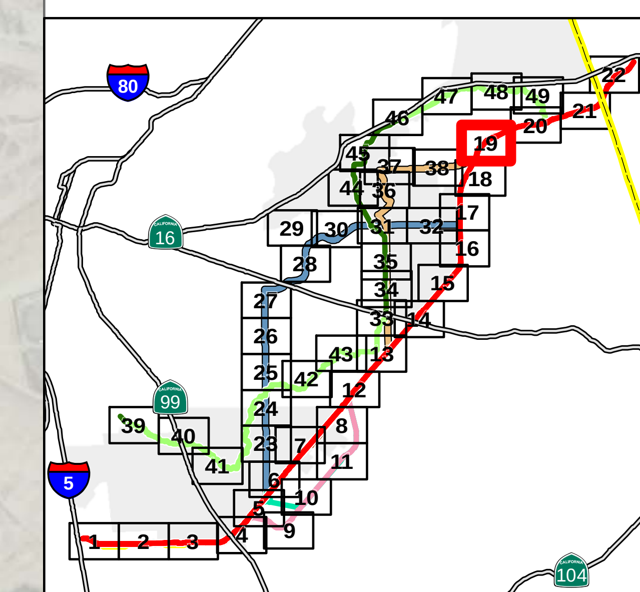
Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
Sheldon High Access Roadway
Sheldon Reduced Access Roadway Option
Proposed Off-Corridor Multi-Use Path
Existing Off-Corridor Multi-Use Path
Sunrise Boulevard Alignment
Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
Disturbed
Dredge Tailings
Freshwater Marsh
High Density Development
Irrigated Pasture
Landscaped
Low Density Development
Major Roads
Mine Tailings
Mixed Riparian Scrub
Mixed Riparian Woodland
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 19

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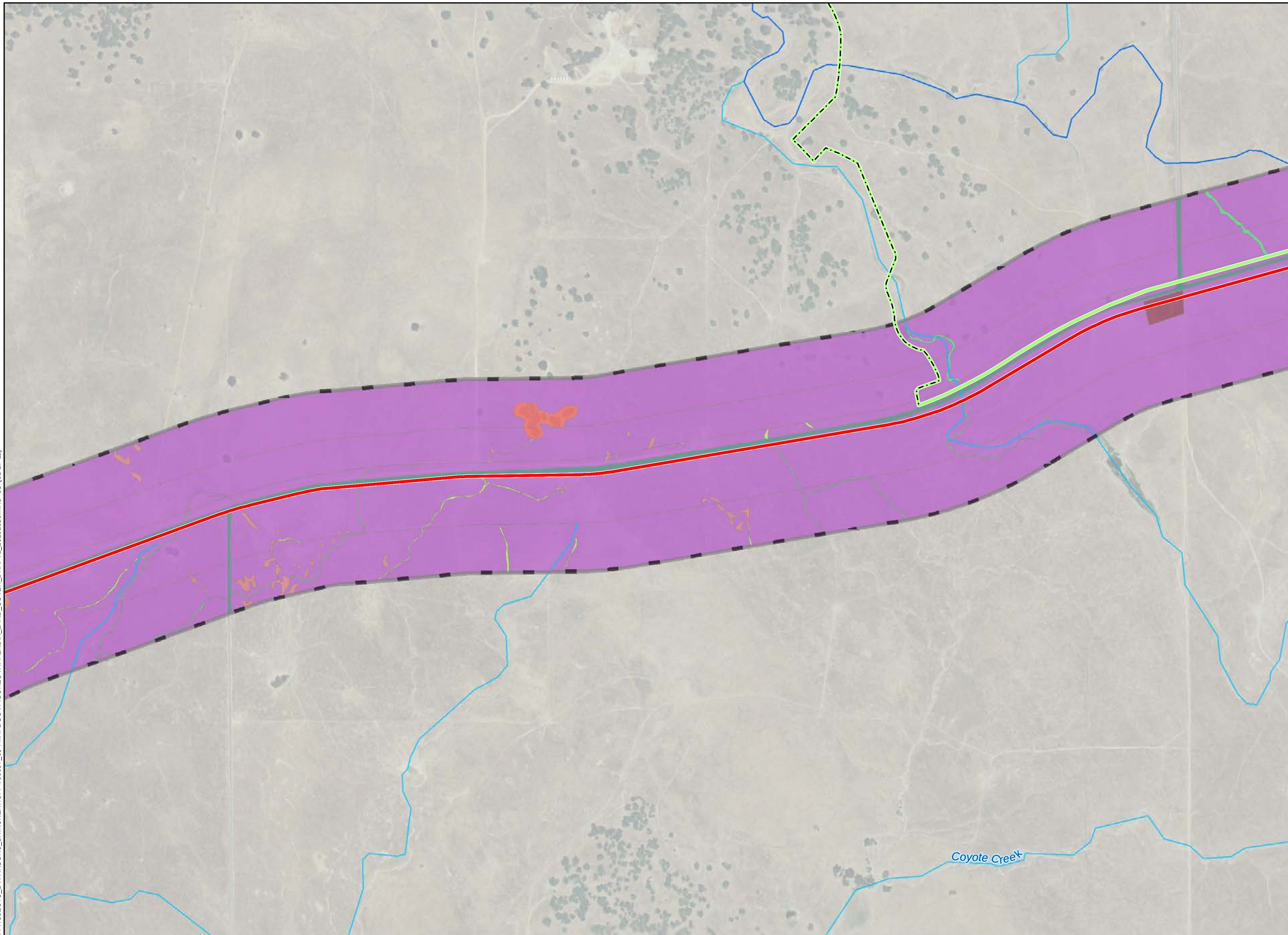


Highway
Major Road
Road
Study Area
New Road Construction

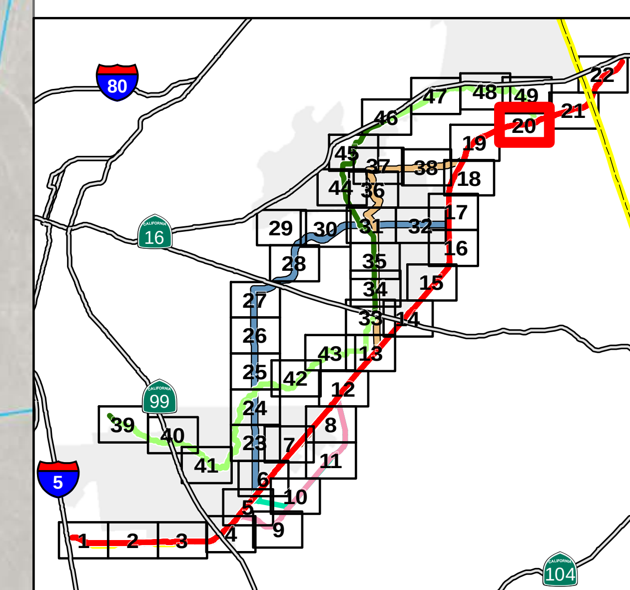
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
Sheldon High Access Roadway
Sheldon Reduced Access Roadway Option
Proposed Off-Corridor Multi-Use Path
Existing Off-Corridor Multi-Use Path
Sunrise Boulevard Alignment
Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
Disturbed
Dredge Tailings
Freshwater Marsh
High Density Development
Irrigated Pasture
Landscaped
Low Density Development
Major Roads
Mine Tailings
Mixed Riparian Scrub
Mixed Riparian Woodland
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

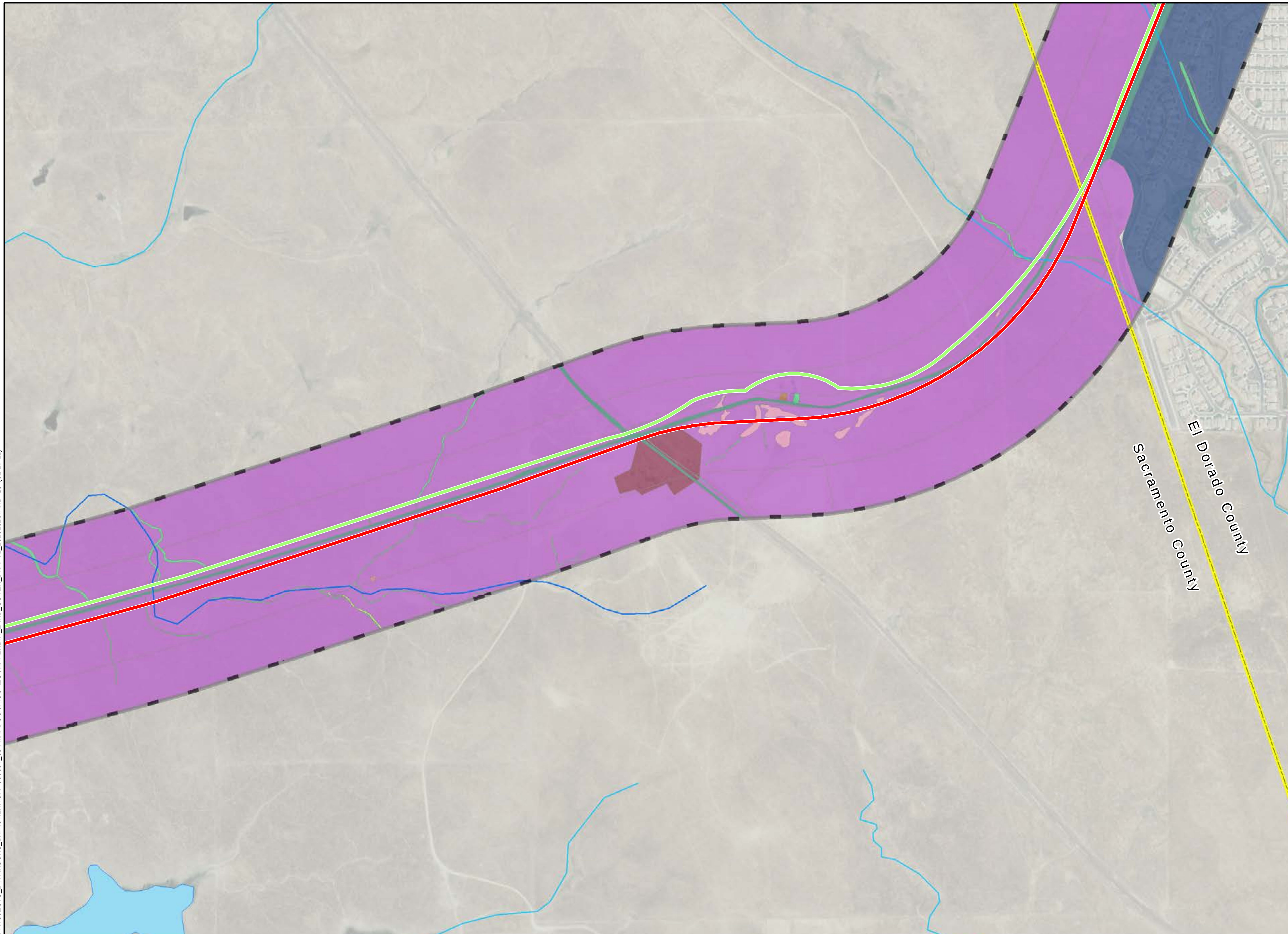
Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 20



Highway
Major Road
Road
Study Area
New Road Construction

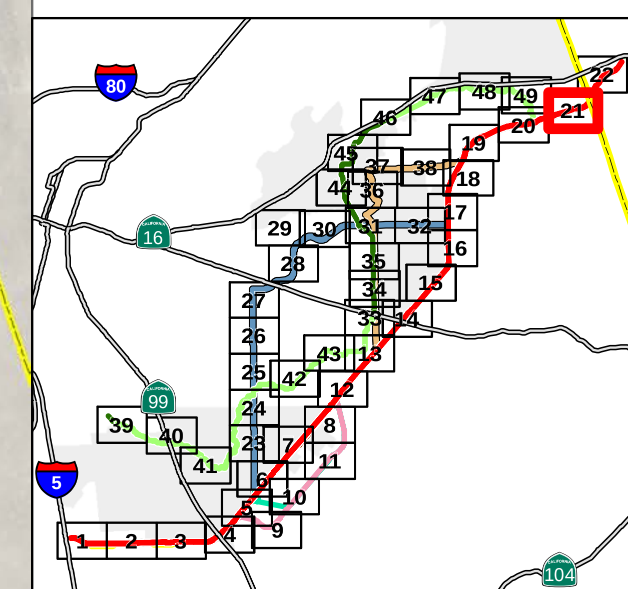
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
Sheldon High Access Roadway
Sheldon Reduced Access Roadway Option
Proposed Off-Corridor Multi-Use Path
Existing Off-Corridor Multi-Use Path
Sunrise Boulevard Alignment
Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
Disturbed
Dredge Tailings
Freshwater Marsh
High Density Development
Irrigated Pasture
Landscaped
Low Density Development
Major Roads
Mine Tailings
Mixed Riparian Scrub
Mixed Riparian Woodland
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

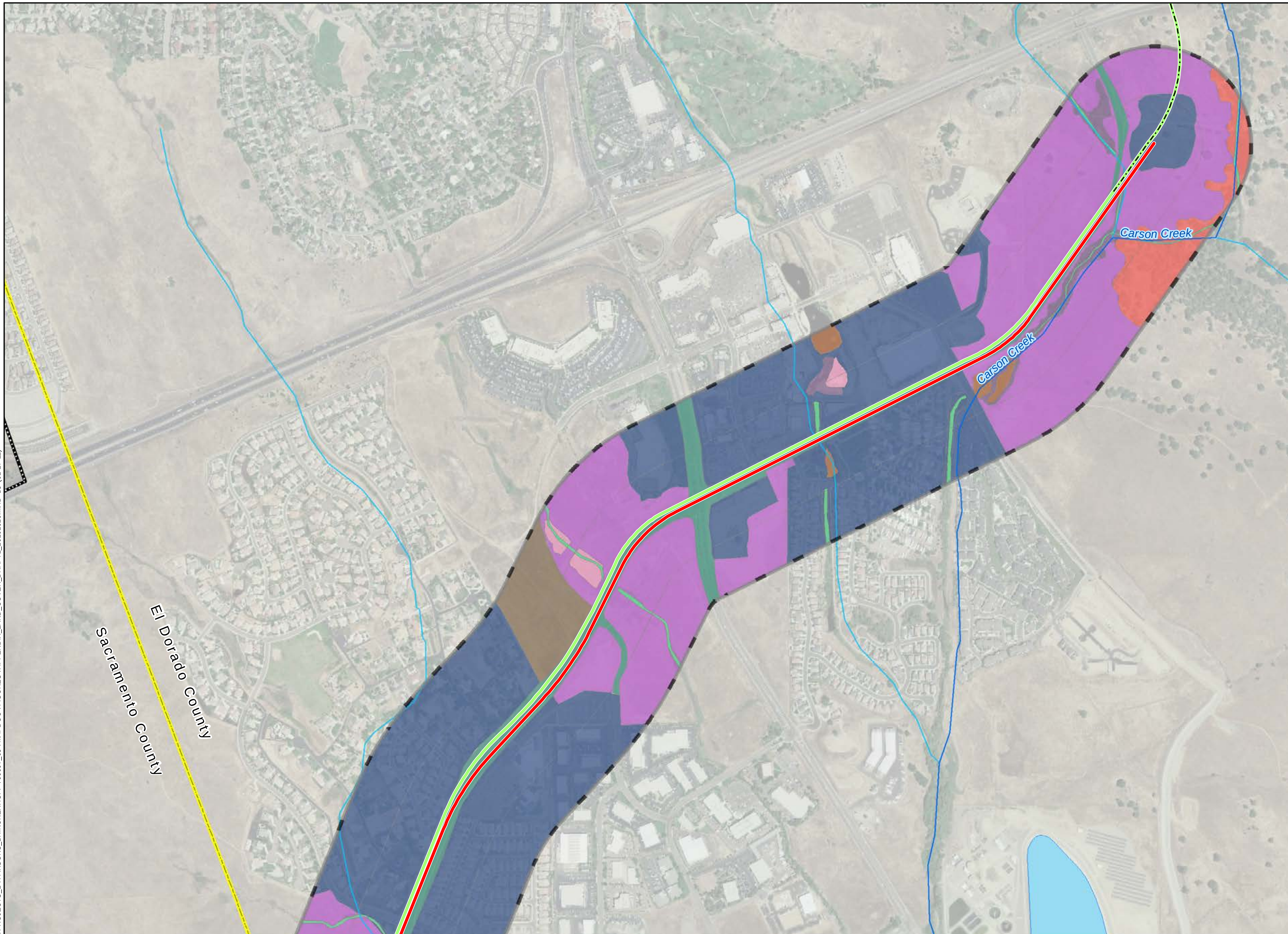
Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 21



Highway
Major Road
Road
Study Area
New Road Construction

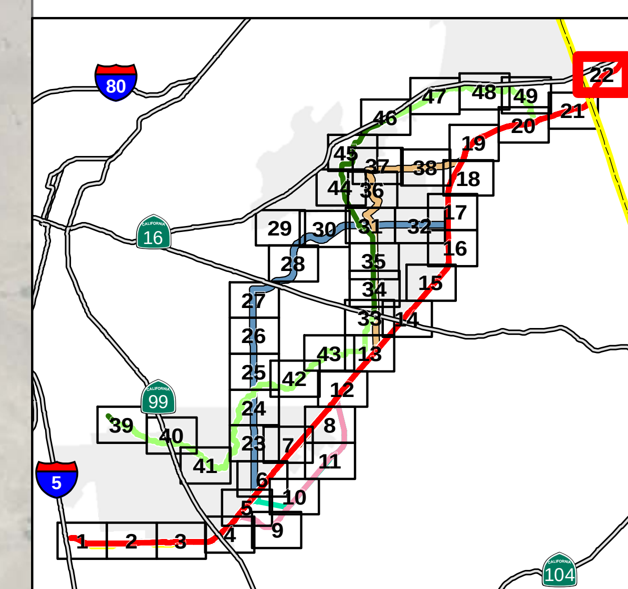
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
Sheldon High Access Roadway
Sheldon Reduced Access Roadway Option
Proposed Off-Corridor Multi-Use Path
Existing Off-Corridor Multi-Use Path
Sunrise Boulevard Alignment
Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
Disturbed
Dredge Tailings
Freshwater Marsh
High Density Development
Irrigated Pasture
Landscaped
Low Density Development
Major Roads
Mine Tailings
Mixed Riparian Scrub
Mixed Riparian Woodland
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 22

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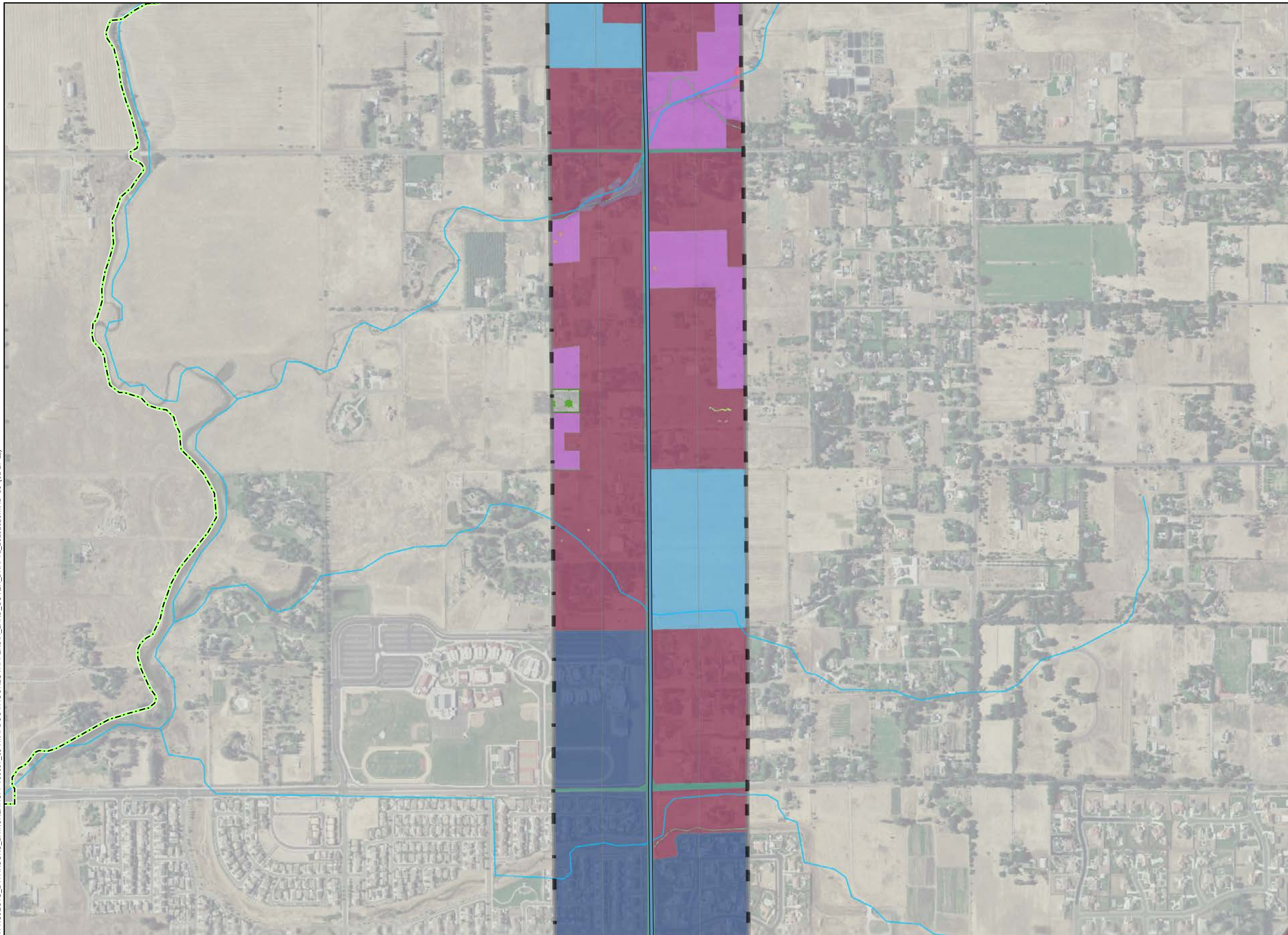


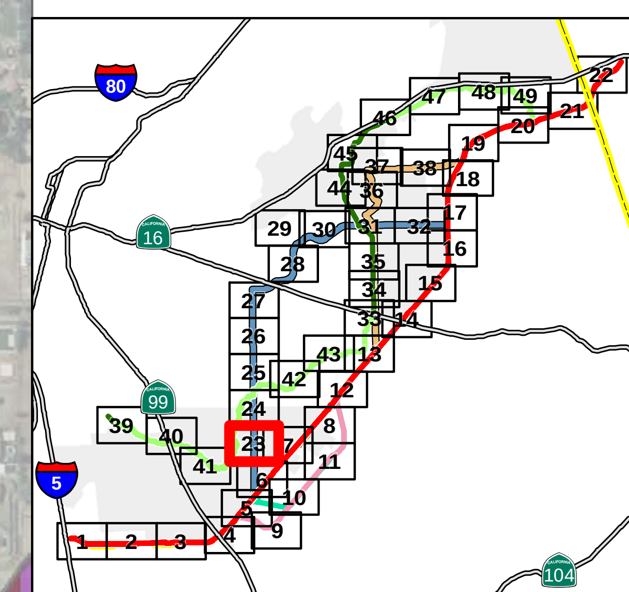
Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
Sheldon High Access Roadway
Sheldon Reduced Access Roadway Option
Proposed Off-Corridor Multi-Use Path
Existing Off-Corridor Multi-Use Path
Sunrise Boulevard Alignment
Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
Disturbed
Dredge Tailings
Freshwater Marsh
High Density Development
Irrigated Pasture
Landscaped
Low Density Development
Major Roads
Mine Tailings
Mixed Riparian Scrub
Mixed Riparian Woodland
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Feet

Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

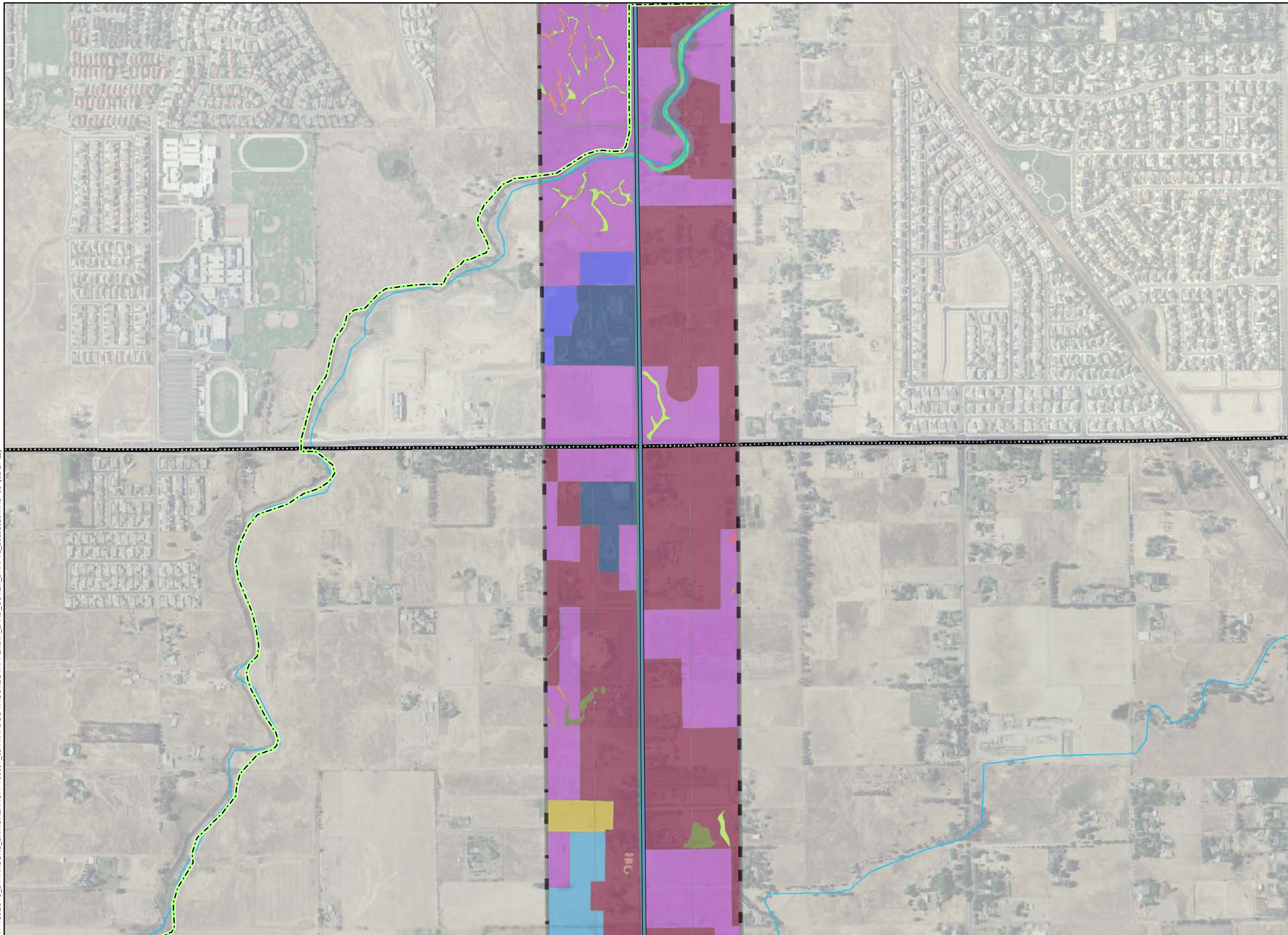
Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 23



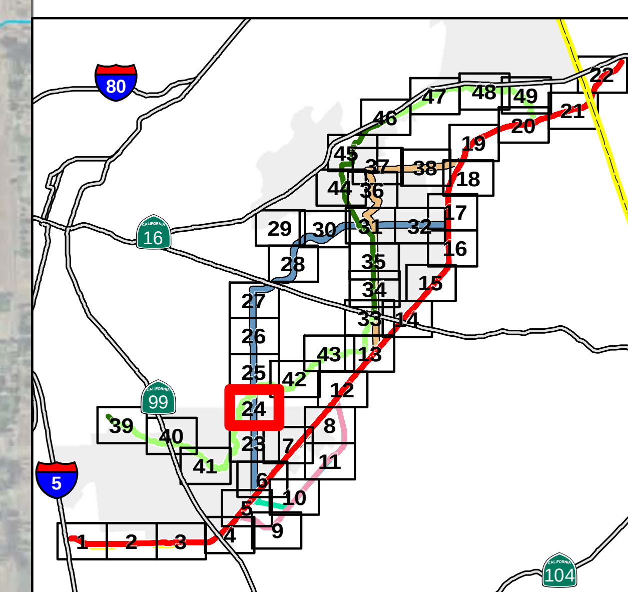
Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
Sheldon High Access Roadway
Sheldon Reduced Access Roadway Option
Proposed Off-Corridor Multi-Use Path
Existing Off-Corridor Multi-Use Path
Sunrise Boulevard Alignment
Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
Disturbed
Dredge Tailings
Freshwater Marsh
High Density Development
Irrigated Pasture
Landscaped
Low Density Development
Major Roads
Mine Tailings
Mixed Riparian Scrub
Mixed Riparian Woodland
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

Plot Date
January 27, 2011

CAPITAL SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 24

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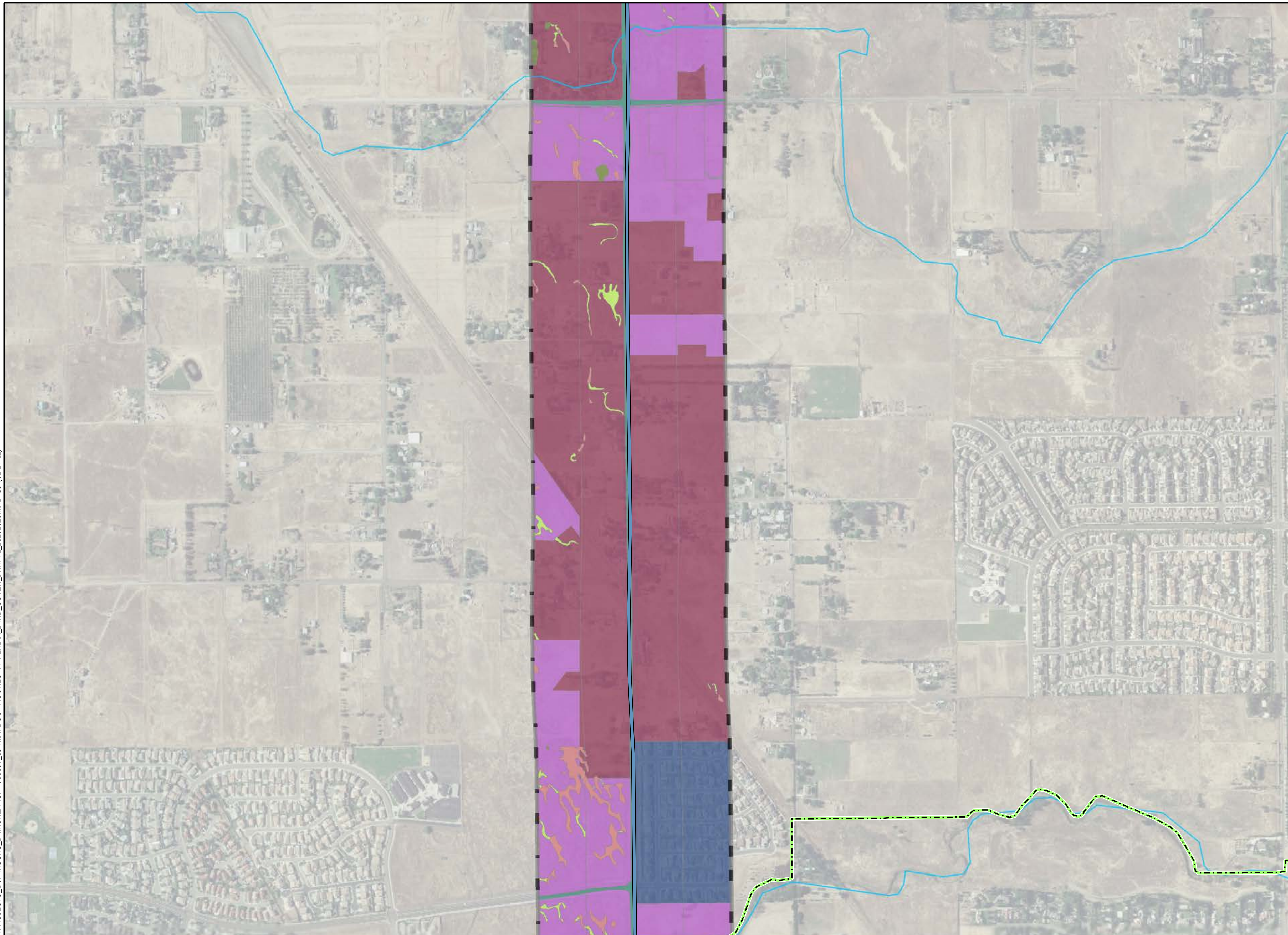


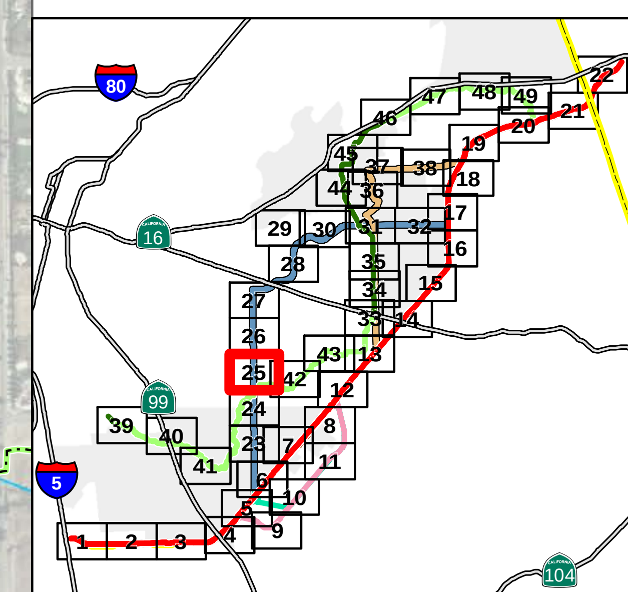
- Highway
- Major Road
- Road
- Study Area
- New Road Construction
- Water Bodies
- Streams
- Major Streams

Project Description

- Proposed Project
- Kammerer Road Bypass Option
- Deer Creek Causeway Option 1
- Deer Creek Causeway Option 2
- Sheldon High Access Roadway
- Sheldon Reduced Access Roadway Option
- Proposed Off-Corridor Multi-Use Path
- Existing Off-Corridor Multi-Use Path
- Sunrise Boulevard Alignment
- Bradshaw Road Alignment

Land Cover Type

- Annual Grassland
- Aqueduct
- Blue Oak Woodland
- Cropland
- Disturbed
- Dredge Tailings
- Freshwater Marsh
- High Density Development
- Irrigated Pasture
- Landscaped
- Low Density Development
- Major Roads
- Mine Tailings
- Mixed Riparian Scrub
- Mixed Riparian Woodland
- Open Water
- Orchard
- Riparian Woodland
- Seasonal Pond
- Seasonal Wetland
- Stream
- Swale
- Valley Oak Riparian Woodland
- Vernal Pool
- Vineyard



PB PSOMAS | ICF INTERNATIONAL

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Feet

Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

Plot Date
January 27, 2011

CAPITAL SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 25

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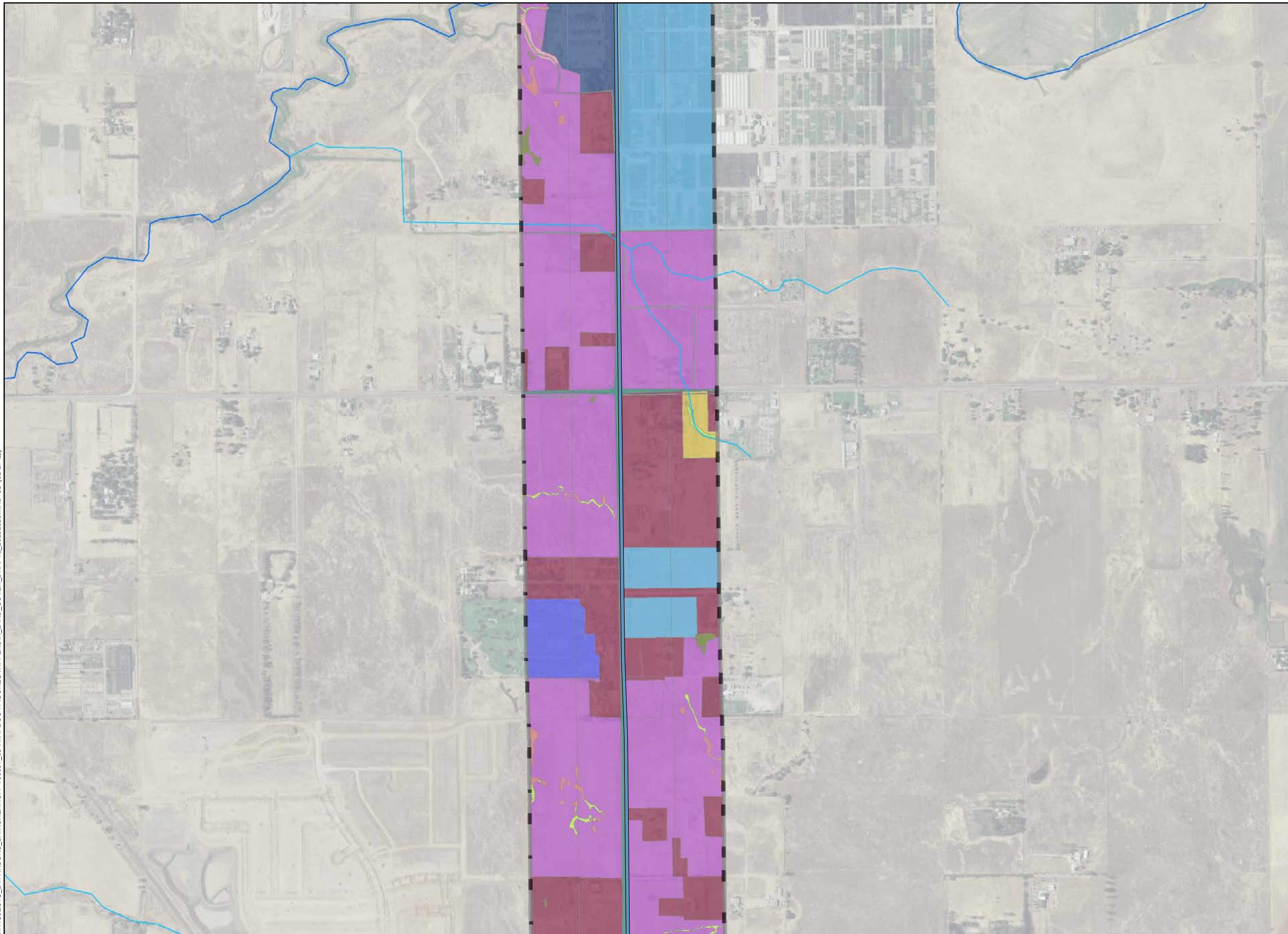


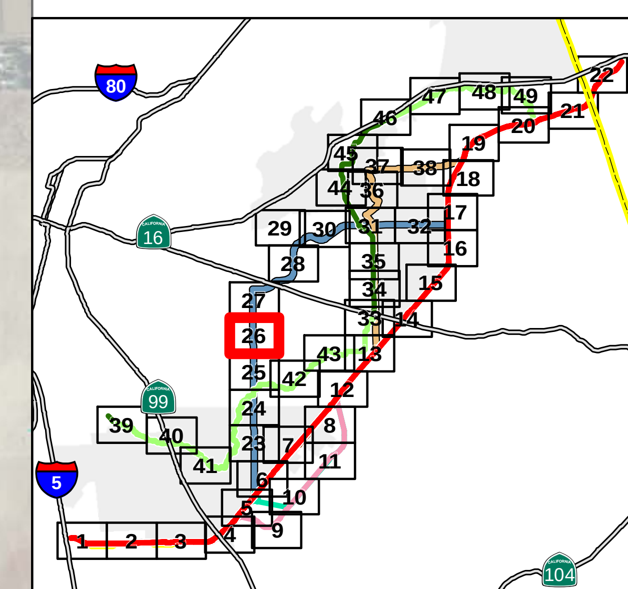
Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
Sheldon High Access Roadway
Sheldon Reduced Access Roadway Option
Proposed Off-Corridor Multi-Use Path
Existing Off-Corridor Multi-Use Path
Sunrise Boulevard Alignment
Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
Disturbed
Dredge Tailings
Freshwater Marsh
High Density Development
Irrigated Pasture
Landscaped
Low Density Development
Major Roads
Mine Tailings
Mixed Riparian Scrub
Mixed Riparian Woodland
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 26

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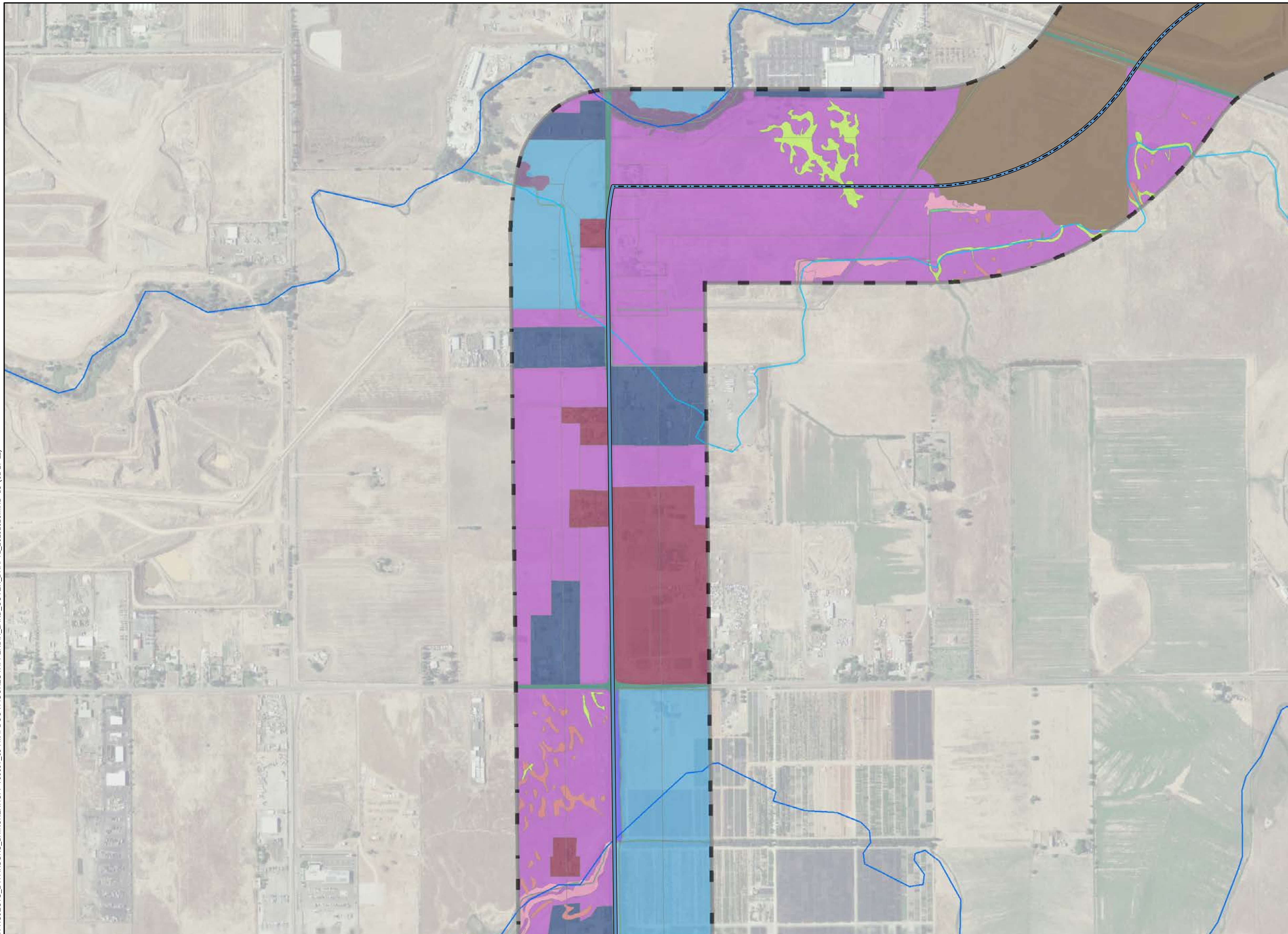


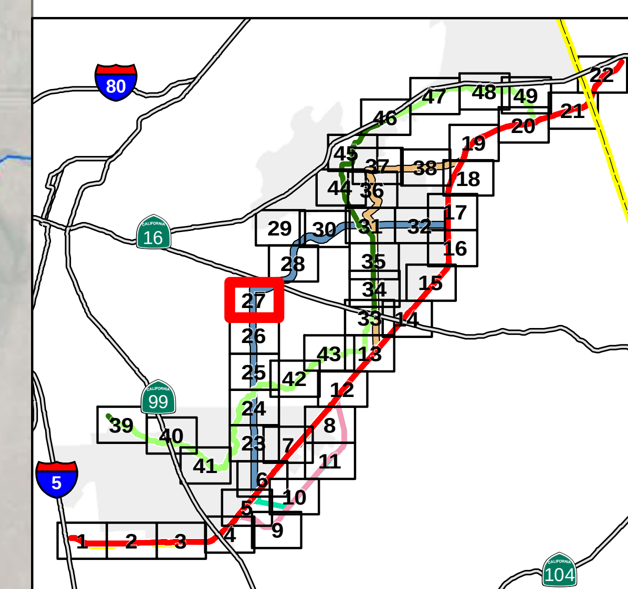
Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

- Proposed Project
- Kammerer Road Bypass Option
- Deer Creek Causeway Option 1
- Deer Creek Causeway Option 2
- Sheldon High Access Roadway
- Sheldon Reduced Access Roadway Option
- Proposed Off-Corridor Multi-Use Path
- Existing Off-Corridor Multi-Use Path
- Sunrise Boulevard Alignment
- Bradshaw Road Alignment

Land Cover Type

- Annual Grassland
- Aqueduct
- Blue Oak Woodland
- Cropland
- Disturbed
- Dredge Tailings
- Freshwater Marsh
- High Density Development
- Irrigated Pasture
- Landscaped
- Low Density Development
- Major Roads
- Mine Tailings
- Mixed Riparian Scrub
- Mixed Riparian Woodland
- Open Water
- Orchard
- Riparian Woodland
- Seasonal Pond
- Seasonal Wetland
- Stream
- Swale
- Valley Oak Riparian Woodland
- Vernal Pool
- Vineyard



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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

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January 27, 2011

CAPITAL SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 27

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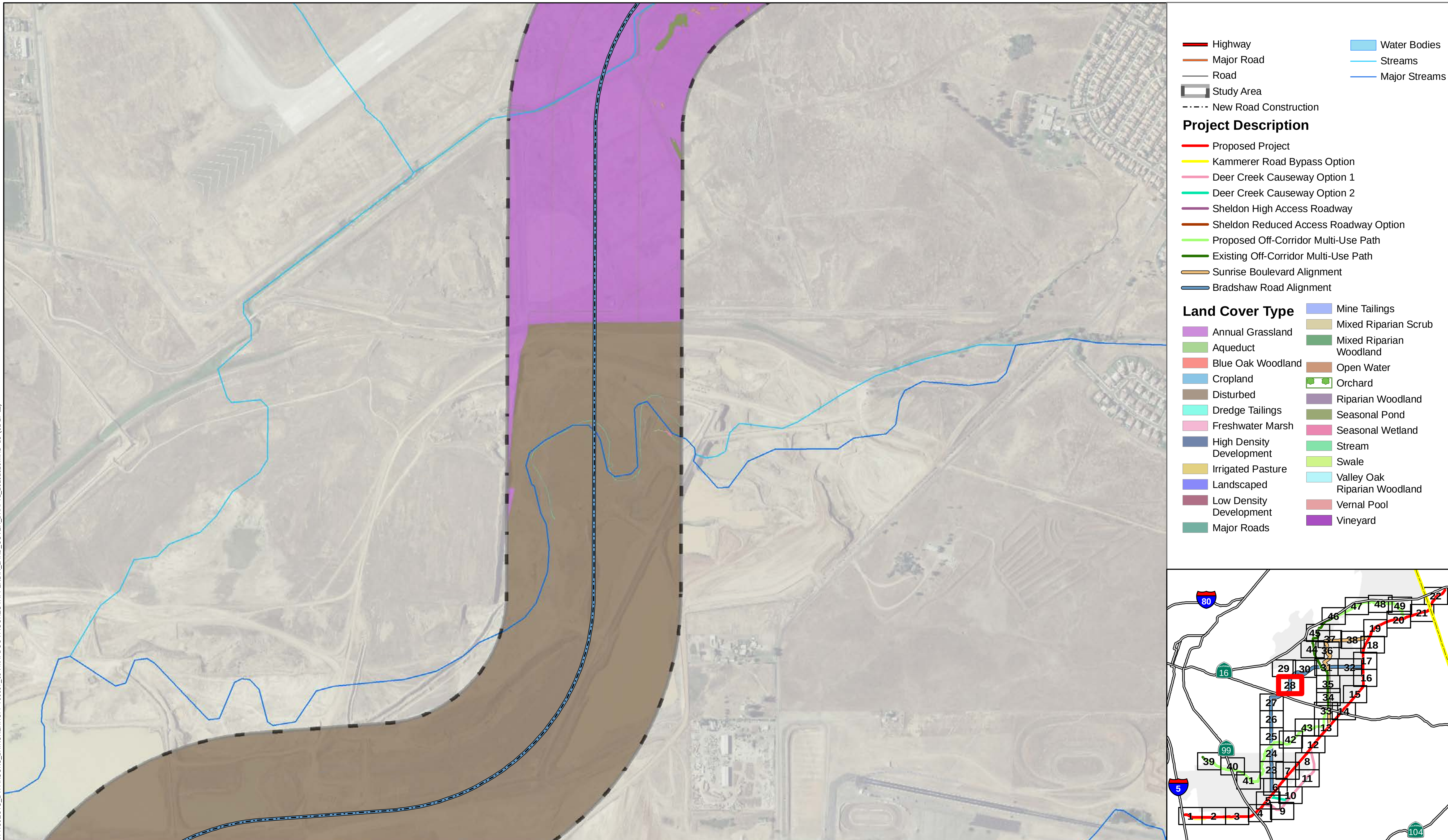

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Plot Date
January 27, 2011

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CAPITAL SOUTHEAST CONNECTOR Connecting Communities

Land Use and Biological Resources

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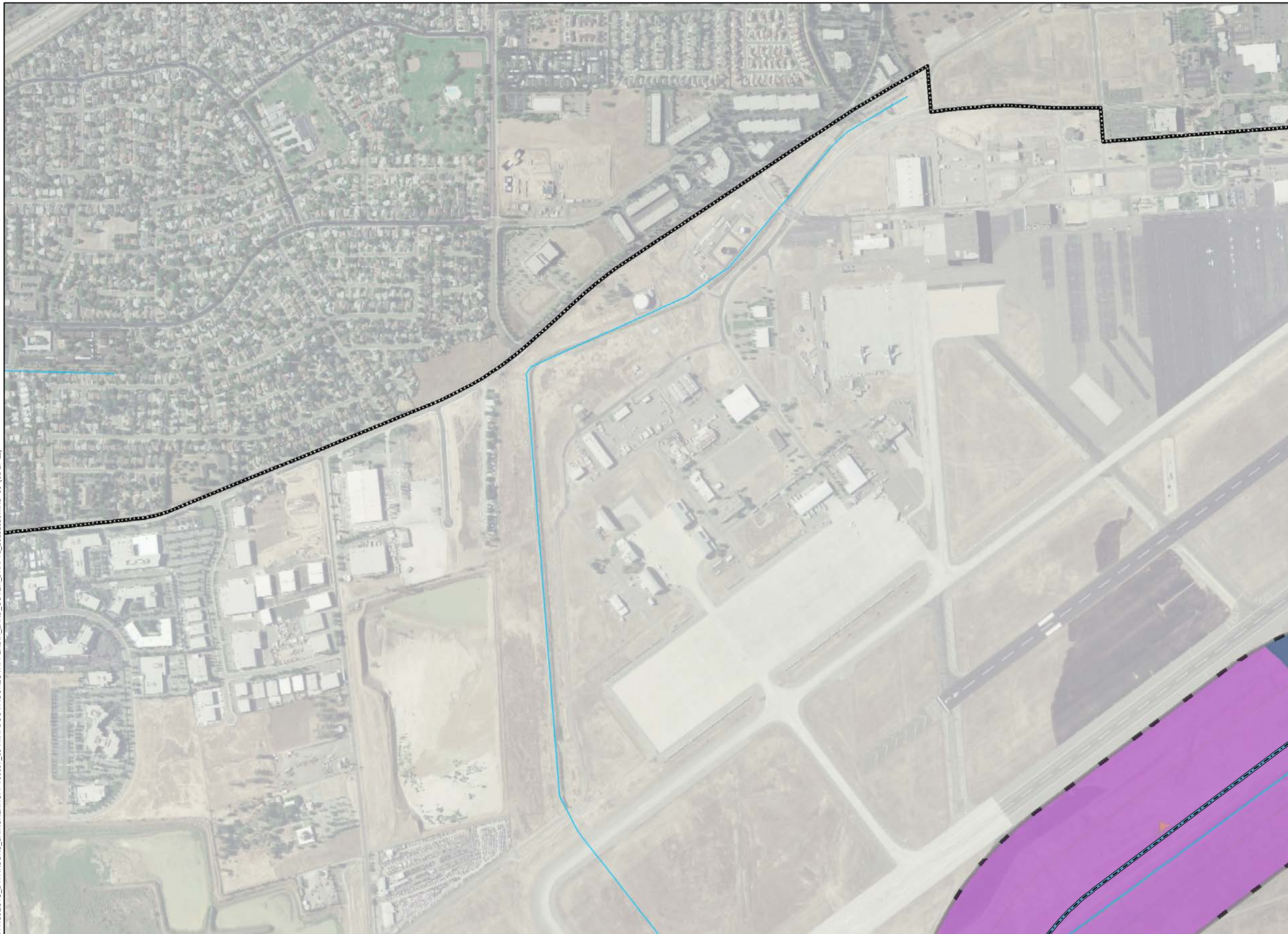

Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
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Sheldon Reduced Access Roadway Option
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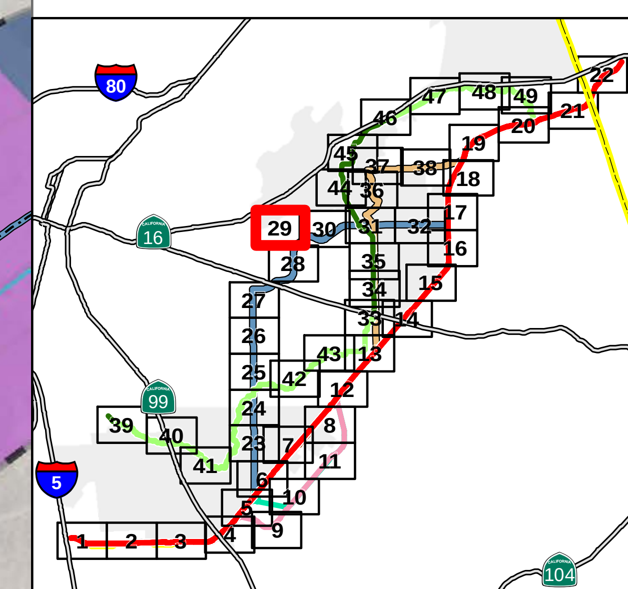
Existing Off-Corridor Multi-Use Path
Sunrise Boulevard Alignment
Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
Disturbed
Dredge Tailings
Freshwater Marsh
High Density Development
Irrigated Pasture
Landscaped
Low Density Development
Major Roads
Mine Tailings
Mixed Riparian Scrub
Mixed Riparian Woodland
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Connecting Communities

Land Use and Biological Resources

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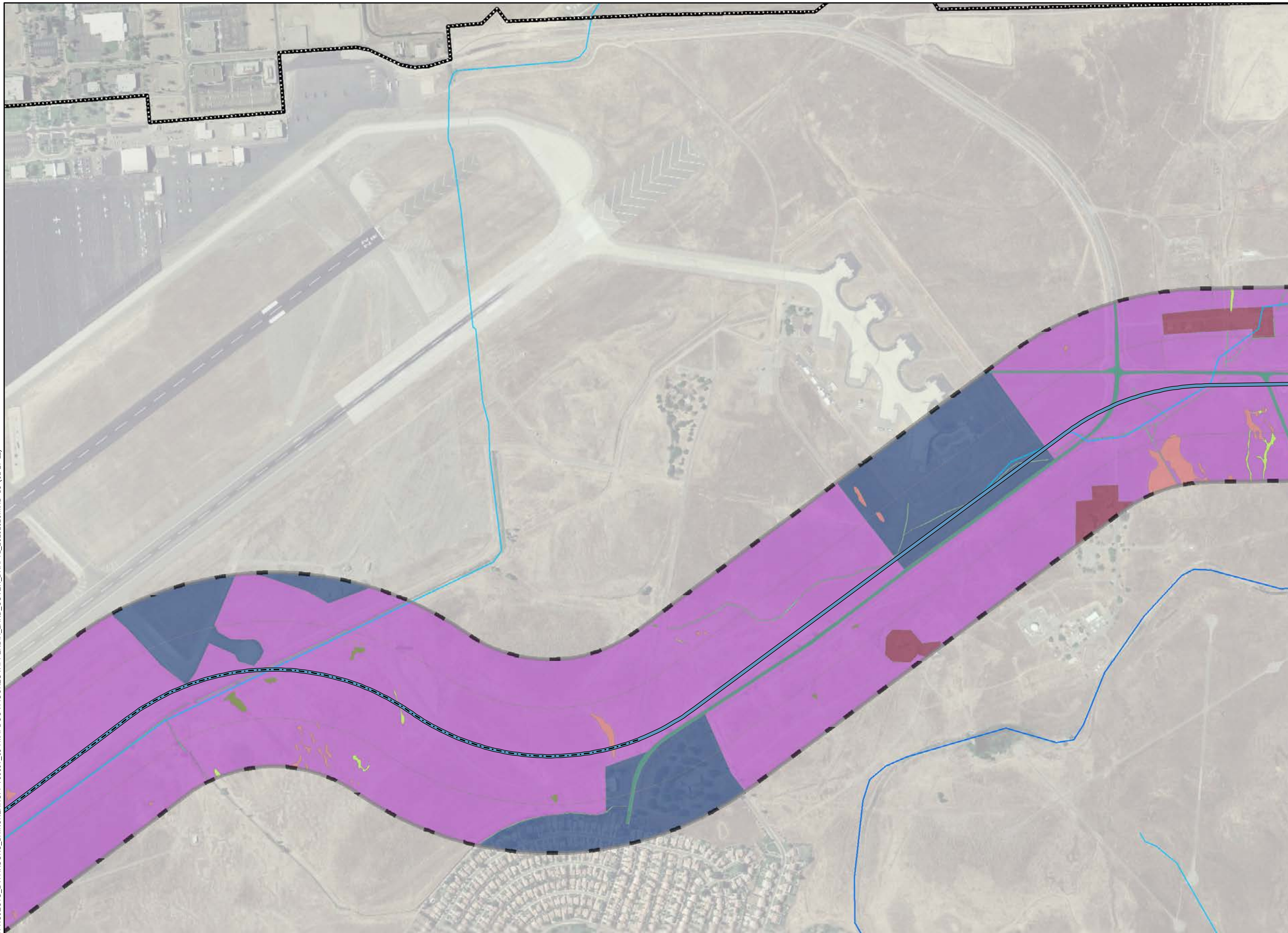

- Highway
- Major Road
- Road
- Study Area
- New Road Construction
- Water Bodies
- Streams
- Major Streams

Project Description

- Proposed Project
- Kammerer Road Bypass Option
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- Low Density Development
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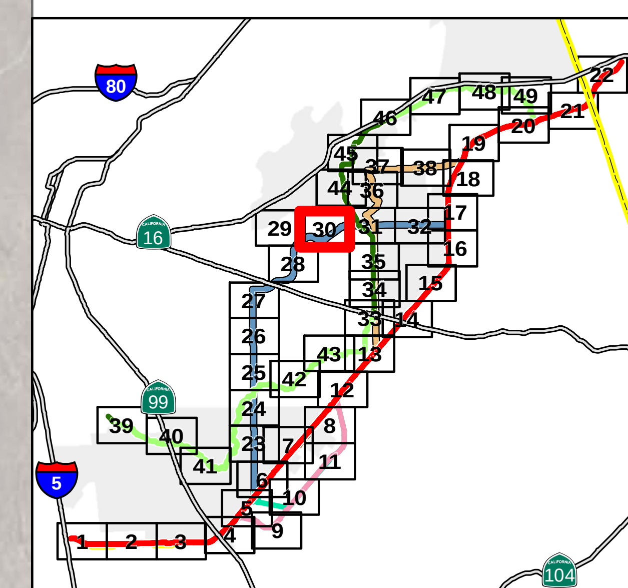
- Orchard
- Riparian Woodland
- Seasonal Pond
- Seasonal Wetland
- Stream
- Swale
- Valley Oak Riparian Woodland
- Vernal Pool
- Vineyard



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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

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January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 30

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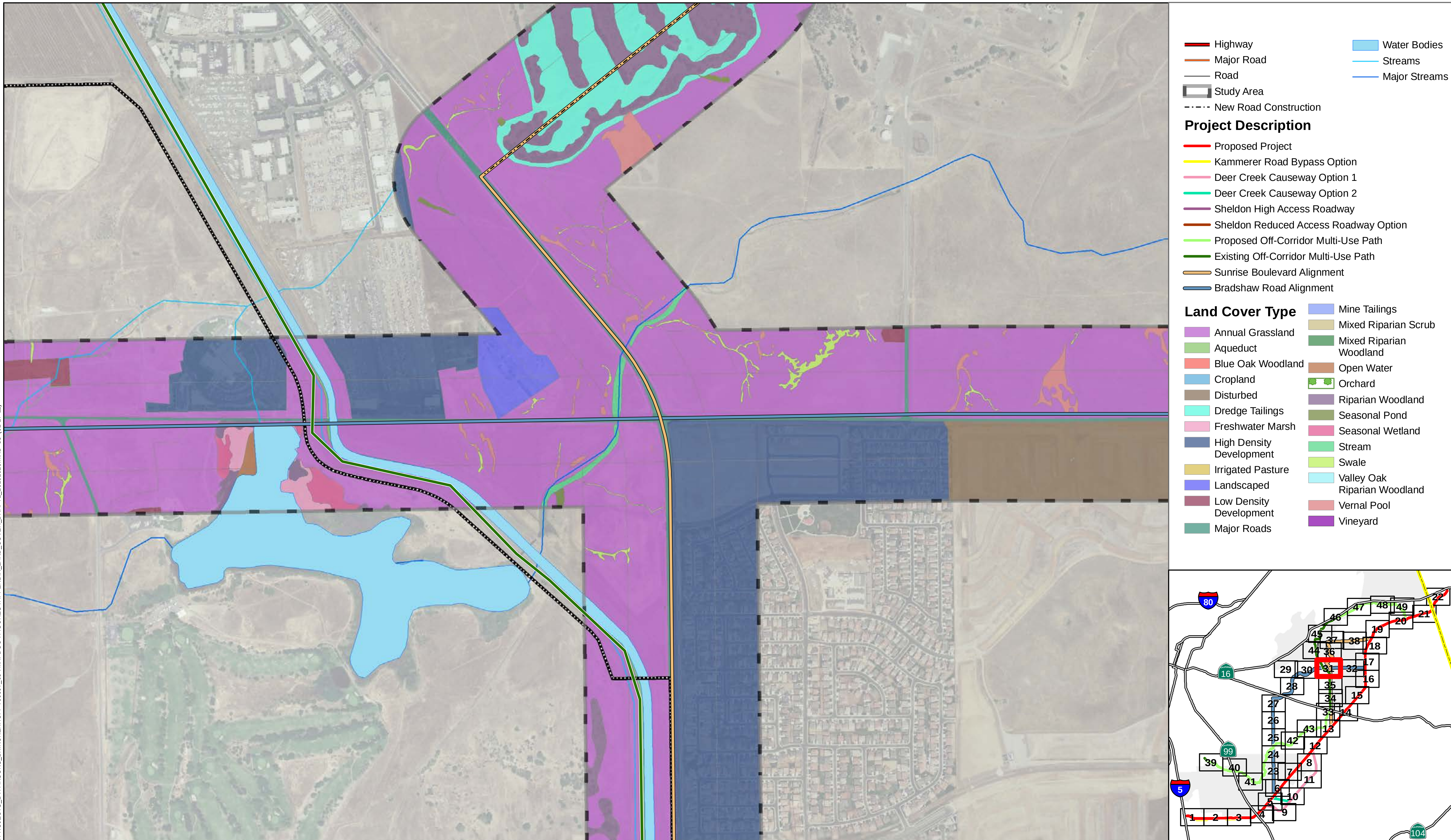

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Plot Date
January 27, 2011

CAPITAL SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

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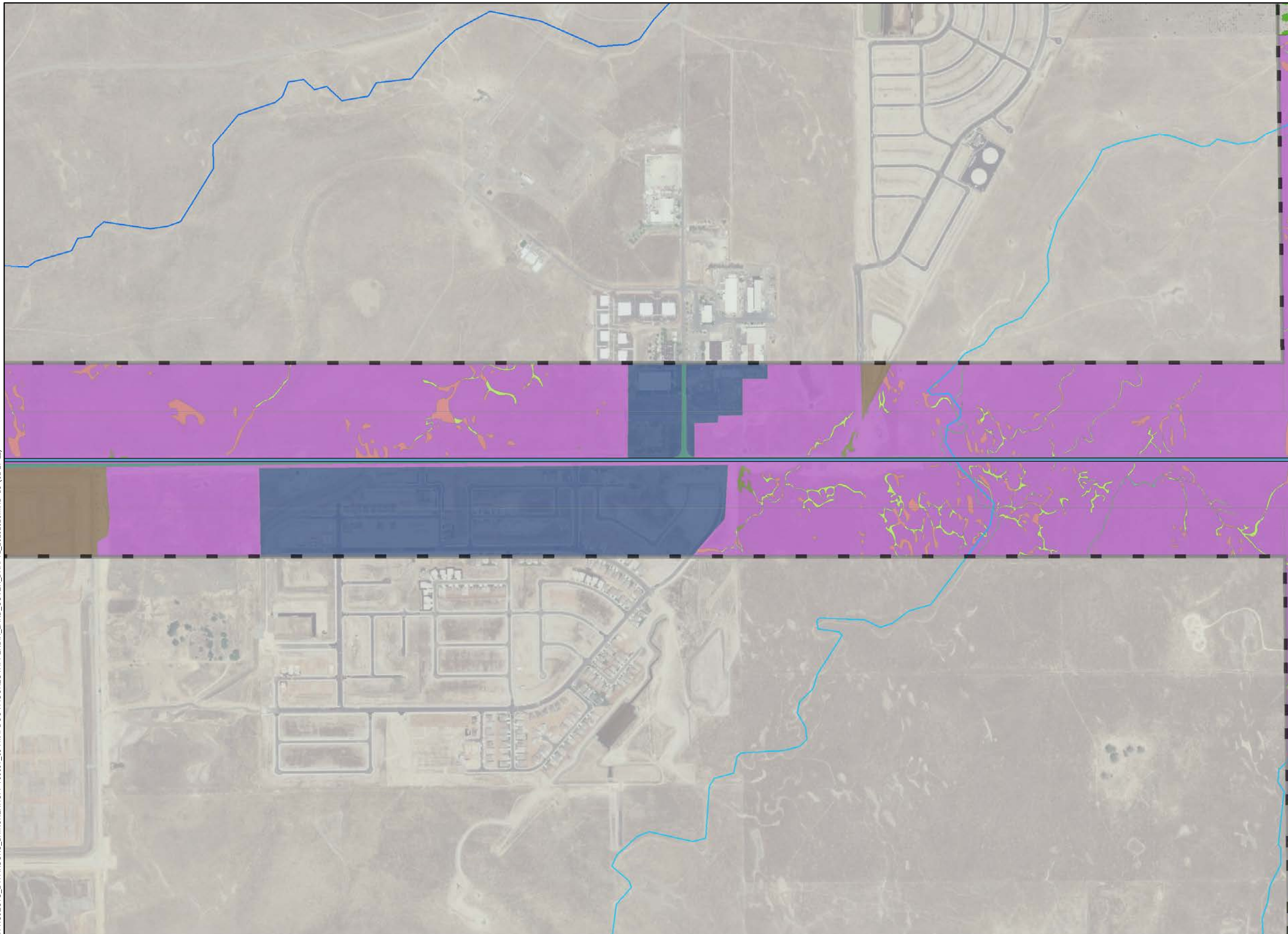

Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
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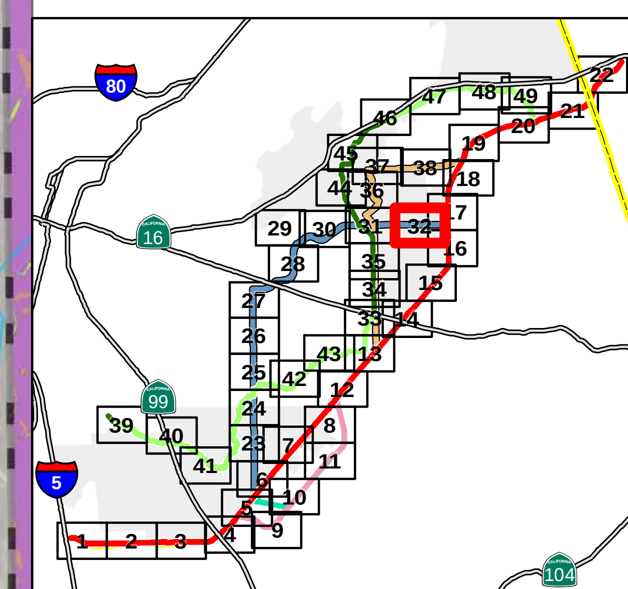
Existing Off-Corridor Multi-Use Path
Sunrise Boulevard Alignment
Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
Disturbed
Dredge Tailings
Freshwater Marsh
High Density Development
Irrigated Pasture
Landscaped
Low Density Development
Major Roads
Mine Tailings
Mixed Riparian Scrub
Mixed Riparian Woodland
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

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CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

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Sheet 32

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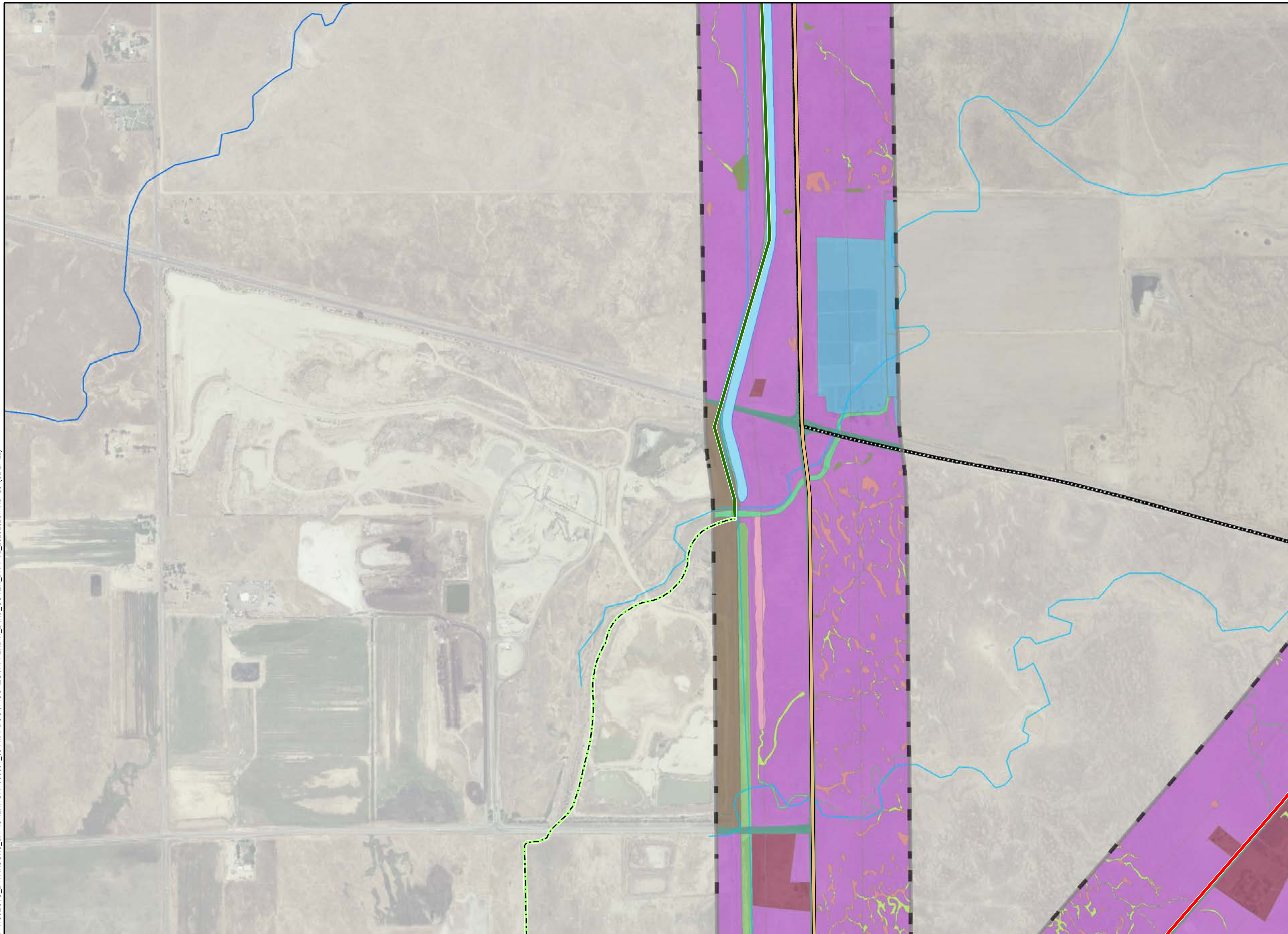

Highway
Major Road
Road
Study Area
New Road Construction

Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
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Sheldon Reduced Access Roadway Option
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Existing Off-Corridor Multi-Use Path
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Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
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Irrigated Pasture
Landscaped
Low Density Development
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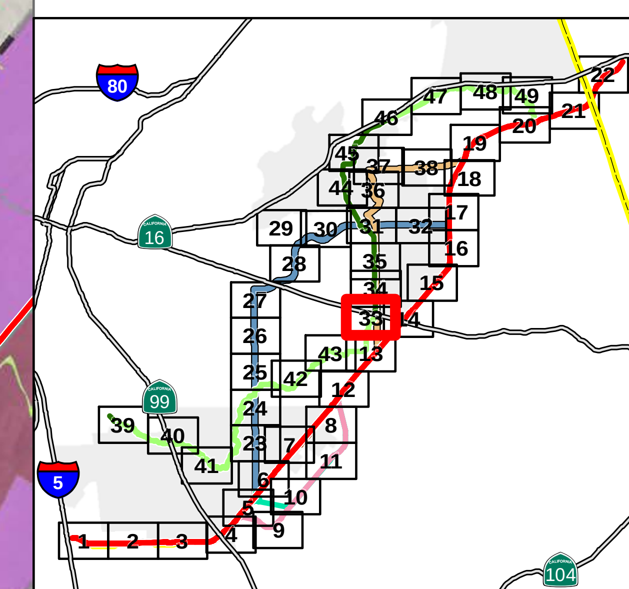
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Data Layers Provided by Sacramento County GIS Department, Sacramento County Planning Department, SACOG, El Dorado County, El Dorado County Planning Department, The US Fish and Wildlife Service, and USGS

Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

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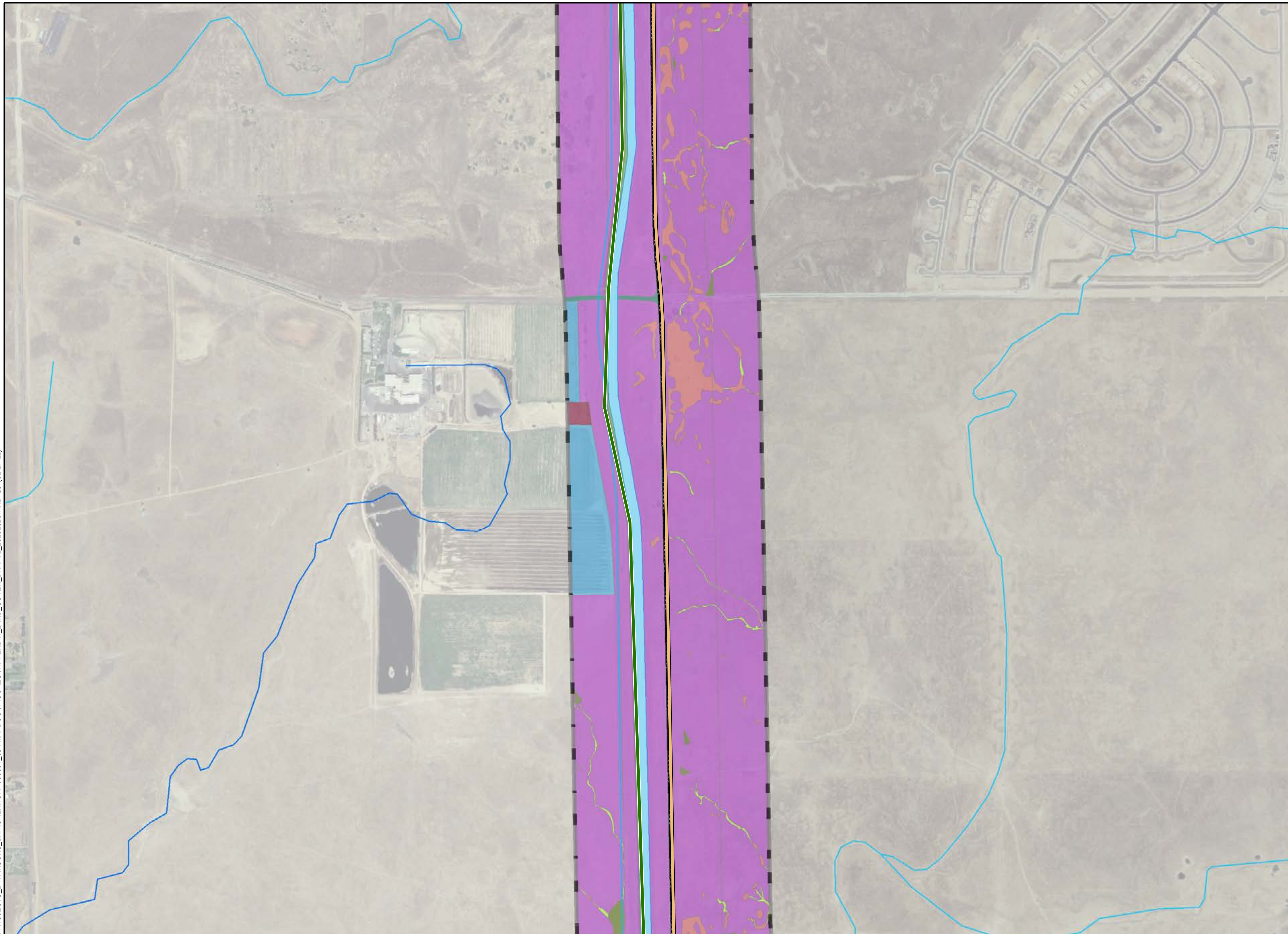
Sheet 33



Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
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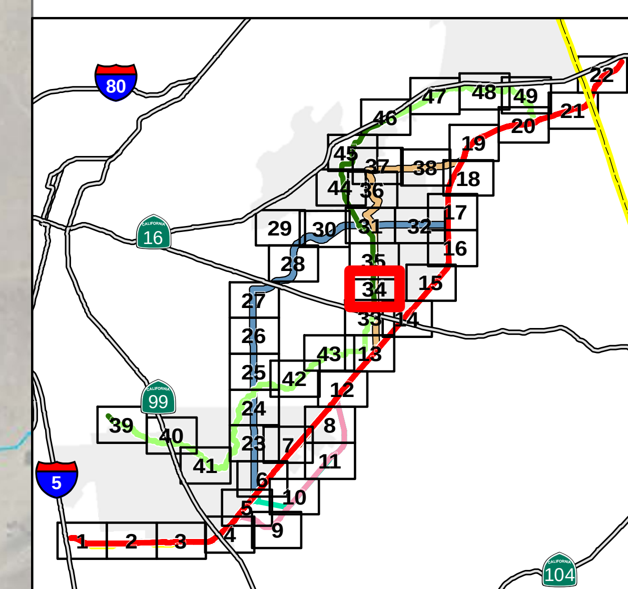
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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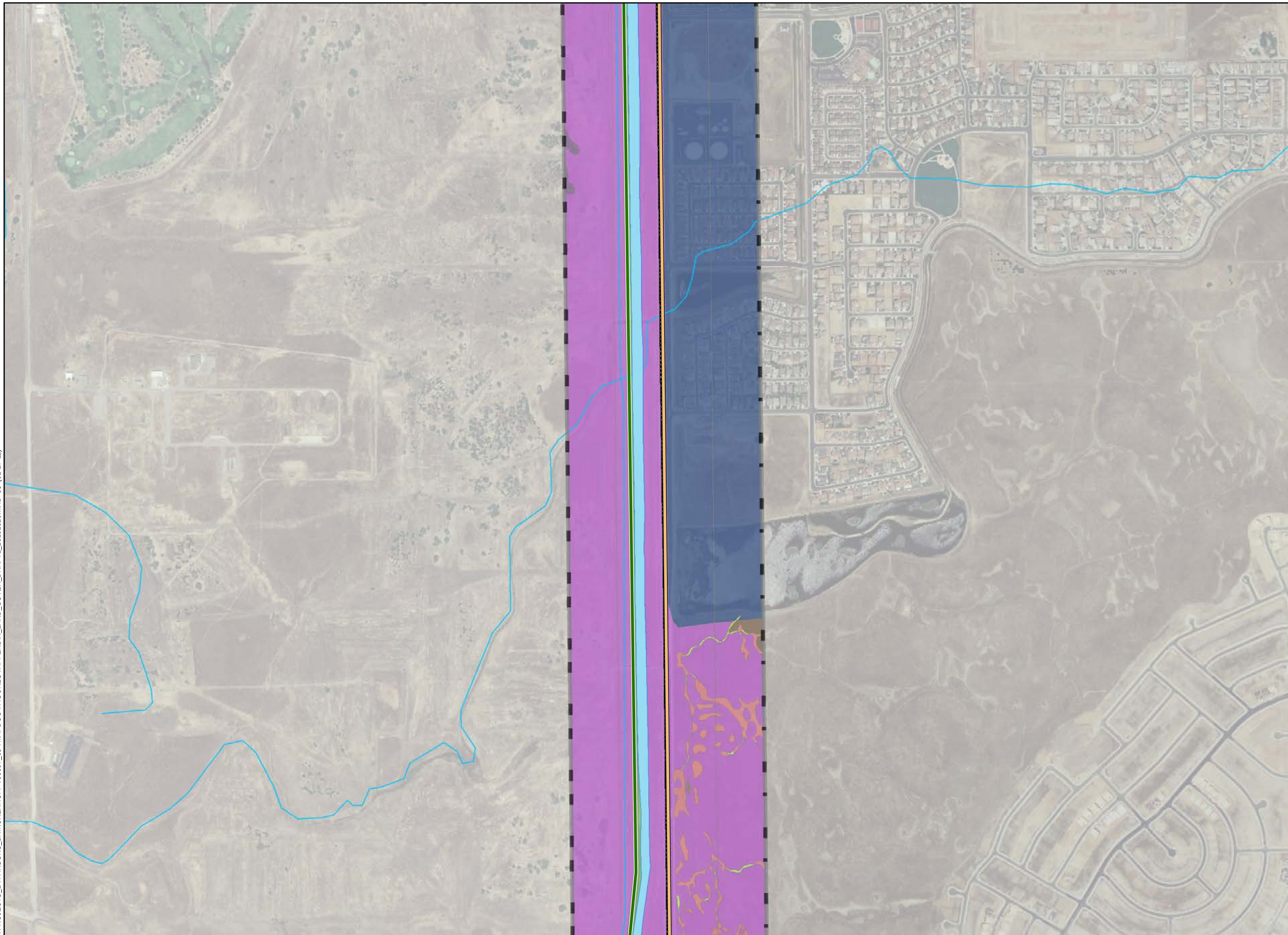
Plot Date
January 27, 2011

CAPITAL SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 34



Highway
Major Road
Road
Study Area
New Road Construction

Water Bodies
Streams
Major Streams

Project Description

- Proposed Project
- Kammerer Road Bypass Option
- Deer Creek Causeway Option 1
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Land Cover Type

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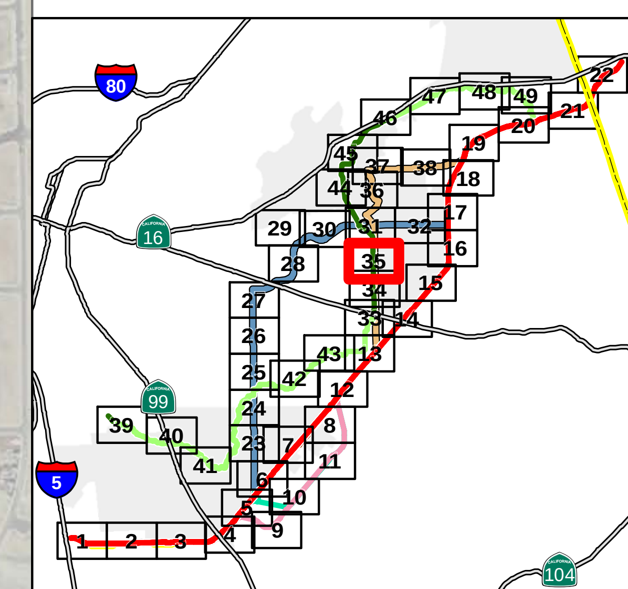
- Orchard
- Riparian Woodland
- Seasonal Pond
- Seasonal Wetland
- Stream
- Swale
- Valley Oak Riparian Woodland
- Vernal Pool
- Vineyard



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Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 35

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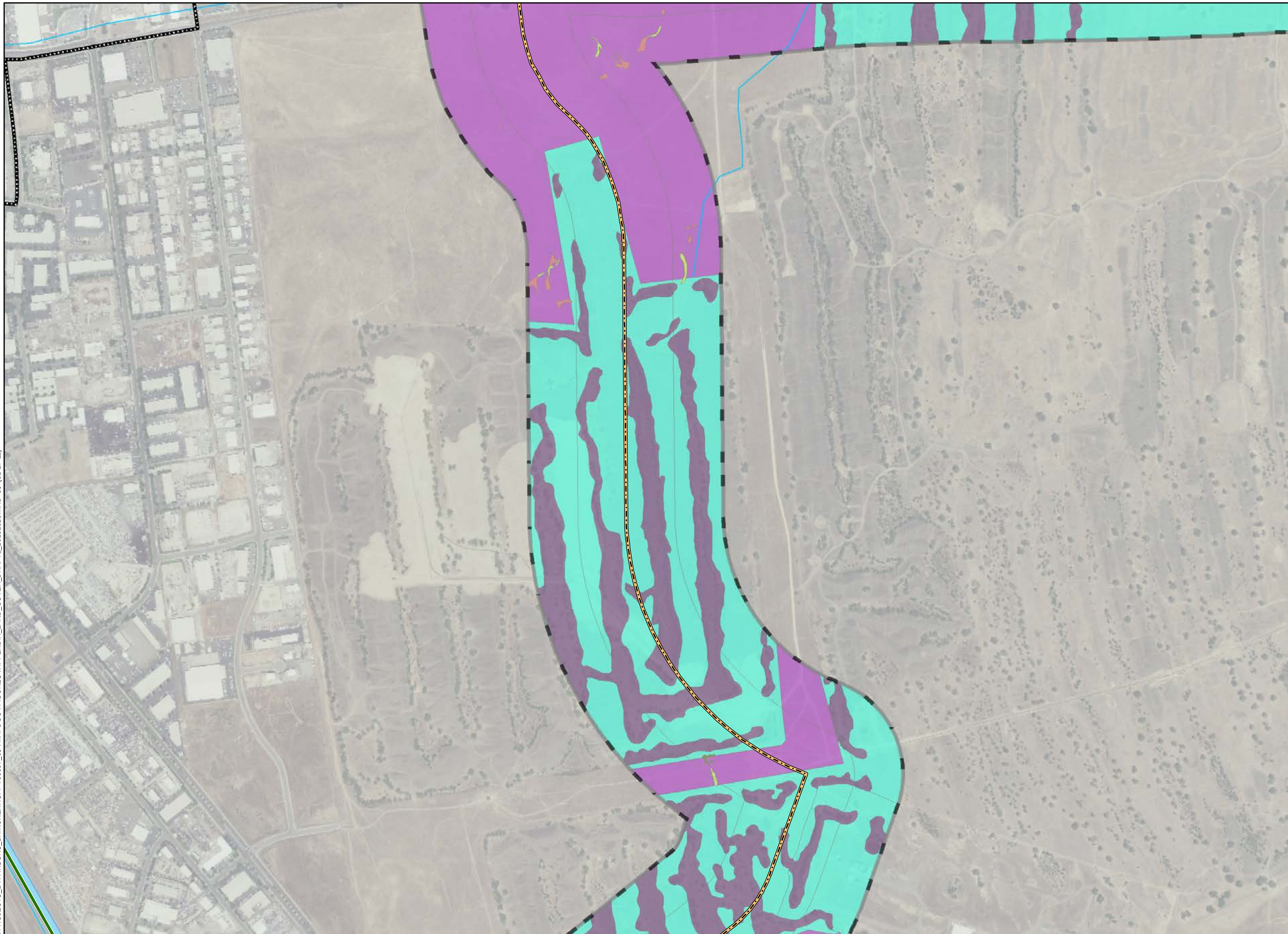

Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
Sheldon High Access Roadway
Sheldon Reduced Access Roadway Option
Proposed Off-Corridor Multi-Use Path
Existing Off-Corridor Multi-Use Path
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Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
Disturbed
Dredge Tailings
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Irrigated Pasture
Landscaped
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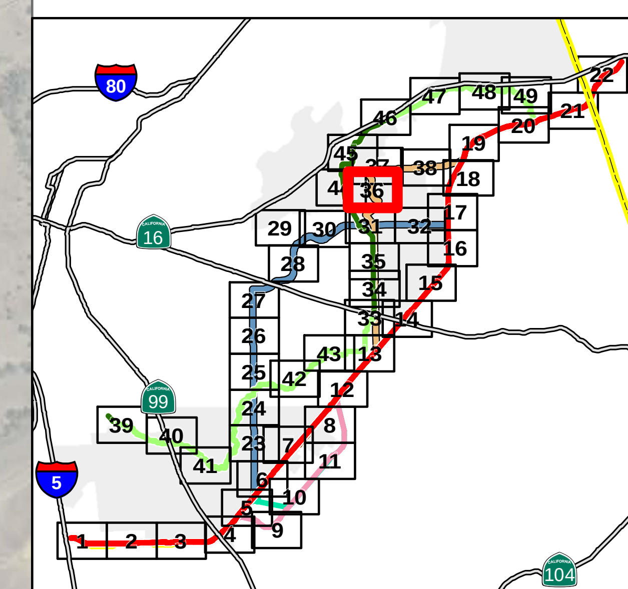
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 36

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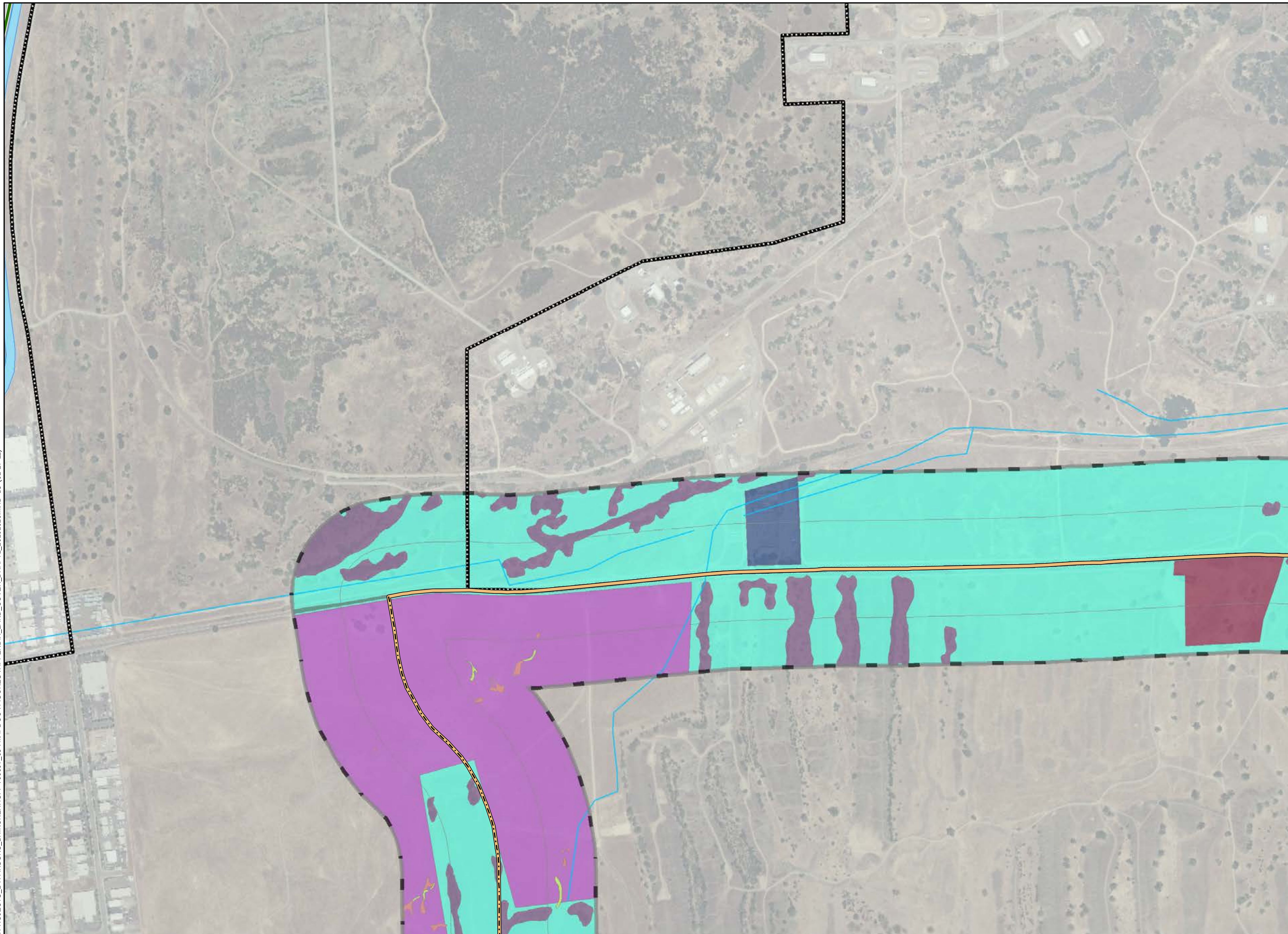

Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
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Existing Off-Corridor Multi-Use Path
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Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
Disturbed
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Stream
Swale
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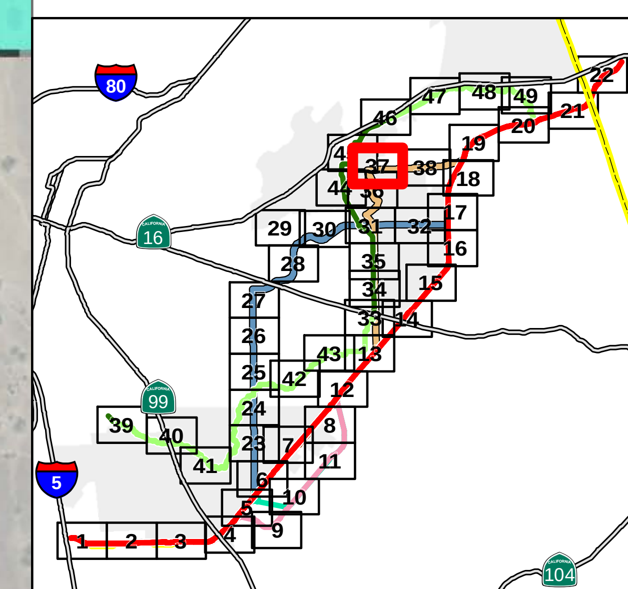
Vineyard



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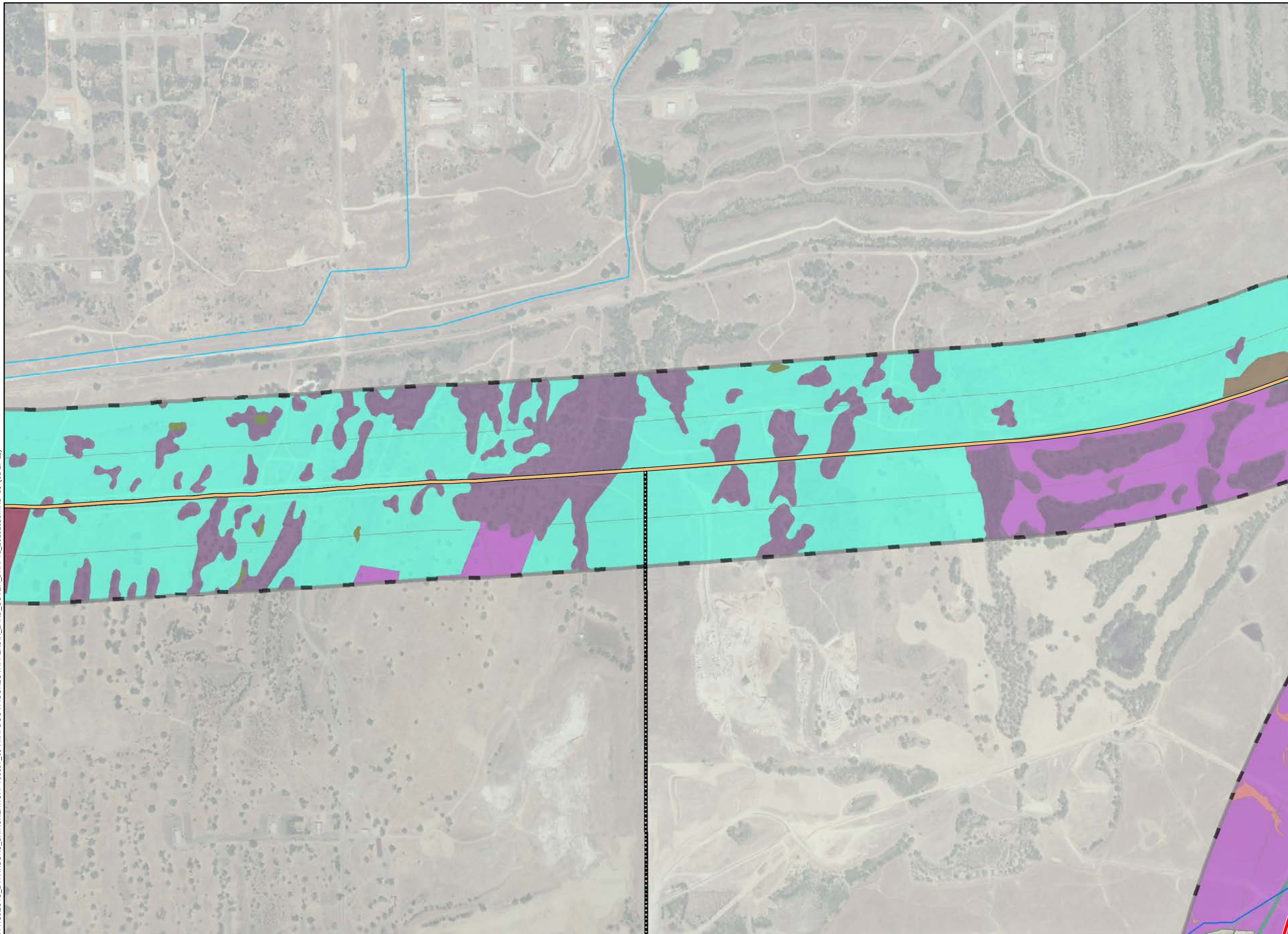
Plot Date
January 27, 2011

CAPITAL | SOUTHEAST CONNECTOR
Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 37



- Highway
- Major Road
- Road
- Study Area
- New Road Construction
- Water Bodies
- Streams
- Major Streams

Project Description

- Proposed Project
- Kammerer Road Bypass Option
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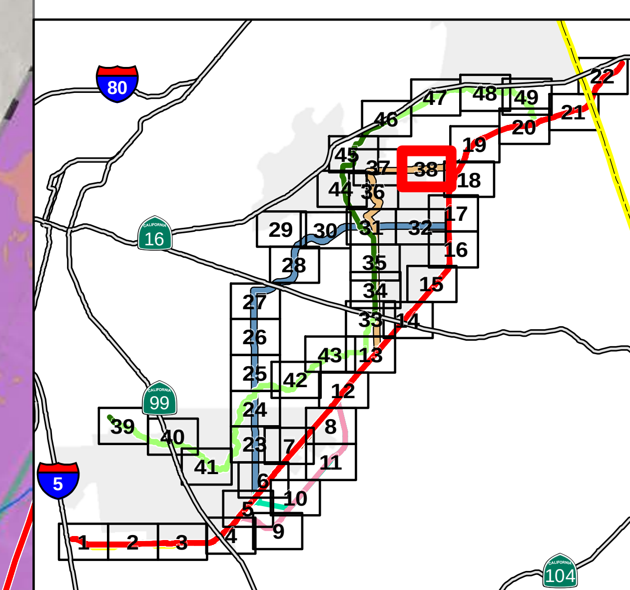

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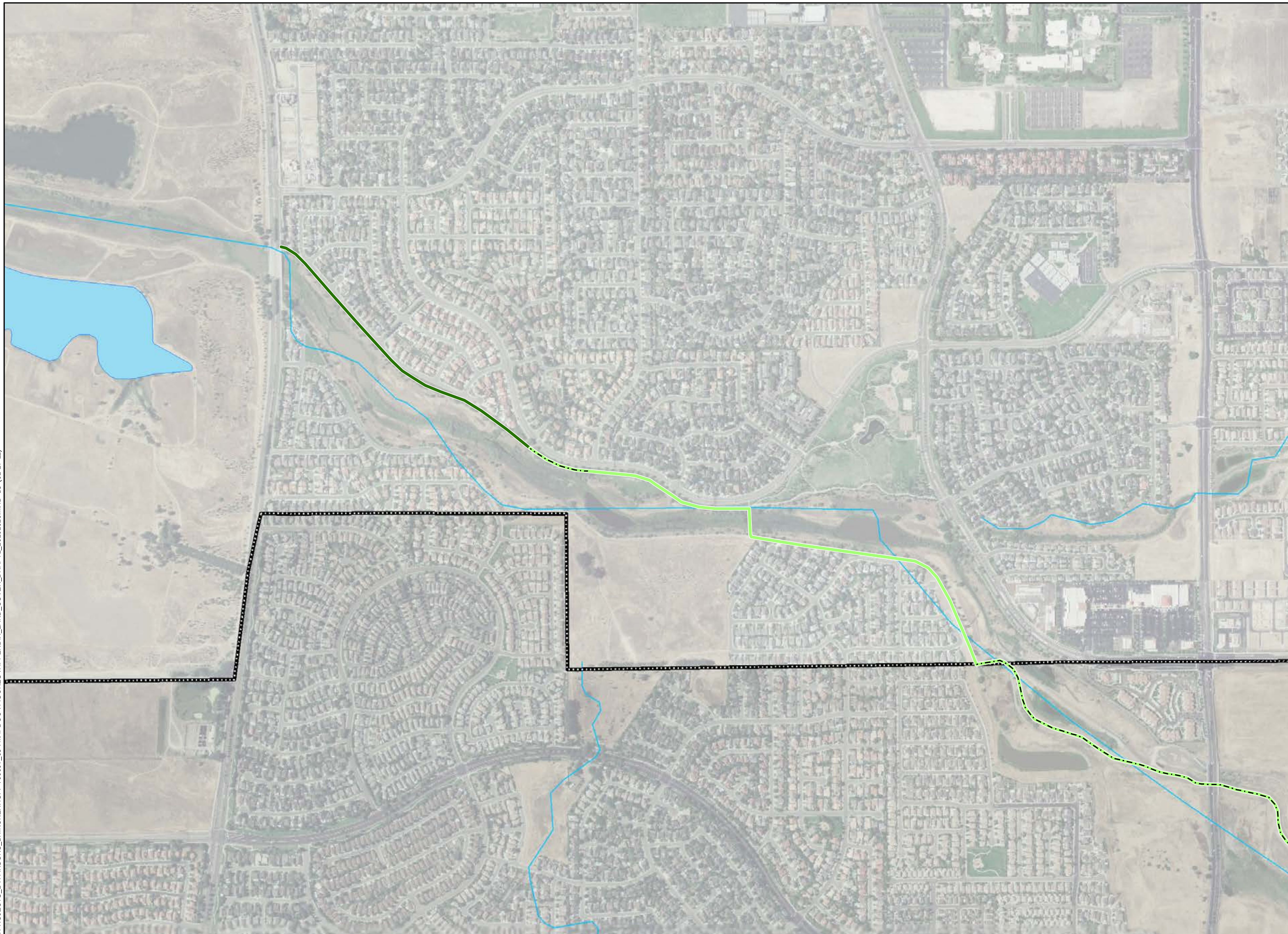
Plot Date
January 27, 2011

CAPITAL SOUTHEAST CONNECTOR Connecting Communities

Land Use and Biological Resources

Appendix I

Sheet 38



Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
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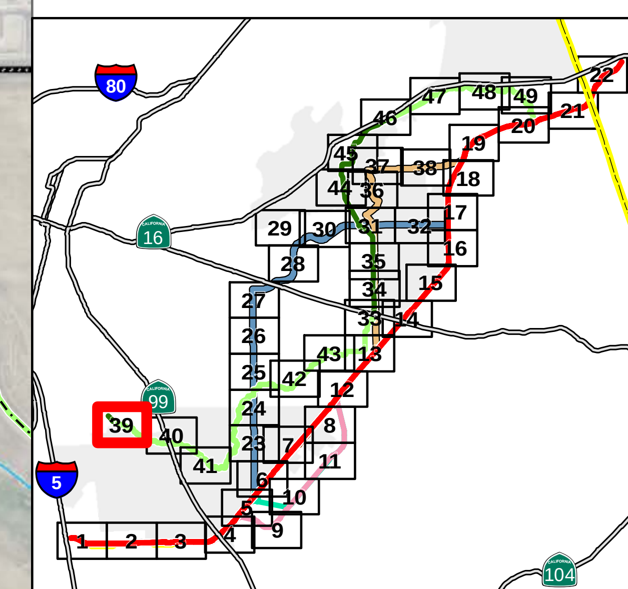
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Connecting Communities

Land Use and Biological Resources

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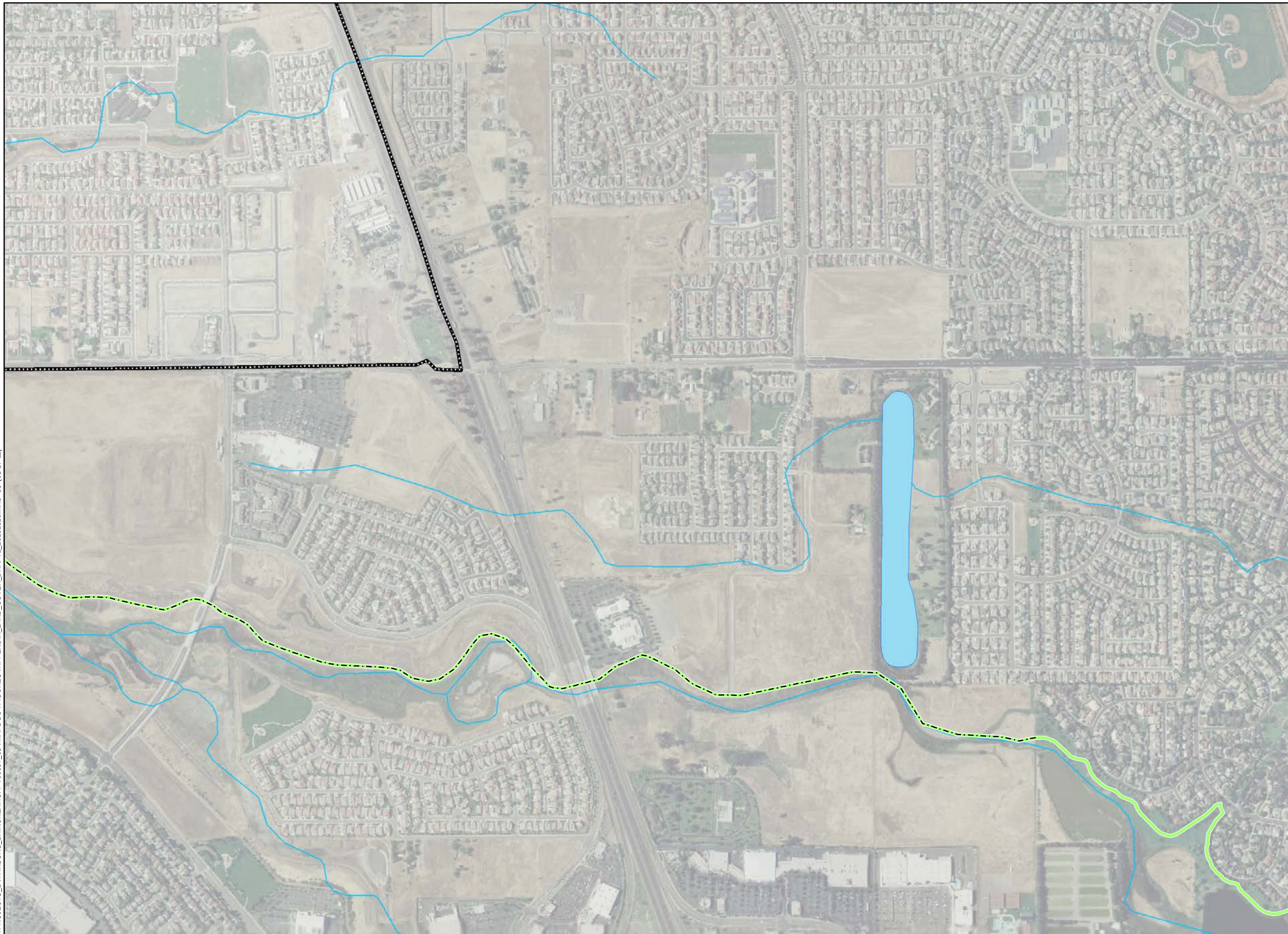


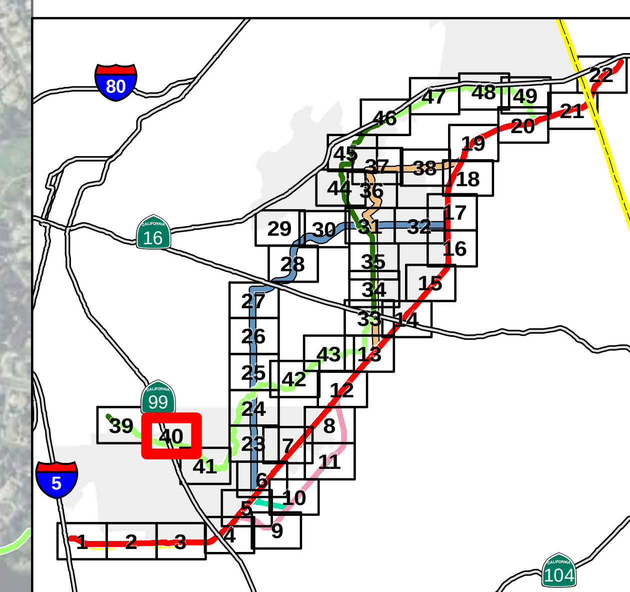
Highway
Major Road
Road
Study Area
New Road Construction
Water Bodies
Streams
Major Streams

Project Description

Proposed Project
Kammerer Road Bypass Option
Deer Creek Causeway Option 1
Deer Creek Causeway Option 2
Sheldon High Access Roadway
Sheldon Reduced Access Roadway Option
Proposed Off-Corridor Multi-Use Path
Existing Off-Corridor Multi-Use Path
Sunrise Boulevard Alignment
Bradshaw Road Alignment

Land Cover Type

Annual Grassland
Aqueduct
Blue Oak Woodland
Cropland
Disturbed
Dredge Tailings
Freshwater Marsh
High Density Development
Irrigated Pasture
Landscaped
Low Density Development
Major Roads
Mine Tailings
Mixed Riparian Scrub
Mixed Riparian Woodland
Open Water
Orchard
Riparian Woodland
Seasonal Pond
Seasonal Wetland
Stream
Swale
Valley Oak Riparian Woodland
Vernal Pool
Vineyard



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Study Area
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Water Bodies
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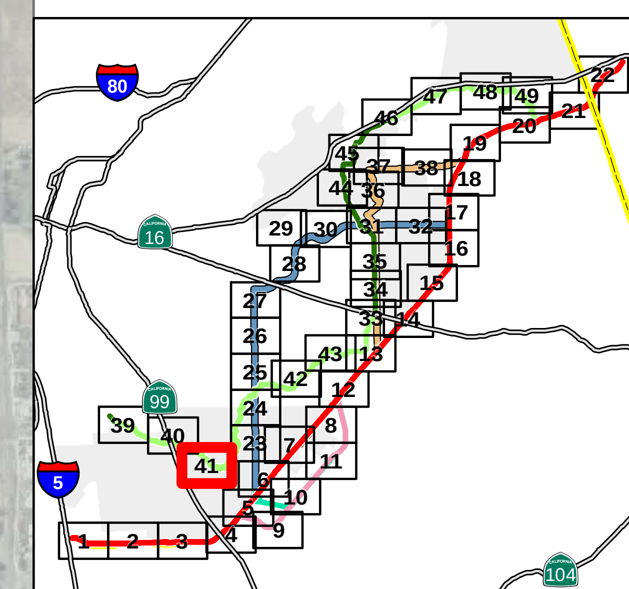

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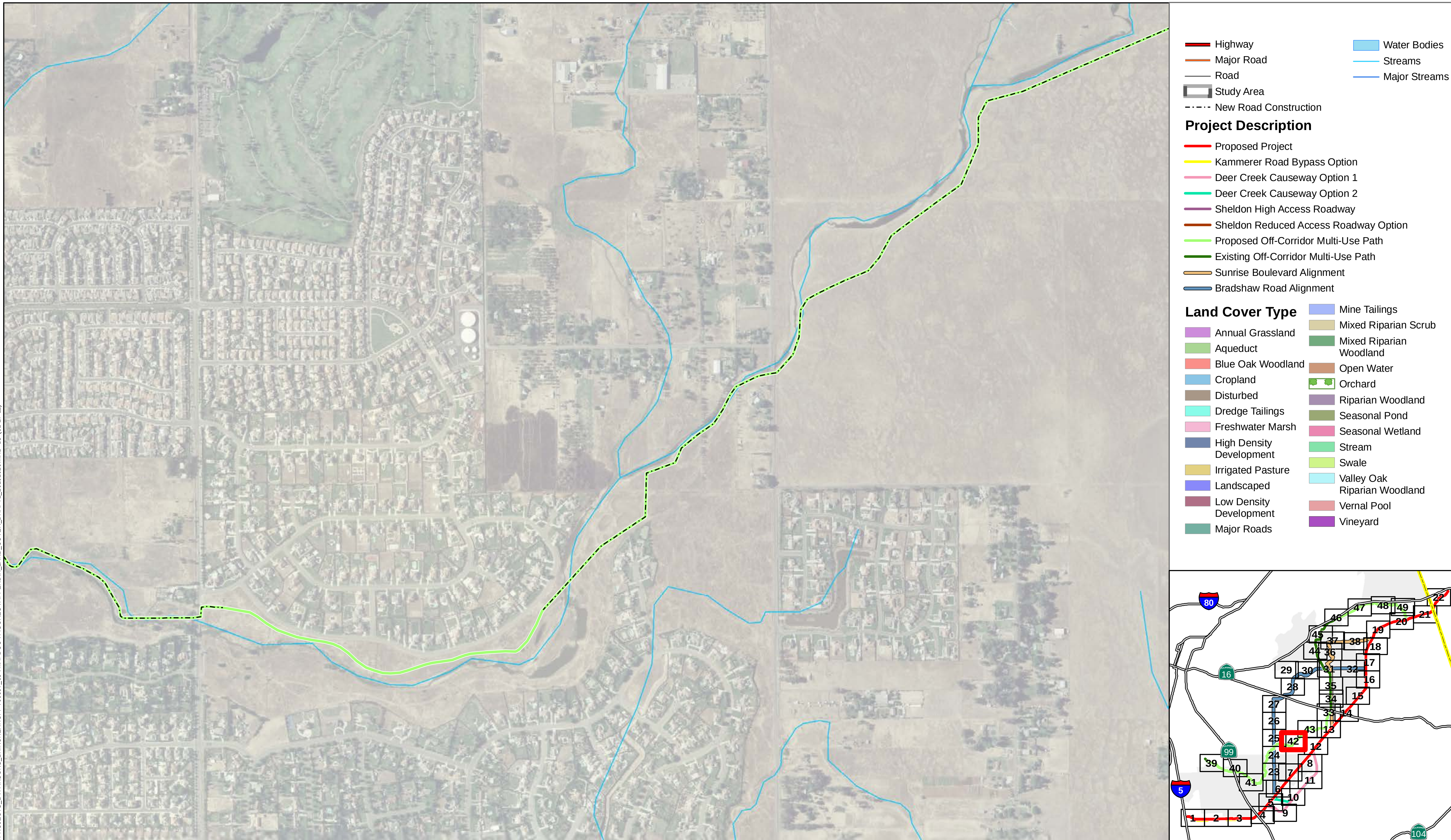

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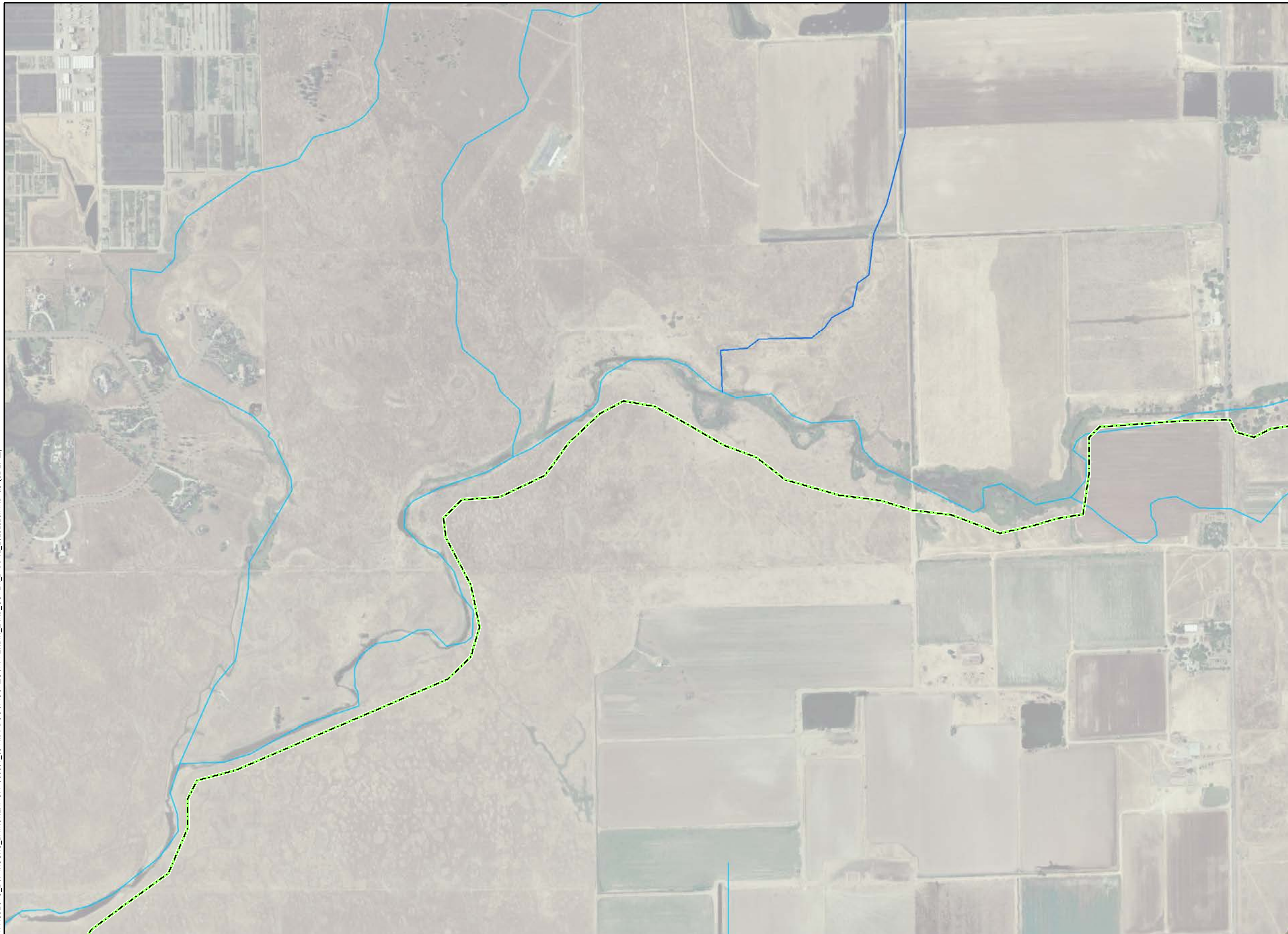

Highway
Major Road
Road
Study Area
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Major Streams

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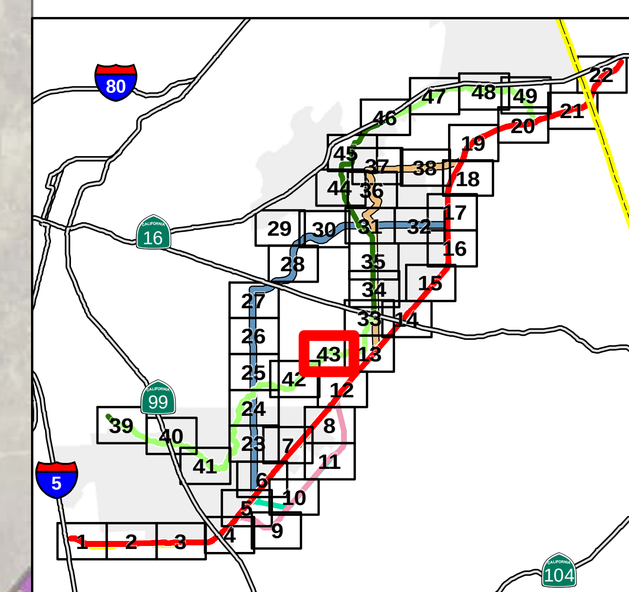
Vernal Pool
Vineyard



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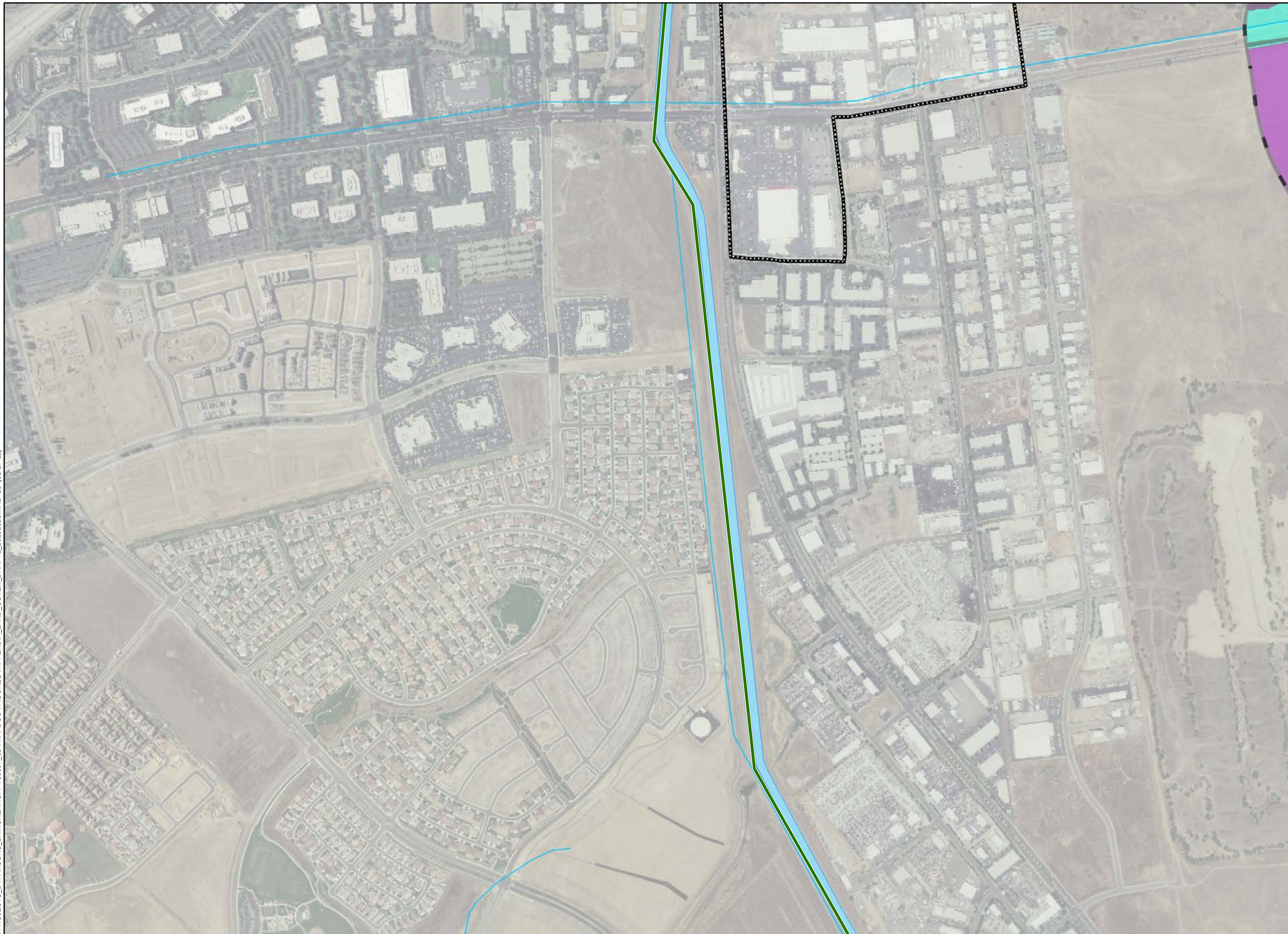

- Highway
- Major Road
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Project Description

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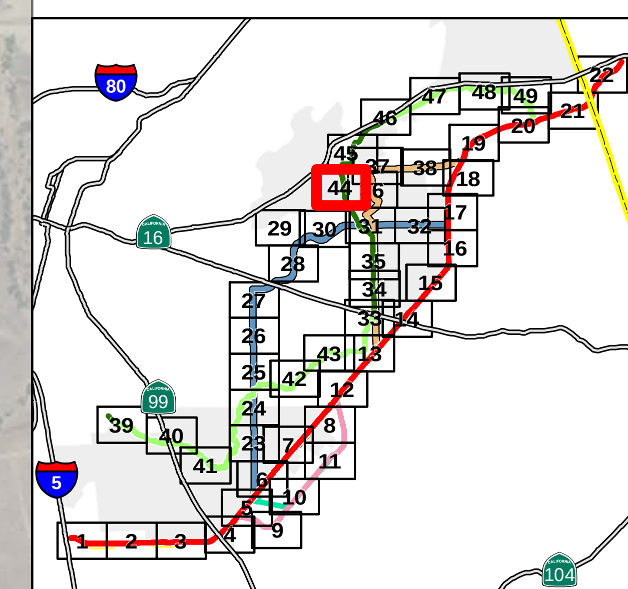

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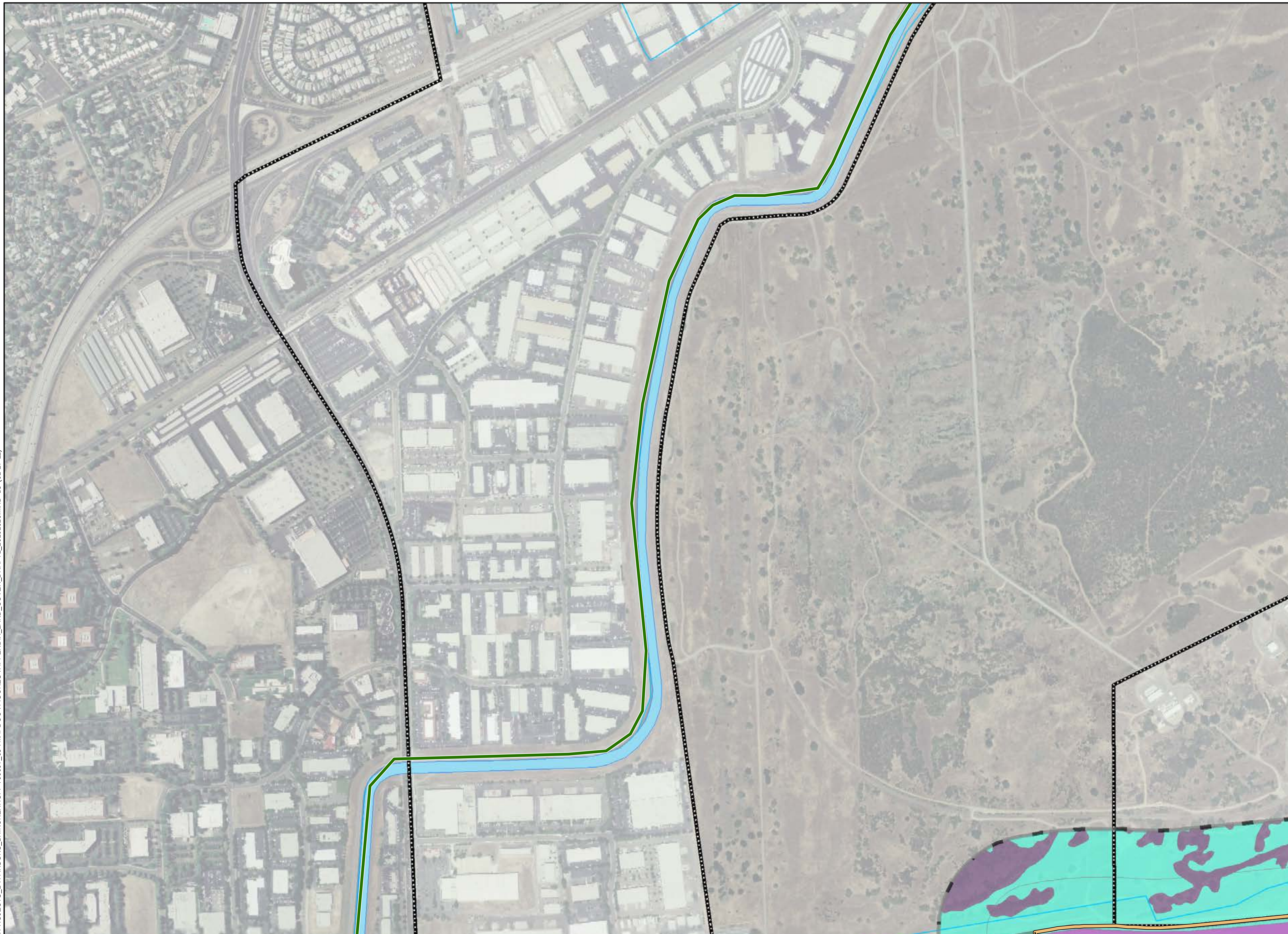

Highway
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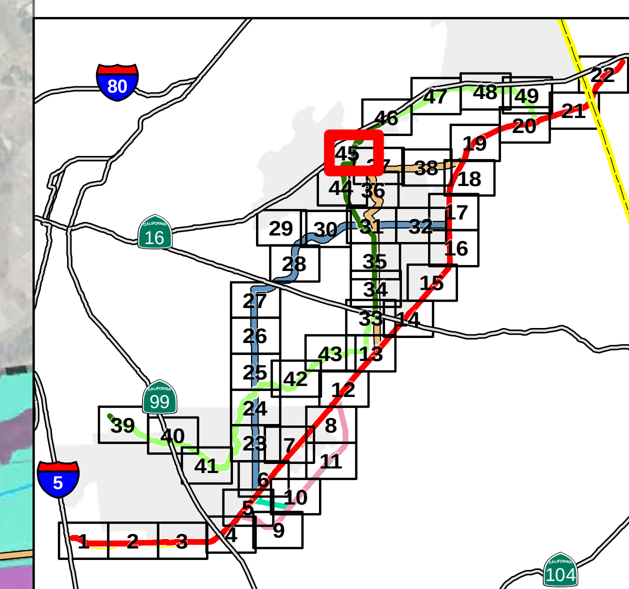

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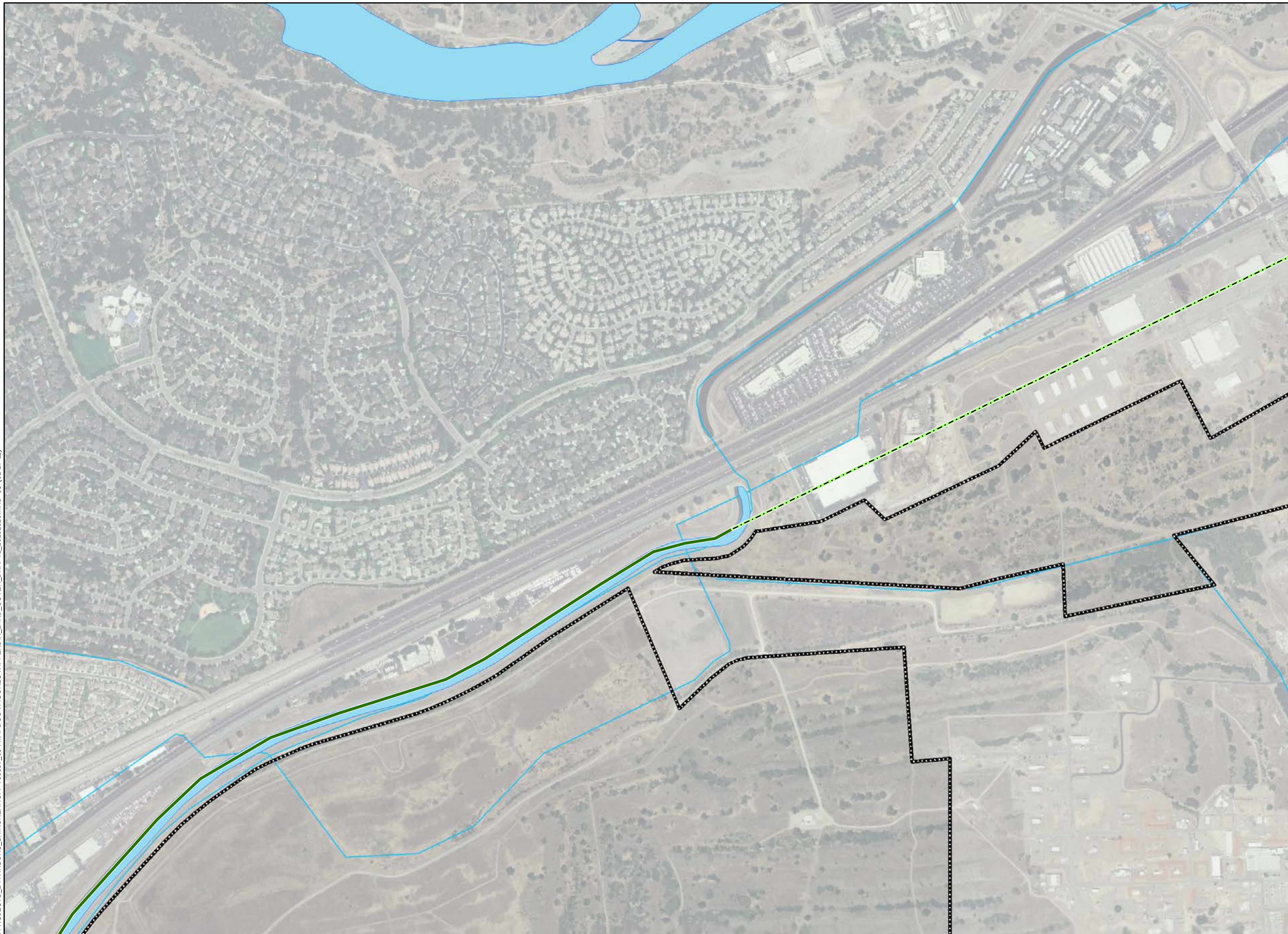

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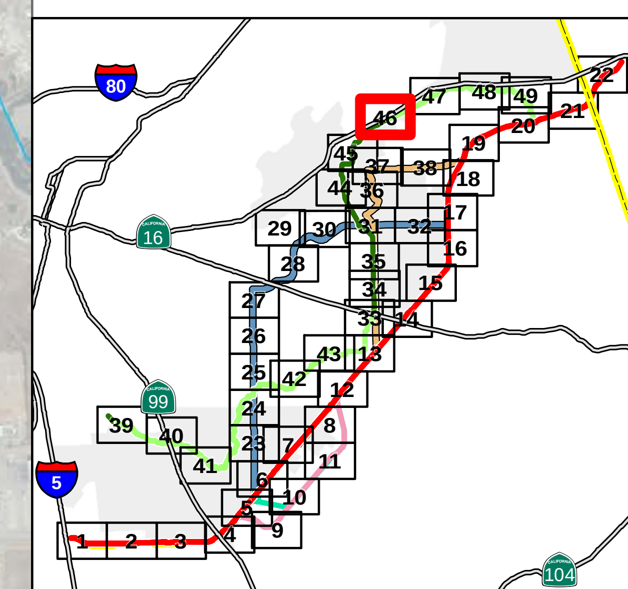

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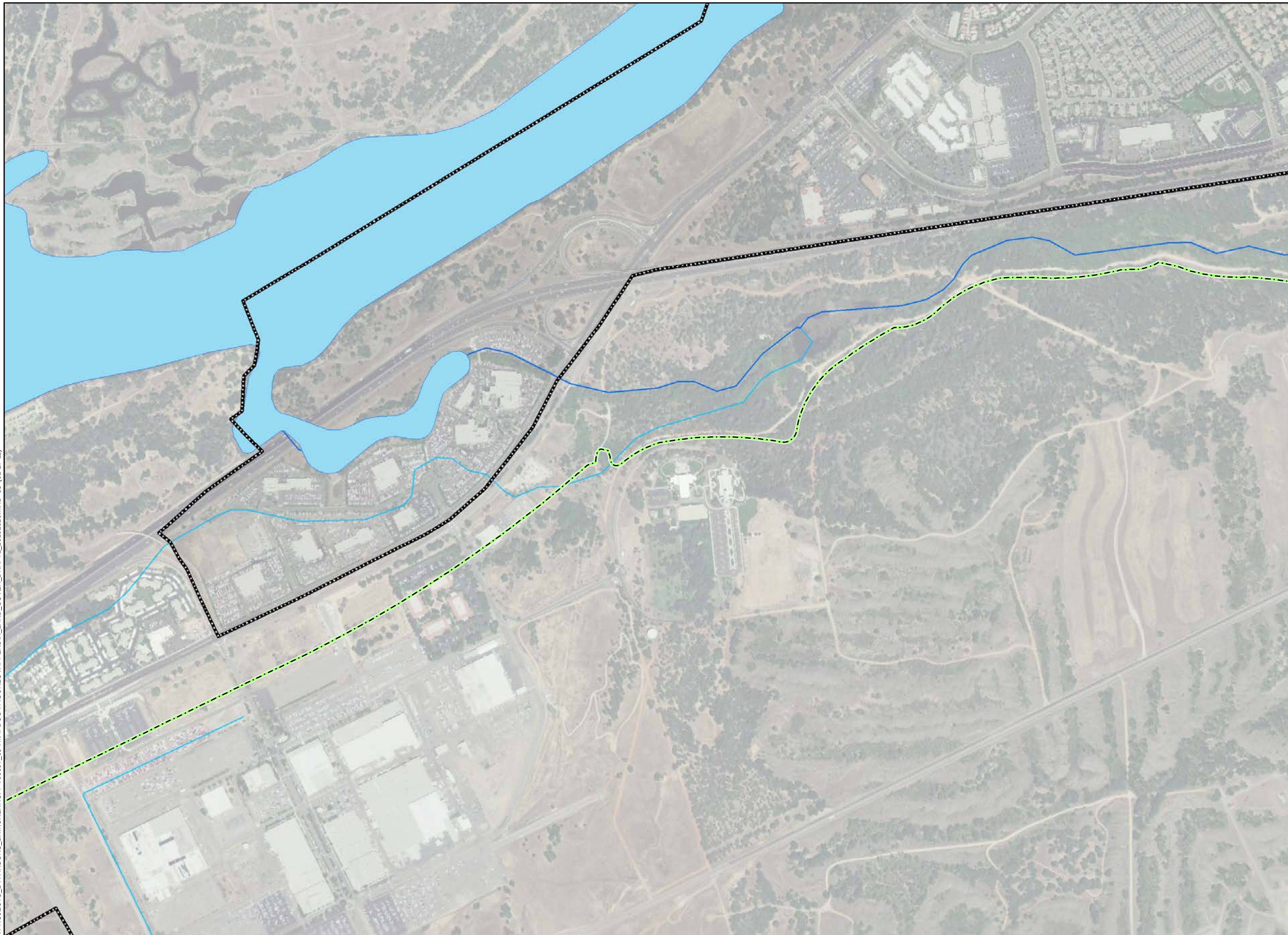

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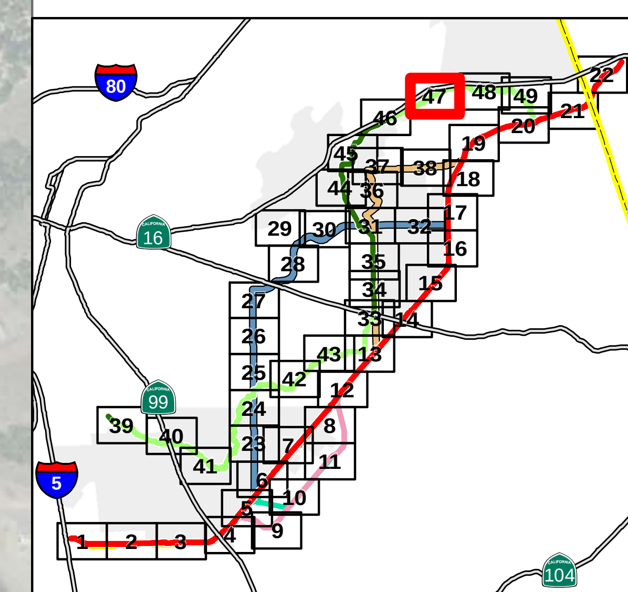

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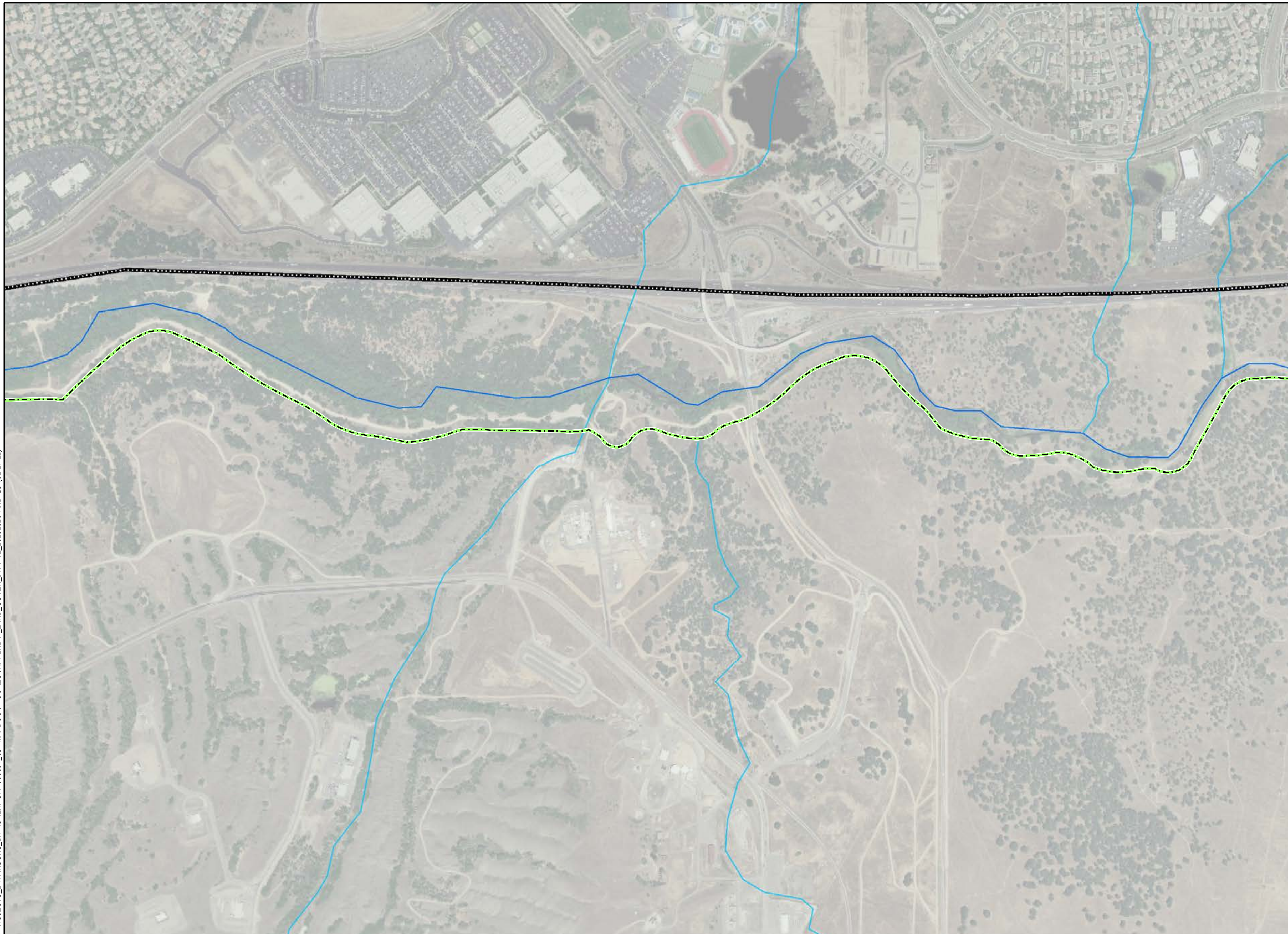

- Highway
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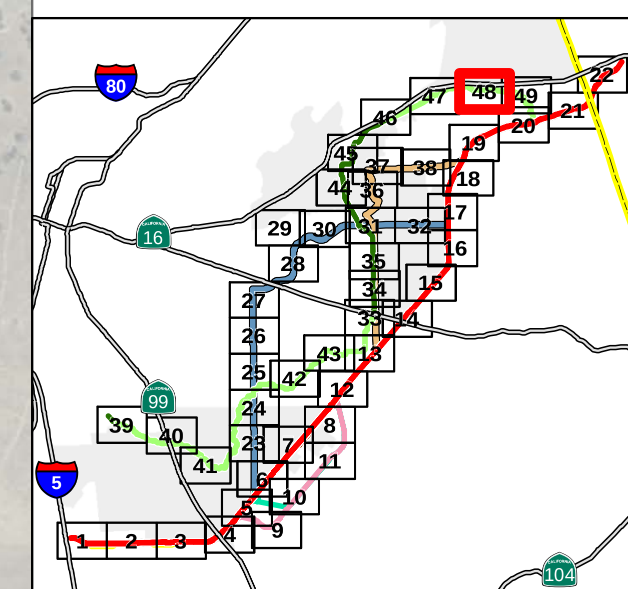

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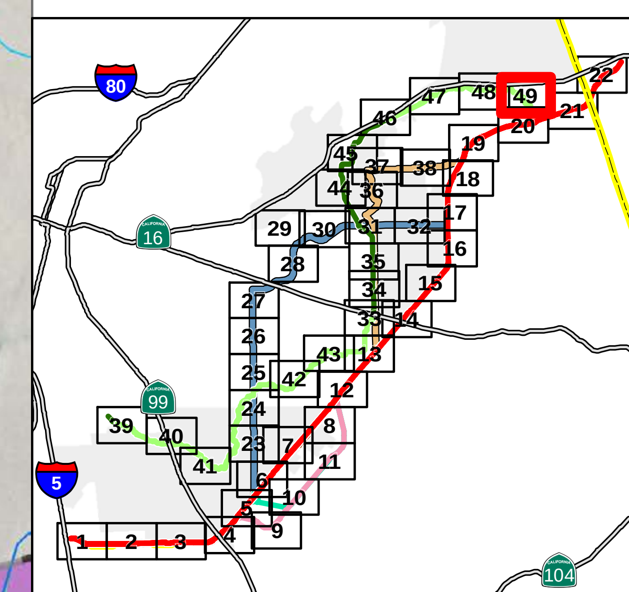

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Connecting Communities

Land Use and Biological Resources

Appendix I

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Appendix J

Analysis of Access Roads between US 50 and the Capital SouthEast Connector Project

DKS Associates
TRANSPORTATION SOLUTIONS

MEMORANDUM

TO:	Tom Zlotkowski
FROM:	John P. Long
DATE:	November 3, 2010
SUBJECT:	Analysis of Access Roads between US 50 and the Capital Southeast Connector Project — P/A No. 08238

Overview

El Dorado County is concerned about how traffic will flow to and from the eastern portion of the Connector project. Their primary objective is to limit increases in traffic volumes on White Rock Road and Latrobe Road through El Dorado Hills.

The Metropolitan Transportation Plan (MTP), as well as the El Dorado County General Plan and the proposed Folsom SOI Specific Plan, assume that a number of improvements will be implemented over the next 25 years to increase both the number and capacity of the roadway connections between US 50 and White Rock Road. The Connector EIR analysis assumes that these roadway improvements will be implemented in the year identified in the MTP. However, El Dorado County is concerned that some of these roadway improvements may not occur in a timely manner and thus affect traffic volumes on White Rock Road and Latrobe Road through El Dorado Hills. They want to understand how the planned connections through the Folsom SOI, as well as the proposed West Access to the EDH Business Park, will feed traffic to/from the Connector.

To address these issues, the Capital Southeast Connector JPA has been working with El Dorado County DOT and the City of Folsom to evaluate future traffic conditions in the El Dorado Hills and Folsom SOI area. The JPA has asked DKS to:

1) Provide more information on future travel patterns traveling to and from the eastern portion of the Connector.
2) Conduct a "sensitivity analysis" involving traffic forecasts under future development levels with alternative roadway networks to determine how the timing of roadway improvements will impact traffic patterns and volumes.

This memorandum provides a summary of our analysis.

Future Travel Patterns

An analysis of the projected origins and destinations of persons who will travel on White Rock Road in 2035 was conducted. Figure 1 shows the projected origin and destination of the trips that would use the section of White Rock Road west of Prairie City Road in 2035 with the Connector project. It indicates the following:

- Of the 75,000 daily vehicle trips projected in to use White Rock Road west of Prairie City Road in 2035, only about 10,000 daily vehicle trips (about 13 percent) would use White Rock Road east of the County line.
- Most of the of the traffic (about 67 percent) that will use White Rock Road west of Prairie City Road in 2035 (about 50,000 daily trips) will have origins and destinations in the City of Folsom while about 33 percent would travel to/from El Dorado County.
- An even higher amount (about 74 percent) of the traffic that will use White Rock Road west of Prairie City Road would access that road segment via Folsom SOI roadways (Prairie City Road, Oak Avenue Parkway and Scott Road). Traffic using that section of White Rock Road which is heading to/from US 50 east of Sylva Valley Road is expected to use Scott Road to reach US 50, not the eastern portion of White Rock Road, based on travel times.

Figure 2 shows the projected origin and destination of daily vehicle trips that would use the section of White Rock Road west of Empire Ranch Road in 2035 with the Connector project. It shows the following:

- Of the projected 28,800 daily vehicle trips in 2035 that would use White Rock Road west of Empire Ranch Road, about 12,100 daily vehicle trips would use the future West Access Road to access the El Dorado Hills Business Park and about 12,500 daily vehicle trips would use White Rock Road east of the future West Access Road to access various locations in the El Dorado Hills community.
- Only about 1,000 daily vehicle trips would travel through the community to access US 50 at Sylva Valley Rd interchange.

Summary of Sensitivity Analysis

The Connector EIR analysis assumes that the roadway improvements under the No Project Alternative will be implemented in the year identified in SACOG's Metropolitan Transportation Plan (MTP). However, there is uncertainty about the timing of several key improvements involving connections to White Rock Road, including the following:

- The construction of the proposed West Access to the El Dorado Hills Business Park,
- The construction of the US 50/Empire Ranch Road interchange and extension of Empire Ranch Road from US 50 to White Rock Road

The MTP assumes that these roadway improvements would be constructed before 2025 and thus they were assumed to be implemented by the 2025 in the Connector EIR analysis. However, if one or more of these improvements are not constructed by 2025, or even 2035, then traffic volumes on some other roadways in the El Dorado Hills and Folsom SOI area would be different than the volumes forecasted in the Connector EIR. To show how volumes could change if key improvements are postponed, a number of future roadway network scenarios were crafted and evaluated. This analysis indicated that the following scenarios best demonstrate the impact on traffic volumes on White Rock Road and Latrobe Road through El Dorado Hills:

- Scenario 1: Construct all of the MTP roadway improvements without the proposed Connector. This represents the No Project Alternative in Connector EIR
- Scenario 2: Construct all of the MTP roadway improvements with the proposed Connector. This represents the Proposed Project Alternative in the Connector EIR
- Scenario 3: Scenario 2 but postpone construction of the proposed West Access to the El Dorado Hills Business Park, as well as construction of the US 50/Empire Ranch Road interchange and extension of Empire Ranch Road from US 50 to White Rock Road until after 2035
- Scenario 4: Scenario 2 but postpone construction of the proposed West Access to the El Dorado Hills Business Park until after 2035
- Scenario 5: Scenario 2 but postpone construction of the US 50/Empire Ranch Road interchange and extension of Empire Ranch Road from US 50 to White Rock Road until after 2035

The total future housing and employment levels assumed in El Dorado Hills and the City of Folsom are generally consistent with SACOG's estimated future development levels. Table 1 shows the projected 2035 daily traffic volume for each scenario. Table 2 chows the projected change in daily traffic volumes between key scenarios.

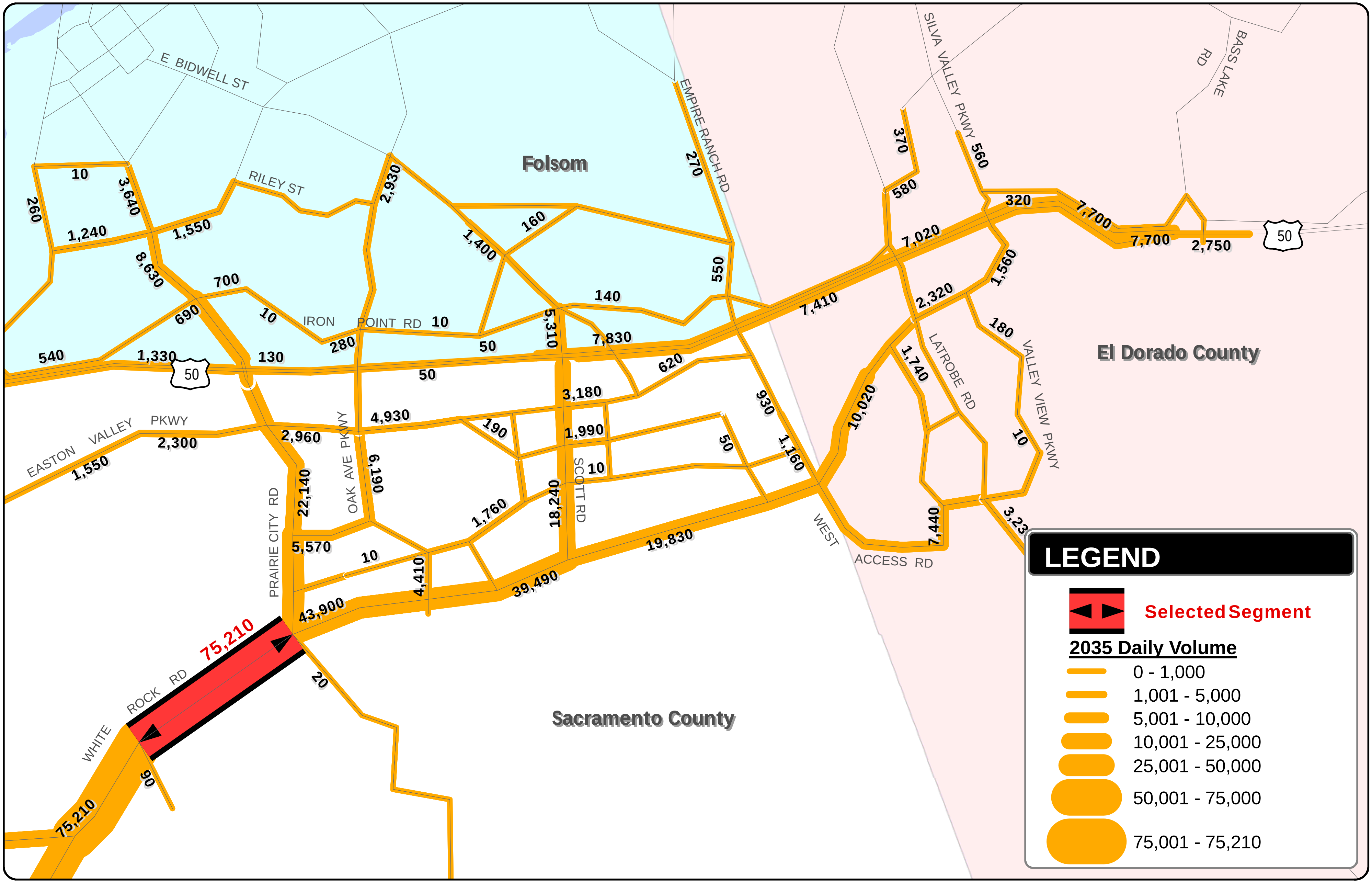
The proposed Connector project would upgrade White Rock Road between Grant Line Road and the El Dorado County line from a "thoroughfare" to an "expressway" facility but it would not change the planned improvements to White Rock Road in El Dorado County from those anticipated in the County's General Plan. Figure 3 shows the changes in traffic volumes that would result from implementation of the Connector project. Roadway segments that would have higher volumes due to the Connector are shown in red while segments that would have lower volumes are shown in green. The width of the green or red line on each segment indicates the magnitude of the change in volume.

Compared to the Connector No Project Alternative, implementation of Connector Project would result in only a modest increase traffic volume (5 to 10 percent) on White Rock Road between Empire Ranch Road and Latrobe Road. The largest change in volume due to the Connector Project would occur on White Rock Road west of Scott Road.

Figures 4 through 6 show the changes in traffic volumes that would result from postponing one or more of the new roadway connections to White Rock Road until after 2035. Roadway segments that would have higher volumes due to the postponement of roadway improvements are shown in red while segments that would have lower volumes are shown in green the width of the green or red line on each segment indicates the magnitude of the change in volume. The segments colored blue are the improvements that were assumed to be postponed and width of the blue line on each segment indicates the magnitude of the volume that would need to divert to other roadways.

The major conclusions from the sensitivity analysis on how postponing key roadway improvements would affect traffic volumes in the El Dorado Hills' area can be summarized as follows:

- If both the proposed West Access Road and the extension of Empire Ranch Road to White Rock Road are not implemented, the traffic volume on White Rock Road between Empire Ranch Road and Latrobe Road would exceed the capacity of a four-lane road by 2025, with or without the Connector
- Implementation of West Access Road would substantially decrease volumes on White Rock Road between Empire Ranch Road and Latrobe Road and on Latrobe Road between US 50 and Golden Foothill Parkway, with or without the Connector
- Implementation of the extension of Empire Ranch Road to White Rock Road would cause a significant decrease in traffic volume on Latrobe Road between US 50 and Golden Foothill Parkway, but it would result in only a modest decrease in traffic volume on White Rock Road between Empire Ranch Road and Latrobe Road.
- To minimize traffic volumes increases on White Rock Road and Latrobe Road through El Dorado Hills, it will be important to construct both the West Access Road and the extension of Empire Ranch Road before 2025



DISTRIBUTION OF TRIPS

That Use White Rock Road West of Prairie City Road

2035 With Proposed Connector Project

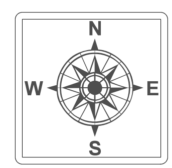
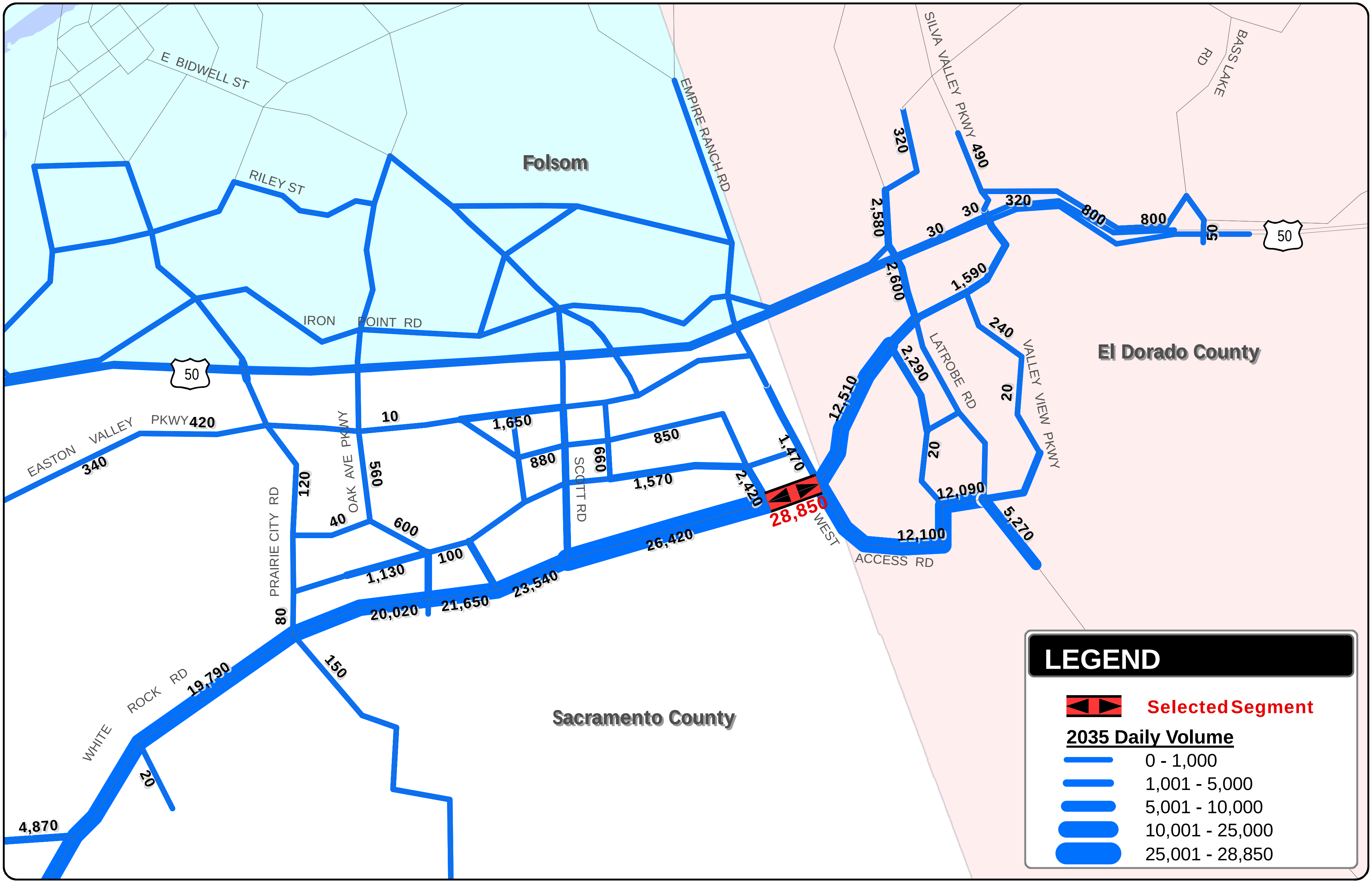


FIGURE 1



DISTRIBUTION OF TRIPS

That Use White Rock Road West of El Dorado Hills Business Park West Access Road

2035 With Proposed Connector Project

FIGURE 2

Table 1
Projected Traffic Volumes for Scenarios

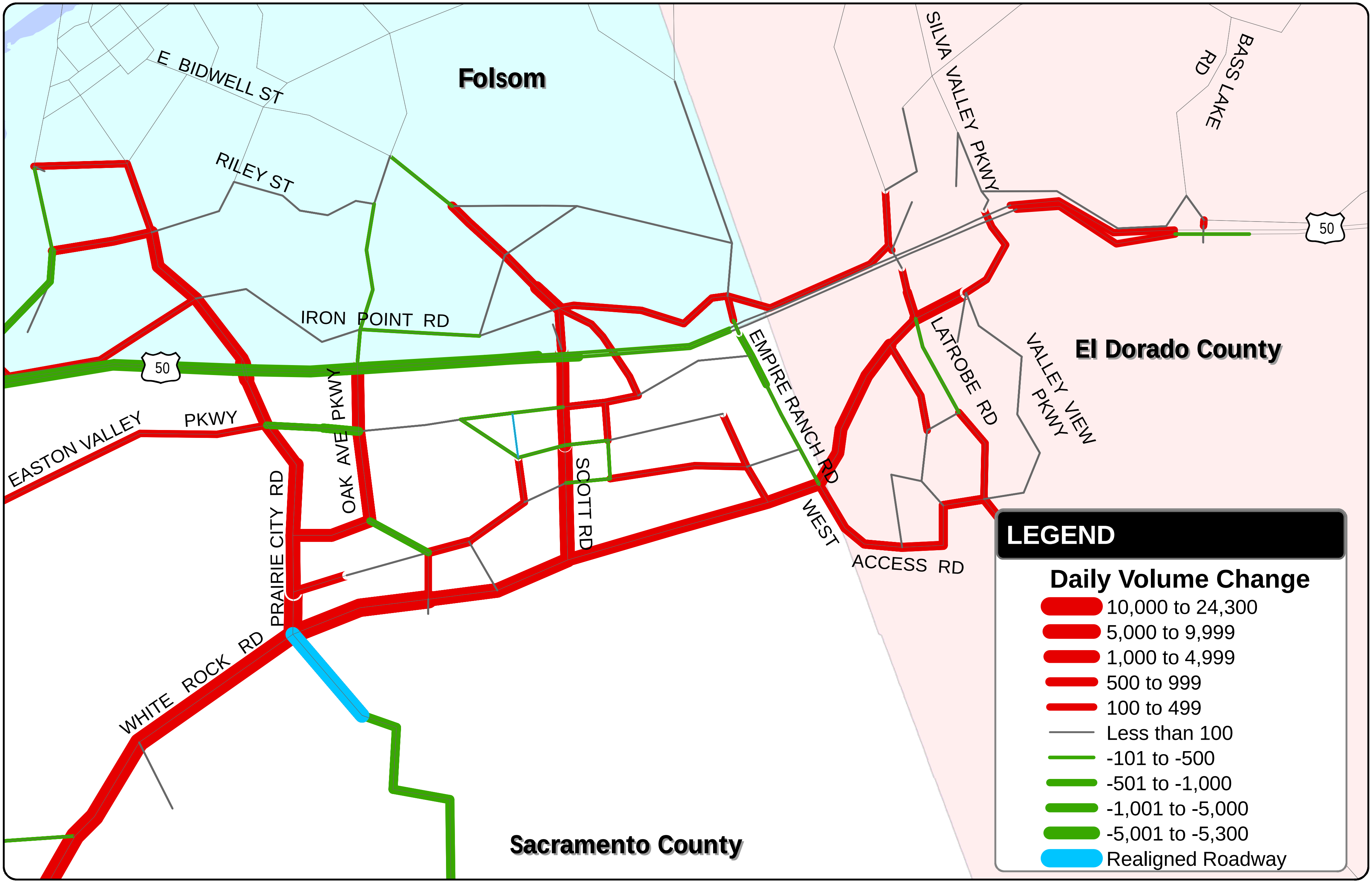
Roadway	From	To	2035 Average Daily Traffic Volumes					
			2008	Scenario				
				1. Connector No Project	2. Connector Proposed Project	3	4	5
On Connector Alignment								
White Rock Rd	US-50	Valley View Pkwy	9,300	20,300	21,000	28,600	25,900	25,600
White Rock Rd	Valley View Pkwy	Latrobe Rd	13,700	23,800	25,100	25,700	25,900	25,600
White Rock Rd	Latrobe Rd	Windfield Way	10,100	22,200	23,100	34,800	29,300	27,400
White Rock Rd	Windfield Way	Four Seasons Dr	7,800	20,600	22,000	38,400	33,100	25,800
White Rock Rd	Four Seasons Dr	Empire Ranch Rd	6,400	18,700	20,500	33,100	34,000	20,400
White Rock Rd	Empire Ranch Rd	Scott Rd (North)	8,500	26,300	29,500	33,100	26,600	40,900
White Rock Rd	Scott Rd (North)	Oak Ave Pkwy	5,700	42,200	51,600	47,800	49,500	50,300
White Rock Rd	Oak Ave Pkwy	Prairie City Rd	5,700	41,400	51,900	49,600	50,400	50,400
El Dorado County							-	-
Latrobe Rd	US-50	Town Center Blvd	40,200	72,700	72,800	88,200	86,800	84,500
Latrobe Rd	Town Center Blvd	White Rock Rd	24,700	50,500	50,800	67,100	65,300	63,300
Latrobe Rd	White Rock Rd	Golden Foothill Pkwy	19,100	40,800	40,800	64,400	64,500	52,400
Valley View Pkwy	White Rock Rd	Blackstone Pkwy	3,300	12,100	12,000	16,600	16,100	12,500
West Connection to Business Park	Sacramento Co	Golden Foothill Pkwy		33,500	34,400	200	200	22,200
City of Folsom								
Empire Ranch Rd	Iron Point Rd	US-50		27,600	28,100	-	28,400	-
Empire Ranch Rd	US-50	Easton Valley Pkwy		43,900	43,300	-	33,800	-
Empire Ranch Rd	Easton Valley Pkwy	White Rock Rd		27,300	27,200	-	12,100	-
Scott Rd	US-50	Easton Valley Pkwy	4,800	52,600	55,600	62,100	50,700	60,700
Scott Rd	Easton Valley Pkwy	White Rock Rd	4,800	18,700	23,700	21,700	20,500	23,900

Scenarios:
3 - Postpone Emprire Ranch Xxt and West Accces to EDH Bus Park
4 - Postpone West Accces to EDH Business Park
5 - Postpone Emprire Ranch Extension

Table 2
Projected Change in Traffic Volumes

Roadway	From	To	Change in 2035 Daily Volume: Between Connector No Project (Scenario 1) and Scenario 2	Between Connector Project (Scenario 2) and Scenario: 3	4	5
On Connector Alignment						
White Rock Rd	US-50	Valley View Pkwy	700	7,600	4,900	4,600
White Rock Rd	Valley View Pkwy	Latrobe Rd	1,300	600	800	500
White Rock Rd	Latrobe Rd	Windfield Way	900	11,700	6,200	4,300
White Rock Rd	Windfield Way	Four Seasons Dr	1,400	16,400	11,100	3,800
White Rock Rd	Four Seasons Dr	Empire Ranch Rd	1,800	12,600	13,500	-100
White Rock Rd	Empire Ranch Rd	Scott Rd (North)	3,200	3,600	-2,900	11,400
White Rock Rd	Scott Rd (North)	Oak Ave Pkwy	9,400	-3,800	-2,100	-1,300
White Rock Rd	Oak Ave Pkwy	Prairie City Rd	10,500	-2,300	-1,500	-1,500
El Dorado County						
Latrobe Rd	US-50	Town Center Blvd	100	15,400	14,000	11,700
Latrobe Rd	Town Center Blvd	White Rock Rd	300	16,300	14,500	12,500
Latrobe Rd	White Rock Rd	Golden Foothill Pkwy	0	23,600	23,700	11,600
Valley View Pkwy	White Rock Rd	Blackstone Pkwy	-100	4,600	4,100	500
West Connection to Business Park	Sacramento Co	Golden Foothill Pkwy	900	-34,200	-34,200	-12,200
City of Folsom			0			
Empire Ranch Rd	Iron Point Rd	US-50	500	-28,100	300	-28,100
Empire Ranch Rd	US-50	Easton Valley Pkwy	-600	-43,300	-9,500	-43,300
Empire Ranch Rd	Easton Valley Pkwy	White Rock Rd	-100	-27,200	-15,100	-27,200
Scott Rd	US-50	Easton Valley Pkwy	3,000	6,500	-4,900	5,100
Scott Rd	Easton Valley Pkwy	White Rock Rd	5,000	-2,000	-3,200	200

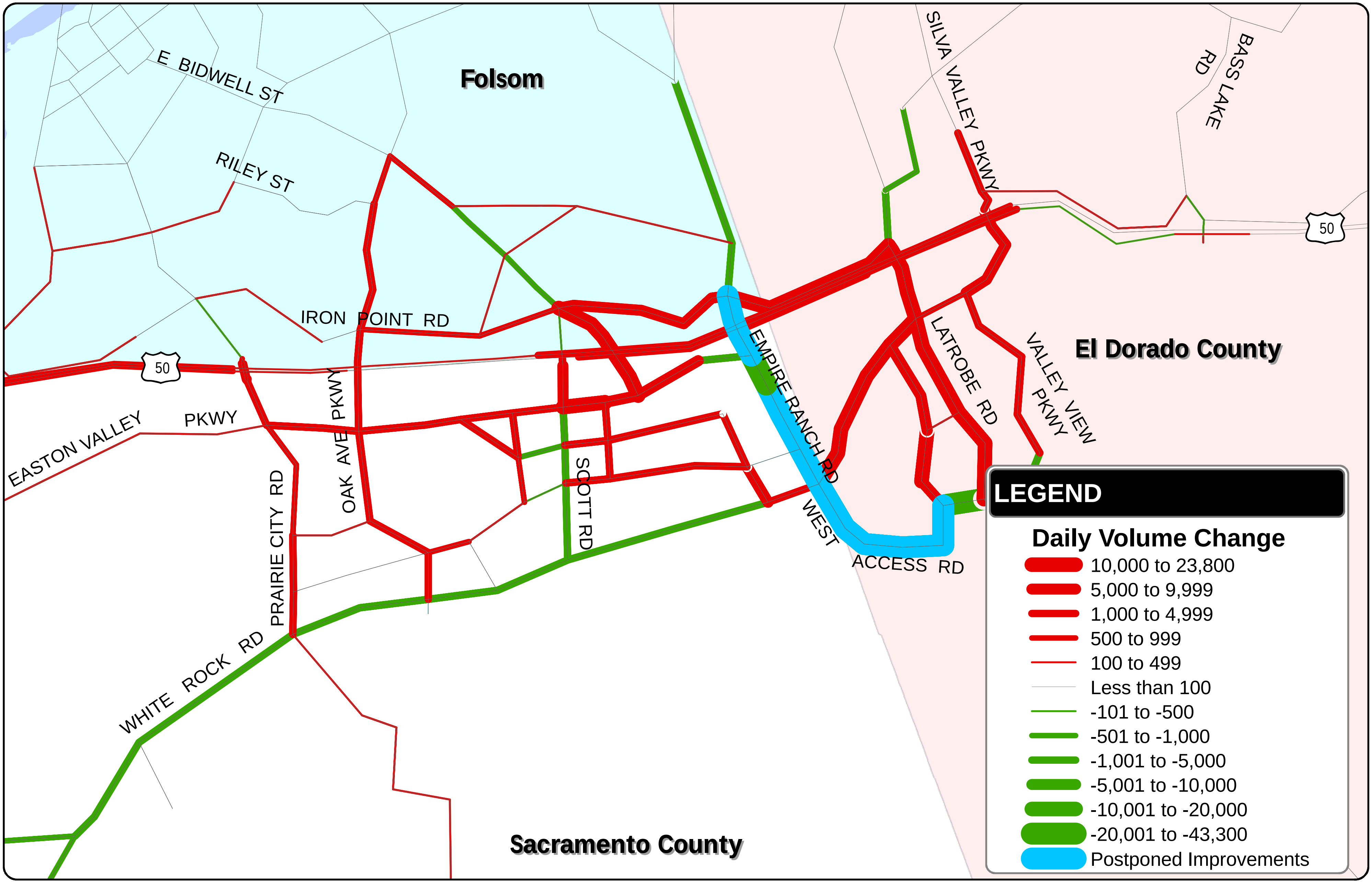
Scenarios:
3 - Postpone Emprire Ranch Xxt and West Accces to EDH Bus Park
4 - Postpone West Accces to EDH Business Park
5 - Postpone Emprire Ranch Extension



CHANGE IN 2035 TRAFFIC VOLUME

2035 MTP WITHOUT CONNECTOR (Scenario 1) vs. 2035 MTP WITH CONNECTOR (Scenario 2)

FIGURE 3

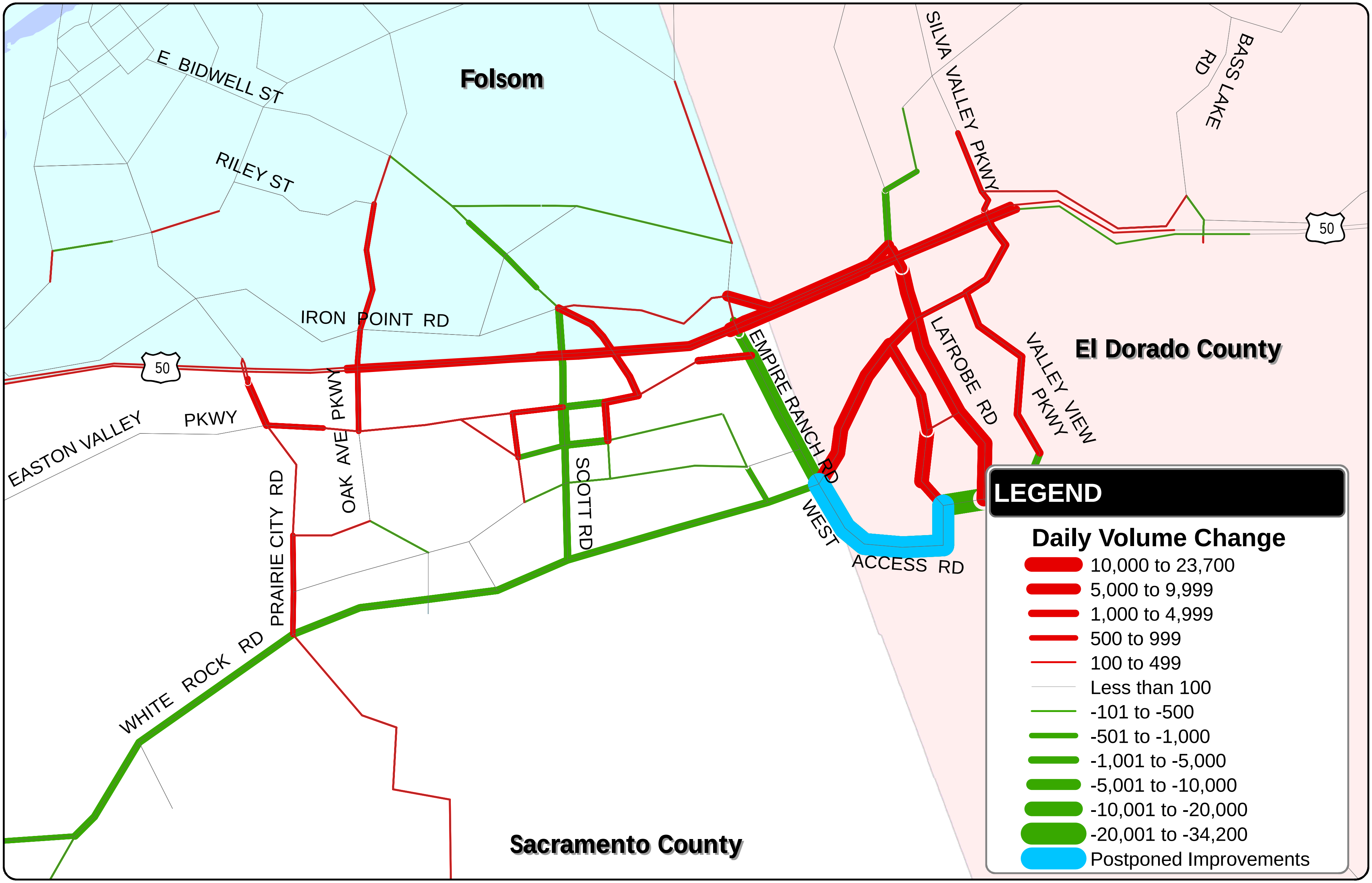


CHANGE IN 2035 TRAFFIC VOLUME

2035 MTP WITH CONNECTOR (Scenario 2) vs. SCENARIO 3 CONDITIONS WITHOUT:

- Empire Ranch Road south of Iron Point Road
- El Dorado Hills Business Park West Access Road

FIGURE 4

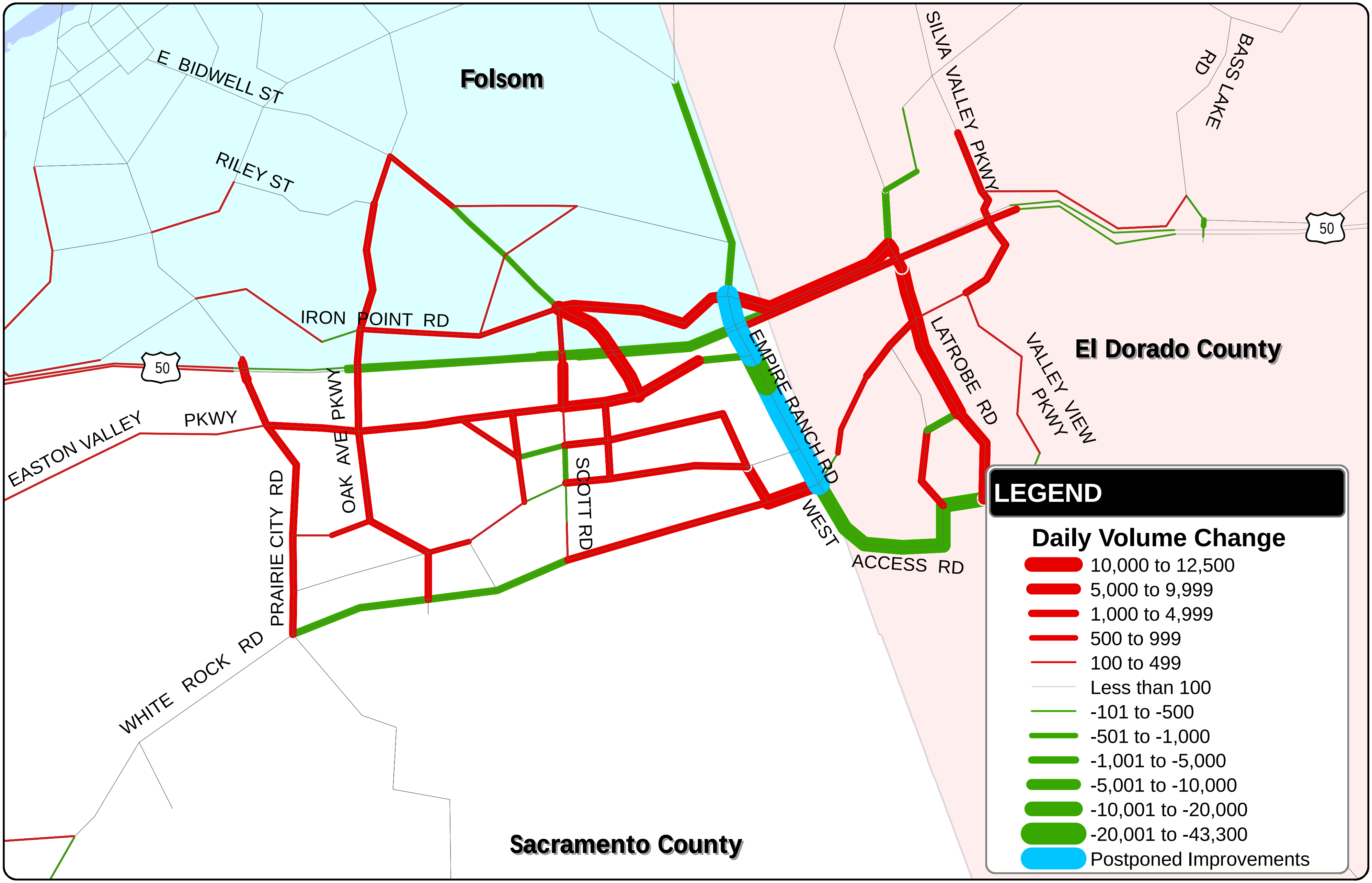


CHANGE IN 2035 TRAFFIC VOLUME

2035 MTP WITH CONNECTOR (Scenario 2) vs. SCENARIO 4 CONDITIONS WITHOUT:

- El Dorado Hills Business Park West Access Road

FIGURE 5



CHANGE IN 2035 TRAFFIC VOLUME

2035 MTP WITH CONNECTOR (Scenario 2) vs. SCENARIO 5 CONDITIONS WITHOUT:

- Empire Ranch Road Iron Point Road to White Rock Road

FIGURE 6

The Capital SouthEast Connector will be an integrated, multimodal regional facility that will accelerate economic development and facilitate goods movement while supporting sustainable planned growth and preserving open space, wildlife habitat, and valuable agricultural lands.

County of Sacramento California

City of Elk Grove California

City of Rancho Cordova California Incorporated 2003

City of Folsom Distinctive by Nature

El Dorado County California