McHenry Avenue Corridor Improvement Project

San Joaquin County, California
Caltrans District 10

McHenry Avenue Widening
Federal Aid Number RPSTPLE-5929(196)

Replacement of the Stanislaus River Bridge (Bridge No. 38C-0032) on McHenry Avenue
Federal Aid Number BRLS-5929(166)

Replacement of the South San Joaquin Irrigation District Bridge (Bridge No. 29C-0166) on McHenry Avenue
Federal Aid Number BRLS-5929(167)

Initial Study with Proposed Mitigated Negative Declaration / Environmental Assessment

Prepared by the
State of California Department of Transportation
and San Joaquin County

The environmental review, consultation, and any other action required in accordance with applicable federal laws for this project is being, or has been, carried out by the California Department of Transportation under its assumption of responsibility pursuant to 23 U.S. Code 327.

March 2013

General Information About This Document

What's in this document?

The County of San Joaquin (County) and the California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration, have prepared this Initial Study/Environmental Assessment, which examines the potential environmental impacts of alternatives being considered for the proposed project located in San Joaquin and Stanislaus Counties, California. Caltrans is the lead agency under the National Environmental Policy Act (NEPA), and San Joaquin County is the lead agency under the California Environmental Quality Act (CEQA). The document describes why the project is being proposed, alternatives for the project, the existing environment that could be affected by the project, and potential impacts from each of the alternatives, and the proposed avoidance, minimization, and/or mitigation measures.

What should you do?

Please read this Initial Study/Environmental Assessment. Additional copies of this document, as well as the technical studies, are available for review at Caltrans District 10 Office at 1976 E. Dr. Martin Luther King Jr. Blvd., Stockton, CA 92505; the County of San Joaquin Public Works Department at 1810 E. Hazelton Avenue, Stockton, CA 95205; the County of Stanislaus Public Works Department at 1716 Morgan Road, Modesto, CA 95358; and the Escalon Branch Library at 1540 Second St, Escalon, CA 95320-1938.

Attend the public information meeting at the Escalon Community Center located at 1055 Escalon Avenue, Escalon, CA on March 27th, 2013 from 6:00 p.m. to 7:30 p.m.

We welcome your comments. If you have any concerns regarding the proposed project, please attend the public information meeting, or send your written comments to Caltrans by the deadline.

Submit comments via U.S. mail to Caltrans at the following address:

Julie Myrah, Senior Environmental Planner
Environmental MPS and Local Assistance Branch
California Department of Transportation, District 10
1976 E. Dr. Martin Luther King Jr. Blvd.
Stockton, CA 95205

Submit comments via e-mail to Julie_Myrah@dot.ca.gov

Please submit comments by the deadline: April 9, 2013.

What happens next?

After comments are received from the public and reviewing agencies, Caltrans, as assigned by the Federal Highway Administration, and/or San Joaquin County may (1) give environmental approval to the proposed project, (2) do additional environmental studies, or (3) abandon the project. If the project is given environmental approval and funding is appropriated, San Joaquin and Stanislaus Counties could design and construct all or part of the project.

For individuals with sensory disabilities, this document is available in Braille, in large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Julie Myrah, Environmental MPS and Local Assistance Branch, 1976 E. Dr. Martin Luther King Jr. Blvd., Stockton, CA 95205; (209) 948-7427 Voice, or use the California Relay Service TTY number, 711.

SCH# ________

Caltrans District 10

Federal Aid Numbers: RPSTPLE-5929(196), BRLS-5929(166), and BRLS-5929(167)

Widen McHenry Avenue from approximately 200 feet south of Jones Road in San Joaquin County to approximately 1,700 feet south of East River Road in Stanislaus County.

INITIAL STUDY
with Proposed Mitigated Negative Declaration /ENVIRONMENTAL ASSESSMENT

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 U.S. Code 4332(2)(C) and 23 U.S. Code 327

THE STATE OF CALIFORNIA
Department of Transportation

and

THE COUNTY OF SAN JOAQUIN

with

THE COUNTY OF STANISLAUS

3/7/13
Date of Approval

Michael Selling for
Thomas M. Gau
Director, Dept of Public Works
San Joaquin County
CEQA Lead Agency

3/8/13
Date of Approval

Margaret L. Lawrence
MARGARET L. LAWRENCE
Environmental Office Chief - North
Caltrans Central Region
NEPA Lead Agency

Proposed Mitigated Negative Declaration

Pursuant to: Division 13, Public Resources Code

Project Description

The County of San Joaquin (County) proposes to widen and improve McHenry Avenue from 200 feet south of Jones Road in San Joaquin County to 1,700 feet south of East River Road in Stanislaus County. The proposed project includes improvements to the intersection of McHenry Avenue and East River Road and the replacement and widening of the Stanislaus River Bridge (Bridge No. 38C-0032) and the South San Joaquin Irrigation District (SSJID) Bridge (Bridge No. 29C-0166).

Determination

This proposed Mitigated Negative Declaration is included to give notice to interested agencies and the public that it is the County's intent to adopt a Mitigated Negative Declaration for this project. This does not mean that the County's decision regarding the project is final. This Mitigated Negative Declaration is subject to modification based on comments received by interested agencies and the public.

The County has prepared an Initial Study for this project and, pending public review, expects to determine from this study that the proposed project would not have a significant effect on the environment for the following reasons:

The proposed project would have no effect on consistency with state, regional, and local plans and programs, coastal zone, wild and scenic rivers, parks and recreational facilities, community character and cohesion, paleontology, and plant species.

In addition, the proposed project would have no significant effect on existing and future land use, growth, farmlands, community impacts, environmental justice, utilities and emergency services, traffic and transportation/pedestrian and bicycle facilities, visual/aesthetics, cultural resources, hydrology and floodplain, water quality and storm water runoff, and geology/soils/seismic, and climate change.

Proposed Avoidance, Minimization, and Mitigation Measures:

- Minimize project footprint to reduce impacts to farmland conversion and right-of-way acquisition.
- Existing overhead and underground utilities would be protected, relocated, or removed as necessary.
- A Transportation Management Plan would be prepared.
- Construction would be staged to ensure traffic circulation would continue with minimal disruption.

- Aesthetic measures including: storing construction materials away from visible areas, lighting restrictions, and semi-transparent vehicle barriers.
- Construction will be stopped if archaeological materials or human remains are discovered.
- Restrictions on construction activities in the Stanislaus River and the SSJID canal.
- Implementation of Best Management Practices (BMPs) and other water quality regulations to minimize impacts to water quality.
- Implementation of engineering, construction, and maintenance practices as recommended in the Geotechnical Services Report.
- A project-specific Lead Compliance Plan would be prepared.
- An Asbestos Compliance Plan would be prepared if asbestos containing materials are identified in structures during bridge demolition.
- Compliance with Section 7-1.01F, Section 10, and dust control requirements of Caltrans' Standard Specifications, as well as San Joaquin Valley Air Pollution Control District (SJVAPCD) Rule 9510, Indirect Source Review to reduce construction-related air quality impacts.
- Compliance with regulations during construction to reduce short-term noise impacts.
- Mitigate impacts and fund habitat restoration and post-project monitoring related to riparian habitat loss.
- Minimize and mitigate for the loss of oak trees.
- Minimize and mitigate for the loss of jurisdictional riverine habitat.
- Detailed avoidance, minimization, and mitigation measures for Chinook Salmon, Hardhead, Western Pond Turtle, Yellow-Breasted Chat, Raptors and other Migratory Birds, Special-Status Bats, Valley Elderberry Longhorn Beetle, Central Valley Steelhead, and Swainson's Hawk.

Michael Selling for

Thomas M. Gau
Director, Dept of Public Works
San Joaquin County

3/7/13

Date

Summary

The environmental review, consultation, and any other action required in accordance with applicable federal laws for this project is being, or has been, carried out by the California Department of Transportation (Caltrans) under its assumption of responsibility pursuant to 23 U.S.C. 327. San Joaquin County (County), in cooperation with Caltrans and Stanislaus County, propose to widen and improve a 1.1-mile-long segment of McHenry Avenue from 200 feet south of Jones Road in San Joaquin County, California, to 1,700 feet south of East River Road in Stanislaus County, California. The project would signalize and widen the McHenry Avenue/East River Road intersection; widen along the eastern right-of-way of McHenry Avenue to add a center two-way turn lane from 200 feet north of the McHenry Avenue/East River Road intersection to approximately 200 feet south of Jones Road and 5-foot-wide shoulders to accommodate bicycles; replace and widen the existing bridge across the Stanislaus River; and replace and widen the existing bridge across the South San Joaquin Irrigation District (SSJID) canal.

Summary of Potential Impacts from Alternatives

Potential Impact	Build Alternative (Proposed Project)	No Build Alternative
Existing and Future Land Use	Consistent with the San Joaquin County and Stanislaus County General Plans.	Inconsistent with the San Joaquin County and Stanislaus County General Plans.
Growth	Would support planned and approved growth in areas surrounding the project area.	Might inhibit planned and approved growth surrounding the project area, thus potentially encouraging growth in areas not planned for growth.
Farmlands	The proposed project would convert approximately 4 acres of farmland to non-farmland use.	Would not directly convert farmland to non-farmland use; however, it might encourage growth in areas that are not planned for growth, thus resulting in conversion of farmland in other areas.
Community Impacts	No effects to community character and cohesion are anticipated.	No impact on community character and cohesion.
Environmental Justice	No disproportionate effect on minority or low-income communities.	No disproportionate effect on minority or low-income communities.
Utilities/Emergency Services	Would relocate overhead electrical lines through a portion of the project area. Coordination with utility	No effect on utilities or emergency services.

Potential Impact	Build Alternative (Proposed Project)	No Build Alternative
	service providers before relocation would prevent utilities or emergency services interruption.	
Traffic and Transportation/ Pedestrian and Bicycle Facilities	Would improve traffic operations through the project area and at the McHenry Avenue/East River Road intersection; is consistent with the San Joaquin County Bicycle Master Plan Update and the Stanislaus County Non-Motorized Transportation Plan.	Would result in continued and worsening traffic operations through the project area and at the intersection of McHenry Avenue/East River Road.
Visual/Aesthetics	Would result in low to moderate change in the visual setting of the project area.	Would result in no change to the existing visual setting of the project area.
Cultural Resources	No historic properties are located within the area of potential effects.	No effect on cultural resources.
Hydrology and Floodplain	Work in but no effect to floodplain, with avoidance and minimization measures, minimal effect to hydrology.	No effect on area hydrology or floodplains.
Water Quality and Storm Water Runoff	With avoidance and minimization measures, minimal short term construction related water quality / storm water runoff impacts from construction.	No effect on water quality or storm water runoff.
Geology/Soils/Seismic	With avoidance measures, no effect on geology/soils/seismic risks.	Might result in seismic-related risks associated with the inadequate seismic safety of the existing Stanislaus River Bridge.
Hazardous Waste/Materials	Short term construction impacts including potential exposure to pesticides, asbestos, aerially deposited lead, and lead-based paint.	No effects from hazardous waste or materials.
Air Quality	Congestion relief provided by the proposed project would help to reduce idling times, acceleration, and braking, all of which contribute to air pollution. With avoidance and minimization measures, minor short-term construction impacts.	Would result in continued and worsening traffic operations which are detrimental to air quality.
Noise and Vibration	With avoidance measures, minor effects from short term construction noise and vibration; beneficial effect on operational noise levels.	Would eventually result in noise levels that would exceed federal and county noise criteria in several locations throughout the project area.
Natural Communities	With avoidance, minimization and mitigation, only temporary minimal effects to natural communities.	No effects to natural communities.

Potential Impact	Build Alternative (Proposed Project)	No Build Alternative
Wetlands and Other Waters	With avoidance, minimization and mitigation measures, only minimal effects to wetlands or other waters.	No effects to wetlands or other waters.
Animal Species	With avoidance measures, would result in minimal effects to special-status animal species.	No effects to special-status animal species.
Threatened and Endangered Species	With avoidance, minimization, and mitigation measures, only minimal temporary effects to threatened and endangered species.	No effects to threatened and endangered species.
Invasive Species	With avoidance measures, only minimal effects from invasive species.	No effects from invasive species.
Climate Change	The proposed project would result in a reduction of GHG emissions of approximately 32.6% within the project study area. With minimization measures, minor short-term construction impacts.	Would result in continued and worsening traffic operations which would increase GHG emissions.

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List of Abbreviated Terms

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
AB	Assembly Bill
ADA	Americans with Disabilities Act
APE	Area of Potential Effects
ARB	Air Resources Board
BMP	best management practices
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CDFG	California Department of Fish and Game (known as Department of Fish and Wildlife as of 1/1/13)
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CO	carbon monoxide
CWA	Clean Water Act
dBA	A-weighted decibels
EO	Executive Order
ESA	environmentally sensitive area
FGC	Fish and Game Code
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FSTIP	Federal Statewide Transportation Improvement Program
FTA	Federal Transit Administration
GHG	greenhouse gas
HPSR	Historic Property Survey Report
HRER	Historic Resources Evaluation Report
lbs/day	pounds per day
Ldn	day-night level
LEDPA	least environmentally damaging practicable alternative
Leq	equivalent sound level
LOS	level of service
MBTA	Migratory Bird Treaty Act
mph	miles per hour
MPO	metropolitan planning organization
MSAT	Mobile Source Air Toxics
MS4	municipal separate storm sewer systems
msl	mean sea level

$MTCO_2e$	metric tons CO_2 equivalent
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NO_2	nitrogen dioxide
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NTU	nephelometric turbidity units
OHP	Office of Historic Preservation
OHWM	ordinary high water mark
OID	Oakdale Irrigation District
O_3	ozone
Pb	lead
PG&E	Pacific Gas and Electric
PM	particulate matter
ppm	parts per million
POAQC	Projects of Air Quality Concern
PRC	Public Resources Code
RCRA	Resource Conservation and Recovery Act
ROG	reactive organic gases
RTIP	Regional Transportation Improvement Plan
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SJCOG	San Joaquin Council of Governments
SJVAB	San Joaquin Valley Air Basin
SO_2	sulfur dioxide
SSJID	South San Joaquin Irrigation District
STANCOG	Stanislaus Council of Government
STIP	State Transportation Improvement Program
SWDR	Storm Water Data Report
SWMP	Storm Water Management Plan
SWPPP	Stormwater Pollution Protection Plan
SWRCB	State Water Resources Control Board
UPRR	Union Pacific Railroad
USACE	United States Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency

USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VELB	valley elderberry longhorn beetle
VMT	vehicle miles traveled
WDR	waste discharge requirements
WEAP	Worker Environmental Awareness Program
WPCP	Water Pollution Control Plan

Chapter 1 Proposed Project

1.1 Introduction

The California Department of Transportation (Caltrans), in cooperation with San Joaquin County (County) and Stanislaus County, propose to widen and improve a 1.1-mile segment of McHenry Avenue and to replace and widen two bridges. The proposed project is located in the southeast portion of San Joaquin County and the northern portion of Stanislaus County, south of the City of Escalon, and crosses the Stanislaus River directly south of the intersection at East River Road, at the border of San Joaquin and Stanislaus Counties, California. The project vicinity is shown in **Figure 1-1**, Regional Vicinity Map. The project location is shown in **Figure 1-2**, Project Location Map.

The County of San Joaquin is the lead agency under the California Environmental Quality Act (CEQA), with the County of Stanislaus serving as a CEQA responsible agency. Caltrans, under its assumption of responsibility pursuant to 23 U.S. Code 327, is the federal lead agency pursuant to the National Environmental Policy Act (NEPA).

The McHenry Avenue Corridor Improvement Project is an aggregate of three component projects with three distinct federal aid numbers:

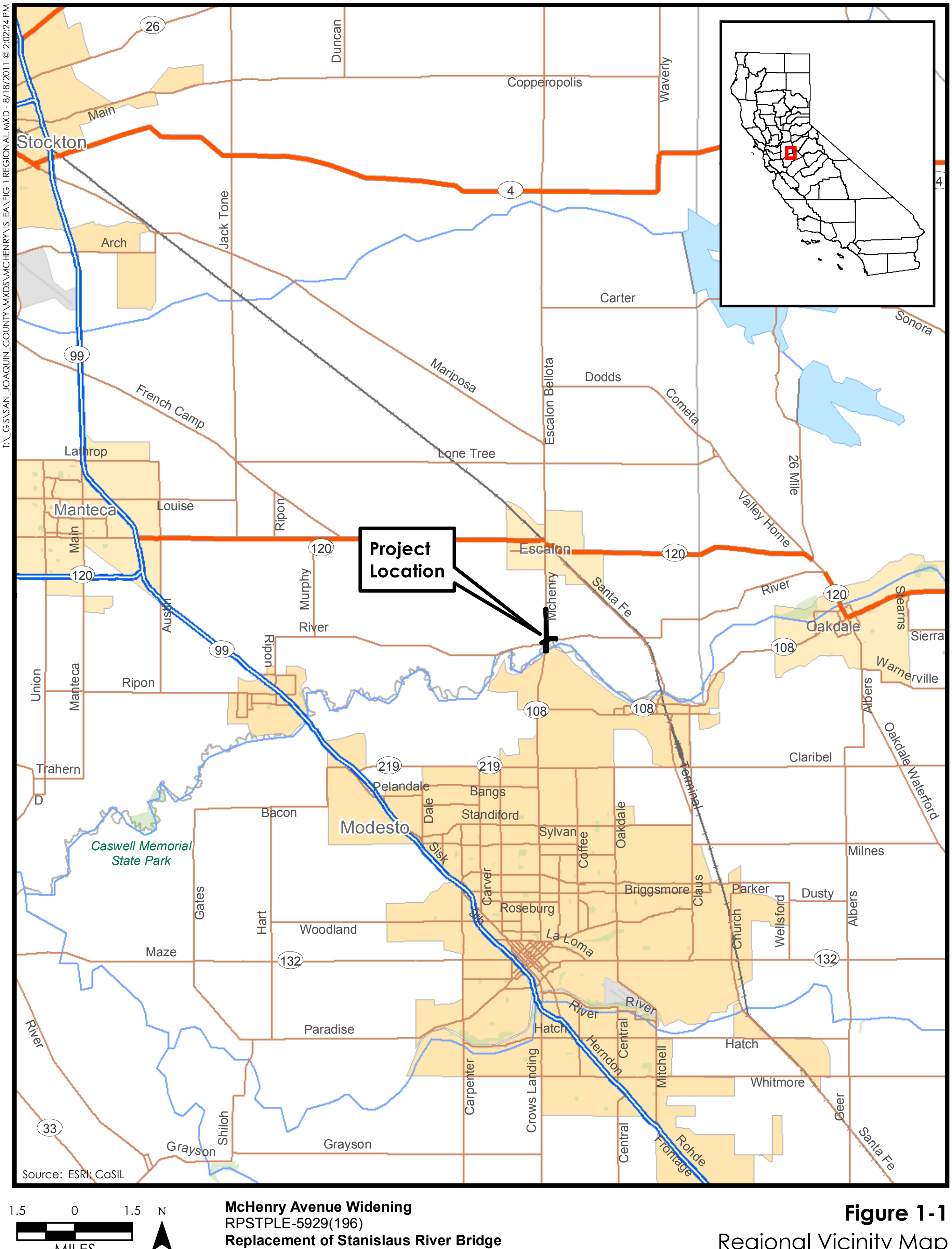
1) RPSTPLE-5929(196): Widening of McHenry Avenue to accommodate a two-way center left turn lane from just south of Jones Road to south of Stanislaus River, and improvement of the McHenry Avenue/East River Road intersection. The project limits extend along McHenry Avenue from approximately 200 feet south of Jones Road in San Joaquin County to approximately 1,700 feet south of East River Road in Stanislaus County. The project limits also extend along East River Road in San Joaquin County, from approximately 1,300 feet east of McHenry Avenue to approximately 700 feet west of McHenry Avenue. The estimated cost for this component project is $5,718,080.

2) BRLS-5929(166): Replacement and widening of the Stanislaus River Bridge (No. 38C-0032) on McHenry Avenue to accommodate the proposed roadway improvements. The estimated cost for this component project is $20,603,600.

3) BRLS-5929(167): Replacement and widening of the South San Joaquin Irrigation District (SSJID) Main Canal Bridge (No. 29C-0166) on McHenry Avenue to accommodate the proposed roadway improvements. The estimated cost for this component project is $2,714,000.

The total estimated cost for the entire McHenry Avenue Corridor Improvement Project is $29,035,680. The three component projects are evaluated together in this document, and would be advertised, bid, and constructed as a whole.

This project is included in the 2011 Federal Statewide Transportation Improvement Program (FSTIP) and is proposed for funding from the federal Highway Bridge Program (HBP), the State Transportation Improvement Program (STIP), and the Proposition 1B Transportation Bond Program. It is also included in the San Joaquin Council of Governments 2011 Regional Transportation Plan (RTP) and the 2010 Regional Transportation Improvement Plan (RTIP).



McHenry Avenue Widening
RPSTPLE-5929(196)
Replacement of Stanislaus River Bridge (Bridge No. 38C-0032) on McHenry Avenue
BRLS-5929(166)
Replacement of SSJID Bridge (Bridge No. 29C-0166) on McHenry Avenue
BRLS-5929(167)

Figure 1-1
Regional Vicinity Map

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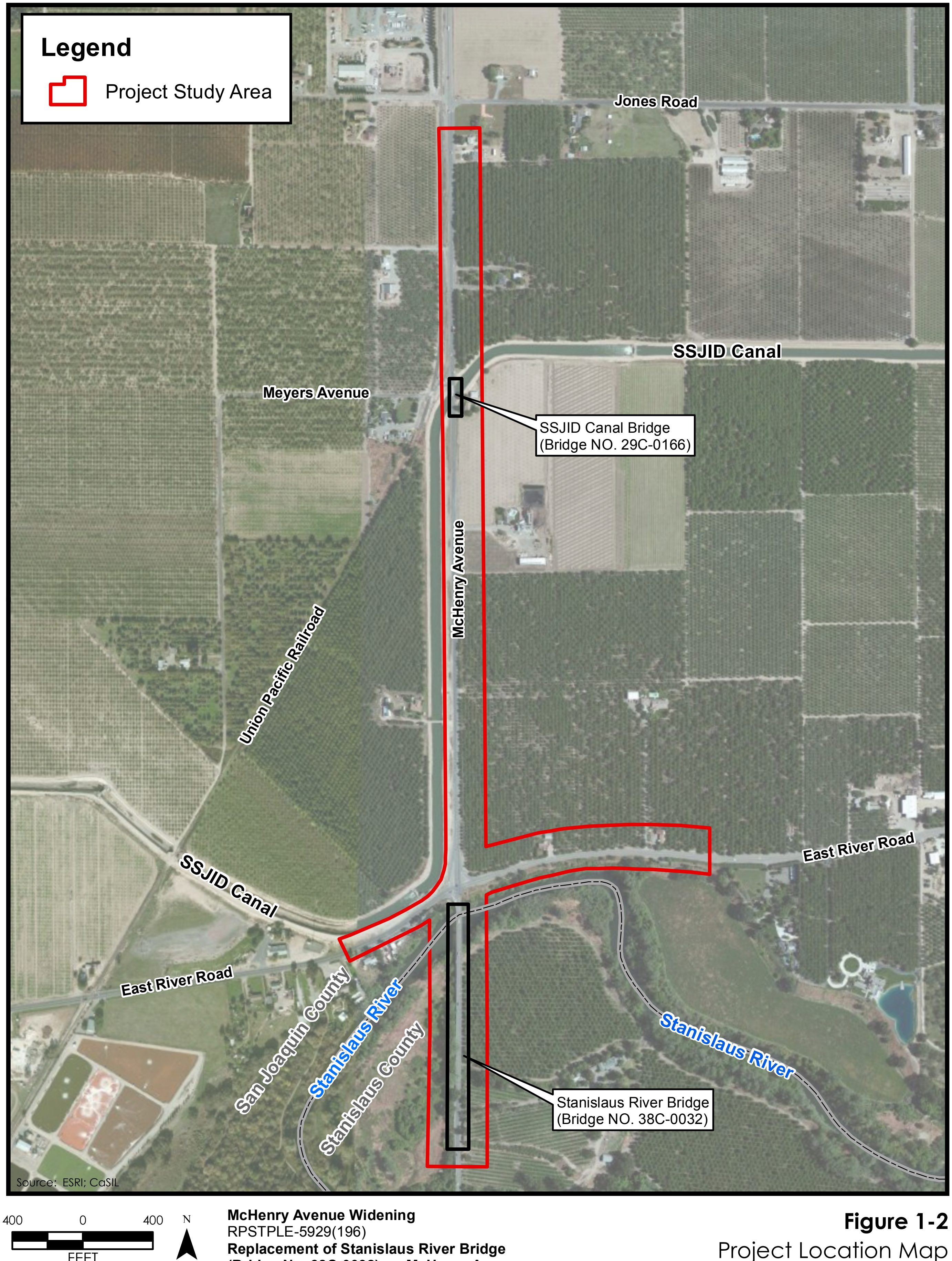

McHenry Avenue Widening
RPSTPLE-5929(196)
Replacement of Stanislaus River Bridge (Bridge No. 38C-0032) on McHenry Avenue
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BRLS-5929(167)

Figure 1-2
Project Location Map

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1.2 Purpose and Need

1.2.1 Purpose

The purpose of the proposed McHenry Avenue Corridor Improvement Project is to address traffic safety and congestion issues in the area of the McHenry Avenue/East River Road intersection, which were identified in the *Final Corridor Study for McHenry Avenue from Ladd Road-Patterson Road (State Route 108) to Catherine Way in San Joaquin and Stanislaus Counties Near the City of Escalon* (Corridor Study), and to address necessary safety improvements for two bridge structures as required by state- and federally-mandated programs. The project would address the following objectives:

- Congestion Relief and Transportation Demand. Relieve traffic congestion and reduce traffic delays at the intersection of McHenry Avenue and East River Road, thereby improving traffic flow and reducing vehicle emissions along the corridor. Accommodate the planned ultimate five-lane width of McHenry Avenue at the bridges over the SSJID Main Canal and the Stanislaus River.

- Roadway Safety. Provide for protected left turn movements along McHenry Avenue within the limits of the project.

- Bridge Safety. Support federal, state, and local policies that mandate safety improvements for the two bridges within the project limits.

1.2.2 Need

1.2.2.1 Congestion Relief and Transportation Demand

Current growth in the San Joaquin Valley and surrounding developing areas has created the need to relieve traffic congestion and improve circulation in the area. At the McHenry Avenue/East River Road intersection, existing and forecasted future traffic levels show the need for additional capacity and better circulation. As shown in **Table 1.1**, based on the weighted average operation, the McHenry Avenue/East River Road intersection currently operates at level of service (LOS) F during the AM and PM peak hours. Under the 2030 no build condition, the operation of this intersection is predicted to continue to degrade; in 2030 without improvements it would operate at a weighted average of LOS F. Furthermore, the delay is predicted to increase substantially from 88.7 seconds in the AM peak hour to 464.0 seconds in the 2030 no build condition; similarly, the PM peak hour delay is predicted to increase from 103.3 seconds under existing conditions to 819.9 seconds in the 2030 no build condition.

While the McHenry Avenue/Jones Road intersection operates at acceptable LOS under the existing (2008) conditions, this intersection is predicted to operate at a failing LOS in 2030; particularly, at the westbound approach in the PM peak hour, where delays of 1558.9 seconds are predicted.

The proposed project is only intended to improve the level of service (LOS) and safety at the McHenry Avenue/East River Road intersection and to allow safer left turns on McHenry Avenue between Jones Road and East River Road. It is not intended to address future traffic capacity needs along McHenry Avenue, as identified in the Corridor Study. Although both bridges within the project limits would be constructed to their ultimate five-lane width, they would only be striped for three lanes after construction to help relieve traffic congestion. No additional travel lanes would be added to either bridge; each bridge would have two travel lanes and a center turn lane. The Stanislaus River Bridge would be striped to conform to the existing two lane roadway at its southern end.

Table 1.1
Existing 2008 and 2030 No Build Peak Hour Levels of Service

Intersection	Control[1]	Existing AM Peak Hour		Existing PM Peak Hour		2030 AM Peak Hour		2030 PM Peak Hour	
		Delay (in seconds)[2]	LOS[3]	Delay (in seconds)[2]	LOS[3]	Delay (in seconds)[2]	LOS[3]	Delay (in seconds)[2]	LOS[3]
McHenry Avenue/East River Road	4-way								
Weighted Average[4]		88.7	***F***	103.3	***F***	464.0	***F***	819.9	***F***
Northbound Approach		138.2	***F***	203.3	***F***	789.0	***F***	1305.2	***F***
Southbound Approach		104.2	***F***	41.7	***E***	441.9	***F***	580.2	***F***
Eastbound Approach		21	C	40.7	***E***	63.5	***F***	380.5	***F***
Westbound Approach		33.5	D	15.8	C	70.8	***F***	22.4	C
McHenry Avenue/Meyers Avenue	2-way								
Northbound Left Turn		0	A	8.3	A	0	A	10.3	B
Eastbound Approach		17.8	C	11	B	29.9	D	17.6	C
McHenry Avenue/Jones Road	2-way								
Northbound Left Turn		8.4	A	8.2	A	8.9	A	10.3	B
Southbound Left Turn		8.2	A	8.6	A	8.7	A	13.1	B
Eastbound Approach		16.5	C	14.5	B	23.1	C	299.9	***F***
Westbound Approach		18	C	22.2	C	128.5	***F***	1558.9	***F***

Note: ***Bold italicized text*** *indicates unacceptable levels of service.*
[1], 2-way = unsignalized 2-way stop, 4-way = unsignalized 4-way stop, Meyers Ave intersection is a T-intersection with only one stop sign
[2] Weighted average delay
[3] LOS = level of service
[4] For 4-way stop controlled intersections, the HCM methodology used to calculate LOS yields an average weighted delay for each approach and then for the entire intersection. For 2-way or 1-way stop controlled intersections, the HCM methodology does not yield a weighted average for the entire intersection for 2-way or 1-way stop controlled intersections.

1.2.2.2 Roadway Safety

The collision rate of 0.75 per million vehicles at the McHenry Avenue/East River Road intersection is three times higher than the statewide average of 0.22 per million vehicles. The historical traffic collision data for the McHenry Avenue corridor were obtained from the California Highway Patrol Statewide Integrated Traffic Records System. These data, which covered the 3½ year period from January 1, 2005 through June 30, 2008, were reviewed and summarized to identify the locations and nature of traffic collisions within the corridor. Although the data did not specify how many of these collisions were specifically related to left-turn movements, they did reveal the following patterns:

- A total of 20 collisions were reported along McHenry Avenue in this corridor during the timeframe noted above.
- 85% of the collisions occurred at intersections and 15% occurred between intersections and were not related to traffic conditions on intersection approaches.
- 75% of the collisions occurred at the McHenry Avenue/East River Road intersection.
- 30% of the accidents were injury collisions and 70% were property-damage-only collisions.

The Corridor Study considered a variety of configurations and locations to improve the LOS and accident rate at the McHenry Avenue/East River Road intersection, while accommodating anticipated traffic volumes and the need for safe left turn movements. It was determined that maintaining the intersection at its present location worked best for both interim and long-term corridor needs, but that modifications to the intersection would be necessary.

1.2.2.3 Bridge Safety

Each of the two existing bridges within the project limits has its own safety issues related to both structural and geometric deficiencies.

The SSJID Main Canal Bridge (No. 29C-0166) is a two-lane, undivided north–south-oriented structure located in San Joaquin County approximately 0.32 mile south of Jones Road. The bridge was constructed with one lane in 1931 and then widened to accommodate two travel lanes in 1954. The existing bridge does not meet the current minimum American Association of State Highway and Transportation Officials (AASHTO) clear width requirement of 40 feet (excluding bridge rail width). The Corridor Study determined that the bridge was functionally inadequate; it cannot accommodate necessary safety improvements and ultimate traffic demands.

The Stanislaus River Bridge (No. 38C-0032) is jointly owned by San Joaquin and Stanislaus Counties and was built in 1959. No modifications have been made to this structure since its original construction. The bridge is ranked as a Category #1 structure (bridges that may collapse during an earthquake and potentially threaten public safety). The most recent Structure Inventory Appraisal dated September 18, 2002 concluded that the structure is structurally deficient.

1.3 Alternatives

This section describes the proposed project and the design alternatives that were developed by an interdisciplinary project development team to achieve the project's purpose and need while avoiding or minimizing environmental impacts. The alternatives are the build alternative and the no build alternative.

1.3.1 Build Alternative

The proposed build alternative would implement roadway and bridge safety improvements along McHenry Avenue and at the McHenry Avenue/East River Road intersection that are compatible with future improvements identified in the referenced Corridor Study.

The proposed improvements include:

- Widening McHenry Avenue from 200 feet south of Jones Road to East River Road to provide three 12-foot-wide lanes (two travel lanes and a center two-way turn lane) with 5-foot-wide shoulders to accommodate bicycles. All widening of McHenry Avenue would be to the east to avoid impacts to the existing SSJID Canal district and the Union Pacific Railroad (UPRR) facilities north of the Stanislaus River. Existing private driveways along McHenry Avenue would be modified as required to conform to the roadway improvements.

- Modifying the McHenry Avenue/East River Road intersection, which is currently controlled by stop signs in all four directions. Improvements to the intersection would include installing traffic signals and widening East River

Road to add dedicated right and left turn lanes for both legs approaching McHenry Avenue. The number of through traffic lanes would not be changed.

- Replacing and widening the Stanislaus River Bridge to accommodate the ultimate five-lane configuration for McHenry Avenue (four 12-foot-wide travel lanes, a 12-foot-wide median/left turn lane, and two 5-foot-wide shoulders). The bridge would be built to its ultimate five lane width (as called for in the Corridor Study) instead of only three lanes (as needed for this project) because it is most cost effective to do so. For this project, the Stanislaus River Bridge would be striped for the interim three-lane configuration (two travel lanes and one median/left turn lane); no additional travel lanes would be added at this time, and the bridge would be striped to conform to the existing two-lane roadway at its southern end.

- Replacing and widening the SSJID Canal Bridge to accommodate the ultimate five-lane configuration for McHenry Avenue (four 12-foot-wide travel lanes, a 12-foot-wide median/left turn lane, and two 5-foot-wide shoulders). Similar to the Stanislaus River Bridge, the SSJID Canal Bridge would be striped for the interim three-lane configuration (two travel lanes and one median/left turn lane); and no additional travel lanes would be added.

- Relocating utilities. The Modesto Irrigation District supplies both power and water within the area. The utility has overhead transmission lines on the east side of McHenry Avenue that parallel the Stanislaus River Bridge, crossing into San Joaquin County to the north side of East River Road then to the west side of McHenry Avenue where their distribution lines share poles with the Pacific Gas & Electric Company (PG&E). PG&E overhead power facilities also parallel East River Road. The SSJID canal crosses McHenry Avenue near Meyers Avenue, then parallels the west side of McHenry Avenue until it turns to the west at East River Road. Existing overhead and underground utilities within or adjacent to any proposed improvements would be protected, relocated, or removed as necessary. The portion of Modesto Irrigation District’s existing transmission lines on the east side of McHenry Avenue in Stanislaus County would be permanently relocated to the east to accommodate the construction of the Stanislaus River Bridge. Temporary relocations or protection in place might be required for both Modesto Irrigation District and PG&E distribution lines north of the Stanislaus River in San Joaquin County.

- During construction season one (stage 1), one-half of the proposed new Stanislaus River Bridge would be built upstream of and immediately adjacent to the existing bridge. Traffic on McHenry Avenue would continue to use the existing Stanislaus River Bridge during this first stage of construction. During construction season 2 (stage 2), all traffic on McHenry Avenue would be diverted to the new half of the Stanislaus River Bridge, and the existing Stanislaus River Bridge would be demolished. During the construction season 3 (stage 3), traffic will continue to use the new bridge while bridge construction and roadway work is completed.

1.3.2 No Build Alternative

The purpose of describing and analyzing a no build alternative is to allow decision-makers to compare the impacts of approving the project with the impacts of not approving the proposed project. Under the no build alternative, McHenry Avenue would not be widened, the McHenry Avenue/East River Road intersection would not be modified, and the Stanislaus River and SSJID Canal Bridges would not be replaced or widened.

The McHenry Avenue/East River Road intersection is currently operating unacceptably in both the morning and evening peak traffic hours. The functionality of the intersection would continue to deteriorate as additional traffic resulting from planned and approved growth surrounding the project area occurs. The no build alternative would lead to longer traffic delays and the potential for a greater number of vehicle collisions along McHenry Avenue and at the McHenry Avenue/East River Road intersection.

In addition, the no build alternative would not accommodate the anticipated travel needs of planned developments in the cities of Escalon and Modesto which are adjacent to the project area. This would result in poor circulation in and around the project area. The no build alternative is inconsistent with local, regional, and system planning.

1.3.3 Comparison of Alternatives

Criteria considered by Caltrans to evaluate the alternatives included project purpose and need objectives, project costs, potential environmental effects, and input from public services, public agencies, property owners, and the general public.

After the public circulation period, all comments would be considered, and Caltrans and San Joaquin County would identify a preferred alternative and make the final determination of the project's effect on the environment. In accordance with CEQA, if no unmitigable significant adverse impacts are identified, San Joaquin County would prepare a Negative Declaration or Mitigated Negative Declaration. Similarly, if Caltrans determines the action does not significantly impact the environment, Caltrans, as assigned by the Federal Highway Administration, would issue a Finding of No Significant Impact in accordance with the NEPA.

Table 1.2 compares the project alternatives considering the above criteria.

Table 1.2
Comparison of Alternatives

Criteria	Build Alternative (Proposed Project)	No Build Alternative
Meets the project purpose and need	Yes	No
Provides a functional and safe roadway design	Yes	No
Improves current and future traffic operations	Yes	No
Requires right-of-way acquisition from adjacent property owners	Yes	No
Avoids substantial environmental effects	Yes	No
Estimated cost	$29,035,680	$0

1.3.4 Alternatives Considered But Eliminated from Further Discussion

The CEQA requires an environmental document to identify any alternatives that were considered by the lead agency, but which were eliminated as infeasible during the scoping process, and briefly explain the reasons for the lead agency's determination. As part of the *Final Corridor Study for McHenry Avenue from Ladd Road-Patterson Road (State Route 108) to Catherine Way in San Joaquin and Stanislaus Counties Near the City of Escalon* (Corridor Study) completed in August 2001, several design options for the intersections and bridges within the project area were evaluated. Based on that evaluation, recommendations regarding preferred options were made and those have been carried forward into the Build Alternative currently proposed for this project. In addition, since completion of the Corridor Study, additional analyses have been done as part of the type selection process for the bridge structures. The results of the Corridor Study and the subsequent analyses are discussed below.

1.3.4.1 Intersection Options and Analysis

In the Corridor Study, four options were evaluated for the McHenry Avenue/East River Road Intersection. All options incorporated the ultimate lane configuration at the intersection, which consists of five lanes on McHenry Avenue and four lanes on East River Road. Option 1 was the recommended option and is represented by the current Build Alternative.

The following text, taken substantially from the Corridor Study, summarizes the findings of the Corridor Study:

Option 2 would relocate the McHenry Avenue/East River Road intersection approximately 1500 feet to the north, to avoid immediate widening of the Stanislaus River Bridge. One traffic signal would be required for this option.

The advantage of this option is that the relocated intersection would not require the widening of the Stanislaus River Bridge prior to constructing improvements to the intersection. The disadvantages of this option include the construction of two new bridge structures on East River Road west of McHenry Avenue that cross the SSJID Main Canal. Option 2 would require the realignment of East River Road, resulting in the second largest amount of right-of-way required for any of these options. This option would also require raising the profile of McHenry Avenue at the intersection to accommodate one of the bridge structures over the SSJID Main Canal. The estimated construction cost for Option 2 in 2001 dollars is $4,406,000, which includes $1,488,000 (2001 dollars) for the two new bridge structures on East River Road that cross the SSJID Main Canal. The 2001 costs of widening the Stanislaus River Bridge to its ultimate width is $9,702,000.

Option 3 relocates and realigns the west leg of River Road. As proposed, it would cross the SSJID Main Canal west of the Union Pacific Railroad (UPRR) and parallel the UPRR on the west side where it would tie into an existing local road and railroad crossing on McHenry Avenue north of the SSJID Main Canal crossing. Option 3 would require the construction of two traffic signals.

The advantage of this option is that, due to the relocated west leg of East River Road, the widening of the Stanislaus River Bridge could be reduced by approximately 14 feet compared to Option 1. The disadvantages of this option include the construction of a new bridge structure on East River Road to cross the SSJID Main Canal, the construction of two traffic signals, and the creation of an offset intersection. Option 3 requires the largest amount of right-of-way of any of these options, and would require improvements to the existing at-grade railroad crossing, where the new west leg of East River Road would tie into McHenry Avenue. The estimated construction cost for Option 3 in 2001 dollars is $3,807,000, which includes $744,000 (2001 dollars) for the new bridge structure on East River Road crossing the SSJID Main Canal. This estimated construction cost excludes widening of the Stanislaus River Bridge. The 2001 costs of widening the Stanislaus River Bridge to its ultimate width is $9,702,000.

Option 4 considers a roundabout at the existing intersection. This option would not require the construction of any traffic signals.

The disadvantage of this option is that it would be almost physically impossible to construct. This option would require the modification and relocation of the SSJID Main Canal and outfall structure, and major improvements to the Stanislaus River Bridge. The estimated construction cost for Option 4 in 2001 dollars is $4,334,000. Additional construction costs for the widening and flaring of the Stanislaus River Bridge are estimated at approximately $11,000,000 in 2001 dollars.

1.3.4.2 Bridge Options and Analysis

Subsequent to the Corridor Study, additional analyses were completed for the proposed Stanislaus River Bridge and SSJID Main Canal Bridge. The results of those analyses are summarized below.

Stanislaus River Bridge

As part of the 2003 *Rehabilitation versus Replacement: McHenry Avenue over the Stanislaus River Bridge No. 38C-0032* report, a life-cycle cost analysis was performed on four options to determine which would be most cost-effective. The four options included:

- Option 1: Seismic retrofit and rehabilitation. This option would not address any of the current or future LOS concerns; it would address only the seismic and structural concerns.

- Option 2: Tapered widening, coupled with seismic retrofit and rehabilitation. This option would address the seismic and structural concerns and include a tapered widening that would address some of the LOS concerns but would not consider the future corridor requirement for through-lanes to meet future demands.

- Option 3. Full length widening, coupled with seismic retrofit and rehabilitation. This option would address the seismic and structural concerns and would include a widening of the structure to accommodate future traffic needs.

- Option 4 (a component of the build alternative – not eliminated): Replacement of the existing structure. The option would address the seismic and structural concerns and would include a widening of the structure to accommodate future traffic needs.

Table 1.3 below presents the comparison of the options. The recommendation of the *Rehabilitation versus Replacement: McHenry Avenue over the Stanislaus River Bridge No. 38C-0032* report was to implement Option 4 (replacement). This was based on a determination that Option 1 would be obsolete within 3 to 5 years of the completion of its construction. Option 2 would require the widening of the remaining portion of the structure after 5 to 7 years and given its original construction date of 1959, its useful life would not be extended enough to justify the public expenditure. Option 3 would have a 40 year useful life but over the 40 years its life cycle cost would be $14,288,375 (in 2003 dollars). This would be nearly $5,000,000 more than the life cycle cost of Option 4 (bridge replacement).

Table 1.3 Stanislaus River Bridge Options Comparison (2003 Dollars)

Option	Description	Construction Cost	Remaining Service Life Post Rehab/Retrofit/ Replace (1)	Meets Corridor Functional Requirements After Year 2020 (2)	Replacement Cost at end of 40 years (3)	Total Cost over 40 years (not including maintenance) (4)
1	Retrofit-- Deck Rehabilitation and Barrier Replacement	$ 4,310,000	40	NO	NA	NA
2	Retrofit--Deck Rehabilitation, Barrier Replacement, and Tapered Widening	$ 8,600,000	40	NO	NA	NA
3	Retrofit--Deck Rehabilitation, Barrier Replacement, and Full Widening	$ 9,660,000	40	YES	$ 4,568,375	$ 14,228,375
4	Replacement	$ 9,170,000	75	YES	$ -	$ 9,170,000

SSJID Main Canal Bridge

As documented in the Structure Type Selection Report (April 2011), the only solution that was considered for this structure was replacement. The original bridge has a T-beam superstructure with 1-inch square shaped reinforcement and was probably built around 1931. A slab widening was added to the original bridge in 1954. The existing barrier does not meet current standards. Bridge inspection records show that the existing bridge (No. 29C0166) has a 36.8 sufficiency rating. A sufficiency rating less than 50 indicates eligibility for replacement under the Federal Highway Administration bridge program. Due to the age, condition and sufficiency rating of the existing structure, a rehabilitate and widen alternative was not studied.

1.3.4.3 Transportation System Management/Transportation Demand Management Alternatives

Transportation System Management (TSM) strategies increase the efficiency of existing facilities; they are actions that increase the number of vehicle trips a facility can carry without increasing the number of through lanes. Examples of TSM strategies include: ramp metering, auxiliary lanes, turning lanes, reversible lanes and traffic signal coordination. TSM also encourages automobile, public and private transit, ridesharing programs, and bicycle and pedestrian improvements as elements of a unified urban transportation system. Modal alternatives integrate multiple forms of transportation modes, such as pedestrian, bicycle, automobile, rail, and mass transit.

Transportation Demand Management (TDM) focuses on regional means of reducing the number of vehicle trips and vehicle miles traveled as well as increasing vehicle occupancy. It facilitates higher vehicle occupancy or reduces traffic congestion by expanding the traveler's transportation options in terms of travel method, travel time, travel route, travel costs, and the quality and convenience of the travel experience. A typical activity within this component would be providing contract funds to regional agencies that are actively promoting ridesharing, maintaining rideshare databases, and providing limited rideshare services to employers and individuals.

These alternatives have been eliminated as stand-alone alternatives because the proposed project is not adding additional through lanes (other than additional lanes on the Stanislaus River Bridge) and is not affecting the number of vehicle trips within the corridor. However, the proposed project does include the addition of wider shoulders to accommodate bicycle traffic and it also includes traffic signals to optimize the operations of the facilities within the proposed project area.

1.4 Permits and Approvals Needed

The following permits, reviews, and approvals would be required for project construction:

Table 1.4
Permits, Reviews and Approvals Required for Project Construction

Agency	Permit/Approval	Status
United States Fish and Wildlife Service (USFWS)	Section 7 Consultation for federally listed Threatened and Endangered Species	A Biological Opinion issued by the USFWS on June 7, 2011.
United States National Marine Fisheries Service (NMFS)	Section 7 Consultation for federally listed Threatened and Endangered Species. Essential fish habitat consultation pursuant to the Magnuson-Stevens Act.	A Biological Assessment assessing the project's potential effects to federally listed Threatened and Endangered species was prepared and submitted to the NMFS on January 28, 2011. Section 7 essential fish habitat consultation pursuant to the Magnuson-Stevens Act is currently under way. Biological Opinion rendered September 13, 2012.
United States Army Corps of Engineers (USACE)	Clean Water Act (CWA) Section 404 Permit for dredging or filling waters of the United States	A CWA Section 404 permit would be required prior to the start of construction.
California Department of Fish and Game (CDFG)	1602 Agreement for Streambed Alteration	A 1602 Agreement would be required prior to the start of construction.
Regional Water Quality Control Board (RWQCB)	CWA Section 401 Water Quality Certification	A CWA Section 401 permit would be required prior to start of construction.
Central Valley Flood Protection Board (CVFPB)	Encroachment permit for work within the Stanislaus River (a regulated stream)	An encroachment permit would be required prior to start of construction.
State Historic Preservation Office	Section 106 consultation initiated February 4, 2011	Caltrans assumption of concurrence made January 10, 2013 due to lack of formal response from SHPO.
United States Coast Guard	Approval of bridge plans and location prior to construction	Advanced approval issued February 17, 2009.

Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

This chapter explains the impacts that the project would have on the human, physical, and biological environments in the project area. It describes the existing environment that could be affected by the project, potential impacts from each of the alternatives, and proposed avoidance, minimization, and/or mitigation measures. Any indirect impacts are included in the general impacts analysis and discussions that follow.

As part of the scoping and environmental analysis conducted for the project, the following environmental issues were considered, but no adverse impacts were identified. Consequently, there is no further discussion regarding these issues in this document.

Consistency with State, Regional, and Local Plans and Programs – The proposed project is included in the 2011 FSTIP and the STIP. It is also included in the San Joaquin Council of Governments 2011 RTP and the 2010 RTIP. The project is also identified in the San Joaquin County General Plan. Finally, the project is included in the Stanislaus County Capital Improvement Plan for 2011–2012. Therefore, the project is consistent with these plans.

Coastal Zone – The project area is not within the coastal zone.

Wild and Scenic Rivers – The Stanislaus River is not a designated Wild and Scenic River.

Parks and Recreation Facilities – There are no parks or recreational facilities within the limits of the proposed project. The McHenry Avenue Recreation Area managed by the U.S. Army Corps of Engineers (USACE) is located 0.85 miles west of the project at 24300 East River Road, Escalon, CA. The project would not directly or indirectly affect this or any other parks and recreation facilities.

Community Character and Cohesion – The proposed project would not increase or decrease public access, would not divide an established community or neighborhood, would not separate a community from community facilities, would not substantially influence growth in the surrounding area, would not substantially change adjacent residents' quality of life, would not increase urbanization or isolation of the surrounding community, and would not affect a community with high levels of cohesion. As such, effects to community character and cohesion are not anticipated as a result of this project.

Paleontology – According to the July 2009 San Joaquin County General Plan Background Report, the vast majority of paleontological specimens from San Joaquin County have been found in rock formations in the foothills of the Diablo Mountain Range, east of the project site. No impacts to paleontological resources are anticipated as a result of this project. However, if fossils are discovered during ground disturbing activities, construction work in these areas will be halted or diverted to allow recovery of fossils by a qualified paleontologist in a timely manner.

Plant Species – There are no special-status plant species that have the potential to occur in the project area.

2.1 Human Environment

2.1.1 Land Use

Land use topics such as consistency with state, regional, and local plans and programs, coastal zones, wild and scenic rivers, and parks and recreational facilities have not been discussed in the following section. As discussed previously, no impacts to these issue areas are expected to occur.

2.1.1.1 Existing and Future Land Use

Affected Environment

The project area is located in the southeast corner of San Joaquin County and at the north-central edge of Stanislaus County. McHenry Avenue is a north–south, two-lane road connecting the City of Escalon to the north of the project area and the City of Modesto to the south. East River Road is an east-west two lane road that begins immediately east of North Ripon Road and ends at Henry Road. The SSJID Canal Bridge and the Stanislaus River Bridge are located on McHenry Avenue at the northern and southern ends of the project, respectively.

Land use within and adjacent to the project area is primarily agricultural, with walnuts and almonds being the major crop types. There is a former commercial use area (service station no longer in business) located at the southwest corner of McHenry Avenue and East River Road. One residence lies within the construction footprint located near the SSJID Canal Bridge, at 21026 McHenry Avenue. Adjacent and nearby developments include an agricultural facility, residence/farm complexes, the Union Pacific Railroad right of way, the South San Joaquin Irrigation District (SSJID) canal/pumping plant, and a few mobile homes (see **Figures 2-1a and 2-1b**).

According to the San Joaquin County General Plan, most of the land outside the Escalon city limits and urban expansion area, which includes the project area, is in agricultural use, and land along the Stanislaus River is planned to be maintained in open space. Under the Stanislaus County General Plan, the project area's land use is designated as agricultural.

The project lies within the Planning Areas of the San Joaquin and Stanislaus County General Plans. **Table 2.1** identifies the project's relationship with proposed zoning and land use of those jurisdictions.

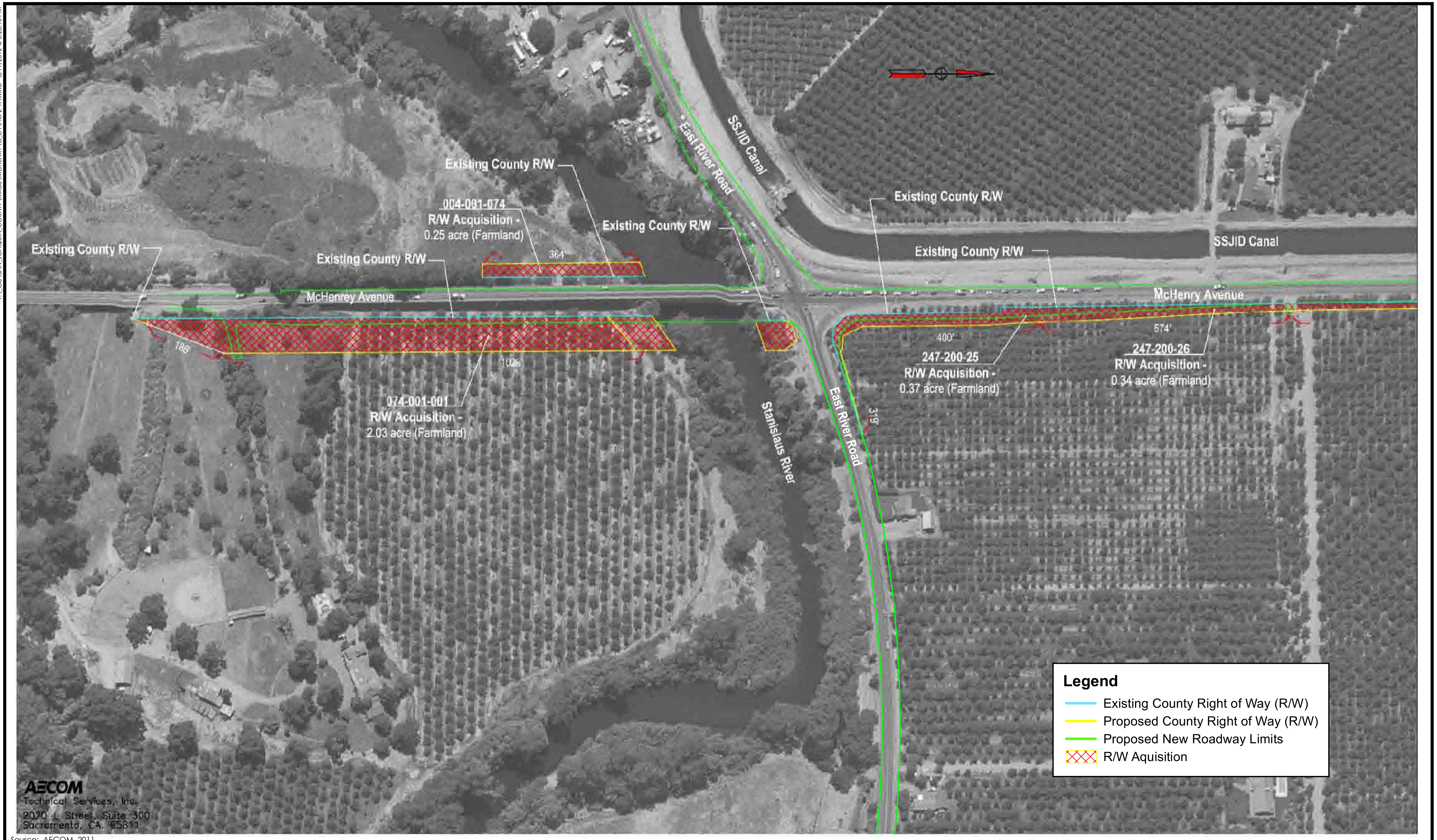
Table 2.1
Proposed Land Uses within the Project Footprint

Plan Name	Jurisdiction	Planning Area	Proposed Uses	Determination
San Joaquin County General Plan 2010	San Joaquin County	Escalon Planning Area	Agriculture on 40 acre minimums	Consistent; project listed in plan
Stanislaus County General Plan 2010	Stanislaus County	Del Rio Planning Area	A-2 District: Agriculture on 10 acre minimums and 40 acre minimums	Consistent; project listed in plan

Environmental Consequences

Permanent Impacts

Approximately 4 acres of land would be acquired to widen McHenry Avenue and the McHenry Avenue/East River Road intersection. New County right-of-way would be purchased from several parcels next to the current roadways, all of which are zoned for agricultural use. No changes to general land uses designated in the San Joaquin County General Plan or Stanislaus County General Plan are proposed as a result of the project. The project would not change accessibility to residential, commercial, or industrial land uses. The project would improve traffic flows through the McHenry Avenue corridor, which would reduce travel times through the area but would not change access to or between land use areas.



McHenry Avenue Widening
RPSTPLE-5929(196)
Replacement of Stanislaus River Bridge
(Bridge No. 38C-0032) on McHenry Avenue
BRLS-5929(166)
Replacement of SSJID Bridge
(Bridge No. 29C-0166) on McHenry Avenue
BRLS-5929(167)

Figure 2-1a

Location of Agricultural Land Surrounding the Project Area

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Source: AECOM 2011

175 0 175
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McHenry Avenue Widening
RPSTPLE-5929(196)
Replacement of Stanislaus River Bridge (Bridge No. 38C-0032) on McHenry Avenue
BRLS-5929(166)
Replacement of SSJID Bridge (Bridge No. 29C-0166) on McHenry Avenue
BRLS-5929(167)

Figure 2-1b
Location of Agricultural Land Surrounding the Project Area

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Temporary Impacts

Approximately 12 acres of temporary easements would be required for construction of the build alternative. Therefore, minor changes to land use would occur during construction of the proposed project. No temporary residential or business relocations would be required during construction.

Avoidance, Minimization, and/or Mitigation Measures

Minor changes to land use in the project area would occur as a result of the project. However, because the project would not conflict with planned land uses through the project area, no avoidance, minimization, or mitigation measures are required.

2.1.2 Growth

Regulatory Setting

The Council on Environmental Quality regulations, which established the steps necessary to comply with the NEPA of 1969, require evaluation of the potential environmental consequences of all proposed federal activities and programs. This provision includes a requirement to examine indirect consequences, which may occur in areas beyond the immediate influence of a proposed action and at some time in the future. The Council regulations, 40 CFR 1508.8, refer to these consequences as secondary impacts. Secondary impacts may include changes in land use, economic vitality, and population density, which are all elements of growth

The CEQA requires the analysis of a project's potential to induce growth. CEQA Guidelines Section 15126.2(d) requires that environmental documents "discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment."

Affected Environment

According to the San Joaquin County General Plan (adopted in 2010), San Joaquin County will continue to experience considerable development pressure in the next 15 to 20 years. New residents moving into the county from the San Francisco Bay Area and Sacramento, combined with the natural population increase of existing county families, will result in a substantial increase in the county's population. The Department of Finance predicts that San Joaquin County's population will grow from an estimated 2010 population of 741,417 to a population of 965,094 by 2020. The San Joaquin County General Plan intends to provide for future growth in a manner that preserves the natural and rural assets of the county, through ensuring that future urban development is compact, as opposed to sprawling. As such, the General Plan directs most of the development to urban communities. In order for this growth to occur, public facilities must be provided.

According to the Stanislaus County General Plan (adopted in 1994), most of the cities in the county have recently proposed or are considering significant expansions of their spheres of influence. This fact, along with the ongoing migration of people into Stanislaus County, will likely result in continued development and increased population growth. As identified in the General Plan, the Stanislaus Area Association of Governments (known as the Stanislaus Council of Governments or StanCOG) forecasts that by the year 2015 the population of Stanislaus County will reach 709,100, as compared to the 1994 General Plan population of 412,676, a 42% increase. The California Department of Finance estimates that Stanislaus County's population will grow from an estimated 2010 population of 559,708 to a total 2020 population of 699,144, a 20% increase.

Environmental Consequences

The proposed project would have a low to moderate influence on growth, but would not induce growth. The San Joaquin County and Stanislaus County General Plan's have the goal of focusing growth areas in existing incorporated cities and urban areas and their spheres of influence. By providing adequate traffic flow through the project area, the project would facilitate safe and convenient travel between the two urban centers of Escalon and Modesto, thus supporting the Counties' ability to focus growth in urban areas and reducing pressure to convert agricultural lands between these two urban centers to nonagricultural uses.

Because the proposed project would not change accessibility, would have a low to moderate influence on growth, and would not result in changes to land uses already planned and considered under the San Joaquin County and Stanislaus County General Plans, it is not anticipated that the project would result in project-related growth. As such, no resources of concern would be indirectly affected as a result of the project's influence on growth. No further growth analysis is warranted.

Avoidance, Minimization, and/or Mitigation Measures

Because the project would not have substantial effects to growth or induce growth, no avoidance, minimization, or mitigation measures are required.

2.1.3 Farmlands

Regulatory Setting

The NEPA and the Farmland Protection Policy Act (7 USC 4201–4209 and its regulations, 7 CFR Part 658) require federal agencies to coordinate with the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) if their activities may irreversibly convert farmland (directly or indirectly) to nonagricultural use. For purposes of the Farmland Protection Policy Act, farmland includes prime farmland, unique farmland, and land of statewide or local importance.

The CEQA requires the review of projects that would convert Williamson Act contract land to nonagricultural uses. The main purposes of the Williamson Act are to preserve agricultural land and to encourage open space preservation and efficient urban growth. The Williamson Act provides incentives to landowners through reduced property taxes to deter the early conversion of agricultural and open space lands to other uses.

Affected Environment

A Farmland Conversion Impact Rating for Corridor Type Projects, Form NRCS-CPA-106, was approved on August 26, 2011 following coordination with the Stockton, California office of the NRCS.

As of 2007, the most recent year for which information is available, there were approximately 737,503 acres of farmland in San Joaquin County. The average farm size in the county was 204 acres. As of 2007, there were approximately 788,954 acres of farmland in Stanislaus County. The average farm size in the county was 192 acres.

The proposed project is surrounded primarily by farmland, with most parcels actively farmed. The crops on the surrounding farmland consist almost entirely of orchard trees. In order to accommodate the project, approximately 4 acres of farmland would be acquired from several parcels abutting McHenry Avenue and converted to transportation use; all of the affected parcels are under Williamson Act contracts. Planned property acquisition would not bisect any parcels; all new County right of way would be acquired along parcel edges. **Figures 2-1a** and **2-1b** show the location of agricultural land surrounding the project area and also illustrate and describe the farmland conversion that would result from right-of-way acquisition required to accommodate the project.

Environmental Consequences

The proposed project would require acquisition of farmland adjacent to the existing roadway to accommodate the widened McHenry Avenue. **Table 2.2** below summarizes the farmland conversion impacts of each alternative.

Table 2.2
Farmland Conversion by Alternative

Alternatives	Land to be Converted to Non-Agricultural Use (acres)	Prime and Unique Farmland (acres)	Percentage Loss of Farmland in San Joaquin County	Percentage Loss of Farmland in State	Farmland Conversion Impact Rating
Build Alternative	4	4	0	0	150.32
No Build Alternative	0	0	0	0	0

Source: Form NRCS-CPA-106 (Farmland Conversion Impact Rating for Corridor-Type Projects)

The final Farmland Conversion Impact Rating for the proposed project is 150.32 points out of a possible total of 260 points. According to 7 Code of Federal Regulations (CFR) 658.4 (a)(2), "Sites receiving a total score of less than 160 need not be given further consideration for protection and no additional sites need to be evaluated."

Avoidance, Minimization, and/or Mitigation Measures

The proposed project is designed to minimize impacts to farmland conversion through using the smallest project footprint possible while meeting the project's purpose and need and fulfilling design and safety requirements. Because the project's Farmland Conversion Impact Rating is less than 160 points, the further consideration of farmland protection is not required.

2.1.4 Community Impacts

2.1.4.1 Property Acquisition

Regulatory Setting

Caltrans' Relocation Assistance Program is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and Title 49 CFR Part 24. The purpose of a relocation assistance program is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably so that such persons would not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole.

All relocation services and benefits are administered without regard to race, color, national origin, or sex in compliance with Title VI of the Civil Rights Act (42 USC 2000d, et seq.). Please see **Appendix B** for a copy of Caltrans' Title VI Policy Statement.

Affected Environment

The project area consists of primarily agricultural land, with a small number of farm-associated residences and outbuildings (barns, sheds, equipment storage, etc.). A former service station that is no longer in operation is located at the southwest corner of the McHenry Avenue/East River Road intersection.

Along both the McHenry Avenue corridor and the East River Road corridor within the project area, the existing County roadway right-of-way is between 60 and 80 feet wide.

Environmental Consequences

The proposed project would require acquisition of portions of six privately-owned parcels. **Table 2.3** below provides a summary of required right-of-way acquisition.

Table 2.3
Right-of-Way Acquisition Summary

Assessor's Parcel Number (APN)	Acquisition (acres)	Full or Partial	Land Use Type
074-001-001	2.03	Partial	Agricultural
247-200-025	0.37	Partial	Agricultural
247-200-026	0.58	Partial	Agricultural
247-200-001	0.20	Partial	Agricultural
247-160-017	0.51	Partial	Agricultural
004-001-074	0.25	Partial	Agricultural
Total acquisition	3.94		

All right-of-way acquisitions required for the project would be partial acquisitions or "sliver takes" of small portions of land adjacent to McHenry Avenue to accommodate the roadway widening. The project would not require full acquisition of any parcels, nor would it result in the need to relocate residences or business. No existing residential, agricultural, or commercial/industrial structures would be affected by the project. The project would not require Relocation Assistance Program services or payments.

Avoidance, Minimization, and/or Mitigation Measures

In order to avoid or minimize the right-of-way acquisition required for the project, the proposed project widens McHenry Avenue and East River Road as little as possible while still meeting the project's purpose and need, complying with roadway design criteria, and satisfying San Joaquin County and Stanislaus County roadway design requirements.

No full parcel acquisitions or relocation of residences or businesses would be required; therefore, no Relocation Assistance Program services or payments would be needed, and no additional avoidance, minimization, or mitigation measures would be required.

2.1.5 Environmental Justice

Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* signed by President Clinton on February 11, 1994. This EO directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services (DHHS) poverty guidelines. For 2012, this was $23,050 for a family of four.

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have also been included in this project. The Department's commitment to upholding the mandates of Title VI is evidenced by its Title VI Policy Statement, signed by the Director, which can be found in Appendix B of this document.

Affected Environment

In accordance with the December 16, 2011 FHWA Guidance on Environmental Justice, localized census tract data was pulled from the 2010 United States census; the data can be found at http://2010.census.gov/2010census/. The project area is located within two census tracts: census tract 49.02 in San Joaquin County and census tract 5.01 in Stanislaus County. Information on minority populations, elderly populations and low-income populations were obtained. As defined in the FHWA guidance, minority populations include: Black or African American, Hispanic, Asian American, American Indian/Alaskan Native, and Native Hawaiian or Pacific Islander. **Tables 2.4 and 2.5** below summarize the data available from the 2010 United Census.

Based on the census data regarding minority populations, no pockets of minority populations were found that were substantially different in comparison to the counties' population distribution. In fact, when comparing the population demographics of the census tracts to the countywide demographics, both census tracts have substantially lower percentages of minority populations. However, because the data does show some percentage of the population to be minority, further analysis was conducted.

Table 2.4: Relevant Environmental Justice Population Statistics San Joaquin County

	San Joaquin County	Percentage of County Total Population	Census Tract 49.02	Percentage of Total Census Tract Population
Total Population	685,306		6106	
Hispanic Population	266,341	38.9%	1,982	32.5%
African American	51,744	7.6%	41	0.7%
Asian	98,472	14.4%	76	1.2%
American Indian/Alaska Native	7,196	1.1%	52	0.9%
Native Hawaiian/Pacific Islander	3,758	0.5%	2	0.0%

Table 2.5: Relevant Environmental Justice Population Statistics Stanislaus County

	Stanislaus County	Percentage of County Total Population	Census Tract 5.01	Percentage of Total Census Tract Population
Total Population	514,453		7165	
Hispanic Population	215,658	41.9%	2,152	30.0%
African American	14,721	2.9%	208	2.9%
Asian	26,090	5.1%	511	7.1%
American Indian/Alaska Native	5,902	1.1%	67	0.9%
Native Hawaiin/Pacific Islander	3,401	0.7%	43	0.6%

**Table 2.6 Median Household Income
Data Relevant to Environmental Justice**

Census 2010 Geography	Total Households	Median Household Income ($)
Census Tract 49.02	1,939	56,797
Census Tract 5.01	2,468	82,895
Escalon city	2,657	65,457
San Joaquin County	212,905	54,341
Stanislaus County	163,841	51,094

Source: U.S. Census Bureau, 2006-2010 American Community Survey, Tables B11001 and B19013
ACS data are estimates; they are not counts. Income data is provided in 2010 inflation adjusted dollars.

As shown in **Table 2.6**, the household median income in the census tracts 49.02 and 5.01 are both above the 2012 DHHS poverty definition of $23,050 for a family of four. Census tract 5.01 has a median household income level that is much higher than the Stanislaus County median household income.

Although the results of the statistical research did not yield information that would lead to the identification of low-income or minority populations within the project area, a parcel with mobile homes was identified directly west of the proposed project on East River Road (see **Figures 2-1a and 2-1b**). Mobile homes can be indication of individuals living at a lower income level.

Environmental Consequences

While the field review indicated the potential for a low-income population directly to the west of the proposed project, no disproportionately high and adverse effects were identified with respect to that parcel. As per FHWA Order 6640.23, a disproportionately high and adverse effect on a minority or low income population means the adverse effect is predominantly borne by such population or is appreciably more severe or greater in magnitude on the minority or low-income population than the adverse effect suffered by the non-minority or non-low-income population. No portion of the parcel on which the mobile homes are located has been identified for acquisition. Furthermore, the parcel is located far enough away from the proposed project site and is shielded by mature trees such that the residents would not have a view of the proposed project or its construction. While the residents may be able to hear some noise during construction of the proposed project, the noise level will not be any greater or more severe than that experienced by the rest of the population within and around the proposed project. The same holds true for any construction-related or operational air quality impacts and traffic-related impacts.

Based on the above discussion and analysis, the proposed project will not cause disproportionately high and adverse effects on any minority or low-income populations as per EO 12898 regarding environmental justice.

Avoidance, Minimization, and/or Mitigation Measures

Because the project would not have substantial effects to environmental justice, no avoidance, minimization, or mitigation measures are required.

2.1.6 Utilities/Emergency Services

Affected Environment

The project area contains overhead power lines and cable television lines, and underground sewer and water lines. The Modesto Irrigation District supplies both power and water in the area. Its overhead power transmission lines are located on the east side of McHenry Avenue, parallel to the Stanislaus River Bridge; they cross into San Joaquin County to the north side of East River Road then to the west side of McHenry Avenue where their distribution lines share poles with PG&E power lines. PG&E overhead power facilities are also located north of and parallel to East River Road. The SSJID Main Canal crosses McHenry Avenue south of Jones Road, then parallels the west side of McHenry Avenue until it turns to the west at East River Road. SSJID underground waterlines cross the existing McHenry Road in three places: approximately 1,100 feet north of the Stanislaus River Bridge; at the SSJID Main Canal; and at Jones Road.

Environmental Consequences

Construction of this project would require relocation of utility facilities within the project limits. A detailed utility relocation study would be done during final design of the project. Potential utility service relocations are being coordinated between the utility service providers and the San Joaquin County and Stanislaus County Public Works Departments. Because this coordination would prevent service disruptions, no adverse temporary, permanent, indirect, or cumulative effects to utilities from the proposed build alternative are expected.

Avoidance, Minimization, and/or Mitigation Measures

Existing overhead and underground utilities within or adjacent to any proposed improvements would be protected, relocated, or removed as necessary. The portion of Modesto Irrigation District’s existing transmission lines on the east side of McHenry Avenue in Stanislaus County would be permanently relocated approximately 100 feet to the east to accommodate the construction of the Stanislaus River Bridge. Temporary relocations or protection in place might be required for both Modesto Irrigation District and PG&E distribution lines north of the Stanislaus River in San Joaquin County. If relocations are required, then the County will prepare any additional environmental documentation required to keep the proposed project in environmental compliance.

Because no adverse temporary, permanent, indirect, or cumulative effects to utilities are anticipated as a result of the proposed project, no other avoidance, minimization, or mitigation measures are required.

2.1.7 Traffic and Transportation/Pedestrian and Bicycle Facilities

Regulatory Setting

The Department, as assigned by FHWA, directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects (see 23 Code of Federal Regulations [CFR] 652). It further directs that the special needs of the elderly and the disabled must be considered in all federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

In July 1999, the U.S. Department of Transportation (USDOT) issued an Accessibility Policy Statement pledging a fully accessible multimodal transportation system. Accessibility in federally-assisted programs is governed by the USDOT regulations (49 CFR Part 27) implementing Section 504 of the Rehabilitation Act (29 United States Code [USC] 794). FHWA has enacted regulations for the implementation of the 1990 Americans with Disabilities Act (ADA), including a commitment to build transportation facilities that provide equal access for all persons. These regulations require application of the ADA requirements to federal-aid projects, including Transportation Enhancement Activities.

Affected Environment

Traffic and Transportation

A Traffic Analysis was prepared for the proposed project in January 2010. The project area analyzed in the Traffic Analysis begins at the intersection of McHenry Avenue/East River Road and extends north to the intersection of McHenry Avenue/Jones Road (**Figure 2-2**). The Traffic Analysis evaluated three intersections, all of which are in San Joaquin County:

- McHenry Avenue/East River Road
- McHenry Avenue/Meyers Avenue

- McHenry Avenue/Jones Road

The Stanislaus/San Joaquin County line runs along the Stanislaus River, midway through the project area. McHenry Avenue provides a crossing of the Stanislaus River, and the next nearest crossing of the river is 3.3 miles to the southeast away as a straight line; therefore, McHenry Avenue attracts a lot of north-south traffic.

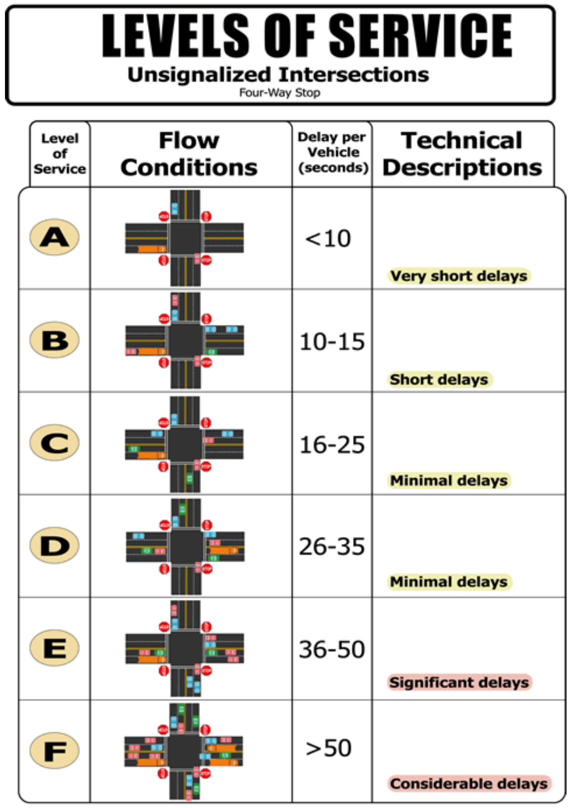
McHenry Avenue and East River Road within the project area are two-lane rural roadways, as are the other roadways in the vicinity. Left turn lanes are generally not present on McHenry Avenue within project limits.

Affected intersections within project limits are controlled by stop signs, not traffic signals. The McHenry Avenue/East River Road intersection is controlled by stop signs on all four roadway approaches. Posted speed limits on McHenry Avenue are 45 mph north of Jones Road and 55 mph south of Jones Road. East River Road is posted as 55 mph east of McHenry Avenue, but there are no speed limit signs immediately west of McHenry Avenue. The McHenry Avenue/Meyers Avenue intersection is a T- intersection and is controlled by one stop sign on Meyers Avenue. The McHenry Avenue/Jones Road intersection is controlled by two stop signs on Jones Road. (**Figure 2.2**)

Traffic Congestion History

Traffic congestion is ranked using a grading system describing the quality of road facility operation, ranging from level of service A (indicating free-flow traffic conditions with little or no delay) to level of service F (representing oversaturated conditions where traffic flows exceed design capacity, resulting in long lines of vehicles and delays). (**Table 2.7**) According to the San Joaquin County General Plan, San Joaquin County strives to maintain a LOS D or better at all intersections and a LOS C or better on the roadway within the project area. As shown in **Table 2.8**, the intersection of McHenry Avenue/East River Road operates unacceptably (LOS E or F) during both AM and PM peak traffic hours (the times during the morning and evening when traffic is the greatest).

Table 2.7
Level of Service for
Four-Way Stop Intersections



LEVELS OF SERVICE
Unsignalized Intersections
Four-Way Stop

Level of Service	Flow Conditions	Delay per Vehicle (seconds)	Technical Descriptions
A		<10	Very short delays
B		10-15	Short delays
C		16-25	Minimal delays
D		26-35	Minimal delays
E		36-50	Significant delays
F		>50	Considerable delays

Source: 2000 HCM, Exhibit 17-22, Level of Service Criteria for AWSC Intersections

Figure 2-2 Existing Lanes and Intersection Controls

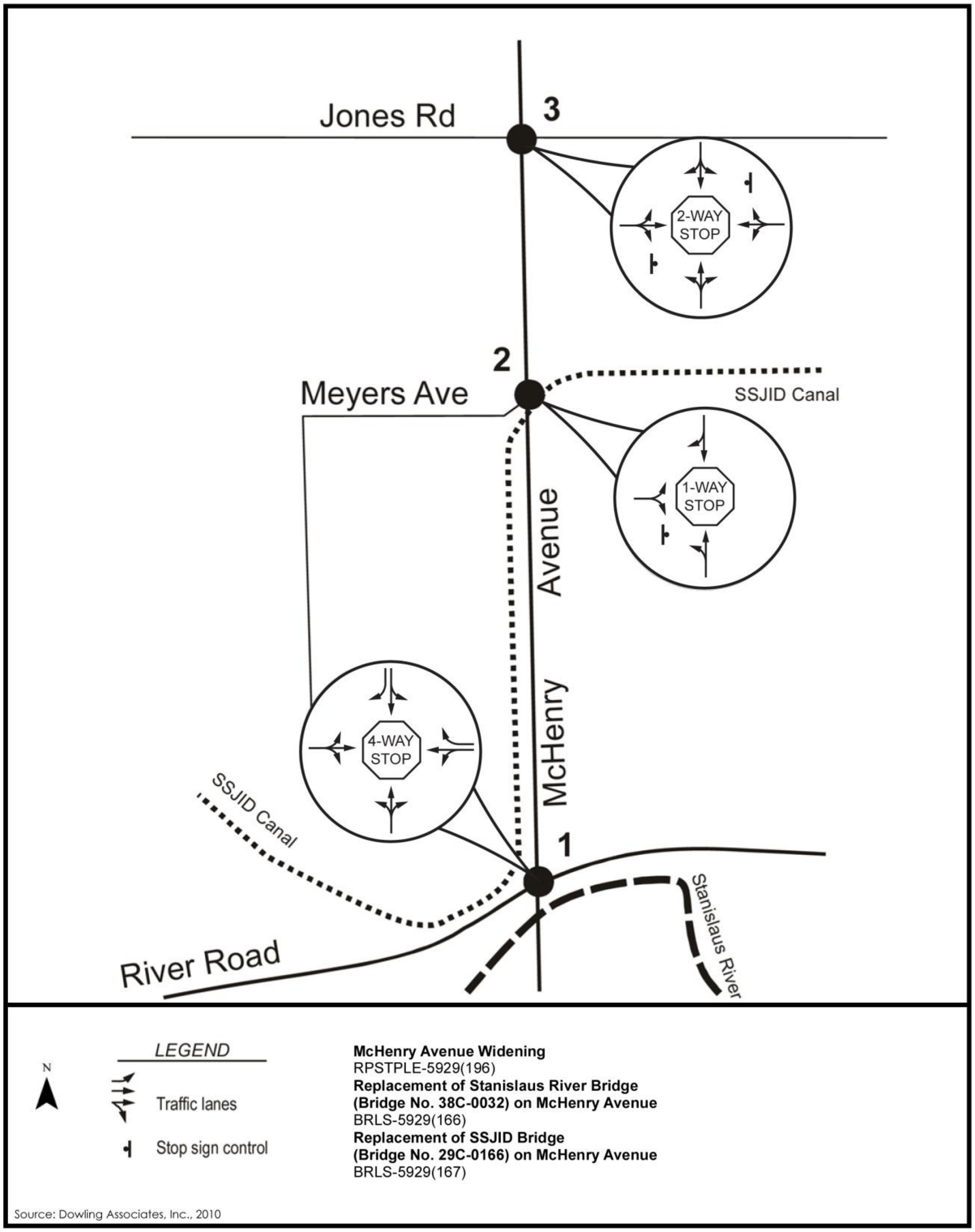


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Table 2.8
Existing 2008 Peak Hour Levels of Service

Intersection	Control[1]	AM Peak Hour		PM Peak Hour	
		Delay (in seconds)[2]	LOS[3]	Delay (in seconds)[2]	LOS[3]
McHenry Avenue/East River Road	4-way				
Weighted Average[4]		88.7	***F***	103.3	***F***
Northbound Approach		138.2	***F***	203.3	***F***
Southbound Approach		104.2	***F***	41.7	***E***
Eastbound Approach		21	C	40.7	***E***
Westbound Approach		33.5	D	15.8	C
McHenry Avenue/Meyers Avenue	1-way				
Northbound Left Turn		0	A	8.3	A
Eastbound Approach		17.8	C	11	B
McHenry Avenue/Jones Road	2-way				
Northbound Left Turn		8.4	A	8.2	A
Southbound Left Turn		8.2	A	8.6	A
Eastbound Approach		16.5	C	14.5	B
Westbound Approach		18	C	22.2	C

*Note: **Bold italicized text** indicates unacceptable levels of service.*
[1], 2-way = unsignalized 2-way stop, 4-way = unsignalized 4-way stop, Meyers Ave intersection is a T-intersection with only one stop sign
[2] Weighted average delay
[3] LOS = level of service
[4] For 4-way stop controlled intersections, the HCM methodology used to calculate LOS yields an average weighted delay for each approach and then for the entire intersection. For 2-way or 1-way stop controlled intersections, the HCM methodology does not yield a weighted average for the entire intersection for 2-way or 1-way stop controlled intersections.

Traffic Collision History

Historical reported traffic collision data for the McHenry Avenue corridor was obtained from the California Highway Patrol Statewide Integrated Traffic Records System and is summarized in **Table 2.9** below.

Table 2.9
Traffic Collision History
(January 1, 2005, through June 30, 2008)

Location	Property Damage Only	Injury	Fatal	Total
Intersections				
McHenry Avenue/Jones Road Intersection	–	–	–	–
McHenry Avenue/Meyers Avenue Intersection	–	2	–	2
McHenry Avenue/East River Road Intersection	12	3	–	15
Subtotal	12	5	–	17
Non-Intersections				
McHenry Avenue between Jones Road and Meyers Avenue	1	–	–	1
McHenry Avenue between Meyers Avenue and East River Road	1	1	–	2
Subtotal	2	1	–	3
Total Collisions	**14**	**6**	**–**	**20**
Percentage of Collisions	**70%**	**30%**	**0%**	**100%**

The information above and other data from the California Highway Patrol (CHP) reveal the following patterns:

- A total of 20 collisions were reported along McHenry Avenue in this corridor during the 3½-year period, with 5 to 8 collisions per year.
- 85% of the collisions occurred at intersections and 15% occurred between intersections and were not related to traffic conditions on intersection approaches.
- 75% of these collisions occurred at the McHenry Avenue/East River Road intersection.
- Overall, 30% were injury collisions and 70% were property-damage-only collisions.

Typically, there is a direct connection between traffic volume levels and the number of reported collisions. Therefore, to correctly compare the collision experience at locations with varying traffic volume levels, it is necessary to calculate collision rates. Collision rates express the number of collisions in terms of the number of vehicles using the facility. **Table 2.10** shows the results of such a calculation for the McHenry Avenue/East River Road intersection.

Table 2.10
Traffic Collision Rates – McHenry Avenue/East River Road Intersection
(January 1, 2005, through December 31, 2007)

	Total Collisions (3 years)	PM Peak Hours Vehicles[1]	Estimated Daily Vehicles[2]	Collision Rate (per million vehicles)[3]
McHenry Avenue/East River Road Intersection	14	1,433	17,265	0.75

[1] *Total vehicles entering the intersection during the PM peak hour.*
[2] *Assuming peak hour volume is 8/3% of daily volume (per McHenry Avenue counts).*
[3] *Collisions per million entering vehicles (three-year calculation).*

The result indicates that this intersection has a collision rate of 0.75 collisions per million entering vehicles. The collision rate of 0.75 per million vehicles at the McHenry Avenue/East River Road intersection is three times higher than the statewide average of 0.22 per million vehicles. The historical traffic collision data for the McHenry Avenue corridor were obtained from the California Highway Patrol Statewide Integrated Traffic Records System.

Traffic Forecasts

The future traffic volume levels for the McHenry Avenue corridor were estimated using a computerized traffic forecasting model. The model used is maintained by the San Joaquin Council of Governments (SJCOG), which covers San Joaquin County in detail and includes elements of the broader surrounding regions, including Sacramento County, Stanislaus County, and the Bay Area Counties. The forecast year used in this analysis is the year 2030.

Table 2.11 compares the predicted LOS for the Build and No Build alternatives in year 2030 for the three intersections evaluated for the proposed project.

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Table 2.11
Current (2008) and Future (2030) Peak Hour Delays and Levels of Service

Intersection	Current (2008 Conditions)					No Build Alternative (2030 Conditions)					Build Alternative (2030 Conditions)				
	Control[1]	AM Peak Hour		PM Peak Hour		Control[1]	AM Peak Hour		PM Peak Hour		Control[1]	AM Peak Hour		PM Peak Hour	
		Delay (seconds)[2]	LOS[3]	Delay (seconds)[2]	LOS[3]		Delay (seconds)[2]	LOS[3]	Delay (seconds)[2]	LOS[3]		Delay (seconds)[2]	LOS[3]	Delay (seconds)[2]	LOS[3]
McHenry Avenue/East River Road															
Weighted Average[4]	4-way	88.7	***F***	103.3	***F***	4-way	464.0	***F***	819.9	***F***	Signal[5]	43.6	D	46.0	D
Northbound Approach		138.2	***F***	203.3	***F***		789.0	***F***	1305.2	***F***		NA	NA	NA	
Southbound Approach		104.2	***F***	41.7	***E***		441.9	***F***	580.2	***F***		NA	NA	NA	
Eastbound Approach		21.0	C	40.7	***E***		63.5	***F***	380.2	***F***		NA	NA	NA	
Westbound Approach		33.5	D	15.8	C		70.8	***F***	22.4	C		NA	NA	NA	
McHenry Avenue/Meyers Avenue	2-way					2-way					2-way				
Northbound Left Turn		0.0	A	8.3	A		0.0	A	10.3	B		0.0	A	10.3	B
Eastbound Approach		17.8	C	11.0	B		29.9	D	17.6	C		29.9	D	17.6	C
McHenry Avenue/Jones Road	2-way					2-way					2-way				
Northbound Left Turn		8.4	A	8.2	A		8.9	A	10.3	B		8.9	A	10.3	B
Southbound Left Turn		8.2	A	8.6	A		8.7	A	13.1	B		8.7	A	13.1	B
Eastbound Approach		16.5	C	14.5	B		23.1	C	299.9	***F***		23.1	C	299.9	***F***
Westbound Approach		18.0	C	22.2	C		128.5	***F***	1558.9	***F***		128.5	***F***	1558.9	***F***

*Note: **Bold italicized text** indicates unacceptable levels of service.*
[1] Signal = signalized, 1-way = unsignalized 1-way stop; 2-way = unsignalized 2-way stop, 4-way = unsignalized 4-way stop, Meyers Ave intersection is a T-intersection with only one stop sign
[2] Weighted average delay
[3] LOS = level of service
[4] For 4-way stop controlled intersections, the HCM methodology used to calculate LOS yields an average weighted delay for each approach and then for the entire intersection. For 2-way or 1-way stop controlled intersections, the HCM methodology does not yield a weighted average for the entire intersection for 2-way or 1-way stop controlled intersections.
[5] For a 4-way signal, the HCM methodology yields the weighted average delay for the entire intersection; the delays at the individual approaches are not calculated separately.

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As shown in **Table 2.11**, the McHenry Avenue/East River Avenue intersection would operate with LOS F in 2030 AM and PM peak hours on all four legs of the McHenry the intersection.

As also shown in **Table 2.11**, the unsignalized intersections of McHenry Avenue/Meyers Avenue and McHenry Avenue/Jones Road would operate with the same LOS conditions in 2030 under both the Build and No Build alternatives, because no improvements to these intersections would be made under the proposed project. In 2030, the McHenry Avenue/Jones Road intersection would carry enough traffic to meet the criteria for installation of traffic signals; however, improvements to this intersection are not proposed as part of this project.

Pedestrian and Bicycle Facilities

Under current conditions, there are no bicycle facilities within the project area. The only existing pedestrian facility in the project area is a walkway on the Stanislaus River Bridge. Neither McHenry Avenue nor East River Road is a pedestrian route through the project area, and no facilities compliant with the Americans with Disabilities Act (ADA) are currently located in the project area.

Environmental Consequences

Traffic and Transportation

The project is expected to have a beneficial impact on both short- and long-term transportation operations in the area by relieving current and future congestion at the McHenry Avenue/East River Road intersection. The project is also expected to improve safety along McHenry Avenue by providing a center left turn lane through the project area.

<u>Traffic Congestion</u>

The proposed project is expected to reduce traffic congestion by signalizing the McHenry Avenue/East River Road intersection. Traffic analysis data comparing current conditions to the future conditions with and without the project (see **Table 2.11**) demonstrates that the proposed signalization of the McHenry Avenue/East River Road intersection has a positive impact on LOS, improving it from F to D, and significantly reduces delay times. With the proposed project, 2030 weighted delay times are 43.6 seconds during the AM peak and 46.0 seconds during the PM peak; without the project, the weighted average delay would be 464.0 seconds in the AM peak and 819.9 seconds in the PM peak.

Construction activities for the project would temporarily disrupt traffic flow through roadways in the project area. Heavy trucks delivering equipment and materials, as well as construction worker and project inspector vehicles, might slightly increase the volume of traffic through the area during project construction. The types and number of vehicles and equipment would vary depending on the phase of the project. Additionally, roadway diversions and full or partial lane closures during road widening and bridge reconstruction would also temporarily disrupt traffic flow and increase delays through the area.

Traffic Collisions

Addition of a center left turn lane to McHenry Avenue and improving the McHenry Avenue/East River Road intersection should improve safety and reduce the chance traffic accidents.

Pedestrian and Bicycle Facilities

The proposed project would not construct ADA-compliant facilities, as neither McHenry Avenue nor East River Road is a pedestrian route through the project area and pedestrian facilities are not proposed as part of the project.

The San Joaquin County Bicycle Master Plan Update (November 2010) identifies a planned Class III bike lane on McHenry Avenue between Escalon and the San Joaquin/Stanislaus County line. A Class III Bikeway (as defined by the San Joaquin County Bicycle Master Plan) provides for shared use with pedestrians and motor vehicles and is identified only by signage. The Stanislaus County Non-Motorized Transportation Plan (September 2008) identifies a planned Class II bike lane on McHenry Avenue between Pelandale Avenue and the Stanislaus/San Joaquin County line. Class II bike facilities (as defined by the Stanislaus County Non-Motorized Transportation Plan) provide a striped and stenciled, minimum 5-foot-wide lane for one-way bicycle travel. The project would construct 5-foot-wide paved shoulders along McHenry Avenue within the project limits to accommodate pedestrians and bicycle use consistent with both plans.

Avoidance, Minimization, and/or Mitigation Measures

The following minimization measures would be implemented to reduce traffic impacts resulting from construction activities:

- A Transportation Management Plan would be prepared before starting construction work and would be implemented by the San Joaquin County Department of Public Works throughout the construction of the project. This plan would include such elements as public information/public awareness; the location of access to the construction site; any private driveway turn restrictions;

temporary traffic control devices or flaggers; travel time restrictions for construction-related traffic to avoid peak travel periods on selected roadways; and designated parking and staging areas for workers and equipment.

- The project would require three constructions seasons which coincide with three different stages of construction. Construction stages are planned to ensure traffic circulation will continue with minimal disruption during the three construction seasons, as described in Section 1.3.1.

2.1.8 Visual/Aesthetics

Regulatory Setting

NEPA of 1969, as amended, establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* [emphasis added] and culturally pleasing surroundings (42 USC 4331[b] [2]). To further emphasize this point, the FHWA in its implementation of NEPA (23 USC 109[h]) directs that final decisions regarding projects are to be made in the best overall public interest taking into account adverse environmental impacts, including, among others, the destruction or disruption of aesthetic values.

Likewise, CEQA establishes that it is the policy of the state to take all action necessary to provide the people of the state "with…enjoyment of aesthetic, natural, scenic, and historic environmental qualities" (California Public Resources Code Section 21001[b]).

Affected Environment

A Visual Impact Assessment (September 2010) was prepared to assess the proposed project's potential effects to visual quality and aesthetics in the area.

The project study area comprises McHenry Avenue from approximately 1,700 feet south of East River Road to 4,000 feet north of East River Road and extends east 1,300 feet along East River Road and west 700 feet along East River Road. The project study area consists of ruderal/urban, orchard, annual grassland, valley oak woodland, valley foothill riparian forest, riverine, and open water (SSJID). The elevation within the project study area is between 78 and 116 feet above mean sea level (msl). Elevation is highest in the northern portion of the project study area and lowest in the Stanislaus River. Within the project study area, the banks of the Stanislaus River on both sides are very steep (70–100% slopes). On the south side of the Stanislaus River, there is a terrace lower (approximately 80 feet in elevation) than the terrace at East River Road on the opposite side of the river (approximately 100 feet in elevation).

The visual setting within the project corridor includes McHenry Avenue, the Stanislaus River Bridge, East River Road, and medium-density orchard on both sides of the roadways. The existing roadway is narrow with no shoulders, curbs, gutters, or sidewalks. Several residences are located adjacent to the project area and are largely shielded from the view of vehicles traveling on the roadway by topography and riparian or orchard vegetation. The Stanislaus River flows east to west through the project study area. West of McHenry Avenue and south of East River Road, there is also a large cement-lined overflow channel for the SSJID, approximately 5 feet wide.

Views in the project area vary according to the location of the viewer. The dominant view in the project study area includes views of the roadway and bridges by drivers traveling through the project area on McHenry Avenue or East River Road.

Sensitive viewers of the project area include mostly:

- **Local Motorists/ Local Residents/Commuters:** These viewers would have on-road views of McHenry Avenue and East River Road and views of the above-deck elements of the Stanislaus River and SSJID Canal Bridges. Drivers traveling through the project area have views of the roadway and the bridge as they pass through the area on a daily or weekly basis. Driver focus is expected to remain primarily on the roadway itself, rather than on the surrounding views. Passengers would have a higher awareness of the surrounding views.

- **Tourists and Other Non-Local Motorists:** Tourists or other non-local drivers traveling through the area would be expected to have a somewhat higher awareness of the visual characteristics of the area, but are not as sensitive to changes in the visual setting because they do not see the area on a regular basis.

- **Users of the Stanislaus River:** Recreational users (hikers, fisherman, campers, etc.) along the Stanislaus River.

Visual quality is evaluated by identifying three elements of the viewshed:

- **Vividness** is the visual power or memorability of landscape components as they combine in distinctive visual patterns.

- **Intactness** is the visual integrity of the natural and man-built landscape and its freedom from encroaching elements. It can be present in well-kept urban and rural landscapes, as well as in natural settings.

- **Unity** is the visual coherence and compositional harmony of the landscape considered as a whole. It frequently attests to the careful design of individual manmade components in the landscape.

The FHWA states that visual analysis methods should correlate with public judgments of visual quality well enough to predict those judgments. This approach is particularly useful in highway planning because it does not presume that a highway project is necessarily an eyesore. This approach to evaluating visual quality can also help identify specific methods for mitigating each adverse impact that may occur as a result of a project.

The visual vividness of the project study area is moderately high. The residential structures within the developed portion of the project study area are not visibly unique and mostly are surrounded by vegetation that screens them from view. The agricultural structures in the area, however, are more visually vivid; the orchards with strong horizontal lines are visually unique features to the area and create distinct patterns. Additionally, the undeveloped expanse of native vegetation and bodies of open water near and within the Stanislaus River is visually unique when compared to the large expanses of agricultural development that comprise most of the project study area.

The visual intactness of the project study area is moderately high. The area comprises mixed land uses such as residential, agricultural, and open space. These elements mesh with one another; for example, the residential areas are interspersed with agricultural orchards, making the actual residences blend into the view. Agricultural uses occur adjacent to the highly-vegetated open space with riparian woodlands, making the transition from one land use to another somewhat seamless.

The visual unity of the project study area is moderate. The proposed project spans multiple land uses that have moderate visual coherence (consistency). The rural agricultural uses are somewhat visually harmonious with the open space areas, and the small residential structures have visual coherence with the agricultural uses.

Because it is not feasible to analyze all the views in which the proposed project would be seen, it is necessary to select a number of key viewpoints that represent key elements of the proposed project as they would be seen by the primary viewer groups. **Figure 2-3,** Project Viewshed and Viewpoints, illustrates how the viewshed for this project was defined and where viewpoint photos were taken. The visual quality of each key view was quantified using an evaluation scale of 1 to 7 (1 = very low, 4 = medium, 7 = very high) for vividness, intactness, and unity. (**Tables 2.12 through 2.16**)

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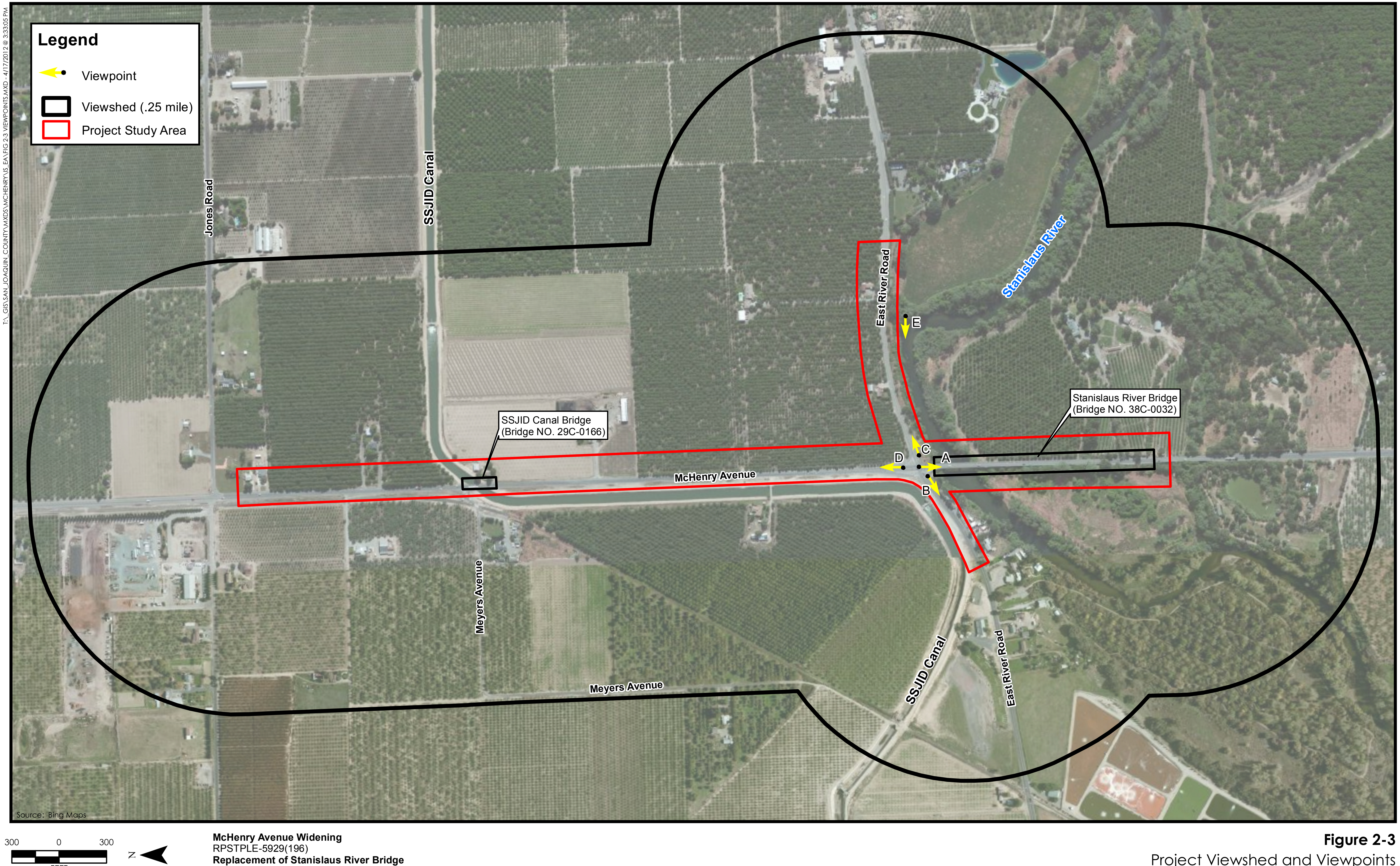

McHenry Avenue Widening
RPSTPLE-5929(196)
Replacement of Stanislaus River Bridge
(Bridge No. 38C-0032) on McHenry Avenue
BRLS-5929(166)
Replacement of SSJID Bridge
(Bridge No. 29C-0166) on McHenry Avenue
BRLS-5929(167)

Figure 2-3
Project Viewshed and Viewpoints

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Key Viewpoint A – McHenry Avenue/East River Road Intersection Looking South

Key Viewpoint A is the view by drivers north of the Stanislaus River Bridge (over the Stanislaus River) looking toward the Stanislaus River. The Key Viewpoint A photograph was taken at the existing McHenry Avenue/East River Road intersection, facing south. Key Viewpoint A comprises the two-lane McHenry Avenue. Land cover in the foreground and middle ground consists of foothill riparian, urban environment (roadway), and agricultural (walnut orchards) and foothill riparian is in the background.

Proposed Project Elements

Under the proposed project, the existing bridge across the Stanislaus River would be replaced and widened to accommodate the ultimate five-lane configuration for McHenry Avenue. The Stanislaus River Bridge would be striped to conform to the existing two-lane roadway at its southern terminus. Minor loss of riparian vegetation would occur as a result of the bridge widening. Utility poles and lines would be relocated to the east but would look similar to the existing conditions.

Viewpoint A – McHenry Avenue/East River Road
Looking South Along Stanislaus River Bridge Over Stanislaus River

Table 2.12
Visual Quality Comparison for Key Viewpoint A

Key Viewpoint		Vividness	Intactness	Unity	Visual Quality = (V+I+U)/3	VQ Difference
A	Existing	4.25	5	4.5	4.58	-0.08
	Build	4	5	4.5	4.5	

Ratings for the existing views shown in **Table 2.12** indicate visual quality is better than moderate for all three categories. The level of vividness is due to the relatively lush vegetation along the Stanislaus River. Intactness and unity is higher than moderate due to the low amount of development within the immediate surroundings.

Under the build condition, visual quality would be lower than the existing but would remain better than moderate for all categories. The lower visual quality is attributed to the removal of riparian vegetation on the east side of bridge. Visual quality would remain moderately high, however, because outside the right-of-way the riparian landscape unit is not blocked considerably and still remains visually homogenous.

Key Viewpoint B – McHenry Avenue/East River Road Intersection Looking West

Key Viewpoint B represents a resident's and a motorist's view from along East River Road in the project area. Key Viewpoint B was photographed facing west along East River Road just past the intersection of East River Road and McHenry Avenue. In this view, residential and urban development dominates the viewshed. Key Viewpoint B, and the views it represents, is of low visual quality due to lack of natural components (vegetation, water, landscape) and is high in man-made development.

<u>Proposed Project Elements</u>

The proposed project would add dedicated left and right turn pockets and install traffic signals on East River Road at the intersection, with no change in the number of through lanes.

Viewpoint B – McHenry Avenue/East River Road Intersection Looking West

Table 2.13
Visual Quality Comparison for Key Viewpoint B

Key Viewpoint		Vividness	Intactness	Unity	Visual Quality = (V+I+U)/3	VQ Difference
B	Existing	3	4	3	3.3	-0.1
	Build	2.8	4	2.8	3.2	

Ratings for the existing views shown in **Table 2.13** indicate visual quality is moderate to low in all three categories. The level of vividness is low due to the relative lack of vegetation along the roadside and the high level of man-made development including the SSJID facilitates on the north side of East River Road. Intactness and unity is moderate due to the amount of development within the right-of-way for this portion of the project.

Under the proposed project, the visual quality would stay relatively the same as the existing conditions. The vividness, intactness, and unity would be relatively unchanged by the modifications to the roadway. Very little vegetation would be removed and only man-made development would increase.

Key Viewpoint C – McHenry Avenue/East River Road Intersection Looking East

Similar to Key Viewpoints A and B, Key Viewpoint C represents a motorist's view from the intersection of McHenry Avenue and East River Road. The Key Viewpoint C photograph was taken at the intersection of McHenry Avenue and East River Road looking east toward the eastern terminus of the project. In this view, visible landscape units are built/urban, foothill riparian, and agricultural (walnut orchard).

Proposed Project Elements

The proposed project would add dedicated left and right turn pockets and install traffic signals on East River Road at the intersection, with no change in the number of through lanes.

Viewpoint C – McHenry Avenue/East River Road Intersection Looking East

Table 2.14
Visual Quality Comparison for Key Viewpoint C

Key Viewpoint		Vividness	Intactness	Unity	Visual Quality = (V+I+U)/3	VQ Difference
C	Existing	5	5	6	5.3	-0.23
	Build	4.7	4.5	6	5.07	

Ratings for existing views shown in **Table 2.14** indicate visual quality is moderately high at a rating of 5.3 on a scale of 1 to 7. The moderately high rating is attributed to the vegetation along the roadsides and the unity of the landscape. Although the landscape is largely natural, man-made structures (road and utility wires) prevented higher ratings for intactness and unity.

Under the build condition, visual quality would be lower than the existing but would still remain moderate for all categories. The lower visual quality would be attributed to the removal of vegetation on the both sides of East River Road and the expansion of man-made development. Visual quality would still remain moderate, however, because outside the right-of-way both the riparian and orchard vegetation units would not be blocked considerably and would still remain visually homogenous.

Key Viewpoint D – McHenry Avenue/East River Road Intersection Looking North

Key Viewpoint D represents a motorist's view from along McHenry Avenue within the project area. Key Viewpoint D was photographed facing north along McHenry Avenue just past the intersection of East River Road and McHenry Avenue. In this view, agricultural and urban development dominates the viewshed. This viewpoint characteristic remains consistent from the north side of the SSJID canal to the northern terminus of the project. To the left of the photo, the SSJID canal and overhead utility lines can be seen. Key Viewpoint D, and the views it represents, is of low visual quality due to lack of natural components (vegetation, water, landscape) and is high in man-made development.

<u>Proposed Project Elements</u>

The proposed project would add dedicated left and right turn pockets and install traffic signals on East River Road at the intersection, with no change in the number of through lanes.

In addition, north of the intersection, McHenry Avenue would be widened along the eastern right-of-way to provide three 12-foot-wide lanes (two travel lanes and a center two-way turn lane) with 5-foot-wide shoulders to accommodate bicycles.

Viewpoint D – McHenry Avenue/East River Road Intersection Looking North

Table 2.15
Visual Quality Comparison for Key Viewpoint D

Key Viewpoint		Vividness	Intactness	Unity	Visual Quality = (V+I+U)/3	VQ Difference
D	Existing	3.25	5	6	4.75	-0.25
	Build	3	4.5	6	4.5	

Vividness for Key Viewpoint D is low to moderate based on the lack of water and natural vegetation within the viewpoint. Ratings for the existing views shown in **Table 2.15** indicate visual quality is better than moderate for intactness and unity based on the uniform nature of the orchard on the east side of McHenry Avenue.

With the proposed project, visual quality would be lower than the existing but would still remain moderate for intactness and unity. The lower visual quality would be attributed to the removal of vegetation on the east side of McHenry Avenue and the expansion of man-made development. Visual quality would still remain moderate, however, because outside the right-of-way the orchard vegetation unit would not be blocked considerably and would still remain visually homogenous.

Key Viewpoint E – Stanislaus River View of Stanislaus River Bridge

Key Viewpoint E represents a recreationist's view from along the Stanislaus River. Key Viewpoint E was photographed facing west and was taken on the north bank of the Stanislaus River, roughly 1,200 feet southeast of the of McHenry Avenue/East River Road intersection. In this view, the Stanislaus River, foothill riparian vegetation, and the bridge (in the distance) dominate the viewshed. Lush riparian vegetation in the foreground, middle ground, and background is particularly striking due to the density of plants and vivid greenery, giving it a contrasting character with the surrounding water of the river. Key Viewpoint E, and the views it represents, is of high visual quality.

<u>Proposed Project Elements</u>

The proposed project would replace the existing bridge across the Stanislaus River and widen it to accommodate the ultimate five-lane configuration for McHenry Avenue (four 12-foot-wide travel lanes, 12-foot-wide median/left turn lane, and 5-foot-wide shoulders). The north end of the Stanislaus River Bridge would be striped to conform to the widened McHenry Avenue, and the south end of the bridge would be striped to match the existing two-lane width of McHenry Avenue. Minor loss of riparian vegetation would occur as a result of the bridge widening.

Viewpoint E – River View of the Stanislaus River

Table 2.16
Visual Quality Comparison for Key Viewpoint E

Key Viewpoint		Vividness	Intactness	Unity	Visual Quality = (V+I+U)/3	VQ Difference
E	Existing	6	6	6	6	-0.5
	Build	5.5	5.5	5.5	5.5	

Ratings for the existing views shown in **Table 2.16** indicate visual quality is high at a rating of 6.0 on a scale of 1 to 7. The high vividness rating is attributed to the expanse of natural landscape with minimal man-made features, clear views of the Stanislaus River, and lush vegetation. Intactness and unity are rated high based on the minimal number of man-made features in the view and the natural compatibility of the riparian vegetation and the river.

With the proposed project, the Stanislaus River Bridge over the Stanislaus River would be widened to a five-lane facility (striped to three lanes). The new bridge structure would be similar in structure (pilings and architecture) as the existing bridge. From Key Viewpoint E, little would change in terms of vividness, intactness, or unity since only the bridge's width would change. Some riparian vegetation would be removed, decreasing the unity and intactness, although the vegetation is expected to grow back over time.

Environmental Consequences

Temporary Impacts

During the construction phase of the project, on-site storage of construction materials and debris, movement of soil, and other construction activities would be visible to viewers in the area. Construction personnel and equipment working on the bridges, intersection, and roadway would also be visible throughout project construction. These activities would be visible from all viewpoints, though to varying degrees depending on the phase of construction. However, these effects would be temporary and limited to the length of construction, which is anticipated to last a total of three years.

Some nighttime work may occur for work within the right-of-way, and construction lighting would be required for these activities. This lighting could result in "spillover" lighting, which is defined as artificial lighting that spills over onto adjacent properties. Spillover lighting from the intersection could interrupt sleeping patterns or cause other nuisances to neighboring residents. In addition, lighting could be disturbing to drivers passing by these construction activities.

Bridge and Roadway Improvement Impacts

The project would cause a low level of change in the visual environment of the project study area and the surrounding area, as seen from the viewpoints analyzed in the Visual Impact Assessment. For the analyzed viewpoints, the visual environment would be composed of different visual elements but would have a similar visual character as the existing visual environment. The low level of change caused by project features within the analyzed viewpoints would be viewed by motorists and recreationalists. Based on the existing and build condition, each of the viewpoints analyzed would experience a low visual and/or aesthetic change as a result of the project. Only minor changes to the existing visual resources are anticipated. Low viewer responses to the anticipated visual environment changes are expected at each location. In combination with the exposure and sensitivity for each of these viewer groups, the project would have a moderate impact on analyzed viewpoints.

The proposed project would not introduce any new visual elements into the project study area, as the project is composed of two bridge replacements and intersection improvements. The existing bridges would be replaced with bridges similar in style and architecture to the existing bridges.

In addition, the proposed project would not impact any designated landmarks, historic resources, visually significant trees, or rock outcroppings.

Lighting and Glare Effects

The main source of daytime glare in the project study area is sunlight reflecting from structures with reflective surfaces such as windows. Building materials (i.e., reflective glass and polished surfaces) are the most substantial sources of glare. The amount of glare depends on the intensity and direction of sunlight, which is more acute at sunrise and sunset because the angle of the sun is lower during these times. The project does not propose to construct structures with reflective surfaces that would result in daytime glare.

A source of glare during the nighttime hours is artificial light. Sources of nighttime lighting and illumination within the project study area include, but are not limited to, limited residential properties, nonresidential uses associated with farming operations, car headlights, and street lighting. The planned new traffic signals at the McHenry Avenue/East River Road intersection would introduce a new source of nighttime lighting and illumination in the project study area. The only sensitive receptors in the project study area are the residents but the proposed traffic signals would not disrupt nighttime views since the residents and their homes are not located within view of the proposed signal locations.

Avoidance, Minimization, and/or Mitigation Measures

Temporary Construction Effects

- Construction materials and debris would be stored away from highly visible areas, which would include, but not be limited to, temporary construction easements located outside of the Stanislaus River floodplain.

- Nighttime construction lighting would be faced downward and away from adjacent occupied properties. In addition, lighting would be directed away from traffic lanes and areas where lighting could disturb passing drivers. Adjacent residents would be provided with a County contact number in case nighttime lighting becomes disruptive.

Bridge and Roadway Improvement Impacts

- Bridge design would optimize views to the Stanislaus River by bridge users by incorporating a semi-transparent vehicle barrier for both new bridges. Solid Caltrans concrete barriers (Types 25–80) would be avoided in the project design, where possible. As appropriate for required roadway design, Caltrans metal rail barriers should be considered, with the objective of maintaining existing views to the Stanislaus River by motorists and cyclists (Caltrans Metal Rail Barriers: ST-30, ST-40, ST-10).

Lighting and Glare Impacts

- Lighting poles and signs would be designed to minimize reflection to the extent feasible. All reflective surfaces would be painted with an anti-reflective coating or otherwise treated to reduce light reflection.

- Lighting types and shading methods would be incorporated into the project to ensure that lighting impacts are reduced to the greatest extent feasible. Methods may include focusing lighting away from residential properties, using hooded lighting, and reducing the height of the lighting as much as possible.

2.1.9 Cultural Resources

Regulatory Setting

"Cultural resources" as used in this document refers to all "built environment" resources (structures, bridges, railroads, water conveyance systems, etc.), culturally important resources, and archaeological resources (both prehistoric and historic), regardless of significance. Laws and regulations dealing with cultural resources include those discussed below.

The National Historic Preservation Act of 1966 (NHPA), as amended, sets forth national policy and procedures regarding historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places (NRHP). Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 CFR 800). On January 1, 2004, a Section 106 Programmatic Agreement between the Advisory Council, the FHWA, the State Historic Preservation Officer (SHPO), and Caltrans went into effect for department projects, both state and local, with FHWA involvement. The Programmatic Agreement implements the Advisory Council's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to Caltrans. The FHWA's responsibilities under the Programmatic Agreement have been assigned to Caltrans as part of the Surface Transportation Project Delivery Pilot Program (23 CFR 327) (July 1, 2007).

Historical resources are considered under CEQA, as well as California Public Resources Code (PRC) Section 5024.1, which established the California Register of Historical Resources. PRC Section 5024 requires state agencies to identify and protect state-owned resources that meet NRHP listing criteria. It further specifically requires Caltrans to inventory state-owned structures in its rights-of-way.

Affected Environment

An Area of Potential Effects (APE) map was approved on April 29, 2010. A Historic Property Survey Report (HPSR), including an accompanying Archaeological Survey Report (ASR) and a Historic Resources Evaluation Report (HRER), was prepared in October 2010. The ASR and HRER were approved in December 2010 and the HPSR was approved on January 12, 2011.

The APE encompasses all areas subject to construction-related impacts, including staging areas, grading limits, and proposed right-of-way acquisitions. The APE extends roughly 1.5 miles along McHenry Avenue, from approximately 300 feet south of Jones Road to 1,700 feet south of East River Road. The APE also extends approximately 0.41 miles along East River Road, approximately 800 feet west and 1,500 feet east of McHenry Avenue, and encompasses all County right of way within the stated limits. The anticipated vertical extent of ground disturbance is 2 to 3 feet around the roadwork. Piles could be drilled as deep as between 75 and 110 feet deep around the Stanislaus River bridge structure.

The HPSR and ASR were prepared based on a pedestrian survey of the APE (performed by qualified archaeologists on November 5, 2009); a records search; and outreach to the Native American Heritage Commission, local Native American representatives and/or tribal contacts, and the San Joaquin County and Escalon historical societies.

The records search was conducted by the Central California Information Center (CCIC) of the California Historical Resources Information System in October 2009. The records search was conducted in order to identify previously recorded sites and previously conducted studies within the APE, extending out to a 1-mile radius.

The records search results indicated that roughly half of the APE had been evaluated in previous cultural resources surveys. Several other previous cultural resource investigations occurred outside the APE but within a 1-mile radius of the project area. Several resources were listed by the CCIC as being near the project area, the closest of which is the Walton House (P-50-1959), which is located approximately half a mile east of the APE and would not be affected by the project.

Previously evaluated resources located within the APE include at the western end, two segments of the Union Pacific/Tidewater Southern Railroad (CA-SJO-256H / CA-STA-425H), Bridge 29C-0166 (McHenry Avenue over the SSJID Canal), and at the southern end, Bridge 38C-0032 (McHenry Avenue over the Stanislaus River). The two bridges were formally determined ineligible for the NRHP with SHPO concurrence. These resources are not historical resources for the purposes of CEQA. The railroad segment was previously determined not to appear to meet the eligibility criteria for NRHP listing. Segments of the SSJID Canal (P-39-4233) located outside of the APE have been previously evaluated and determined ineligible for listing for the NRHP. Caltrans determined that the segment of the SSJID Canal within the APE is not eligible for listing in the NRHP.

No archaeological resources or sacred sites were identified within the APE during the pedestrian survey or after contacting the Native American Heritage Commission, local Native American representatives, and tribal contacts. Given the nature of soil deposition and the geomorphologic characteristics of the APE, combined with historic-era disturbances, it is unlikely that significant subsurface prehistoric archaeological resources are present within the APE that could be adversely impacted by the proposed project. Historic-era mapping and archival research demonstrates that the APE was heavily developed during the 19th and 20th centuries. In addition, archival and field research indicates that the APE has been heavily disturbed by extensive historic-era grading, modern construction, and other considerable landscape-altering activities.

Caltrans has determined that the evaluated resource within the project's APE is not eligible for inclusion in the NRHP. Caltrans made a Finding of No Historic Properties Affected and requested the SHPO's concurrence in this determination on February 4, 2011, according to Section 106 PA Stipulation IX.A and 36 CFR 800.4(d)(1). Caltrans did not receive a response from the SHPO; therefore, an assumption of concurrence was made on January 10, 2013 in accordance with provisions in the Section 106 PA.

Environmental Consequences

As currently designed, the proposed project is not expected to affect cultural resources. It is possible, although unlikely, that buried cultural materials would be encountered during ground-disturbing project construction activities.

Avoidance, Minimization, and/or Mitigation Measures

With implementation of the following recommended measures, the project would not be expected to result in impacts to cultural resources.

- If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area would be diverted until a qualified archaeologist can assess the nature and significance of the find.

- If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities would cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner would notify the Native American Heritage Commission (NAHC) who would then notify the Most Likely Descendent. The Environmental MPS/Local Assistance Branch, California Department of Transportation, District 10 would also be contacted so that Caltrans may work with the Most Likely Descendent on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

2.2 Physical Environment

2.2.1 Hydrology and Floodplain

Regulatory Setting

Executive Order 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The FHWA requirements for compliance are outlined in 23 CFR 650 Subpart A.

In order to comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments

- Risks of the action

- Impacts on natural and beneficial floodplain values
- Support of incompatible floodplain development
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values impacted by the project.

The base floodplain is defined as the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year. An encroachment is defined as an action within the limits of the base floodplain.

Affected Environment

Two separate design hydraulic studies - one for each affected bridge – were prepared for this project in July 2011. A Water Quality Report was also prepared for the project in July 2011.

The Stanislaus River watershed drains an approximately 1,050-square-mile basin at the Stanislaus River Bridge site. The headwaters of the Stanislaus River are at an approximate elevation of 10,000 feet in the Sierra Nevada mountain range. The Stanislaus River Basin is located on the east side of the San Joaquin Valley north of the Tuolumne River and south of the Calaveras River. The Stanislaus River flows in a southwesterly direction and flows to the San Joaquin River. **Figure 2-4** illustrates lake and dam locations on the Stanislaus River. **Figure 2-5** illustrates the San Joaquin Eastside Valley Watershed in which the project area is located.

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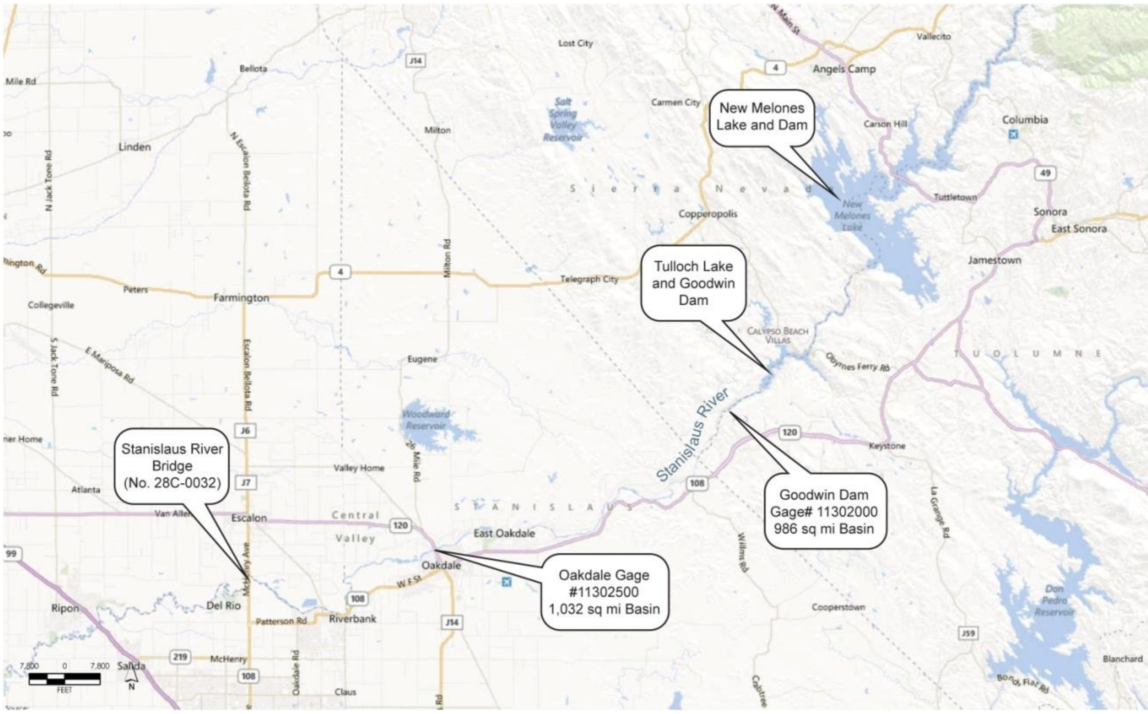
Figure 2-4 Lake and Dam Locations on the Stanislaus River



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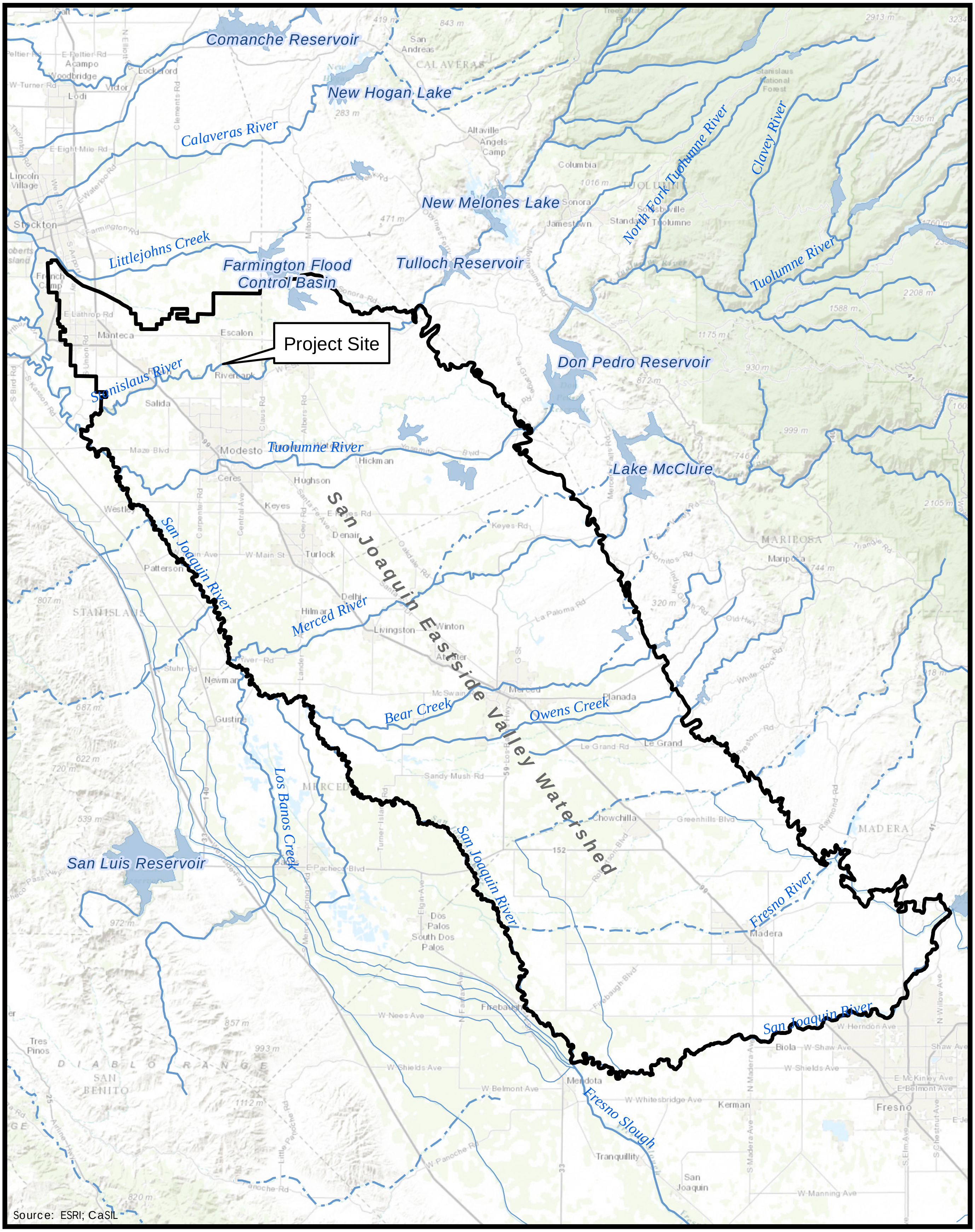

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MILES

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McHenry Avenue Widening
RPSTPLE-5929(196)
Replacement of Stanislaus River Bridge (Bridge No. 38C-0032) on McHenry Avenue
BRLS-5929(166)
Replacement of SSJID Bridge (Bridge No. 29C-0166) on McHenry Avenue
BRLS-5929(167)

Figure 2-5
San Joaquin Eastside Valley Watershed

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Historically, the Stanislaus River was a free-flowing, meandering, alluvial river with extensive floodplains. Most of the river is now channelized, with levees limiting the path of the river. The hydrology of the Stanislaus River basin has changed considerably following the construction of the New Melones Dam in 1979. This dam drains 904 square miles or approximately 86% of the watershed area at the bridge. The flood of record on the Stanislaus River prior to the dam construction was 62,500 cubic feet per second in December of 1955. The 100-year flood discharge is now estimated to be 8,000 cubic feet per second. The USACE is required to maintain an 8,000-cubic feet per second floodway; actual operations have kept releases much lower than 8,000 cubic feet per second in most years

Historically, floodwater typically spilled over the banks of the Stanislaus River approximately every other year. However, since the construction of Goodwin Dam, Tulloch Dam, and New Melones Dam, the Stanislaus River has been contained within the riverside levees and maintains near constant water levels. Goodwin Dam, built in 1912 by the Oakdale Irrigation District (OID) and SSJID, diverts water into the OID and SSJID canals and is the upstream barrier for steelhead and salmon migration on the Stanislaus River. Tulloch Dam is a hydroelectric dam cooperatively owned by the Oakdale and South San Joaquin Irrigation Districts, and was completed in 1958. New Melones Dam is designed to control floods up to the 100-year flood, or the flood with a 1% chance of occurring in any year. **Figure 2-6** shows the 100-year and 500-year flood boundaries according to the Federal Emergency Management Agency (FEMA).

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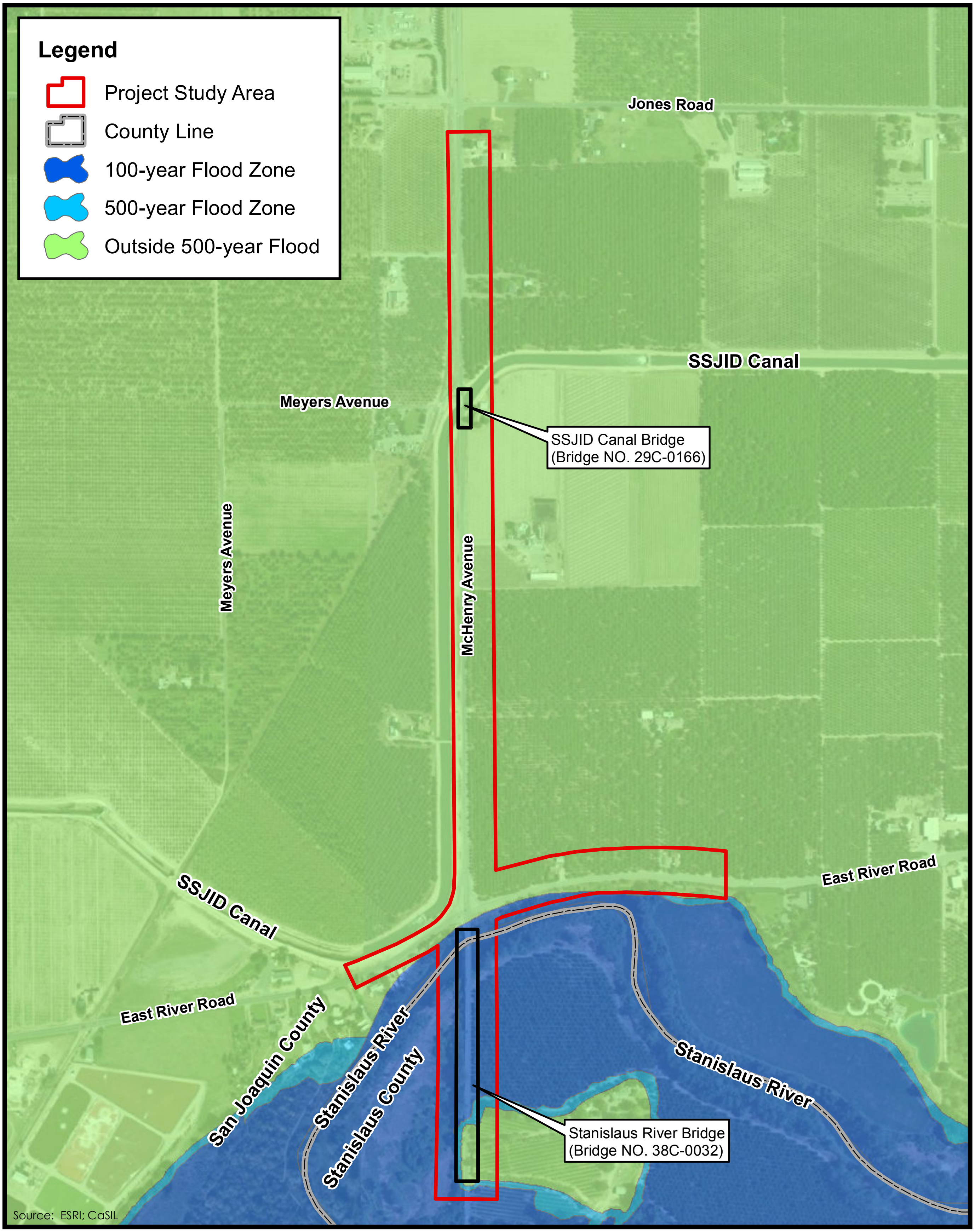

McHenry Avenue Widening
RPSTPLE-5929(196)
Replacement of Stanislaus River Bridge
(Bridge No. 38C-0032) on McHenry Avenue
BRLS-5929(166)
Replacement of SSJID Bridge
(Bridge No. 29C-0166) on McHenry Avenue
BRLS-5929(167)

Figure 2-6

100-year and 500-year Flood Boundaries

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Environmental Consequences

Temporary Impacts

During project construction, the Stanislaus River would be temporarily diverted around the construction zone in order to accommodate construction activities (removal of the existing Stanislaus River Bridge and construction of the new bridge) and to protect water quality. Additionally, temporary embankment/work pad(s) would be constructed in the river channel to support drilling equipment for the construction of bridge support piles. The diverted river flows would be diverted into a 20-foot-wide channel opening provided between the end of the temporary embankment and the north bank of the river. Following construction of the new bridge, the temporary diversion and work pads would be removed and the river bed restored to pre-construction contours.

Permanent Impacts

The proposed new Stanislaus River Bridge would be constructed on the same alignment as the existing bridge, with widening to occur on the upstream side. The proposed bridge soffit elevation would provide 22.9 feet of clearance above the 100-year floodwater surface elevation. The proposed bridge would replace the existing 1,136-foot-long, 31 span bridge with a 1,148-foot-long, 25-span bridge, with most of the supporting bridge piles located in the floodplain area south of the Stanislaus River. To help prevent liquefaction of the bridge foundation, permanent stabilization in the floodplain would consist of 3-foot-diameter "stone columns" placed in a 7-foot-square grid in the overbank area. Stone columns use a depth vibrator to penetrate the soils to the treatment depth. Crushed stone is then introduced, displacing the surrounding soils and creating a "stone column" typically 30 to 36 inches in diameter. Through vibration and displacement, the soils are densified and reinforced to mitigate the liquefaction hazard, increase the bearing capacity, and reduce the settlement. All stone columns would be placed and anchored below the existing grade of the floodplain.

Modeling was used to estimate the water surface elevation for the existing bridge and proposed replacement bridge. The modeling acquired from the FEMA shows that the water surface elevation would be unchanged by the proposed bridge. As such, the proposed project would not affect or increase flood hazards.

Avoidance, Minimization, and/or Mitigation Measures

Temporary Construction Effects

- Temporary river diversions would be limited to dry-season months (June 15 to October 15) to avoid the potential for flows in the Stanislaus River to overtop diversion equipment.

- Coffer dams and other diversion equipment would be designed with adequate capacity to accommodate anticipated river flows.

- The Central Valley Flood Protection Board (CVFPB) has jurisdiction over the Stanislaus River. The "non-permissible work period" is November 1 through April 15th.

Long-Term Operational Effects

- Because the proposed project would not affect flood elevations or hazards along the Stanislaus River or the surrounding the project area, no avoidance, minimization, or mitigation measures are required.

2.2.2 Water Quality and Stormwater Runoff

Regulatory Setting

Federal Requirements: Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. Known today as the Clean Water Act (CWA), Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. Important CWA sections are:

- Sections 303 and 304 require states to promulgate water quality standards, criteria, and guidelines.

- Section 401 requires an applicant for a federal license or permits to conduct any activity which may result in a discharge to waters of the U.S. to obtain certification from the State that the discharge would comply with other provisions of the act. (Most frequently required in tandem with a Section 404 permit request. See below.)

- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. The RWQCB administers this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).

- Section 404 establishes a permit program for the discharge of dredge or fills material into waters of the United States. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's waters.

The USACE issues two types of 404 permits: Standard and General. There are two types of General Permits: Regional and Nationwide. Regional Permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide Permits are issued to authorize a variety of minor project activities with no more than minimal effects.

There are two types of Standard Permits: Individual permits and Letters of Permission. Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE's Standard Permits. For Standard Permits, the USACE decision to approve is based on compliance with the USEPA's Section 404 (b)(1) Guidelines (USEPA CFR 40 Part 230) and whether permit approval is in the public interest. The Section 404(b)(1) Guidelines were developed by the USEPA in conjunction with the USACE and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The guidelines state that the USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other significant adverse environmental consequences. Per the guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The guidelines also restrict permitting activities that violate water quality or toxic effluent standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause significant degradation to waters of the U.S. In addition, every permit from the USACE, even if not subject to the Section 404(b)(1) guidelines, must meet general requirements (see 33 CFR 320.4). A discussion of the LEDPA determination, if any, for this document is included in the Wetlands and Other Waters section.

State Requirements: Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This act requires a Report of Waste Discharge for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface waters and/or groundwater of the State. It predates the CWA and regulates discharges to waters of the State. Waters of the State include more than just waters of the U.S., such as groundwater and surface waters not considered waters of the U.S. Additionally, the act prohibits discharges of waste as defined, and this definition is broader than the CWA definition of a pollutant. Discharges under the Porter-Cologne Act are permitted by waste discharge requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA and for regulating discharges to ensure compliance with the water quality standards. Details regarding water quality standards in a project area are contained in the applicable RWQCB Basin Plan. States designate beneficial uses for all water body segments and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, each state identifies waters failing to meet standards for specific pollutants, which are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source controls, the CWA requires the establishment of total maximum daily loads, which specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, water pollution control, and water quality functions throughout the state. RWQCBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

National Pollution Discharge Elimination System (NPDES) Program

<u>Municipal Separate Storm Sewer Systems</u>

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water dischargers, including municipal MS4s. The USEPA defines an MS4 as any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water that are designed or used for collecting or conveying storm water. The

Central Valley Water Resources Control Board has identified the San Joaquin County as an owner/operator of an MS4. The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.

Construction General Permit

The Construction General Permit (Order No. 2009-009-DWQ), adopted on September 2, 2009, became effective on February 14, 2011. The permit regulates storm water discharges from construction sites which result in a disturbed soil area of one acre or greater and/or are smaller sites that are part of a larger common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least one acre must comply with the provisions of the Construction General Permit. Construction activity that results in soil disturbances of less than one acre is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop storm water pollution prevention plans; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The 2009 Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases and are based on potential erosion and transport to receiving waters. Requirements apply according to the risk level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, as well as before construction and after construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective storm water pollution prevention plan (SWPPP). In accordance with Caltrans' Standard Specifications, a Water Pollution Control Plan (WPCP) is necessary for projects with a disturbed soil area of less than one acre.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water body must obtain a 401 Certification, which certifies that the project would be in compliance with state water quality standards. The most common federal permits triggering Section 401 certification are CWA Section 404 permits issued by the USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before the USACE issues a 404 permit.

In some cases, the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as WDRs under the State Water Code that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

Because San Joaquin County is the primary owner/operator of the affected transportation facilities, it is responsible for obtaining all necessary permits, fully complying with the conditions of the permits, achieving all performance standards, and preparing all required reports.

Affected Environment

A Water Quality Assessment Report was prepared for the project in July 2011 and approved on August 2, 2011.

The Stanislaus River flows through the project area from east to west. It flows 120 miles from its headwaters at elevations over 11,500 feet in the western Sierra Nevada to its confluence with the San Joaquin River in the Central Valley near the City of Ripon. The Stanislaus River drainage basin lies north of the Tuolumne River watershed and south of the Calaveras and Mokelumne River watersheds. The Stanislaus River drains approximately 1,100 square miles of mountainous and valley terrain, with 40 percent of the basin above the snowline.

Rainfall within the project area drains toward the Stanislaus River channel following the natural topography. The Stanislaus River is on average 130 feet wide near the project area. The majority of the runoff from the existing road sheet flows to the adjacent properties. Runoff from the immediate vicinity of the McHenry Avenue/East River Road intersection flows into two corrugated metal culverts that drain the storm runoff from the road into the river. West of McHenry Avenue and south of East River Road is a large cement-lined overflow channel for the SSJID canal, approximately 5 feet wide, that flows into the river.

SSJID diverts water from the Goodwin Dam on the Stanislaus River into the SSJID canal. The SSJID canal crosses McHenry Avenue near Meyers Road, then parallels the west side of McHenry Avenue until it turns to the west at East River Road.

Local Contaminants

Land uses within and surrounding the project area affect the existing water quality by contributing contaminants to existing surface waters and groundwater. The project site is currently surrounded by agricultural, residential, and commercial land uses. Pollutants in storm water runoff from these land uses include sediments, hydrocarbons, metals, pesticides, herbicides, fertilizers, bacteria, and trash.

Surface Water Quality

Impaired surface waters within San Joaquin and Stanislaus Counties are those listed by the RWQCB as not attaining water quality standards due to one or more pollutants. Regional water quality control boards are required to prepare a list of water bodies with pollutant levels in excess of the standards established to protect the beneficial uses of the water. The latest update of this list was published by the RWQCB in 2010; the Stanislaus River is among the impaired waterways listed. Of the rivers listed, most are contaminated due to urban and agriculture runoff and resource extraction. Total maximum daily loads (TMDLs) have not been established for the Stanislaus River or the SSJID canal. A Total Maximum Daily Load, or TMDL, is a calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards.

Groundwater Quality

Groundwater in the eastern San Joaquin sub-basin (which includes both Stanislaus County and San Joaquin County) is characterized by calcium-magnesium bicarbonate or calcium-sodium bicarbonate water types. Within this sub-basin, indications of contamination include high concentrations of chlorides, salinity intrusion (salts entering the groundwater), and some nitrate and arsenic contamination. For instance, large areas of water containing chlorides occur along the San Joaquin River, resulting from salinity intrusion from the west. Declining water levels and increasing salinity intrusion are major concerns in this sub-basin, as discussed below.

Department of Water Resources Bulletin 118 indicates a history of nitrate contamination in San Joaquin Hydrologic Region, which includes San Joaquin and Stanislaus Counties. Nitrate is thought to primarily be a shallow aquifer contaminant. Groundwater quality issues in the San Joaquin Hydrologic Region might include arsenic contamination at depth related to the volcanic origin of sediments.

Environmental Consequences

Surface Water Quality

Temporary Impacts

Construction of the two bridge replacement structures would require work to occur within the SSJID canal and the Stanislaus River. If not properly contained, these activities could result in the accidental release of soil, petroleum products, or other materials debris into these waterways, which could impact water quality.

Construction of the project would include vegetation removal, grading, and excavation activities within the project area, which could result in increased sedimentation and erosion. If not properly controlled, these pollutants could reach waterways such as the SSJID canal or the Stanislaus River, which could result in impacts to water quality. Because water in these waterways is used for downstream water supply, impacts to water quality would be of particular concern.

A temporary diversion of water within the Stanislaus River at the construction site would be required to remove the existing bridge and to construct the new bridge. River flows would be diverted to a channel opening provided between the end of the temporary embankment and the north bank of the river. Once the diversionary measures are in place, a temporary embankment work pad would be constructed within the Stanislaus River channel.

Permanent Impacts

The project's stormwater conveyance network would be designed to maintain existing drainage patterns to the maximum extent possible. Drainage inlet locations would be based largely on the geometrics of the proposed roadway and would be placed according to the requirements of the Caltrans Highway Design Manual to ensure adequate drainage of the project area. The project would build permanent retention ditches/basins with a capacity of approximately 51,000 cubic feet along McHenry Avenue and East River Road that would capture surface runoff (as described earlier). These retention basins would either percolate or evaporate all surface runoff except for the runoff in the immediate vicinity of the intersection. Because the project would convey storm water in generally existing drainage patterns and would retain runoff that would result from the project, the project's impact to surface hydrology would be minimal.

Groundwater Quality

Temporary Impacts

Dewatering within the Stanislaus River might be required for construction of bridge support piles; however, dewatering would not be expected to affect groundwater supplies or groundwater recharge. All material used during construction of the bridge support piles would be inert material or material similar to project area soils in chemical and physical makeup so that it would have no substantial effect on groundwater quality. No other construction related activities are expected to affect groundwater quality.

Permanent Impacts

The project would have no long-term need for groundwater supply. The widening of the roadway and bridge facilities would result in increased impervious surfaces (surfaces that water cannot pass through) on-site, which would reduce water absorption within the intersection and roadway footprint. However, site runoff would be retained in on-site infiltration basins, allowing all drainage to percolate into the soil and recharge the underlying groundwater sub-basin. Therefore, long-term impacts to groundwater supply and recharge would be minimal.

Roadway storm water runoff contains pollutants associated with vehicle use and roadway landscaping, as well as natural sources. These pollutants include suspended solids, nutrients, pesticides, metals, pathogens, litter, dissolved solids, and petroleum hydrocarbons. Such pollutants do not generally infiltrate past the first few inches or feet of finely grained soil, as they are filtered by soil particles as water infiltrates into the ground. According to the Geotechnical Report (2011) prepared for the project, the depth to groundwater in the project area is between 8.5 and 17 feet below the ground surface. Therefore, any remaining pollutants in project runoff would not infiltrate into groundwater.

Beneficial Water Uses

Designated beneficial uses for surface waters in and adjacent to the project area include municipal domestic uses, agricultural uses, industrial uses, recreation, freshwater habitat, fish migration and spawning, and wildlife habitat. Water in the SSJID canal and the Stanislaus River ultimately flows to the San Joaquin River; therefore, impacts to water quality standards could affect the beneficial uses of both rivers. There are no beneficial uses assigned to the SSJID canal.

Temporary Impacts

During construction, temporary water quality impacts could result from erosion, sedimentation, polluted stormwater runoff, and other construction debris entering into on-site and adjacent drainages and ultimately area waterways.

With implementation of best management practices required for NPDES permits and other applicable water quality regulations, no violation of applicable water quality standards or waste discharge requirements and no impacts to beneficial uses of area waterways would occur as a result of the project.

Permanent Impacts

Construction of the roadway improvements would result in increased storm water runoff from the site. Additional pollutants from storm water runoff could reach the SSJID canal and Stanislaus River and could affect beneficial uses of these waterways.

Retention basins, proposed to be constructed for the project, would retain and filter pollutants. No downstream discharges would occur; therefore, polluted runoff would not be expected to reach any surface waters. Additionally, pollutants do not generally infiltrate past the first few inches or feet of finely grained soil, as they are filtered by soil particles as water infiltrates into the ground. Therefore, polluted runoff would also not be expected to impact beneficial uses of the Stanislaus or San Joaquin Rivers.

Avoidance, Minimization, and/or Mitigation Measures

Surface Water Quality

The local agencies would be responsible for coordinating with the Regional Water Quality Control Board and obtaining permits and authorization as identified in Section 2.2.2.

Temporary Construction Impacts

- Construction within the Stanislaus River would be limited to the period between June 15 and October 15 to minimize impacts to Central Valley steelhead.
- In anticipation of typical agency permit conditions, material and equipment storage would not be permitted within the Stanislaus River floodway and channel after October 31 of each year. Equipment may enter into the floodway but must be removed daily and stored outside of the area susceptible to inundation.

- The planned temporary embankment/work pads within the Stanislaus River would be constructed of clean, local cobble and gravel substrate material approved both by the U.S. Army Corps of Engineers and by the National Marine Fisheries Service.
- Diversion methods to be used within the Stanislaus River would be designed to minimize degradation of water quality.
- Work within the SSJID canal would be restricted to the period between October 15 to February 15, when SSJID is not delivering water to district customers. Dewatering of the canal would not be necessary, since placement of the new culvert would occur when the canal is dry.
- Best Management Practices (BMPs) would be implemented for the project in adherence to all applicable NPDES requirements and other water quality regulations to minimize impacts to water quality. Specific best management practices to be used during construction would be identified as project design advances and finalized within the approved project stormwater pollution prevention program; however, temporary concrete washouts, stabilized construction entrance/exits, silt fencing, sand bag barriers, gravel bag berms, and fiber rolls have been identified as potential construction site BMPs to control increased erosion and sedimentation and to prevent construction site runoff from entering adjacent waterways.
- As part of the NPDES requirements, the contractor would be required to identify and implement BMPs that would reduce debris or other pollutants from entering the SSJID canal or the Stanislaus River.
- With implementation and adherence to NPDES requirements and other applicable water quality regulations (state and federal permits), short-term impacts to water quality standards and waste discharge requirements would be managed through BMPs.

Long-Term Operational Impacts

Because the project would convey storm water in generally existing drainage patterns and would retain runoff that would result from the project, the project’s permanent impact to surface hydrology would be minimal and no avoidance, minimization, or mitigation measures are required.

Groundwater Quality

Temporary Construction Impacts

Because the project would have no substantial effect on groundwater quality, no avoidance, minimization, or mitigation measures are required.

Long-Term Operational Impacts

Because the project's effects to long-term groundwater supply and recharge would be minimal, no avoidance, minimization, or mitigation measures are required.

Beneficial Water Uses

Temporary Construction Impacts

Construction site BMPs would be implemented for the project in adherence to all applicable NPDES requirements and other water quality regulations to minimize impacts to water quality and beneficial water uses. Specific BMPs to be used during construction would be identified as project design progresses and included in the final plans. However, temporary concrete washouts, stabilized construction entrance/exits, silt fencing, sand bag barriers, gravel bag berms, fiber rolls, and good housekeeping practices for materials storage, asphalt laying, etc., have been identified as potential construction site BMPs to control increased erosion and sedimentation and to prevent construction site runoff from entering adjacent waterways and affecting beneficial water uses.

Long-Term Operational Impacts

Treatment BMPs would be implemented as required by NPDES permits to remove pollutants from runoff water. Specific BMPs would be identified as project design advances and would be identified in final design plans; however, infiltration basins, bioswales, and other on-site measures have been identified as potential BMPs to remove pollutants from runoff water. Best management practices required for NPDES permits would be implemented, and other applicable water quality regulations to remove pollutants from runoff water would be followed, to avoid or minimize impacts to the beneficial uses of receiving waters.

2.2.3 Geology/Soils/Seismic

Regulatory Setting

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects "outstanding examples of major geological features." Topographic and geologic features are also protected under the California Environmental Quality Act (CEQA).

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. The Department's Office of Earthquake Engineering is responsible for assessing the seismic hazard for Department projects. Structures are designed using the Department's Seismic Design Criteria (SDC). The SDC provides the minimum seismic requirements for highway bridges designed in California. A bridge's category and classification will determine its seismic performance level and which methods are used for estimating the seismic demands and structural capabilities. For more information, please see the Department's Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria.

Local Regulations

San Joaquin County General Plan:

Policy 1: The risk to human safety and property from seismic and geologic hazards shall be considered in determining the location and intensity of development and the conditions under which it may occur.

Policy 2: Facilities necessary for emergency services should be capable of withstanding a maximum credible earthquake and remain operational to provide emergency response.

Stanislaus County General Plan:

Goal 2: Minimize the effects of hazardous conditions that might cause loss of life and property.

Policy 3: Development should not be allowed in areas that are particularly susceptible to seismic hazard.

Affected Environment

A Geotechnical Services Report was prepared for the proposed project in April 2011.

The project site lies within the central portion of the Great Valley geomorphic province of California. The Great Valley province is an asymmetrical trough, with the western side of the province dropping towards the valley and the eastern side uplifting to the Sierra Nevada mountain range. Within the project area, the erosion of the Sierra Nevada and Coast Ranges has filled in the valley with sediments deposited by the Sacramento and San Joaquin Rivers and their tributaries. The thickness of the valley sediments above bedrock varies from thin at the edges of the valley to thousands of meters deep in the western portion of the valley.

The local geology of the project area includes clay, silt, sand, and gravel of the Modesto Formation that was probably eroded from the Sierra Nevada and deposited along nearby streams and rivers. The Natural Resources Conservation Service's online soil survey identified soils within the project area as fine to very fine sandy loam. Geotechnical investigation in the project area included various test borings. The deepest test bore went to a depth of 150 feet without encountering bedrock.

The project area is not located within a state-designated Alquist-Priolo Earthquake Fault Zone, and no known active faults traverse the site. The project site is in a region where there are very few active faults. **Table 2.17** lists significant active or potentially active faults within an approximately 30-mile radius of the project site.

Table 2.17
Active or Potentially Active Faults Surrounding the Project Area

Name of Fault	Closest Distance to Site	Maximum Earthquake Magnitude
Great Valley Fault 7	22 miles	6.7
Bear Mountains Fault Zone (Negro Jack fault section)	22 miles	6.5
Bear Mountains Fault Zone (Green Springs Run fault)	22 miles	6.5
Bear Mountains Fault Zone (Bowie Flat fault section)	26 miles	6.5

Source: Kleinfelder 2009

Groundwater was measured during geotechnical investigations and was measured at depths ranging from about 8.5 feet to 17 feet below existing ground surface. Groundwater elevations and soil moisture conditions within the project area would vary depending on seasonal rainfall, irrigation practices, land use, and/or runoff conditions not apparent at the time of the field investigation.

Environmental Consequences

The Geotechnical Services Report found that the project site should be suitable for the proposed project from a geotechnical standpoint. The primary concerns from a geotechnical standpoint are the presence of relatively loose soils at the project site, the potential for the future settlement of the proposed pavement areas, and the presence of liquefiable soils in the upper approximately 35 feet of soils in portions of the project area, which could affect the stability of the bridge support piles. Additionally, liquefaction can result in excessive lateral forces against bridge support piles, which might cause damage and/or failure of these piles (which are concrete, relatively slender, and driven into the ground).

Although the project site is in a region where there are very few active faults, seismic design parameters were included in the Geotechnical Services Report. Implementation of these recommendations will ensure that no seismic related impacts occur. Impacts associated with groundwater and bedrock depth are not expected to occur.

Avoidance, Minimization, and/or Mitigation Measures

In order to minimize the chance of future settlement of the proposed new pavement on McHenry Avenue and East River Road and to ensure adequate pavement life and function, the project construction would implement engineering, construction, and maintenance practices as recommended in the Geotechnical Services Report:

- Properly prepare surface and subsurface soils,
- Properly design and implement surface and subsurface drainage to drain water away from the road base, and
- Perform routine maintenance operations to repair degraded pavement areas and cracks.

To address potential liquefaction risks to bridge support piles, the project would implement ground stabilization techniques during project construction to prevent lateral spreading from occurring during seismic events. Examples of ground stabilization techniques that will be employed include:

- Deep dynamic compaction (dropping a large mass on the ground surface to compact subsurface soils);
- Vibro replacement (using a depth vibrator and crushed stone to create a “stone column”); and
- Deep soil mixing walls (mechanically blending soils on site with a cement to create a soil cement product).

To address potential seismic risks, design recommendations listed in the Geotechnical Services Report will be implemented. In addition, avoidance, minimization, and mitigation measures listed in Section 2.2.2, Water Quality and Stormwater Runoff, will reduce potential erosion related impacts.

With implementation of the recommended actions and other practices recommended in the Geotechnical Services Report the proposed project would have little risk of substantial pavement settling, and risk to the bridge over the Stanislaus River and other project features from liquefaction; seismic impacts would be minimized to the greatest extent feasible. With the proposed measures, no impacts to worker safety during construction are anticipated since there are not any known active faults in the project area and the anticipated bridge and roadway construction techniques have a proven safety record. Likewise, no geologic or seismic impacts to the traveling public are anticipated. After project completion, the new structures would be up to current standards and seismically stable.

2.2.4 Hazardous Waste or Materials

Regulatory Setting

Hazardous materials and hazardous wastes are regulated by many state and federal laws. Statutes govern the generation, treatment, storage and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health and land use.

The primary federal laws regulating hazardous wastes/materials are the Resource Conservation and Recovery Act (RCRA) of 1976 and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980. The purpose of CERCLA, often referred to as Superfund, is to clean up contaminated sites so that public health and welfare are not compromised. RCRA provides for “cradle-to-grave” regulation of hazardous wastes. Other federal laws include:

- Community Environmental Response Facilitation Act of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act
- Atomic Energy Act

- Toxic Substances Control Act
- Federal Insecticide, Fungicide, and Rodenticide Act

In addition to the acts listed above, Executive Order (EO) 12088, Federal Compliance with Pollution Control Standards, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

California regulates hazardous materials, waste, and substances under the authority of the CA Health and Safety Code California Health and Safety Code and is also authorized by the federal government to implement RCRA in the state. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup and emergency planning of hazardous waste. The Porter-Cologne Water Quality Control Act also restricts disposal of wastes and requires clean-up of wastes that are below hazardous waste concentrations but could impact ground and surface water quality. California regulations that address waste management and prevention and clean up contamination include Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection.

Worker health and safety and public safety are key issues when dealing with hazardous materials that may affect human health and the environment. Proper disposal of hazardous material is vital if it is encountered, disturbed, or generated during project construction.

Affected Environment

Phase One ESA

A Phase One Environmental Site Assessment (Phase One ESA) for the proposed project was completed on January 24, 2011. On November 14, 2012, a GeoTracker query was pulled for the project site.[1] No new listings or any changes in circumstances were found. The objective of the Phase One ESA is to identify recognized environmental conditions (REC) associated with the project area. An REC is defined as "the presence or likely presence of any hazardous substances or petroleum products on a property under

[1] GeoTracker is the State Water Boards' data management system for managing sites that impact groundwater, especially those that require groundwater cleanup (Underground Storage Tanks, Department of Defense, Site Cleanup Program) as well as permitted facilities such as operating USTs and land disposal sites. Click the following link for the search results for the proposed project: http://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=20001+mchenry+avenue%2C+escalon%2C+ca

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." The Phase One ESA included a site survey (conducted on September 10, 2009), interviews with public sector officials knowledgeable about current and past site use, and review of regulatory agency databases and historical topographic maps and aerial photographs.

The Phase One Assessment's site reconnaissance and records review did not find documentation or physical evidence of soil or groundwater impairments associated with the current or past use of the properties in the project area that meets the criteria of a REC. A review of regulatory databases maintained by county, state, tribal and federal agencies found no documentation of hazardous materials violations or discharge in the project area and did not identify contaminated facilities within the appropriate American Society for Testing and Materials search distances that would reasonably be expected to impact the project.

The former service station at the southwest corner of McHenry Avenue and East River Road (PACOAST INC at 20001 McHenry Avenue South, Escalon, CA) is listed in the SWRCB's Leaking Underground Storage Tank (LUST) database as being a closed/completed case as of 1996 for a release of diesel fuel into soil. The case is reported as closed/completed and is therefore no longer a concern. A closed LUST case (diesel) is also listed for the Rich Fruit Pak Company at 19901 S McHenry Avenue; this case was closed in March 1996.

The Phase One ESA provided recommendations for the following features that were not considered to be RECs:

- Extensive orchard cultivation has occurred within the project boundaries. It is conceivable that persistent agrichemicals have been used historically for these orchards. Significant levels of residual organochlorine pesticides, arsenic, or lead could prompt soil management requirements if material is exported from the project. An agrichemical impact assessment should be conducted within areas of proposed ground disturbance within the project footprint prior to ground disturbance on agricultural fields.

- Given the age of the existing structures, it is conceivable that asbestos containing materials (ACM) or lead-based paint (LBP) may have been used in construction. An ACM and LBP survey should be conducted prior to any bridge demolition within the boundaries of the project.

- Yellow thermoplastic traffic stripes are present along the roadway within the project segment. Yellow traffic stripes may contain heavy metals such as lead and chromium at concentrations in excess of the hazardous waste thresholds established by the California Code of Regulations (CCR) and may produce toxic fumes when heated during the remove process. Removal, storage, transportation, and disposal of yellow traffic stripes would be conducted in strict accordance with the appropriate regulations. Disposal of the stripes would be at a Class 1 disposal facility.

- A possible clandestine drug lab with an ambiguous location is reported in the Department of Justice database. The lab might have been located in the area of the mobile homes on the south side of East River Road. If any demolition is to occur along East River Road, additional studies may be required. Project plans do not require demolition of these mobile homes.

- McHenry Avenue has been at its current location since the early 1900s. It is conceivable that aerially deposited lead (ADL) might exist along the shoulder of the road.

- Concentrations of ADL in excess of regulatory limits are not likely due to the lower classification of the roadway and evidence of disking, grading, and other soil movement activities associated with farming. However, lead concentrations should be evaluated in conjunction with the agrichemical assessment recommended above, if deemed necessary.

Limited Phase Two ESA

Based on the recommended actions for the environmental concerns presented in the Phase One ESA, a Limited Phase Two ESA was completed for the project on June 6, 2012. The scope of work for the Limited Phase Two ESA included:

- Collection of 15 representative soil samples of the shallow soil (0-1 feet below ground surface) along the roadway in the proposed project area;

- Analysis of the soil samples for organochlorine pesticides, arsenic, and lead; and

- Performing an ACM and LBP survey of both bridges in the project area.

Environmental Consequences

Based on the findings of the Phase One Assessment, no recognized environmental conditions (RECs) and no historical RECs were identified for the project area.

The following potential environmental concerns were identified during the Phase One Assessment. These features did not rise to the level of RECs because there was no documentation or visual evidence of any contaminant releases to the environment. The subsequent Limited Phase Two ESA provided laboratory analytical results from representative samples collected from media expected to be disturbed or excavated by project activities, as described below.

Residual Pesticides in Soil

Temporary Impacts

Extensive orchard cultivation has occurred along McHenry Avenue and the north side of East River Road, east of McHenry Avenue. Additional orchards have existed to the west of McHenry Avenue, beyond the SSJID canal. It is conceivable that persistent agrichemicals including organochlorine pesticides such as the now government banned DDT and its derivatives, have been used historically for these orchards. Many organochlorine pesticides are endocrine disrupting chemicals, meaning they have subtle toxic effects on the body’s hormonal systems. Endocrine disrupting chemicals often mimic the body’s natural hormones, disrupting normal functions and contributing to adverse health effects. Numerous studies have linked organochlorine pesticide exposures with cancers and other health effects. Exposure to DDT has been linked to pancreatic cancer and non-Hodgkin’s lymphoma. Exposure to DDT early in life is associated with an increased breast cancer risk later in life. Many other organochlorine pesticides, such as mirex, chlordane and toxaphene, are known to be carcinogenic as well. Organochlorine pesticide exposure is also associated with neurodevelopmental, reproductive, and thyroid disruption health effects in humans. Thus, it is possible that worker exposure to soils with high concentrations of pesticides during project construction could pose a health risk if precautions were not implemented. In addition, soils with pesticide concentrations in excess of the hazardous waste thresholds established by the California Code of Regulations (CCR) would need to be handled and disposed of as hazardous waste.

Laboratory analytical results from the Phase Two ESA indicated that the organochlorine pesticides (DDT and derivatives) were detected in seven of fifteen soil samples. All concentrations of detected pesticides are considered acceptable for unrestricted reuse and were at levels two orders of magnitude below their respective U.S. Environmental Protection Agency Region 9 Regional Health Risk Screening Levels for Residential Soil.

No other organochlorine pesticides were detected. Thus, shallow soil (0-1 feet below ground surface) as well as any deeper soils may be handled as non-hazardous waste.

Permanent Impacts

Typical use of the new bridges and the improved sections of McHenry Avenue and East River Road would not involve human contact with adjacent soils that could be affected by pesticides. Thus no permanent impacts from pesticides would be expected.

Aerially Deposited Lead in Soil

Temporary Impacts

Aerially deposited lead is known to be present within soils near major roadways in operation prior to 1980, when lead was discontinued as a gasoline additive in the State of California. McHenry Avenue has been in place at the current location since the early 1900s. Aerially deposited lead might exist along the shoulder of the road; however, concentrations of aerially deposited lead in excess of regulatory limits are not likely due to the lower classification of McHenry Avenue and East River Road and evidence of disking, grading, and other soil movement activities associated with farming near these roads.

Laboratory analytical results for the soil samples collected on May 5, 2012 for the Phase Two ESA detected low levels of arsenic and lead in all soil samples. Per Caltrans' July 1, 2009 Statewide Lead Variance, lead levels are not considered hazardous if the average lead concentrations are below 1,000 mg/kg total lead and below 5 mg/L soluble lead. Two soil samples had slightly elevated levels of total lead (60 mg/kg and 65 mg/kg). When analyzed for soluble threshold limit concentration lead, both had concentrations of 3.9 mg/L which is below the hazardous waste disposal threshold of 5 mg/L. The Limited Phase Two ESA concluded that concentrations of arsenic and lead detected in the soil within the project footprint indicate that shallow soil (0-1 feet below ground surface) may be handled as non-hazardous waste. Thus, no protective measures are needed to be taken to protect site workers and the public from the lead and arsenic in soil, and no specific soil management procedures are necessary.

Permanent Impacts

Operation of the project improvements would not involve human contact with adjacent soils that could be affected by lead, nor would it increase aerially deposited lead concentrations. Thus no permanent impacts from aerially-deposited lead would be expected.

Asbestos and Lead-Based Paint in Existing Bridges

Temporary Impacts

Given the age of the existing bridge structures, it is conceivable that asbestos-containing materials or lead-based paint may have been used in construction should be conducted prior to any demolition. No evidence of asbestos-containing material or lead-based paint was noted on the Stanislaus River Bridge during the Phase One ESA site reconnaissance. Sampling for asbestos-containing materials and lead-based paint was conducted as part of the Phase Two ESA for the project. Eight samples for asbestos analysis were collected on May 8, 2012 using standard asbestos procedure. Four samples were collected from the San Joaquin Water District Bridge near Meyers Road; two samples were from paint and two were from asphalt material. Four samples were collected from the Stanislaus River Bridge near East River Road; all of these samples were from asphalt material. None of the samples collected showed the presence of asbestos containing material (ACM) (greater than 1% asbestos) or trace ACM (0.1 to 1% asbestos).

Four samples for lead-based paint analysis were collected on May 8, 2012 using standard lead paint sampling procedure. Two samples of peeling white paint were collected from the SSJID Canal Bridge near Meyers Road, and two samples were collected from the graffiti on the Stanislaus River Bridge near East River Road. Both samples collected from the SSJID Canal Bridge contained significant concentrations of lead (greater than 0.5% lead by weight) indicating lead-based paint. One sample from the Stanislaus River Bridge also indicated lead-based paint.

In summary, the Phase Two ESA indicated that:

- ACM was not detected on either bridge.
- Lead-based paints were detected on both bridges. The LBP on the Stanislaus Bridge is related to graffiti only, not to general painting of the bridge structure.

Permanent Impacts

The proposed new bridges will not contain any asbestos or lead-based paint. Thus no permanent effects would be expected.

Yellow Thermoplastic Paint on Roadways

Temporary Impacts

Yellow traffic stripes are present along the roadway within the project segment. Yellow thermoplastic traffic stripes may contain heavy metals such as lead and chromium at concentrations in excess of the hazardous waste thresholds established by the California

Code of Regulations (CCR) and may produce toxic fumes when heated during their removal. The project will therefore be required to have a lead abatement plan to manage the removal and disposal of any paint striping.

Permanent Impacts

The proposed new roadway striping will not contain any lead- or chromium above hazardous waste levels. Thus no permanent effects would be expected.

Avoidance, Minimization, and/or Mitigation Measures

There are no identified facilities next to or within the project area and planned right-of-way acquisition areas that require further evaluation for potential hazardous waste impacts on the design and construction of the planned Project.

Temporary Construction Effects

- The construction contractor would prepare a project-specific Lead Compliance Plan to prevent or minimize worker and public exposure to lead while handling and disposing of lead-containing materials during demolition of the two bridges.

- Removal and disposal of yellow thermoplastic paint and striping from roadways would be done in accordance with applicable state and county requirements, including preparation of a project-specific Lead Compliance Plan to prevent or minimize worker exposure to lead and chromium while handling and disposing of yellow thermoplastic materials. If thermoplastic material is combined with sufficient asphalt grindings to reduce concentrations of lead to a non-hazardous level, no special handling or disposal would be required (per Caltrans Special Provisions).

- If previously unidentified contaminated soil is encountered during excavation or grading, the construction contractor would stop work and contact an environmental hazardous materials professional to conduct an on-site assessment. If the materials are determined to pose a risk to the public or construction workers, the construction contractor would prepare and submit a remediation plan to the appropriate agency and comply with all federal, state, and local laws. Construction plans would be modified or postponed to ensure construction would not inhibit remediation activities and would not expose the public or construction workers to hazardous conditions.

- If asbestos containing materials are identified at concentrations that could pose a health hazard in structures that would be demolished, then the bridges would be removed under acceptable engineering methods and work practices. A California Certified Asbestos Consultant would be retained prior to bridge removal, and would prepare and monitor implementation of an asbestos compliance plan.

2.2.5 Air Quality

Regulatory Setting

The federal Clean Air Act (CAA), as amended in 1990, is the federal law that governs air quality. The California Clean Air Act of 1988 is its companion state law. These laws, and related regulations by the USEPA and the California Air Resources Board (ARB), set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns. The criteria pollutants are carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM, broken down for regulatory purposes into particles of 10 micrometers or smaller (PM_{10}) and particles of 2.5 micrometers and smaller ($PM_{2.5}$), lead (Pb), and sulfur dioxide (SO_2). In addition, state standards exist for visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The NAAQS and state standards are set at a level that protects public health with a margin of safety and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics within their general definition.

Federal and state air quality standards and regulations provide the basic scheme for project-level air quality analysis under the NEPA and the CEQA. In addition to this type of environmental analysis, a parallel “conformity” requirement under the CAA also applies.

CAA Section 176(c) prohibits the U.S. Department of Transportation and other federal agencies from funding, authorizing, or approving plans, programs, or projects that are not first found to conform to a State Implementation Plan (SIP) for achieving the goals of Clean Air Act requirements related to the NAAQS. Transportation conformity takes place on two levels: the regional, or planning and programming, level, and the project level. The proposed project must conform at both levels to be approved. Conformity requirements apply only in nonattainment and maintenance (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. USEPA regulations at 40 CFR 93 govern the conformity process.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the standards set for carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and in some areas sulfur dioxide (SO_2). California has attainment or maintenance areas for all of these transportation-related criteria pollutants except SO_2 and also has a nonattainment area for lead (Pb). However, lead is not currently required by the CAA to be covered in transportation conformity analysis. Regional conformity is based on RTPs and FTIPs that include all of the transportation projects planned for a region over a period of at least 20 years for the RTP and 4 years for the FTIP. RTP and FTIP conformity is based on use of travel demand and air quality models to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that requirements of the Clean Air Act and the SIP are met. If the conformity analysis is successful, the metropolitan planning organization (MPO), FHWA, and Federal Transit Administration (FTA) make determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the CAA. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept, scope, and "open to traffic" schedule of a proposed transportation project are the same as described in the RTP and FTIP, the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

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

Affected Environment

An Air Quality Study Report was prepared for the proposed project in June 2011 and approved December 5, 2011. The project site is located within the San Joaquin Valley Air Basin (SJVAB). The dispersion of air pollution in the SJVAB is determined by the following natural factors:

Topography

The SJVAB occupies the southern half of California's Central Valley. The SJVAB is open to the north and is surrounded by mountain ranges on all other sides. The Coast Ranges, which have an average elevation of 3,000 feet, are along on the western boundary of the SJVAB, while the Sierra Nevadas, which have elevations of 8,000 to 14,000 feet, are along the eastern border. The San Emigdio Mountains, which are part of the Coast Ranges, and the Tehachapi Mountains, which are part of the Sierra Nevada, form the southern boundary and have an elevation of 6,000 to 8,000 feet. The SJVAB is mostly flat with a downward gradient in terrain to the northwest.

Meteorology and Climate

Winter in the SJVAB is mild and fairly humid, while the summer is typically hot, dry, and cloudless. Summer temperatures that often exceed 100°F, and clear sky conditions are favorable to ozone formation. Most of the precipitation in the valley occurs as rainfall during winter storms. The winds and unstable atmospheric conditions associated with the passage of winter storms result in periods of low air pollution and excellent visibility. However, between winter storms, high pressure and light winds lead to the creation of low-level temperature inversions and stable atmospheric conditions, resulting in high CO concentrations and PM accumulation. The orientation of the wind flow pattern in the SJVAB is parallel to the valley and mountain ranges. Summer wind conditions promote the transport of ozone and ozone precursors from the San Francisco Bay Area through the Carquinez Strait, a gap in the Coast Ranges, and low mountain passes such as Altamont Pass and Pacheco Pass.

Criteria Air Pollutants and Precursors

Criteria air pollutants are defined as those pollutants for which the federal and state governments have established air quality standards for outdoor or ambient concentrations to protect public health. The NAAQS and California Ambient Air Quality Standards (CAAQS) have been set at levels to protect human health with a determined margin of safety. For some pollutants, there are also secondary standards to protect the environment. Ozone and PM are generally considered to be regional pollutants because they or their precursors affect air quality on a regional scale. Pollutants such as CO, NO_2, SO_2, and Pb are considered to be local pollutants because they tend to accumulate in the air locally. PM is also considered as a local pollutant. In the vicinity of the proposed project study area, ozone and particulate matter are of particular concern. San Joaquin and Stanislaus Counties are both located within the SJVAB. The SJVAB is currently designated as nonattainment for the NAAQS for 8-hour ozone and $PM_{2.5}$ and has a maintenance plan for PM_{10}; there is also a maintenance plan for CO for the urbanized/metropolitan areas of Kern, Fresno, Stanislaus, and San Joaquin Counties. The area is designated nonattainment for the CAAQS for PM_{10}, $PM_{2.5}$, and ozone standards. Criteria air pollutants, ambient air quality standards, and common sources and effects are summarized in **Table 2.18**.

Table 2.18
State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard	Federal Standard	Health and Atmospheric Effects	Typical Sources	Attainment Status
Ozone (O_3)	1 hour 8 hours	0.09 ppm 0.070 ppm	– 0.075 ppm	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include a number of known toxic air contaminants.	Low-altitude ozone is almost entirely formed from reactive organic gases (ROG) and nitrogen oxides (NO_x) in the presence of sunlight and heat. Major sources include motor vehicles and other mobile sources, solvent evaporation, and industrial and other combustion processes. Biologically produced ROG may also contribute.	Federal: 1-hour – No federal standard 8 hour – Nonattainment/ Extreme State: 1-hour – Nonattainment/ Severe 8-hour – Nonattainment
Carbon Monoxide (CO)	1 hour 8 hours 8 hours (Lake Tahoe)	20 ppm 9.0 ppm 6 ppm	35 ppm 9 ppm –	Asphyxiant. CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.	Federal: Attainment/ Unclassified State: Attainment/ Unclassified
Respirable Particulate Matter (PM_{10})	24 hours Annual	50 μg/m^3 20 μg/m^3	150 μg/m^3 –	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources (wind-blown dust, ocean spray).	Federal: Attainment State: Nonattainment

Pollutant	Averaging Time	State Standard	Federal Standard	Health and Atmospheric Effects	Typical Sources	Attainment Status
Fine Particulate Matter ($PM_{2.5}$)	24 hours Annual	– 12 µg/m^3	35 µg/m^3 15 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter — considered a toxic air contaminant — is in the $PM_{2.5}$ size range. Many aerosol and solid compounds are part of $PM_{2.5}$.	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical (including photochemical) reactions involving other pollutants including NO_x, SO_x, ammonia, and ROG.	Federal: Nonattainment State: Nonattainment
Nitrogen Dioxide (NO_2)	1 hour Annual	0.18 ppm 0.030 ppm	100 ppb 53 ppb	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain.	Motor vehicles and other mobile sources; refineries; industrial operations.	Federal: Attainment/ Unclassified State: Attainment
Sulfur Dioxide (SO_2)	1 hour 3 hours 24 hours	0.25 ppm – 0.04 ppm	75 ppb 0.5 ppm –	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing.	Federal: Attainment/ Unclassified State: Attainment
Lead (Pb)	30 Day Avg. Quarterly Rolling 3-Month Average	1.5 µg/m^3 – –	– 1.5 µg/m^3 0.15 µg/m^3	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also considered a toxic air contaminant.	Primary: lead-based industrial process like batter production and smelters. Past: lead paint, leaded gasoline. Moderate to high levels of aerially deposited lead from gasoline may still be present in soils along major roads, and can be a problem if large amounts of soil are disturbed.	Federal: No designation/ classification State: Attainment

Notes: ppm = parts per million; µg/m3 = micrograms per cubic meter

Sources: Ambient 2011; San Joaquin Valley Air Pollution Control District 2011

Sensitive Receptors

One of the most important reasons for air quality standards is the protection of those members of the population who are most sensitive to the adverse health effects of air pollution, termed sensitive receptors. The term "sensitive receptors" refers to specific population groups as well as the land uses where individuals would reside for long periods. Commonly identified sensitive population groups are children, the elderly, the acutely ill, and the chronically ill. Commonly identified sensitive land uses would include facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Residential dwellings, schools, parks, playgrounds, childcare centers, convalescent homes, and hospitals are examples of sensitive land uses.

Sensitive land uses located in the vicinity of the proposed project area consist of rural residences and a church located adjacent to the affected roadway segments of East River Road and McHenry Avenue.

Environmental Consequences

Regional Air Quality Conformity

The proposed project is listed in the San Joaquin Council of Governments (SJCOG) financially constrained Regional Transportation Plan which was found to conform by SJCOG on November 12, 2010, and FHWA and FTA made a regional conformity determination on December 14, 2010. The project is also included in the SJCOG financially constrained Federal Transportation Improvement Program (FTIP) on page 16 in Table 7-3. The SJCOG 2011 FTIP was determined to conform by FHWA and FTA on December 14, 2010. The design concept and scope of the proposed project is consistent with the project description in the 2011 RTP and the 2011 FTIP, and the open to traffic assumptions of the SJCOG's regional emissions analysis.

Project-Level Conformity

The project is located in an attainment/unclassified area for the federal and state CO standards. Therefore, a hot-spot analysis for CO was required.

The project is located in an attainment/maintenance area for the federal PM_{10} standard and is in a nonattainment area for the state PM_{10} standard. The project is located in a nonattainment area for the federal and state $PM_{2.5}$ standards. Therefore, a local hot-spot analysis for conformity was required for $PM_{2.5}$ and PM_{10}.

The project is also located in a severe nonattainment area for the state ozone (1-hour) standard, in a nonattainment area for the state ozone (8-hour) standard, and in a serious nonattainment area for the federal ozone (8-hour) standard. However, because ozone is a regional pollutant, there is no hot-spot procedure for ozone.

Carbon Monoxide Hot-Spot Analysis

Caltrans' Transportation Project-Level Carbon Monoxide Protocol (CO Protocol) was used to analyze CO impacts for the McHenry Avenue Corridor Improvements Project. The hot-spot analysis covered the most congested intersection affected by the project, McHenry Avenue and East River Road, for existing and future (year 2030) conditions.

The ambient air quality effects of traffic emissions were evaluated using the modeling procedures described in Appendix B of the CO Protocol. Predicted CO concentrations are summarized in **Table 2.19**. The assumptions used in the hot-spot analysis are consistent with those used in SJCOG's regional emissions analysis. Based on the modeling conducted, implementation of the proposed project would result in a slight decrease in predicted CO concentrations at receptor locations. Implementation of the proposed project would not cause or contribute to any new localized violations of the federal 1-hour or 8-hour CO ambient standards. The approved RTP and TIP for the project area have no CO mitigation or control measures that relate to the project's construction or operation. Therefore, a written commitment to implement CO control measures is not required.

Table 2.19
Predicted CO Concentrations

Scenario	Highest Concentration (ppm[1]) at Receptor Locations	
	1-Hour	8-Hour
Existing Without Project	7.1	3.0
Existing With Project	6.3	3.0
Future Without Project	5.7	3.0
Future With Project	5.5	3.0
CAAQS/NAAQS[2]:	20/35	9
Exceeds CAAQS/NAAQS[2]?	No	No

Source: Ambient 2011
[1] Parts per million
[2] Californis Ambient Air Quality Standards/National Ambient Air Quality Standards
Notes: Represents total background and mobile-source concentrations. Modeling was conducted in accordance with Caltrans-recommended methodologies using the Caline4 computer program. 1-hour and 8-hour receptor locations were placed at 3 and 7 meters from the roadway edge, respectively. To ensure a conservative analysis, background concentrations were based on the highest measured concentrations obtained from the Stockton-Hazelton monitoring station for the last four years of available data (2005–2008). Predicted 8-hour concentrations were calculated assuming a persistence factor of 0.7.

$PM_{2.5}$/PM_{10} Hot-Spot Analysis

Qualitative PM hot-spot analysis is required under the USEPA transportation conformity rule for Projects of Air Quality Concern (POAQC), as described in the USEPA's Final Rule of March 10, 2006. Projects that are not POAQC do not require quantitative (detailed) PM hot-spot analysis.

According to the USEPA Transportation Conformity Guidance (Final Rule), March 10, 2006, the following types of projects are considered POAQC:

1) New or expanded highway projects that have a significant number of or significant increase in diesel vehicles (significant number is defined as greater than 125,000 Annual Average Daily Traffic (AADT) and 8% or more of such AADT is diesel truck traffic, or in practice 10,000 truck AADT or more regardless of total AADT; significant increase is defined in practice as a 10% increase in heavy-duty truck traffic);

2) Projects affecting intersections that are at a level of service D, E, or F, with a significant number of diesel vehicles, or that would change to level of service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;

3) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;

4) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; or

5) Projects in or affecting locations, areas, or categories of sites which are identified in the $PM_{2.5}$ or PM_{10} implementation plan or implementation plan submission, as appropriate, as sites of possible violation.

The proposed project is not considered a project of air quality concern (POAQC) for $PM_{2.5}$ and/or PM_{10} because it does not meet the definition of a POAQC as defined in the USEPA's Transportation Conformity Guidance:

1. Implementation of the proposed project would not result in the construction of a new or expanded highway system that would have a significant number of or significant increase in diesel vehicles. Based on data obtained from the Traffic Analysis prepared for this project, existing total traffic volumes on

McHenry Avenue average approximately 9,500 vehicles per day. Existing traffic volumes on East River Road average approximately 5,200 vehicles per day. Existing truck volumes average approximately 1,112 trucks on McHenry Avenue and approximately 473 trucks on East River Road. Predicted future (year 2030) truck volumes on McHenry Avenue and East River Road would total approximately 1,346 and 774 trucks per day, respectively (Dowling Associates Inc. 2009).

2. Existing truck traffic on primarily affected roadway segments would not be considered significant (i.e., 10,000 average daily traffic or greater). Implementation of the proposed project is not projected to result in a significant increase in total vehicle or truck traffic on these roadways.

3. The proposed project does not involve the construction of new bus or rail terminals, or transfer points.

4. The proposed project does not involve the expansion of bus or rail terminals, or transfer points.

5. The project site is not identified in an implementation plan as a project that would affect locations of sites of possible violation of the $PM_{2.5}$ or PM_{10} ambient air quality standards.

Since the proposed project is not a POAQC, detailed PM hot-spot analysis is therefore not required. San Joaquin County prepared a PM hot-spot consultation memo on January 27, 2011, and SJCOG initiated interagency consultation on February 1, 2011. The EPA concurred on February 8, 2011 and Caltrans concurred on February 9, 2011 that the project is not a POAQC.

Project-level conformity analysis shows that the project would conform with the State Implementation Plan, including localized impact analysis for particulate matter (PM_{10} and $PM_{2.5}$) required by 40 CFR 93.123. Since construction of the project is expected to last three years, construction-related emissions were not considered in the hot-spot analysis.

Permanent Impacts

Long-term air quality impacts attributable to the proposed project would be associated with the operation of motor vehicles on area roadways. The proposed project is needed to provide increased capacity on McHenry Avenue to address congestion concerns and increase safety. Although implementation of the proposed project may result in increased vehicle miles traveled (VMT) due to the decreased level of congestion and increased capacity, congestion relief provided by the proposed project would help to reduce idling times, acceleration, and braking, all of which contribute to a decrease in air pollution. In addition, vehicular emissions rates are anticipated to decrease in future years due to continuing improvements in engine technology and the retirement of older, higher-emitting vehicles. Therefore, no long-term air quality impacts are anticipated.

Temporary Impacts

Emissions and Dust

During construction, short-term degradation of air quality might occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other activities. Emissions from construction equipment also are anticipated and would include CO, nitrogen oxides (NO_X), reactive organic gases (ROG), directly emitted particulate matter (PM_{10} and $PM_{2.5}$), and toxic air contaminants such as diesel exhaust particulate matter. Levels of ozone, which is a regional pollutant derived from NO_X and ROG in the presence of sunlight and heat, might also increase in the project area.

Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, removing or improving existing roadways, and paving roadway surfaces. Construction-related effects on air quality from most highway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. If not properly controlled, these activities would temporarily generate PM_{10}, $PM_{2.5}$ and small amounts of CO, SO_2, NOx, and ROG. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Table 2.20 shows the calculated construction emissions estimated to result from project construction.

Table 2.20
Short-Term Construction-Generated Emissions (Unmitigated)

Construction Phase	Emissions (lbs/day)[1]					
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2
Grubbing/Land Clearing	4.9	21.0	35.7	20.3	5.4	3,397.6
Grading/Excavation	5.6	22.9	38.4	20.7	5.8	3,832.7
Drainage/Utilities/Sub-Grade	5.0	19.3	32.7	20.5	5.6	3,168.4
Paving	3.6	12.2	16.5	1.5	1.4	1,553.2
Maximum Emissions (lbs/day):	5.6	22.9	38.4	20.7	5.8	3,832.7
Total Annual Emissions (tons)	1.0	4.0	6.6	3.5	1.0	643.1

1. *Emissions were calculated using the Road Construction Emissions Model, version 6.3.2, based on default construction equipment and schedule assumptions contained in the model. Assumes approximately 4 total acres of ground disturbance, one-quarter of the project area disturbed on a daily basis.*

The SJVAPCD recommends quantitative significance thresholds of 10 tons/year for ozone-precursor pollutants ROG and NOx. The SJVAPCD considers compliance with Regulation VIII to be sufficient to reduce air quality impacts associated with increased particulate emissions. Projects that do not include dust control measures, in compliance with Regulation VIII, would be considered to have a potentially significant air quality impact.

Some phases of construction, particularly asphalt paving, would result in short-term odors in the immediate area of each paving site(s). Such odors would quickly dissipate as distance from the site(s) increases. Most of the construction impacts to air quality are short term in duration and therefore would not result in adverse or long-term conditions.

Exposure to Naturally Occurring Asbestos

The project area is not located within an area that contains serpentine and ultramafic rock, which might both contain naturally occurring asbestos. Therefore, the impact from naturally occurring asbestos during construction of the proposed project would be minimal to none.

Exposure to Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are National Ambient Air Quality Standards (NAAQS), the USEPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

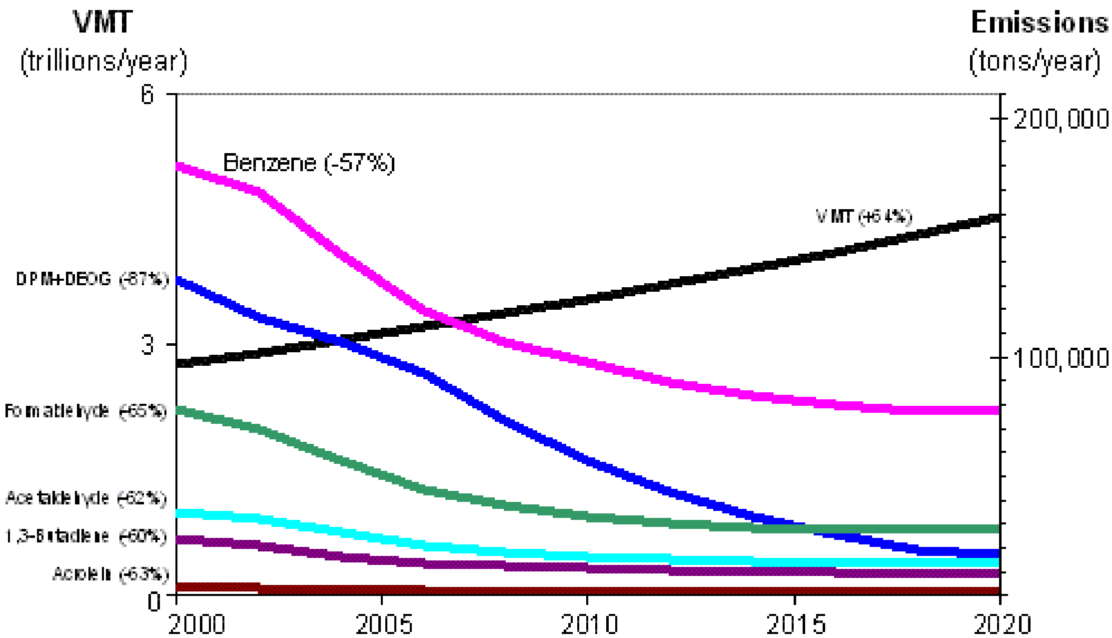
Mobile Source Air Toxics (MSATs) are a subset of 21 of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. There are six main toxics including diesel exhaust, benzene, and formaldehyde, among others. Of these, diesel-exhaust particulate matter (diesel PM) is of primary concern.

The United States Environmental Protection Agency is the lead federal agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The USEPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources (66 FR 17229) on March 29, 2001) under the authority in Section 202 of the Clean Air Act. In its rule, the USEPA examined the impacts of existing and new mobile source control programs, including its reformulated gasoline program, its national low emission vehicle standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy-duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64% increase in VMT, these programs would reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57–65% and would reduce on-highway diesel PM emissions by 87%, as shown in **Figure 2-7**. As a result, the USEPA concluded that no further motor vehicle emissions standards or fuel standards are necessary to further control MSATs.

Project-Level Analysis

Technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent accurate estimates of the MSAT emissions and health effects of this project. However, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives.

Figure 2-7
U.S. Annual Vehicle Miles Traveled (VMT) vs. Mobile Source Air Toxics Emissions, 2000–2020



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: Highway Statistics 2000, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM + DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.

Source: Caltrans 2009b

The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives.

The amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. Based on the Traffic Analysis (2010) prepared for this project, the VMT estimated for the proposed project is assumed to be roughly equivalent to that of the no build alternative. Although the additional capacity increases the efficiency of McHenry Avenue, the proposed project was not assumed to attract rerouted trips from elsewhere in the transportation network (Dowling Associates 2009). Increased vehicle speeds associated with project implementation would result in lower MSAT emissions. Based on mobile-source emissions models, emissions of all of the priority MSATs, with the exception of diesel particulate matter, decrease as speed increases.

The extent to which these speed-related emissions decrease cannot be reliably projected due to the inherent deficiencies of technical models.

Because estimated VMT with project implementation is assumed to be roughly equivalent to existing VMT, it is expected there would be no appreciable difference in overall MSAT emissions with project implementation. Also, regardless of the alternative chosen, emissions would likely be lower than present levels in the design year as a result of existing regulatory control programs that are projected to reduce MSAT emissions by up to approximately 87% between 2000 and 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases (Caltrans 2009b).

The additional travel lanes contemplated would have the effect of moving some traffic closer to nearby existing residential dwellings. In such instances, there may be localized areas where ambient concentrations of MSATs could be higher under certain conditions when compared to the no build alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections of McHenry Avenue. However, as discussed above, the magnitude and the duration of these potential increases compared to the no build alternative cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions for the build alternative could be higher relative to the no build alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs would be lower in other locations when traffic shifts away from them. However, on a regional basis, USEPA and ARB vehicle and fuel regulations, coupled with fleet turnover, would over time cause substantial reductions that in almost all cases would cause region-wide MSAT levels to be significantly lower than today.

Climate Change

Climate change is analyzed in Section 2.4 of this document. Because there have been more requirements set forth in California legislation and executive orders regarding climate change, the issue is addressed in the California Environmental Quality Act (CEQA) chapter of this environmental document and may be used to inform the National Environmental Policy Act (NEPA) decision. The four strategies set forth by

FHWA to lessen climate change impacts do correlate with efforts that the State has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours travelled.

Avoidance, Minimization, and/or Mitigation Measures

Short-Term Construction Air Quality Impacts

The following measures would be implemented to reduce air quality impacts resulting from construction activities:

- The construction contractor would comply with Caltrans' Standard Specifications Section 7-1.01F of Caltrans' Standard Specifications (2006). Section 7, Legal Relations and Responsibility, addresses the contractor's responsibility on many items of concern, such as air pollution; protection of lakes, streams, reservoirs, and other water bodies; use of pesticides; safety; sanitation; and convenience of the public; and damage or injury to any person or property as a result of any construction operation. Section 7-1.01F specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.

- The construction contractor would comply with Section 10 of Caltrans' Standard Specifications, which is directed at controlling dust. If dust palliative materials other than water are to be used, material specifications are contained in Section 18.

- Caltrans Standard Specifications pertaining to dust control and dust palliative requirements are a required part of all construction contracts and should effectively reduce and control emissions impacts during construction. The provisions of Caltrans Standard Specifications, Section 14-1.01, Air Pollution Control, and Section 14-1.02, Dust Control, require the contractor to comply with the San Joaquin Valley Air Pollution Control District's rules, ordinances, and regulations. To control the generation of construction-related PM_{10} emissions, Caltrans would require construction contractors to prepare and submit a Dust Control Plan to the San Joaquin Valley Air Pollution Control District for their approval at least 30 days prior to any earthmoving or construction activities.

- San Joaquin Valley Air Pollution Control District (SJVAPCD) Rule 9510, Indirect Source Review, requires implementation of control measures and/or purchasing of emissions offsets to minimize construction-related NO_x and PM_{10} emissions in excess of 2.0 tons from roadway projects. If the estimated construction emissions exceeds the 2.0 tons, then the contractor would be required to submit an Air Impact Analysis, plus pay any applicable fee to the SJVAPCD at or before the time they submit the Dust Control Plan

- If structures that may contain asbestos are to be demolished, it is the responsibility of the contractor to comply with applicable regulations for asbestos-containing materials.

2.2.6 Noise and Vibration

Regulatory Setting

The National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

California Environmental Quality Act

CEQA requires a strictly baseline versus build analysis to assess whether a proposed project would have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless such measures are not feasible.

National Environmental Policy Act and 23 CFR 772

For highway transportation projects with FHWA (and Caltrans, as assigned) involvement, the Federal-Aid Highway Act of 1970 and the associated implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations contain noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 dBA[2]) is lower than the NAC for

[2] dBA = A-weighted decibels

commercial areas (72 dBA). **Table 2.21** lists the noise abatement criteria for use in the NEPA-23 CFR 772 analysis.

Table 2.21
Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level, dBA $L_{eq}(h)$[3]	Description of Activities
A	57 Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 Exterior	Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 Exterior	Developed lands, properties, or activities not included in Categories A or B above.
D	–	Undeveloped lands.
E	52 Interior	Residence, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

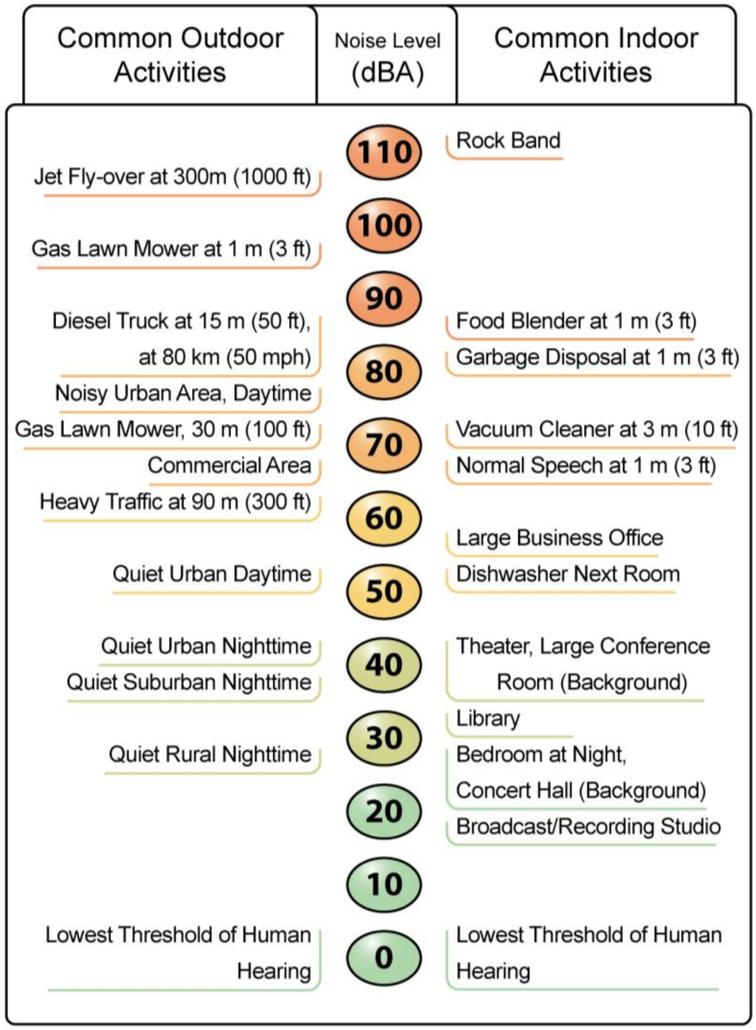
Figure 2-8 lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise levels discussed in this section with common activities.

In accordance with Caltrans' *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, August 2006*, a noise impact occurs when the future noise level with the project results in a substantial increase in noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project would have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

[3] Leq(h) = Equivalent sound level (Leq) over a specific period of time (h).

Figure 2-8
Noise Levels of Common Activities



Caltrans' Traffic Noise Analysis Protocol sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 5 dBA reduction in the future noise level must be achieved for an abatement measure to be considered feasible. Other considerations include topography, access requirements, other noise sources, and safety considerations. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include residents' acceptance, the cost per benefited residence, the absolute noise level, build versus existing noise, environmental impacts of abatement, public and local agencies' input, and newly constructed development versus development pre-dating 1978.

Affected Environment

A Noise Study Report was prepared and approved for the proposed project in April 2011 to identify land uses and sensitive receptors, particularly areas of frequent human use that would benefit from reduced noise levels.

A preliminary Noise Abatement Decision Report was prepared for the project in April 2011 to estimate the construction cost for the noise abatement measures recommended in the Noise Study Report. The NADR does not present the final decision regarding noise abatement; rather, it presents key information on abatement to be considered throughout the environmental review process, based on the best available information at the time the this draft environmental document was published. At the end of the public review process, a final noise abatement decision will be made and will be indicated in the final environmental document. The preliminary noise abatement decision will become the final noise abatement decision unless compelling information received during the environmental review process indicates that it should be changed.

A field investigation was conducted to identify areas that might be affected by noise from the proposed project. Land uses in the project area were categorized by land use type, activity category, and the extent of frequent human use. Although all developed land uses are evaluated in this analysis, the focus is on locations of frequent human use that would benefit from a lowered noise level. Accordingly, the noise analysis focused on locations with defined outdoor activity areas, such as residential backyards. Noise-sensitive land uses in the project area include 13 rural residential dwellings located along McHenry Avenue (including Meyers Avenue and East Wigley Road), 3 residential dwellings located along East River Road, and the Church of Christ located along East River Road west of McHenry Avenue, for a total of 17 sensitive noise receptors

Figure 2-9 through **Figure 2-13** show the locations of sensitive noise receptors identified in or near the project area.

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Figure 2-9
Map Key for Receptors & Potential Sound Wall Locations

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Figure 2-10
Receptor & Potential Sound Wall Locations (Area 1)

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Figure 2-11
Receptor & Potential Sound Wall Locations (Area 2)

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Figure 2-12
Receptor & Potential Sound Wall Locations (Area 3)

#	Receiver Location With No Significant Noise Impact
#	Noise Measurement Locations

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Figure 2-13
Receptor & Potential Sound Wall Locations (Area 4)

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Environmental Consequences

The project is considered a Type 1 project under 23 CFR 772 because it involves the widening of both the Stanislaus River Bridge and the SSJID Canal Bridge. Although this widening of the bridges will not include the addition of any through travel lanes (criteria for a Type 1 project), the widening will accommodate additional lanes in the future under a separate project. In a borderline scenario such as this, Caltrans has determined the proposed project to be a Type 1 project.

Table 2.22 below outlines the existing and future noise levels predicted for the proposed project.

Measurements taken at 17 receptor locations indicate that the existing noise levels range from 52 dB to 68 dB. The future noise levels with the proposed project are predicted to range from 55 dB to 73 dB, depending on the receptor location. Future noise levels are predicted to approach or exceed the federal noise abatement criteria level (NAC) of 67 dB at the following receptor locations: R1, R2, R3, R5, R7, R8, and R9. Because future predicted noise levels would approach or exceed the NAC, abatement must be considered.

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Table 2.22
Existing and Predicted Future Noise Levels

Receptor #	Receptor Type and Location	Existing Noise Level (dBA)	Predicted Future (2030) Noise Level without Project (dBA)	Predicted Future (2030) Noise Level with Project (dBA)	Difference Between Existing and Predicted Future Noise Level With Project (dBA)	Noise Requires Abatement Consideration[1]	Difference Between Predicted Future Noise Levels with and without Project (dBA)	Predicted (2030) Noise Level with Abatement (Sound Walls), and Insertion Loss (Reduction in Noise Level with Sound Wall) (dBA): 6-foot High Sound Wall		8-foot High Sound Wall		10-foot High Sound Wall		12-foot High Sound Wall		14-foot High Sound Wall		Sound Wall Reasonable and Feasible?
								Noise Level	IL[2]	Noise Level	IL[2]	Noise Level	IL[2]	Noise Level	IL[2]	Noise Level	IL[2]	
R1	Residential Dwelling, 25540 Jones Road	64	68	68	+4	Yes	0	65	3	65	3	65	3	64	4	64	4	No
R2	Residential Dwelling, 20708 McHenry Avenue	66	70	70	+4	Yes	0	68	2	67	3	67	3	66	4	66	4	No
R3	Residential Dwelling, 20720 McHenry Avenue	66	70	70	+4	Yes	0	68	2	68	2	68	2	68	2	68	2	No
R4	Residential Dwelling, 20904 McHenry Avenue	58	61	62	+4	No	+1											No
R5	Residential Dwelling, 21146 McHenry Avenue	68	72	73	+5	Yes	+1	71	2	71	2	71	2	71	2	71	2	No
R6	Residential Dwelling, 21332 McHenry Avenue	56	60	60	+4	No	0											No
R7	Residential Dwelling, 25635 East River Road	65	66	68	+3	Yes	+2	67	1	66	2	66	2	65	3	65	3	No
R8	Residential Dwelling, 25410 East River Road	67	70	70	+3	Yes	0	66	4	66	4	66	4	65	5	65	5	No
R9	Residential Dwelling, 25362 East River Road	66	69	69	+3	Yes	0	68	1	68	1	68	1	68	1	68	1	No
R10	Church of Christ, 25260 East River Road	63	65	65	+2	No	0											
R11	Residential Dwelling, 25635 McHenry Avenue	60	64	63	+3	No	-1											
R12	Residential Dwelling, 25492 Meyers Avenue	56	60	61	+5	No	+1											
R13	Residential Dwelling, 25488 Meyers Avenue	55	59	59	+4	No	0											
R14	Residential Dwelling, 25424 Meyers Avenue	54	57	58	+4	No	+1											
R15	Residential Dwelling, 25458 Meyers Avenue	52	55	55	+3	No	0											
R16	Residential Dwelling, 25406 Meyers Avenue	53	57	58	+5	No	+1											
R17	Residential Dwelling, 25137 East Wigley Road	54	58	58	+4	No	0											

[1] *The Noise Abatement Criteria for residential uses is 67 dBA.*
[2] *IL = Insertion Loss (Reduction in Noise Level with Sound Wall)*

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Permanent Impacts (Operational Noise)

Under the San Joaquin County General Plan, the County's maximum allowable noise exposure from transportation noise sources is 65 dB L_{dn} for outdoor activity areas of residential development and 45 dB L_{dn} for indoor spaces. L_{dn} is the average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m.

Under the Stanislaus County General Plan, the maximum normally allowable noise exposure from transportation noise sources is 60 L_{dn} or less for outdoor activity areas of residential development and 45 L_{dn} or less within noise-sensitive interior spaces. Where it is not possible to reduce exterior noise from transportation sources to the normally allowable level using a practical application of the best available noise-reduction technology, a conditionally acceptable exterior noise level of up to 65 L_{dn} would be allowed. Under no circumstances would interior noise levels be allowed to exceed 45 L_{dn} with the windows and doors closed in residential uses.

As shown in **Table 2.22**, the proposed project would exceed the FHWA NAC of 67 dB for residential outdoor areas at receptors R1, R2, R3, R5, R7, R8, and R9.

For California Environmental Quality Act (CEQA) purposes and based on local noise ordinances, a substantial increase in noise levels is not predicted to occur at any receptor locations.

As shown in **Table 2.22**, however, the noise levels at these receptor locations with the proposed project are largely unchanged from what noise levels would be without the proposed project, as the project would not result in substantial amounts of additional traffic through the project corridor, nor would it bring traffic substantially closer to receptor locations. The exception would be at receptor locations R4, R5, R12, R14, and R16, where the proposed project would result in an increase of 1 dB and receptor location R7 which would result in an increase of 2 dB, compared to conditions without the project.

As noted in the Noise Study Report, the trained, healthy human ear is able to discern 1 dB changes in sound levels in a quiet environment. In typical noisy, uncontrolled environments, changes in noise of 1 to 2 dB are generally not perceptible; however, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Therefore, an increase in sound levels that would result in a 3 dB increase would generally be perceived as barely detectable. As such, the 1 to 2 dB increase that would result from the proposed project at receptors listed above would be not generally be perceptible.

Temporary Impacts (Construction Noise)

Construction of the proposed project would require the use of heavy equipment that could increase noise levels in the immediate project area. Examples of equipment used for roadway construction include concrete mixers, bulldozers, backhoes, and heavy trucks. Typical noise levels from this type of equipment are provided in **Table 2.23.**

Table 2.23
Typical Construction Equipment Noise Levels

Equipment	Typical Noise Level (dBA) at 50 feet from Source		Distance to Noise Contours (feet, dBA L_{eq})		
	L_{max}[1]	L_{eq}[2]	70 dBA	65 dBA	60 dBA
Air Compressor	80	76	105	187	334
Auger/Rock Drill	85	78	133	236	420
Backhoe/Front End Loader	80	76	105	187	334
Blasting	94	74	83	149	265
Boring Hydraulic Jack/Power Unit	80	77	118	210	374
Compactor (Ground)	80	73	74	133	236
Concrete Mixer Truck	85	81	187	334	594
Concrete Mixer (Vibratory)	80	73	74	133	236
Concrete Pump Truck	82	75	94	167	297
Concrete Saw	90	83	236	420	748
Crane	85	77	118	210	374
Dozer/Grader/Excavator/Scraper	85	81	187	334	594
Drill Rig Truck	84	77	118	210	374
Generator	82	79	149	265	472
Gradall	85	81	187	334	594
Hydraulic Break Ram	90	80	167	297	529
Jack Hammer	85	78	133	236	420
Impact Hammer/Hoe Ram (Mounted)	90	83	236	420	748
Pavement Scarifier/Roller	85	78	133	236	420
Paver	85	82	210	374	667
Pile Driver (Impact/Vibratory)	95	88	420	748	1,330

Equipment	Typical Noise Level (dBA) at 50 feet from Source		Distance to Noise Contours (feet, dBA L_{eq})		
Pneumatic Tools	85	82	210	374	667
Pumps	77	74	83	149	265
Truck (Dump/Flat Bed)	84	80	167	297	529

Source: FHWA 2006
[1] Lmax = Lmax is the highest instantaneous sound level measured during a specified period.
[2] Leq = Leq represents an average of the sound energy occurring over a specified period.

As indicated in **Table 2.23**, maximum intermittent noise levels associated with construction equipment typically range from approximately 77 to 95 dBA L_{max} at 50 feet. Pile driving and demolition activities involving the use of pavement breakers and jackhammers are among the noisiest activities associated with transportation improvement and construction projects. Depending on equipment usage and duration, average-hourly equipment noise levels typically range from approximately 73 to 88 dBA L_{eq} at 50 feet. Distances to predicted noise contours (noise contours lines connect points of equal noise exposure) would vary depending on multiple factors, such as the number and type of equipment used, equipment usage rates, area of activity, and shielding provided by intervening terrain and structures. Delivery vehicles, construction employee vehicle trips, and haul truck trips may also contribute to overall construction noise levels.

Implementation of the proposed project would involve the use of construction equipment close to existing residential land uses. In addition, the use of pile drivers might also be required for bridge reconstruction activities. Construction activities could temporarily annoy or disrupt the sleep of nearby residents.

Avoidance, Minimization, and/or Abatement Measures

<u>Operational Noise</u>

Sound walls were considered for all receptor locations where predicted future noise levels with the project would exceed the NAC. As shown in **Table 2.22**, sound walls could not provide the needed 5 dB reduction in noise in order to be considered feasible for any of the receptors, with the exception of R8, where a wall constructed to a minimum height of 12 feet and a minimum length of 200 feet would provide a 5 dB reduction. The total cost allowance for such a sound wall, calculated in accordance with Caltrans' Traffic Noise Analysis Protocol, is $47,000. The current estimated cost of the wall is $60,000. Since the estimated cost of the sound wall exceeds the total cost allowance, it is not considered reasonable under federal criteria and, therefore, is not proposed to be constructed as part of the project. Long-term noise abatement would not be incorporated into the project.

Construction Noise

Caltrans' Standard Specifications Section 14-8.02, "Noise Control," requires contractor's operations that occur between the hours of 9 p.m. and 6 a.m. to not exceed 86 dBA at a distance of 50 feet. In addition, the use of loud sound signals would be avoided in favor of light warnings except those required by safety laws for the protection of personnel. Compliance with Caltrans Standard Specifications would help to reduce construction-related noise impacts at nearby receptors.

To minimize potential construction noise impacts, the contractor would:

- Substitute noise/vibration-generating equipment with equipment or procedures that would generate lower levels of noise/vibration. For instance, in comparison to impact piles, drilled piles or the use of vibratory pile driver are preferred alternatives where geological conditions would permit their use.

- Limit noise-generating construction activities, excluding those that would result in a safety concern to workers or the public, to the least noise-sensitive daytime hours (i.e., 7 a.m. to 7 p.m.). Construction activities would be prohibited on Sundays and federal/state-recognized holidays.

- All equipment would have sound-control devices that are no less effective than those provided on the original equipment. No equipment would have an unmuffled exhaust.

- As directed by the County, the contractor would implement appropriate additional noise mitigation measures, including changing the location of stationary construction equipment, turning off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources.

2.3 Biological Environment

2.3.1 Natural Communities

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the federal Endangered Species Act are discussed in Threatened and Endangered Species, Section 2.3.4. Wetlands and other waters are discussed in Section 2.3.2.

Regulatory Setting

Habitat of concern include areas of special concern to resource agencies, areas protected under CEQA, areas designated as sensitive natural communities by the California Department of Fish and Game (CDFG), areas outlined in Section 1600 of the Fish and Game Code (FGC); and areas protected under local regulations and policies.

- County of San Joaquin Riparian Habitat Preservation Ordinance – The County of San Joaquin Riparian Habitat Preservation Ordinance (Chapter 9-1510; Ordinance 3675) strives to preserve the county's riparian habitat. The ordinance requires a project that has the potential to destroy, eliminate, or degrade riparian habitats to prepare a Riparian Habitat Mitigation Plan.

- County of San Joaquin General Plan – Resources of significant biological and ecological importance in San Joaquin County are protected, including riparian areas, significant oak groves, and heritage trees. Discretionary permits are required. Environmental assessments must identify the sensitivity of the resources and measures to protect them. Riparian habitat must be retained or replaced, riparian woodlands may not be removed, significant oak groves must be retained, and heritage trees must be protected. The County educates and encourages farmers and other landowners to preserve natural vegetation in and adjacent to cultivated areas. The County supports the protection of valuable lands by developing tree regulations (General Plan 2010, Volume I).

- County of San Joaquin Tree Protection/Retention Policy – The County of San Joaquin tree ordinance applies to all discretionary projects with native and heritage oaks. Oak removal requires an approved improvement plan. Removal for agricultural operations is exempt, as are emergencies, dead trees, and removals on existing residential lots with less than 10,000 square feet and lots less than 1 acre with a commercial or industrial use. Heritage oak trees are defined as native oak trees that have a single trunk diameter of 32 inches or greater measured at 4.5 feet above the ground (Development Title, 1997, 9-1505).

- County of Stanislaus General Plan – The Stanislaus County General Plan (Stanislaus County 1994) states: "Areas of sensitive plant life including riparian habitats are to be protected by review of development requests to ensure sensitive areas are left undisturbed or are mitigated." Although protection of oak woodland is noted in the General Plan, the County has not adopted a tree protection ordinance to promote conservation of native trees with historic significance, including both heritage trees and oak woodlands.

Affected Environment

A Natural Environment Study was prepared for the proposed project in July 2011. A Biological Assessment was prepared for the proposed project in January 2011. As part of the biological investigations completed for the proposed project, a project study area of approximately 44 acres in and surrounding the project area was identified, which consists of a 200-foot-wide buffer surrounding the project footprint.

Since the project would simply expand existing transportation facilities in essentially the same location, it would not have an effect on wildlife corridors and it would not fragment habitats. The project would have effects on the following natural communities: valley foothill riparian forest and valley oak woodland.

Valley Foothill Riparian Forest

Valley foothill riparian habitats are found in valleys bordered by sloping alluvial fans, slightly dissected terraces, lower foothills, and coastal plains. They are generally associated with low velocity flows, floodplains, and gentle topography. Valley foothill riparian habitat is generally found in the valley and foothill regions of California along low-gradient streams. Typically, this habitat consists of an overstory tree layer, subcanopy tree layer, understory shrub layer, and herbaceous layer. Valley areas supply deep alluvial soils that are usually permanently moist and well aerated to provide for a variety of lush vegetation. Riparian habitat supports a high diversity of wildlife species and provides shade for streams and wetlands, maintaining stream temperatures and reducing stream evaporation.

There are approximately 4.82 acres of valley foothill riparian forest located along the Stanislaus River within the project study area. Valley oaks (*Quercus lobata*) are prominent in the overstory layer, with willows (*Salix spp*) in the understory. Several invasive species are present under the existing Stanislaus River Bridge including Russian thistle (*Salsola tragus*), giant European reed (*Arundo donax*), tree of heaven (*Ailanthus altissima*), melon vines or calabazilla (*Cucurbita foetidissima*), and yellow star-thistle (*Centaurea solstitialis*).

Valley Oak Woodland

The valley oak woodland within the project study area has been reduced to remnants in the eastern and the southern portions of the project study area near the Stanislaus River, totaling 0.56 acre. These areas are dominated by large valley oaks with an understory of either annual grassland or blackberry thickets. In the eastern portion of the project study area, the valley oaks are adjacent to East River Road to the north and annual grassland (a cleared agricultural field) to the south. In the southern portion of the project study area, the valley oaks are reduced to a small, thin strip between two orchards.

Environmental Consequences

Valley Foothill Riparian Forest

Encroachment into the riparian corridor decreases its habitat value and function. The proposed project would result in approximately 0.45 acres of permanent impacts and approximately 1.80 acres of temporary impacts to riparian habitat along the Stanislaus River.

The project might also result in indirect impacts to the surrounding riparian habitat by increasing the amount of sediment in the river during construction; by removing large trees along the riparian corridor; by introducing or aiding in the spread of invasive plant species (refer to Section 2.3.5); and by increasing the amount of shade from the bridge, which might affect the vegetation underneath.

Implementation of the project avoidance and minimization efforts as well as the compensatory mitigation would reduce impacts to riparian habitat so there is no net loss of this valuable habitat type and reduce the spread of invasive plant species.

Valley Oak Woodland

The proposed project would result in approximately 0.06 acre of permanent impact and approximately 0.06 acre of temporary impact to valley oak woodland.

The proposed project would directly remove seven valley oak trees with an aggregate diameter at breast height of 100 inches. Valley oak trees that would be removed are located in Stanislaus County, which does not currently have an oak tree protection ordinance.

The project footprint is within the dripline of another nine valley oak trees with an aggregate diameter at breast height of 254.5 inches; six of which are in Stanislaus County and three of which are in San Joaquin County. Construction activities could result in compaction of the root system, removal of portions of the root system, extensive pruning to accommodate vehicular traffic, or other damage to the trees through the presence of vehicles or equipment. (See **Table 2.24** for a summary of valley oaks impacts.)

Within the project study area, project activities might result in the loss of oak woodland habitat from proposed vegetation disturbance or removal; disrupted reproduction depending on the time of year construction occurs; alteration or loss of canopy cover from proposed vegetation trimming; and noise, light, dust, and ground vibration during construction. Since the project study area contains remnants of valley oak woodland as opposed to large intact expanses of oak woodland, the habitat value for wildlife is narrowed.

Implementation of the project avoidance and minimization efforts as well as the compensatory mitigation would reduce impacts to valley oak woodland habitat so there is no-net-loss of this valuable habitat type.

Avoidance, Minimization, and/or Mitigation Measures

Valley Foothill Riparian Forest

During project development, the size of the work area limits has been reduced to the smallest amount feasible within sensitive habitat areas in order to minimize disturbance of sensitive natural communities.

<u>Temporary Construction Effects</u>

In order to minimize erosion, sedimentation, or runoff that may occur as a result of construction activities, the following measures would be implemented:

- The County would avoid or minimize potential construction-related water quality impacts through compliance with the State Water Quality Control Board (SWQCB) National Pollutant Discharge Elimination System (NPDES) General Permit for construction activities. The County would be responsible for filing a Notice of Intent with the SWQCB and the contractor would prepare a storm water pollution prevention program (SWPPP), developed by a qualified SWPPP practitioner, and implement an appropriate suite of temporary construction BMPs.

- Standard sediment control measures such as silt fencing, straw bale barriers, sediment traps, or other measures, could directly reduce the off-site transport of sediment from disturbed slopes.

- Vegetation that can be preserved shall be identified and flagged or fenced to avoid disturbance.

- Erosion in construction areas shall be controlled through the use of grading operations that eliminate direct routes for conveying runoff to drainage channels and use of soil stabilization BMPs such as mulching, erosion control fabrics, and/or reseeding with grass or other plants where necessary.

- Temporary concentrated flow conveyance systems, such as berms, ditches, and outlet-flow-velocity-dissipation devices to reduce erosion from newly disturbed slopes, shall be implemented.

- A qualified SWPPP Practitioner will identify, construct, regularly inspect, and maintain the BMPs in good working order.

- Development and implementation of coordinated drainage features with permanent post-construction BMPs would minimize potential water quality impacts associated with roadway runoff. The contractor would be responsible for constructing permanent post-construction stormwater BMPs in accordance with County standards, which would be identified and incorporated into the SWPPP. The SWPPP requirements would accommodate the additional drainage discharges generated by the project to avoid adverse effects such as off-site erosion, sedimentation, and water quality impairments. The County would be responsible for long-term inspection and maintenance of the permanent BMPs within their jurisdictional right-of-way to ensure that they are maintained in good working order.

- Any diversion of water necessary for project implementation will require the Contractor to prepare a water diversion plan that complies with all regulatory permits and agreements.

Accidental Spills

Construction specifications shall include the following measures to reduce potential impacts associated with accidental spills of pollutants (i.e., fuel, oil, grease, etc.) to vegetation and aquatic habitat resources:

- The construction contractor shall implement appropriate hazardous materials management practices to reduce the possibility of chemical spills or releases of contaminants, including any non-stormwater discharge. Standard hazardous materials management and spill control and response measures would minimize the potential for surface and groundwater contamination.

- Standard staging area practices for sediment-tracking reduction should also be identified where necessary, including vehicle washing and street sweeping.

Permanent Effects

The San Joaquin County General Plan requires that there be no net loss to riparian habitat from development. In addition, the County requires project proponents to mitigate impacts and fund habitat restoration and post-project monitoring. The County also prohibits the use of riprap above the high water line. The Stanislaus County General Plan has similar goals to protect riparian habitat. The following mitigation measures for permanent impacts to riparian habitat would be implemented:

1. Both San Joaquin and Stanislaus Counties would prefer to mitigate the loss of riparian habitat at a conservation bank within the project service area. The project proposes to mitigate for the permanent loss of 0.45 acre of riparian habitat at a 2:1 ratio at a conservation bank approved by the CDFG and the National Oceanic and Atmospheric Administration’s National Marine Fisheries Service (NOAA/NMFS).

2. If a conservation bank is unavailable to satisfy the credit needs for the proposed project, an in-lieu fee program with both the NOAA/NMFS and the CDFG is proposed.

3. If options 1 and 2 above are not deemed acceptable to the resource agencies, and where riparian habitat cannot be feasibility avoided, the County shall retain a qualified restoration ecologist to assist with identifying an appropriate mitigation

area within the Stanislaus River watershed no more than five miles from the project study area. Within the mitigation area, riparian habitat greater in size to the area impacted by implementation of the proposed project (minimum 2:1 ratio) shall be re-established and protected in perpetuity through a conservation easement. The restoration ecologist shall develop a Habitat Mitigation Plan that specifies the locations of riparian habitat creation, the plants and/or trees to be utilized, details on irrigation of habitat creation areas, and success criteria. A minimum five-year monitoring plan shall be enacted to ensure the long-term success of the newly vegetated area. Plantings shall have a minimal survival rate of 80 percent at the end of the five-year monitoring and maintenance period. If this rate is not met, the plan will require replanting and continued monitoring until a five-year success period is met. The County may also pay in-lieu fees at an approved mitigation bank instead of undertaking a riparian restoration project. Credits at the mitigation bank must be bought prior to the start of construction activities. The County is responsible for any costs associated with completion of this mitigation.

4. For areas of riparian habitat that require temporary disturbance, the County shall prepare and implement an on-site riparian Restoration Plan for disturbed riparian habitat. The plan shall comply with the revegetation requirements established in the environmental permits. The plan shall include onsite and/or offsite location(s) for replacement shrubs and trees, protection measures for replacement shrubs and trees that shall ensure that 80 percent of replacement plantings are alive three years following site revegetation, and monitoring measures, including construction monitoring, by a qualified biologist, arborist, or ecologist. The plan shall be approved by the appropriate resource agencies prior to implementation of the proposed project. Revegetation shall include the removal and monitoring of invasive exotic species like giant European reed and tree-of-heaven.

Oak Woodland

San Joaquin County has an oak ordinance that requires mitigation measures for oak tree removal (Chapter 9-1505; Ordinance 3675). In addition, Senate Concurrent Resolution No. 17 requires that state agencies undertake mitigation when native oaks are removed for projects within their discretion. The proposed project must be consistent with these requirements.

The following mitigation measures for impacts to oak woodland shall be implemented:

1. For oaks that will be preserved on site, construction activities may not compact soil, change grades or drainage near oaks. Environmentally Sensitive Area fencing must be installed prior construction. Irrigation and paving near the dripline (area directly located under the outer circumference of the tree branches) shall be minimized. Heritage trees (as defined through the San Joaquin County Oak Ordinance) may only be removed in the public interest and must be replaced 5:1 (five inches of DBH planted for every inch DBH removed).

2. For areas of oak woodland that may experience temporary effects, implementation of an on-site Restoration Plan shall occur n accordance with the revegetation requirements established in the requirements of the environmental permits but at no less than 1:1. Mitigation ratios, revegetation techniques and success criteria areas must be included in these requirements. A Restoration Plan shall be developed and provided to CDFW prior to implementation of the proposed project.

3. If native oak trees are removed, then they shall be replaced at a 3:1 ratio (three acorns/trees planted for every one removed). The mitigation shall comply with San Joaquin County codes and ordinances. **Table 2.24** below outlines the proposed mitigation. At a minimum, nine acorns/trees consisting of native oak species will be planted as mitigation for the potential impact to native oaks.

4. Impacts on woodland habitat and mitigation requirements shall be addressed in a Habitat Mitigation Plan as described. The County shall retain a qualified restoration ecologist to assist with identifying an appropriate mitigation area no more than ten miles from the project study area. Within the mitigation area, oak woodlands shall be re-established and protected in perpetuity through a conservation easement. The restoration ecologist shall develop an oak woodland replacement program that specifies the locations of oak woodland creation, the replacement trees to be utilized, details on irrigation of habitat creation areas, and success criteria. A minimum five-year monitoring plan shall be enacted to ensure the long-term success of the newly vegetated area. Plantings shall have a minimal survival rate of 80 percent at the end of the five-year monitoring and maintenance period. If this rate is not met, the plan will require replanting and continued monitoring until a five-year success period is met. The County may also pay in-lieu fees at an approved mitigation bank instead of undertaking a restoration project. Credits at the mitigation bank must be bought prior to the start of construction activities. The County is responsible for any costs associated with

completion of this mitigation. The mitigation shall comply with County codes and ordinances.

Table 2.24
Valley Oaks Directly Removed and Potentially Affected by the Proposed Project

Tree Tag #	Impact	San Joaquin Oak Protection	County	Aggregate Diameter at Breast Height (inches)	Mitigation Ratio*
643	Direct Removal	No	Stanislaus	15	3:1
644	Direct Removal	No	Stanislaus	16	3:1
645	Direct Removal	No	Stanislaus	6	3:1
646	Direct Removal	No	Stanislaus	12	3:1
647	Direct Removal	No	Stanislaus	16	3:1
648	Direct Removal	No	Stanislaus	22	3:1
660	Direct Removal	No	Stanislaus	13	3:1
637	Potential Impact	No	Stanislaus	8	3:1
653	Potential Impact	No	Stanislaus	35	3:1
654	Potential Impact	No	Stanislaus	42	3:1
658	Potential Impact	No	Stanislaus	18	3:1
661	Potential Impact	No	Stanislaus	53	3:1
688	Potential Impact	Native Oak	San Joaquin	18	3:1
689	Potential Impact	Native Oak	San Joaquin	16.5	3:1
691	Potential Impact	Native Oak	San Joaquin	22	3:1
776	Potential Impact	No	Stanislaus	42	3:1

*Stanislaus County does not currently have an adopted Oak Tree Ordinance. For the proposed project, Stanislaus County has agreed to mitigate for oak tree impacts using the guidelines outlined in the San Joaquin County Tree Protection/Retention Policy.

2.3.2 Wetlands and Other Waters

Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the Clean Water Act (CWA) (33 United States Code [USC] 1344) is the primary law regulating wetlands and surface waters. One purpose of the CWA is to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army of Engineers (USACE) with oversight by the United States Environmental Protection Agency (U.S. EPA).

USACE issues two types of 404 permits: Standard and General permits. There are two types of General permits, Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to authorize a variety of minor project activities with no more than minimal effects.

There are two types of Standard permits: Individual permits and Letters of Permission. Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE's Standard permits. For Standard permits, the USACE decision to approve is based on compliance with U.S. EPA's Section 404(b)(1) Guidelines (U.S. EPA 40 Code of Federal Regulations [CFR] Part 230), and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines were developed by the U.S. EPA in conjunction with USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

The Executive Order for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this EO states that a federal agency, such as the FHWA and/or Caltrans, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the California Department of Fish and Game (CDFG), the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCB). In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or Tahoe Regional Planning Agency) may also be involved. Sections 1600-1607 of the California Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFG before beginning construction. If CDFG determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFG jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFG.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The RWQCB also issues water quality certifications for impacts to wetlands and waters in compliance with Section 401 of the CWA.

Under the Rivers and Harbors Appropriations Act of 1899, any construction affecting navigable waters may require permits. Navigable waters are defined as those subject to the ebb and flow of the tide and susceptible to use in their natural condition or by reasonable improvements as means to transport interstate or foreign commerce. The USACE grants or denies permits based on the effects on navigation. Most activities covered under this act are also covered under Section 404 of the Clean Water Act.

Affected Environment

A routine on-site determination of jurisdictional waters, including wetlands, was conducted within the project study area on August 20 and September 1, 2009. A Preliminary Wetland Delineation Report was prepared in September 2009 and the preliminary jurisdictional determination was approved by the USACE on March 29, 2010.

Findings of this determination are that potential jurisdictional features occur within the proposed project study area. **Table 2.25** and **Figure 2-14** summarize the acreage of jurisdictional features within the project study area.

Table 2.25
Summary Jurisdictional Waters within the Project Study Area

Feature Type	Linear Feet	Acres	Determination	Reason for Determination
River (Stanislaus River)	390	1.46	Jurisdictional	Traditional Navigable Waterway
Open Water (SSJID/OID Joint Main Canal)	360	0.43	Jurisdictional	Connection to Traditional Navigable Waterway
Overflow Channel (SSJID/OID Joint Main Canal)	77	0.02	Jurisdictional	Connection to Traditional Navigable Waterway
Total	**827**	**1.91**		

A total of 1.91 acres (827 linear feet) of jurisdictional waters comprising a river and open water occur within the project study area.

Environmental Consequences

The proposed project would temporarily affect approximately 0.442 acre and permanently affect (or fill) approximately 0.002 acre of riverine habitat. The temporary impacts include the water diversion with the use of temporary fill for work within the ordinary high water mark (OHWM) of the Stanislaus River. Permanent and temporary impacts to the SSJID overflow channel would occur due to the intersection improvements at East River Road and McHenry Avenue; permanent impacts include 0.007 acre and temporary impacts include 0.004 acre of waters of the U.S (**Figure 2-15**). Except for the replacement of the SSJID Canal Bridge in the northern portion of the project study area, which would permanently affect 0.032 acre and temporary impact 0.188 acre of open water near and under McHenry Avenue (**Figure 2-16**), there would be no other effects to the man-made canal. **Table 2.26** lists the jurisdictional features within the project study area and the permanent and temporary impacts to these features from the proposed project.

Table 2.26
Quantitative Impacts of the Project on Jurisdictional Features

Aquatic Communities	Total Area in Project Study Area	Approximate Area of Disturbance	
		Acres of Permanent Impacts	Acres of Temporary Impacts
Riverine (Stanislaus River)*	1.46	0.002	0.442
Open Water (SSJID/OID Main Canal)*	0.43	0.032	0.188
Overflow Channel	0.02	0.007	0.004
Total	1.91	**0.041**	**0.634**

Source: Results of mapping efforts by PMC in 2009.
**This includes the area under McHenry Avenue.*

Avoidance, Minimization, and/or Mitigation Measures

- During project development, the size of the work area limits has been reduced to the smallest amount feasible within wetland and water areas.
- Impacts to the water quality of the river would be minimized by implementing BMPs and an erosion and sediment control plan.
- To reduce potential impacts to vegetation and aquatic habitat associated with accidental spills of pollutants (i.e., fuel, oil, grease, etc.), the construction contractor would implement appropriate hazardous materials management practices to reduce the possibility of chemical spills or releases of contaminants, including any non-storm water discharge.
- In addition, standard staging area practices for sediment-tracking reduction should also be implemented where necessary, including vehicle washing and street sweeping.

In addition to the avoidance and minimization measures, the County will execute a Restoration Plan with three years of monitoring for the temporary degradation of riparian habitat. The specific goals and criteria will aim to fully restore the functions and values to levels that are statistically identical or superior to that of adjacent habitat.

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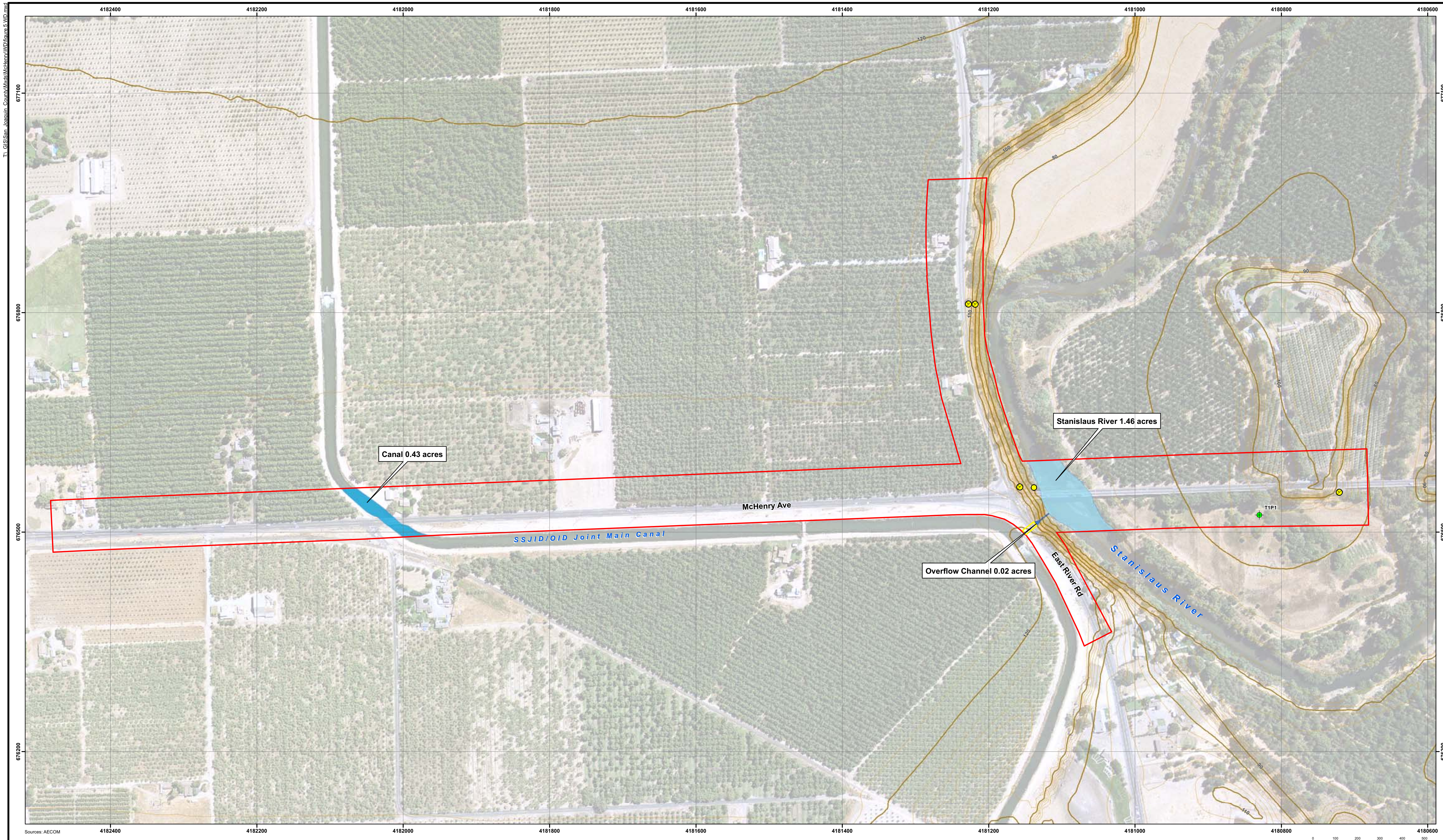
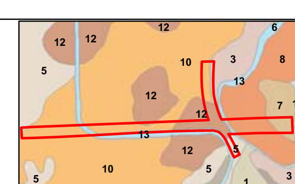


Legend

- Culvert
- Data Point
- Interim Contour
- Index Contour
- Culvert
- Project Study Area (42.59 ac)

Waters of the US

- Stanislaus River (1.46 ac)
- Canal (0.43 ac)
- Overflow Channel (0.02 ac)



Legend

- 1, Chuloak coarse sandy loam
- 2, Columbia fine sandy loam, channeled, partially drained
- 3, Columbia fine sandy loam, partially drained
- 4, Delhi fine sand
- 5, Delhi loamy sand
- 6, Dello sand, partially drained
- 7, Grangeville fine sandy loam
- 8, Grangeville very fine sandy loam
- 9, Gravel Pits
- 10, Honcut sandy loam
- 11, Riverwash
- 12, Veritas fine sandy loam
- 13, Water

SCALE: 1" = 200'
Escalon Quadrangle
HUC - 18040002
T02S R09E Sec. 9, 16, 17
UTM Zone 10 NAD 83

Figure 2-14 Wetland Delineation Map for the McHenry Avenue Corridor Improvements Project

Delineated By: Angela Calderaro **Drafted By: John DeMartino**

PMC

Date: 09/12/09

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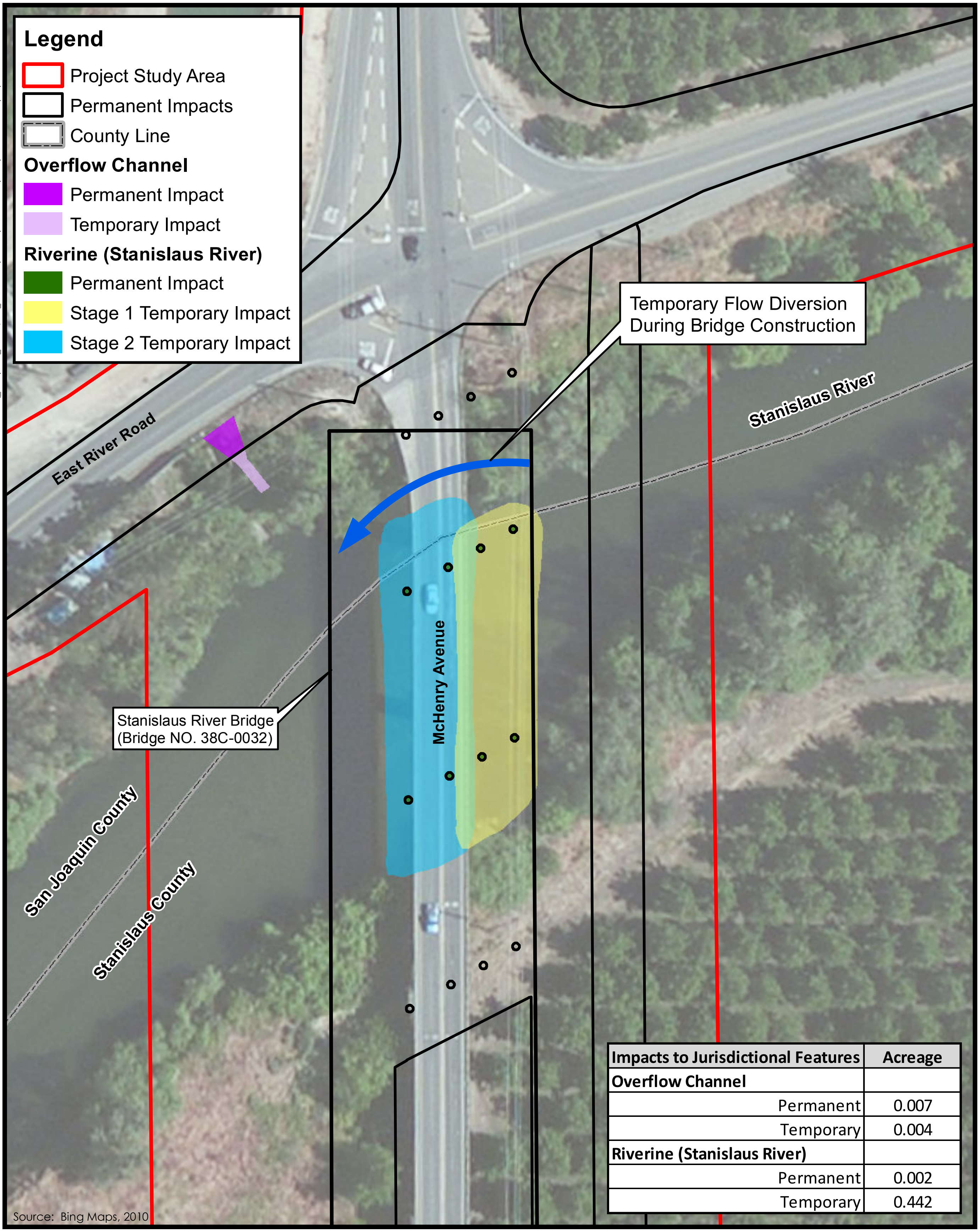

Impacts to Jurisdictional Features	Acreage
Overflow Channel	
Permanent	0.007
Temporary	0.004
Riverine (Stanislaus River)	
Permanent	0.002
Temporary	0.442

30 0 30
FEET
N

McHenry Avenue Widening
RPSTPLE-5929(196)
Replacement of Stanislaus River Bridge (Bridge No. 38C-0032) on McHenry Avenue
BRLS-5929(166)
Replacement of SSJID Bridge (Bridge No. 29C-0166) on McHenry Avenue
BRLS-5929(167)

Figure 2-15
Impacts to Jurisdictional Features (Southern Portion of PSA)

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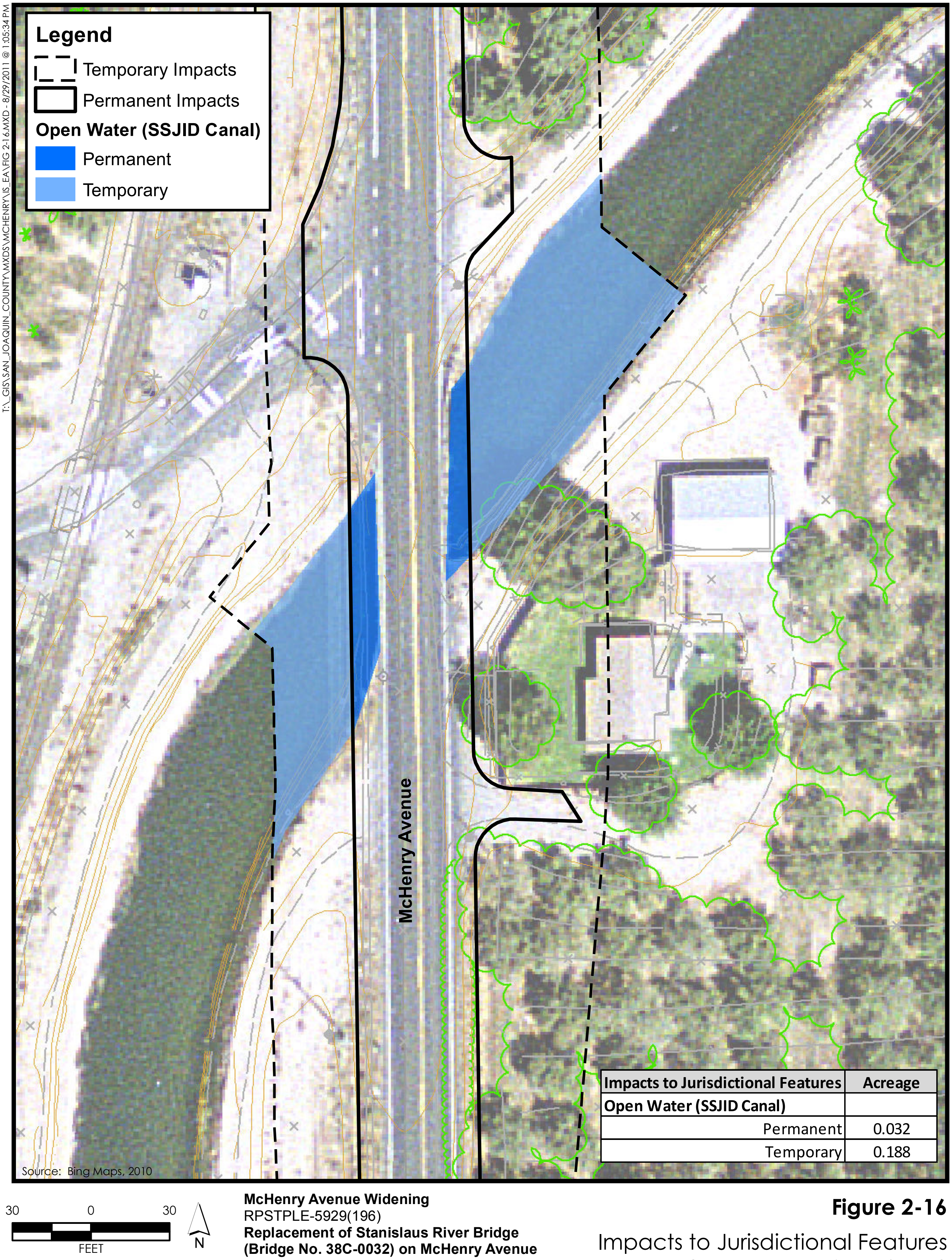
T:_GIS\SAN_JOAQUIN_COUNTY\MXDS\MCHENRY\IS_EA\FIG 2-16.MXD - 8/29/2011 @ 1:05:34 PM



Impacts to Jurisdictional Features	Acreage
Open Water (SSJID Canal)	
Permanent	0.032
Temporary	0.188

McHenry Avenue Widening
RPSTPLE-5929(196)
Replacement of Stanislaus River Bridge (Bridge No. 38C-0032) on McHenry Avenue
BRLS-5929(166)
Replacement of SSJID Bridge (Bridge No. 29C-0166) on McHenry Avenue
BRLS-5929(167)

Figure 2-16
Impacts to Jurisdictional Features (Northern Portion of PSA)

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For permanent removal of 0.002 acre of jurisdictional riverine habitat, the County shall require either replacement of affected acreage at a minimum of 1:1 ratio (one acre must be created for every acre lost) at an USACE approve mitigation bank or payment of in-lieu fees per the no-net-loss policy of the USACE.

For temporary impacts to 0.442 acre of jurisdictional riverine habitat, the County shall restore the area to pre-construction conditions. Restoration plans shall be coordinated by a qualified biologist pursuant to, and through consultation with, USACE, NMFS and CDFG.

2.3.3 Animal Species

Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA/NMFS), and the California Department of Fish and Game (CDFG) are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the state or federal Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in Section 2.3.4 below. All other special-status animal species are discussed here, including CDFG fully protected species and species of special concern, and USFWS or NOAA/NMFS candidate species.

Federal laws and regulations pertaining to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations pertaining to wildlife include the following:

- California Environmental Quality Act
- Sections 1600–1603 of the Fish and Game Code
- Section 4150 and 4152 of the Fish and Game Code

Affected Environment

A Natural Environment Study was prepared for the proposed project in July 2011 and approved on October 18, 2011. As part of that effort, a list of special-status species and habitats that have the potential to occur within the project study area or vicinity was prepared using information provided by the CDFG's California Natural Diversity Database (CNDDB) Rarefind program (2009a; updated 2011), CNDDB online Quickviewer (CDFG 2009b; updated 2011), and the California Native Plant Society online inventory (2009; updated 2011). In addition, a formal list of special-status species with the potential to occur in the project study area was obtained from USFWS in order to develop a comprehensive list of special-status species to be evaluated in this report (USFWS 2009a; updated 2011).

Biological surveys and wildlife habitat assessments were performed within the project study area on August 19 and September 1, 2009.

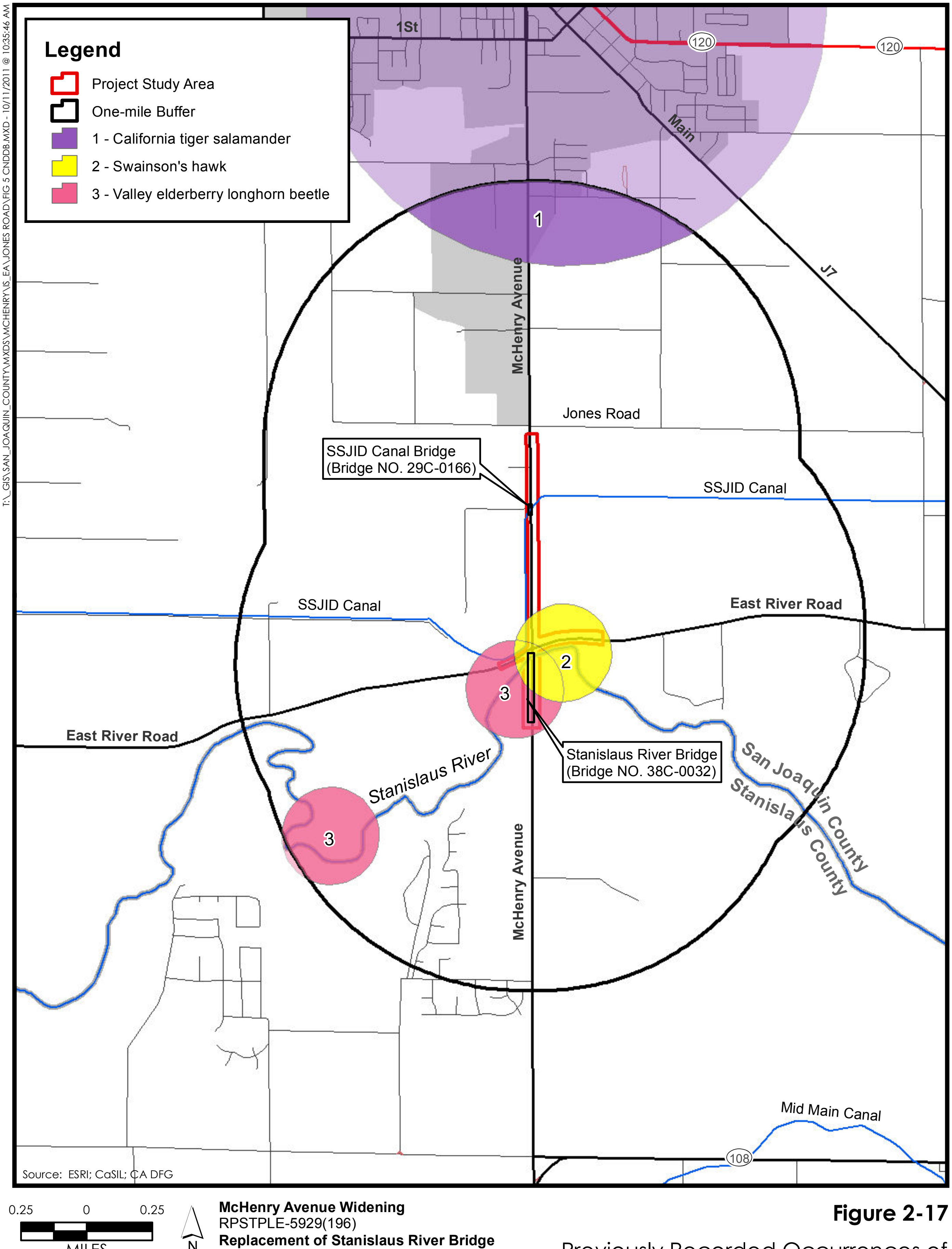
Figure 2-17 shows the previously recorded occurrences of special-status species within a 1-mile radius of the project study area. **Table 2.27** presents special-status species that have the potential to occur in the project study area and therefore are considered in this analysis. Special-status species were considered for this analysis based on field survey results, database search results, relevant literature, and professional expertise.

Table 2.27
Special-Status Species Considered in the Impact Analysis

Species	Federal Status	State Status
Hardhead	N/A	Species of Concern
Chinook salmon	Essential Fish Habitat	Species of Concern
Western pond turtle	N/A	Species of Concern
Yellow-breasted chat	N/A	Species of Concern
Pallid bat	N/A	Species of Concern
Western mastiff bat	N/A	Species of Concern
Western red bat	N/A	Species of Concern

Source: USFWS 2009a, 2011; CDFG 2009a/b, 2011; CNPS 2009, 2011.

T:_GIS\SAN_JOAQUIN_COUNTY\MXDS\MCHENRY\IS_EA\JONES ROAD\FIG 5 CNDDB.MXD - 10/11/2011 @ 10:35:46 AM



McHenry Avenue Widening
RPSTPLE-5929(196)
Replacement of Stanislaus River Bridge (Bridge No. 38C-0032) on McHenry Avenue
BRLS-5929(166)
Replacement of SSJID Bridge (Bridge No. 29C-0166) on McHenry Avenue
BRLS-5929(167)

Figure 2-17

Previously Recorded Occurrences of Special Status Species within a One-mile Radius of the Project Study Area

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Chinook Salmon and Hardhead

The Chinook salmon (*Oncorhynchus tshawytscha*) is a designated CDFG fish species of special concern. Both the Central Valley Chinook salmon spring-run and winter-run environmentally significant units have historical populations within the Stanislaus River; however, both environmentally sensitive units no longer occur within the Stanislaus River. Fall- and late-fall-run Chinook salmon, a CDFG species of concern, is known to occur within the project study area of the Stanislaus River.

The hardhead (*Mylophardon conocephalus*) is a designated CDFG fish species of special concern. Hardhead are typically found in undisturbed areas of larger low- to mid-elevation streams. Hardhead are always found in association with Sacramento pike minnow and usually with Sacramento sucker (*Catostomus occidentalis*).

Western Pond Turtle

Western pond turtle (*Actinemys marmorata*) is a California species of special concern. The western pond turtle includes two subspecies, the northwestern pond turtle (*A. m. marmorata)* and the southwestern pond turtle (*A. m. pallida*). The two subspecies range is interconnected within and around the San Francisco Bay Area. Pond turtles generally occur in streams, ponds, freshwater marshes, and lakes. They require still or slow moving water with in-stream emergent woody debris, rocks, or other similar features for basking sites. Nests are typically located on unshaded upland slopes in dry substrates with clay or silt soils. Suitable habitat is present within the Stanislaus River and surrounding uplands within the project study area. There are two previously recorded occurrences of this species within a 10-mile radius of the project study area (CDFG 2009a).

The riverine habitat (Stanislaus River) located within the project study area represents suitable habitat for the western pond turtle. Species-specific surveys were not conducted; their presence within the project study area is assumed until the species is found within the project study area.

Yellow-Breasted Chat

Yellow-breasted chat (*Icteria virens*) is a California species of special concern and their nests are protected under the Migratory Bird Treaty Act (MBTA). The yellow-breasted chat is a migrant species that nests in riparian habitats along rivers and streams at an elevation up to 4,800 feet on the west side of the Sierra Nevada. Preferred habitats include dense thickets and brush, often with thorns, streamside tangles, and dry brushy hillsides. This species typically breeds from May to July. Suitable habitat for yellow-breated chat is present within the riparian habitat surrounding the Stanislaus River. There are no previously recorded occurrences within a 10-mile radius of the project study area.

Raptors and Other Migratory Birds

Many bird species are migratory and fall under the jurisdiction of the MBTA. Various migratory birds and raptor species, in addition to those described in detail above, have the potential to inhabit the project vicinity. Oak titmouse (*Baeolophus inornatus*), snowy egret (*Egretta thula*), and great blue heron (*Ardea herodias*), among others, are known to occur within the project study area. For instance, swallow nests were observed under the Stanislaus River Bridge structure. Some raptor species, such as red-tailed hawk (*Buteo jamaicensis*) and American kestrel (*Falco sparverius*), are not considered special-status species because they are not rare or protected under the federal Endangered Species Act (FESA) or California Endangered Species Act (CESA); however, the nests of all raptor species are protected under the MBTA and Section 3503.5 of the Fish and Game Code. Migratory birds forage and nest in multiple habitats such as annual grasslands and riparian oak woodlands. The nests of all migratory birds are protected under the MBTA, which makes it illegal to destroy any active migratory bird nest. The trees found within the project study area and in the vicinity provides potential nesting habitat for raptors and migratory birds that occur in the region. Although no active large stick nests or signs of old or previously used nests were observed during field visits, there are numerous trees within the project study area that could serve as nesting habitat for raptors. Tree swallows were actively nesting within a cottonwood snag to the east of the Stanislaus River Bridge over the Stanislaus River on the north bank at the time of the site visits. In addition, swallow nests were observed on the bridge structure.

Special-Status Bats

Special-status bat species including pallid bat (*Antrozous pallidus*), western mastiff bat (*Eumops perotis californicus*), and western red bat (*Lasiurus blossevillii*) are known to occur in the vicinity of the project study area. These species are California species of special concern due to recent population declines. These species are widely distributed throughout California; however, many of these species are rare within these overall ranges. Habitat for bat species consists of foraging habitat, night roosting cover, maternity roost sites, and winter hibernacula. These bat species may forage within a variety of habitats. In general, the CDFG is most concerned about the loss of maternity roosting sites. Suitable roosting sites within these habitats include caves, rock crevices, cliffs, buildings, tree bark, and snags. The great majority of bat roosts are used only seasonally, so there is usually some period when bats are not present. Although there are differences between species, maternity sites are generally occupied between May and September and hibernation sites between October and March, depending on the weather.

Potential maternity and night roosting sites occur in snags, under bark, and in human structures (i.e. the Stanislaus River Bridge) within the project study area. The remains of a California bat (*Myotis californicus*) were observed under the Stanislaus River Bridge on the north bank directly south of the intersection at East River Road, below a small chipped fracture in the bridge. This small crevice is not expected to support a large population of bats. No other crevices were observed under the bridge. Further inspection of the bridge by a Caltrans biologist confirmed the lack of bat habitat or signs of bat (urine stains or bat guano).

Environmental Consequences

Chinook Salmon and Hardhead

Direct Impacts

Hardhead and fall- and late-fall-run Chinook salmon are known to occur or could occur within the Stanislaus River in the project study area. The proposed project has the potential to impact water quality in the Stanislaus River during construction activities. In addition, the removal and installation of support columns may also negatively affect the riverbed and banks of the Stanislaus River.

During construction, diversion of the Stanislaus River at the construction site would be required to remove the existing bridge superstructure and piers, place temporary falsework, and construct the new bridge. A temporary embankment/work pad(s) would be constructed of water bladders, clean, local fill material, and/or other methods that would not result in notably degraded water quality and are proposed for use to divert the flow and maintain dry conditions around the work area. The fill would be temporary (all fill would be removed after the completion of the project or need for falsework) and would be accomplished in two phases.

The proposed project would temporarily affect 0.442 acre and permanently affect (or fill) 0.002 acre of riverine habitat. The temporary impacts include water diversion with the use of temporary fill for work within the OHWM of the Stanislaus River.

The dewatering of the river and placement of the temporary fill may adversely affect steelhead, as salvaging fish during dewatering may induce stress on individual fish (take through harassment) or result in death of individual fish during salvage and transport.

Indirect Impacts

In addition to impacts to the Stanislaus River, the proposed project would also impact riparian vegetation associated with the Stanislaus River, which could indirectly affect hardhead and fall- and late-fall-run Chinook salmon in the river. Activities related to the construction of the proposed project would result in localized loss of vegetation (permanent loss of 0.45 acre of riparian vegetation), general disturbance to the soil, and an increase in impervious surfaces. Removal of vegetation and soil can accelerate erosion processes within the project study area and increase the potential for sediment to enter into the river, which has the potential to contain special-status species. Aquatic organisms are generally not directly affected by suspended solids and turbidity unless they reach extremely high levels (i.e., levels of suspended solids reaching 25 milligrams per liter). At these high levels, suspended solids can adversely affect the physiology of aquatic organisms and may suppress photosynthetic activity at the base of food webs, thereby impacting aquatic organisms either directly or indirectly. The soils on the north bank of the Stanislaus River are particularly susceptible to erosion. It should be noted that the loss of riparian vegetation would be offset to a degree by the construction of the widened bridge over the Stanislaus River. The new bridge would provide approximately an additional 0.16 acres of shade along the vegetated bank of the river and an additional approximately 0.22 acre of shade on the river.

The construction of the bridge under flowing water conditions could result in the release of high levels of sedimentation and debris into downstream aquatic habitat. Temporary construction activities could increase sediment and urban runoff into waterways that could result in impacts to the aquatic environment.

Construction activities typically include the refueling of construction equipment on location. As a result, minor fuel and oil spills may occur, with a risk of larger releases. Without rapid containment and cleanup, these materials could be potentially toxic depending on the location of the spill in proximity to water features. Oils, fuels, and other contaminants could directly affect aquatic organisms, including special-status species that inhabit the creek on and off the project site. Accidental spills within the project work site and into waterways could result in adverse impacts to the aquatic environment. The avoidance and minimization measures would reduce effects from erosion, sedimentation, runoff, and accidental spills.

Western Pond Turtle

Direct Impacts

Implementation of the project would result in temporary disturbance and permanent alteration of upland habitat near the Stanislaus River that could support potential egg-laying or overwintering habitat for the western pond turtle. The proposed project would also directly affect the turtle's aquatic habitat within the Stanislaus River**.** The proposed project would result in direct removal of less than 0.002 acre of riverine habitat, which may provide foraging habitat for the species. In addition, the proposed project would result in temporary disturbance to 0.442 acre of riverine habitat during construction activities. In addition to impacts to the Stanislaus River, the proposed project would also impact riparian vegetation associated with the Stanislaus River, which could affect nesting turtles along the banks of the river. Activities related to the construction of the proposed project would result in localized loss of vegetation (permanent loss of 0.45 acre of riparian vegetation).

Indirect Impacts

Indirect impacts occur for a number of reasons, though primarily through increased human/wildlife interactions, encroachment by exotic weeds, and area-wide changes in surface water flows due to development of previously undeveloped areas.

Yellow-Breasted Chat

Direct Impacts

The project study area contains suitable nesting habitat for yellow-breasted chat. Construction of the project would result in the removal of riparian habitat, including shrubby vegetation where this species may nest. If nesting yellow-breasted chats are present during project construction, the proposed project may cause direct mortality to this species of special concern by removal of vegetation that contain active nests. If construction occurs during the non-nesting season, no impacts are expected; however, if construction activities were scheduled to occur during the nesting season, measures would be necessary to avoid potential impacts to migratory birds and their nests.

Construction activities that require the disturbance of vegetation could cause direct impacts to nesting birds, if birds are actively nesting during construction activities. Removal of habitat within the project study area would be considered a direct and significant impact if any of these species were taken or deterred from traditional nesting or foraging locations.

Indirect Impacts

Excessive noise, disturbance, and vibrations can cause nesting birds to abandon their nests. Construction could also result in noise, dust, increased human activity, and other indirect impacts to bird species in the project vicinity. Potential nest abandonment, mortality to eggs and chicks, and stress from loss of foraging areas would also be considered potentially significant impacts.

Raptors and Other Migratory Birds

Direct Impacts

The project study area contains several large trees suitable for nesting. Construction of the project would result in the removal of several large trees. If nesting raptors are present during project construction, the proposed project may cause direct mortality to raptors or migratory birds by removal of trees that contain active nests. The loss of active nests or direct mortality is prohibited by the MBTA and FGC Section 3503.5. If construction occurs during the non-nesting season, no impacts are expected; however, if construction activities were scheduled to occur during the nesting season, measures would be necessary to avoid potential impacts to migratory birds and their nests.

Construction activities that require the disturbance of trees and other vegetation could cause direct impacts to nesting raptors and migratory birds, if birds are actively nesting during construction activities. Removal of habitat within the project study area would be considered a direct and adverse impact if any of these species were taken or deterred from traditional nesting or foraging locations.

Indirect Impacts

Excessive noise, disturbance, and vibrations can cause nesting raptors to abandon their nests. Construction could also result in noise, dust, increased human activity, and other indirect impacts to nesting raptor or migratory bird species in the project vicinity. Potential nest abandonment, mortality to eggs and chicks, and stress from loss of foraging areas would also be considered potentially adverse impacts.

Special-Status Bats

If maternity roost sites are located within the project study area during construction activities, the proposed project has the potential to directly and indirectly affect special-status bat species. Bats are at their most vulnerable in buildings or other roost sites during the summer, when large numbers may be gathered together and young bats, unable to fly, may be present. Removal of maternity roost sites may cause direct mortality of numerous bats. Noise and dust from construction could indirectly affect bat species during construction.

Avoidance, Minimization, and/or Mitigation Measures

Chinook Salmon and Hardhead

The following avoidance and minimization efforts would be implemented to reduce impacts to the special-status fish species:

1. Construction activities within the Stanislaus River would be limited to the period between June 15 and October 15. To minimize risk of direct take, placement of the temporary in-river fill would be conducted outside of the peak migration period. Migration period is November through May.

2. Before any activities begin on the project, a biologist would conduct a Worker Environmental Awareness Program (WEAP) for all construction personnel.

3. A fish salvage program would be developed and implemented, which would reduce direct take of fish during the construction and placement of the water bladders, pier placement, and dewatering (temporary fill).

4. Placement of the temporary fill would be done so that fish would be able to pass through the project site at all times.

5. All pumped water would be routed to either (1) a sedimentation pond located on a flat stable area above the ordinary high water mark that prevents silt-laden runoff from entering the river, or (2) a sedimentation tank/holding facility that allows only clear water to return to the river and includes disposal of settled solids at an appropriate off-site location.

6. The construction of the proposed bridge using cast-in-place concrete would require the installation of falsework to support the concrete forms within the active waterway of the Stanislaus River. Installation of falsework piling and access shoring within the active waterway area would be permitted only if a vibratory pile hammer is used. Furthermore, any in-water work would be confined within the work windows proposed in the January 2011 Biological Assessment and the Natural Environment Study.

7. A storm water pollution protection plan (SWPPP) would be created and implemented to ensure the proper installation and maintenance of sediment control measures. Implementation of the SWPPP would be phased for the suitable timing for dry-weather protective measures and rainy season protective measures.

8. All refueling, maintenance, and staging of equipment and vehicles would occur at least 60 feet from riparian habitat or water bodies and not in a location from where a spill would drain directly toward aquatic habitat.

9. All temporary disturbed areas would be restored to pre-construction conditions upon completion of construction using appropriate seed mixes or plantings.

These avoidance and minimization measures are those that are typically required by the NMFS, USACE, and CDFG for bank stabilization and channel work, and they are non-discretionary.

Western Pond Turtle

During project development, the size of the work area limits has been reduced to the smallest amount feasible within sensitive habitat areas.

- Additional impacts from habitat disturbance would be avoided by installing protective silt fencing between the aquatic habitats and the construction area limits to prevent accidental disturbance during construction and to protect water quality within the aquatic habitats during construction.

- Standard BMPs would be implemented during and after construction to protect water quality in sensitive habitat areas during construction.

- A preconstruction survey for western pond turtle shall be conducted three days prior to the onset of construction activities adjacent to the Stanislaus River, and every subsequent day while activities occur adjacent to the Stanislaus River. The survey area shall encompass a 100-foot radius of the area to be affected. If juvenile or adult turtles are found within the survey area, the individuals should be moved at least 500 feet downstream of the survey area in suitable habitat. If a turtle nest is found within the survey area, construction activities should not take place within 100 feet of the nest until the turtles have hatched, or the eggs have been moved to an appropriate location.

The County would provide a WEAP for all employees working within the project area so that they are aware of resources in the area, required measures and practices for protecting biological resources, and contacts and procedures in case wildlife is injured or encountered during construction.

Yellow-Breasted Chat

During project development, the size of the work area limits has been reduced to the smallest amount feasible within sensitive habitat areas.

- To prevent impacts to MBTA-protected birds and their nests removal of trees will be limited to only those necessary to construct the proposed project.

- If construction or vegetation removal is proposed during the breeding/nesting season for local avian species (typically February 15th through August 31st), a focused survey for active nests migratory birds within and in the vicinity of (no less than 250 feet outside project boundaries, where possible) the project site shall be conducted by a qualified biologist. Two surveys will be conducted, at least one week apart, with the second survey occurring no more than two days prior to tree removal. If no active nests are found, vegetation removal or construction activities may proceed.

- If an active nest is located during pre-construction surveys, USFWS and/or CDFG (as appropriate) shall be notified regarding the status of the nest. Furthermore, construction activities shall be restricted as necessary to avoid disturbance of the nest until it is abandoned or the biologist deems disturbance potential to be minimal. Restrictions may include establishment of exclusion zones (no ingress of personnel or equipment at a minimum radius of 100 feet (30 meters) around an active migratory bird nest) or alteration of the construction schedule.

- No action is necessary if no active nests are found or if construction will occur during the non-breeding season (generally September 1st through February 28th).

Raptors and Other Migratory Birds

The avoidance and minimization measures listed for yellow-breasted chat would apply to other species of raptors and migratory birds.

It is recommended that if construction occurs on the existing and/or new bridge between February 1 and September 15, then several measures must be implemented to protect active swallow nests in accordance with consultation with the CDFG. These measures may include the following:

- Prior to the arrival of migratory birds to the project area (generally between September 16 and February 1st), all swallow nests should be removed from the sides and underside of the bridge structures. High-powered water and/or a long pole can be used to remove all the nests off the bridge undercrossings.

- Prior to the arrival of migratory birds to the project area (generally between September 16th and January 31st), and after the nests have been removed, exclusionary methods under the bridge structures should be implemented by a qualified contractor. The exclusion should include placing netting on the bridge undercrossings that provides a physical barrier between birds and the areas of the bridge where they would like to construct new nests. The mesh size of the netting should be in the range of ½ to ¾ inch. The net should have no loose pockets or wrinkles that could trap and entangle birds. Attach netting using hooks, if possible, which will make it easier to put the netting on and off the bridge undercrossings. Exclusionary devices shall be installed for at least ten calendar days prior to bridge undercrossing demolition.

- If construction is to begin during the nesting season (between February 1st and September 15th), a survey shall be conducted to determine if birds are nesting on the bridge undercrossings; however, completed nests between February 1st and September 15th cannot be touched without a permit from the USFWS or CDFG, as applicable.

Special-Status Bats

- Prior to initiation of construction activity, a bat survey shall be performed by a wildlife biologist or other qualified professional between March 1 to July 31 in the year prior to the removal of any trees or structures. If bat roosts are identified on site, the County shall require that the bats be safely flushed from the sites where roosting habitat is planned to be removed prior to roosting season (typically May to August) of each construction phase prior to the onset of construction activities. If maternity roosts are identified during the maternity roosting season (typically May to August) they must remain undisturbed until a qualified biologist has determined the young bats are no longer roosting. If roosting is found to occur onsite, replacement roost habitat (e.g., bat boxes) shall be provided onsite for roosting sites removed. If no bat roosts are detected, then no further action is required if the trees and buildings are removed prior to the next breeding season. If removal is delayed, then an additional pre-demolition survey shall be conducted 30 days prior to removal to ensure that a new colony has not established itself.

- If a female or maternity colony of bats are found within the project study area, the project can be constructed without the elimination or disturbance of the roosting colony (e.g., if the colony roosts in a large oak tree not planned for removal), a wildlife biologist shall determine what physical and timed buffer zones shall be employed to ensure the continued success of the colony. Such buffer zones may include a construction-free barrier of 200 feet from the roost and/or the timing of the construction activities outside of the maternity roost season (after July 31 and before March 1).

- If an active nursery roost is known to occur on site and the project cannot be conducted outside of the maternity roosting season, bats shall be excluded from the site after July 31 and before March 1 to prevent the formation of maternity colonies. Non-breeding bats shall be safely evicted, under the direction of a bat specialist.

2.3.4 Threatened and Endangered Species

Regulatory Setting

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act (FESA): 16 United States Code (USC) Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. This act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the Federal Highway Administration (FHWA), are required to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service) to ensure that they are not undertaking, funding, permitting or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a Biological Opinion with an Incidental Take statement, a Letter of Concurrence and/or documentation of a no effect finding. Section 3 of FESA defines take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct.”

California has enacted a similar law at the state level, the California Endangered Species Act (CESA), California Fish and Game Code Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project caused losses of listed species populations and their essential habitats. The California Department of Fish and Game (CDFG) is the agency responsible for implementing CESA. Section 2081 of the Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFG. For species listed under both FESA and CESA requiring a Biological Opinion under Section 7 of the FESA, CDFG may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the California Fish and Game Code.

Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act of 1976, was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

Affected Environment

A Natural Environment Study was completed for the proposed project in July 2011. A Biological Assessment was also prepared for the proposed project in January 2011. A list of special-status species and habitats that have the potential to occur within the project study area or vicinity was prepared using information provided by the CDFG’s California Natural Diversity Database (CNDDB) Rarefind program (2009a; updated 2011), CNDDB online Quickviewer (CDFG 2009b; updated 2011), and the California Native Plant Society online inventory (2009; updated 2011). In addition, a formal list of special-status species with the potential to occur in the project study area was obtained from USFWS in order to develop a comprehensive list of special-status species to be evaluated in this report (USFWS 2009a; updated 2011).

When the USFWS lists a species as threatened or endangered under the FESA, areas of habitat considered essential to its conservation and survival may be designated as critical habitat. These areas may require special consideration and/or protection due to their ecological importance. Potential critical habitat designations within the general vicinity of the project study area were checked using the USFWS Critical Habitat Portal (2009b; updated 2011). The project area contains critical habitat for Central Valley steelhead.

Biological surveys and wildlife habitat assessments within the project study area were performed on August 19 and September 1, 2009. Concurrently, a protocol-level valley elderberry longhorn beetle (VELB) survey was conducted within the project study area. A 50-foot buffer around the grading/clearing limits for the project was surveyed on May 9 and 10, 2011.

Pursuant to FESA, formal Section 7 consultation with both USFWS and NOAA/NMFS has been undertaken. Caltrans initiated Section 7 consultation with USFWS on the VELB through its January 28, 2011 transmittal of the Biological Assessment. On June 7, 2011, the USFWS issued a non-jeopardy Biological Opinion for impacts to federally listed species and their habitats within their jurisdiction (USFWS 81420-2011-F-0289-1).

Caltrans initiated the formal Section 7 consultation and conferencing with NOAA/NMFS on this project in February 2011, with submittal of a Biological Assessment. On May 9, 2011, formal consultation and conferencing was initiated by NOAA/NMFS' Central Valley Office. The BA incorporated recommendations and addressed NMFS comments as discussed in meetings, correspondence, and emails. NOAA/NMFS issued its non-jeopardy biological and conference opinion (BO) for the proposed project and its effects on California Central Valley (CV) steelhead *(Oncorhynchus mykiss)* and its designated critical habitat, on September 13, 2012. Caltrans sent an e-mail to NOAA/NMFS on September 18, 2012 to propose minor changes and clarifications to the language of the BO. NOAA/NMFS responded in a letter on December 7, 2012 approving revisions to the terms and conditions in the BO.

Appendix D contains copies of the Biological Opinions and other pertinent Section 7 correspondence, including the November 27, 2012 species list and clarification documentation from December 2012.

Valley Elderberry Longhorn Beetle

The federally threatened valley elderberry longhorn beetle is dependent on elderberry shrubs for breeding and feeding habitat. Elderberry shrubs are a common component of riparian forests and adjacent upland habitats in California's Central Valley. The VELB spends most of its life in the larval stage, living within the stems of the elderberry plant. USFWS considers all elderberry shrubs with stems one inch or greater diameter at ground level within the species' range to be potential habitat.

The VELB is a medium-sized wood-boring beetle that is approximately two (2) centimeters in length. Due to the obligate relationship with elderberry shrubs, all life history phases of the VELB are closely associated with elderberry. The life cycle takes one or two years to complete.

There are 33 elderberry shrubs or clumps with approximately 611 stems within the project study area. A clump includes all the stems or shoots within 10 to 30 feet of each other without a significant break in the canopy cover. Exit holes were observed on some of the shrubs. Within the project study area, there are several elderberry stems measuring less than one inch at ground level. Technically these are not considered VELB habitat and therefore they were not mapped or counted.

Central Valley Steelhead

The Central Valley steelhead (*Oncorhynchus mykiss*) is an anadromous rainbow trout. The Central Valley evolutionarily significant unit (ESU) of steelhead includes the Sacramento and San Joaquin rivers, along with all of their tributaries. Their numbers have declined drastically in the past several decades due to habitat loss, overfishing, predation, and other factors.

Steelhead spawn from January to March and then do not die like salmon but return to the ocean. The young stay in fresh water for one to four years and then migrate downstream, typically during spring and early summer. Steelhead depend on suitable water temperature and substrate (no larger than 4 inches) for successful spawning and incubation.

The range of this ESU includes all naturally spawned populations of steelhead in the Sacramento and San Joaquin rivers and their tributaries, excluding steelhead from San

Francisco and San Pablo bays and their tributaries, and two artificial propagation programs. The range includes portions of Alameda, Amador, Butte, Calaveras, Colusa, Contra Costa, Glenn, Mariposa, Merced, Nevada, Placer, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tuolumne, Yolo, and Yuba counties. The Central Valley steelhead is part of the Salmonidae family. This family thrives in well-oxygenated waters that have temperatures below a maximum of 72° Fahrenheit.

Swainson's Hawk

Swainson's hawk (Buteo swainsoni) is state-listed as a threatened species and their nests are protected under the MBTA. Swainson's hawks typically nest in riparian habitats or isolated trees bordered by suitable foraging habitat (i.e., grasslands and agricultural fields). This species migrates into California in the spring to establish breeding territories for the summer and typically migrates out of California by the end of September. Swainson's hawks require isolated trees or riparian woodlands for nesting and nests are typically built within close proximity to suitable foraging habitat (agricultural field, annual grasslands, etc.). The Central Valley provides optimal nesting habitat for this species due to the abundance of agricultural fields and riparian woodlands, which this species uses for foraging and nesting, respectively. Foraging habitat includes all annual grassland, low-growing row or field crops, dry-land, and irrigated pasture, non-flooded rice land, and cereal grain crops within ten miles of an active nest site. There are two previously recorded occurrences within a one-mile radius of the project study area. One of these occurrences is within the project study area. Suitable nesting and foraging habitat for this species is present throughout the project study area.

Environmental Consequences

Valley Elderberry Longhorn Beetle

Direct Impacts

USFWS considers all shrubs with stems greater than one inch in diameter at ground level as habitat for VELB. According to the USFWS (1999) Conservation Guidelines, direct removal, trimming, or construction activities within 20 feet of the dripline of an elderberry shrub could result in direct loss (take) of a VELB. Four elderberry shrubs or clumps (shrub numbers 2, 26, 27, and 34) would be removed by the proposed project because they are within the grading limit or construction activities would require removal. Shrub number 2 is a large clump consisting of approximately 50 stems, whereas shrub numbers 26, 27, and 34 are individual shrubs. The direct removal of these shrubs includes removal of 71 stems between one and three inches and 15 stems that are between three and five inches. None of these shrubs had exit holes at the time of the survey. **Table 2.28** below summarizes the stem count for shrubs identified and mapped within the project study area.

A total of 162 stems will be directly impacted by the proposed project. An additional six shrubs/clumps of elderberry with a total of 96 stems greater than one inch in diameter at ground level are within 20 feet of the project footprint. These shrubs, although within the 20-foot buffer, will not be directly removed by the proposed project; however, if a shrub is present within a 20-foot buffer of project activities, there may be impacts such as direct mortality or morbidity of a beetle from construction dust and noise. Caltrans has determined that these actions may affect and is likely to adversely affect VELB. The introduction of Argentine ants from trash left at the construction site may also negatively affect the beetle, as this species is known to prey on the beetle.

Table 2.28
Impacts and Proposed Mitigation Related to Elderberry Shrubs

# Shrubs	Stem Size	# of Stems	Exit Holes	Riparian Habitat	Elderberry Seedling Ratio	# Elderberry Seedlings	Associated Native Ratio	# Associated Natives
10	≥1" – ≤3"	71	No	No	1:1	71	1:1	71
	>3" & <5"	15	No	No	2:1	30	1:1	30
	>3" & <5"	1	Yes	No	4:1	4	2:1	8
	≥ 5"	3	No	No	3:1	9	1:1	9
	≥1" – ≤3"	65	No	Yes	2:1	130	1:1	130
	>3" & <5"	6	No	Yes	3:1	18	1:1	18
	≥5"	1	No	Yes	4:1	4	1:1	4
	Total	**162**				**266**		**270**

A Biological Opinion was issued on June 7, 2011, by the USFWS finding that the project and the cumulative effects, as proposed, are not likely to jeopardize the continued existence of the VELB (*Biological Opinion for the McHenry Avenue Corridor Improvement Project, San Joaquin County, California,* USFWS 81420-2011-F-0289-1).

Indirect Impacts

Approximately 449 stems between the 20-foot and 100-foot buffers would be indirectly affected from project construction. These shrubs will be indirectly impacted by the proposed project according to the USFWS (1999) Conservation Guidelines due to the temporary construction activities that will take place in the vicinity of the shrubs. Construction-related activities that could result in indirect impacts to the VELB include: dust generating activities resulting in air quality effects to the shrub and potential beetle occupants; construction related noise generation that could affect beetle behavior; and ingress of human activities during construction disturbing the elderberry shrubs.

Central Valley Steelhead

Direct Impacts

Central Valley steelhead are known to occur or could occur within the Stanislaus River in the project study area. Suitable habitat is present within the Stanislaus River for foraging for this species. Although spawning habitat does not occur within the project study area for the project, the project does provide migration passage for spawning fish. The proposed project has the potential to impact water quality in the Stanislaus River during construction activities. The proposed project will temporarily affect 0.442 acre and permanently affect (or fill) 0.002 acre of riverine habitat, which is designated critical habitat for the Central Valley steelhead. The temporary impacts include water diversion with the use of temporary fill for work within the OHWM of the Stanislaus River. The dewatering of the river and placement of the temporary fill may adversely affect steelhead, as salvaging fish during dewatering may induce stress on individual fish (take through harassment) or result in death of individual fish during salvage and transport.

Permanent modification to 0.002 acre of Central Valley steelhead critical habitat is not likely to jeopardize the continued existence of California CV steelhead, and is not likely to destroy or adversely modify their designated critical habitat (NOAA 2012).

Indirect Impacts

In addition to impacts to the Stanislaus River, the proposed project will also impact riparian vegetation associated with the Stanislaus River, which could indirectly affect Central Valley steelhead in the river. Activities related to the construction of the proposed project will result in localized loss of vegetation (permanent loss of 0.45 acre of riparian vegetation), general disturbance to the soil, and an increase in impervious surfaces. Removal of vegetation and soil can accelerate erosion processes within the project study area and increase the potential for sediment to enter into the river, which has the potential to contain special-status species. Aquatic organisms are generally not directly affected by suspended solids and turbidity unless they reach extremely high levels. At these high levels, suspended solids can adversely affect the physiology of aquatic organisms and may suppress photosynthetic activity at the base of food webs, thereby impacting aquatic organisms either directly or indirectly. The soils on the north bank are particularly susceptible to erosion. It should be noted that the loss of riparian vegetation will be offset to a degree by the construction of the widened bridge over the Stanislaus River. The new bridge will provide approximately an additional 0.16 acres of shade along the vegetated bank of the river and an addition of approximately 0.22 acre of shade on the river.

The construction of the bridge under flowing water conditions could result in the release of high levels of sedimentation and debris into downstream aquatic habitat. Temporary construction activities could increase sediment and urban runoff into waterways that could result in impacts to the aquatic environment. Additionally, runoff from increased impervious surfaces, such as roadways, contains pollutants (i.e., heavy metals, oil, or litter) that would be discharged into the river via sheet flow and storm drains.

Construction activities typically include the refueling of construction equipment on location. As a result, minor fuel and oil spills may occur, with a risk of larger releases. Without rapid containment and cleanup, these materials could be potentially toxic depending on the location of the spill in proximity to water features. Oils, fuels, and other contaminants could directly affect aquatic organisms, including special-status species that inhabit the creek on and off the project site. Accidental spills within the project work site and into waterways could result in adverse impacts to the aquatic environment. The avoidance and minimization measures would reduce effects from erosion, sedimentation, runoff, and accidental spills.

Swainson's Hawk

Swainson's hawk (*Buteo swainsoni*) is state-listed as a threatened species and their nests are protected under the MBTA. Swainson's hawks typically nest in riparian habitats or isolated trees bordered by suitable foraging habitat (i.e., grasslands and agricultural fields). This species migrates into California in the spring to establish breeding territories for the summer and typically migrates out of California by the end of September. Swainson's hawks require isolated trees or riparian woodlands for nesting and nests are typically built within close proximity to suitable foraging habitat (agricultural field, annual grasslands, etc.). The Central Valley provides optimal nesting habitat for this species due to the abundance of agricultural fields and riparian woodlands, which this species uses for foraging and nesting, respectively. Foraging habitat includes all annual grassland, low-growing row or field crops, dry-land and irrigated pasture, non-flooded rice land, and cereal grain crops within 10 miles of an active nest site. There are two previously recorded occurrences within a 1-mile radius of the project study area. One of these occurrences is within the project study area. This occurrence was recorded in 1995 (CDFG 2009b). Although this occurrence was presumed extant by CDFG, no large stick nests were observed within the project study area. Suitable nesting and foraging habitat for this species is present throughout the project study area.

<u>Direct Impacts</u>

The project study area contains several large trees suitable for nesting. Construction of the project would result in the removal of several large trees. If nesting raptors are present during project construction, the proposed project may cause direct mortality to raptors by removal of trees that contain active nests. The loss of active nests or direct mortality is prohibited by the MBTA and FGC Section 3503.5. If construction occurs during the non-nesting season, no impacts are expected; however, if construction activities were scheduled to occur during the nesting season, mitigation would be necessary to avoid potential impacts.

Construction activities that require the disturbance of trees and vegetation could cause direct impacts to nesting raptors, if birds are actively nesting during construction activities. Removal of habitat within the project study area would be considered a direct and significant impact if any of these species were taken or deterred from traditional nesting or foraging locations.

Indirect Impacts

Excessive noise, disturbance, and vibrations can cause nesting raptors to abandon their nests. Construction could also result in noise, dust, increased human activity, and other indirect impacts to nesting Swainson's hawks in the project vicinity. Potential nest abandonment and mortality to eggs and chicks as a result of construction activities would be considered significant impacts.

The proposed project is not removing significant amounts of foraging habitat (less than 0.01 acre); therefore, impacts to foraging habitat are minimal.

Avoidance, Minimization, and/or Mitigation Measures

Valley Elderberry Longhorn Beetle

Avoidance and minimization efforts for this species have been coordinated with the USFWS during Section 7 Consultation, and include the following:

1. *Establish a 20-foot-wide buffer (minimum) around all elderberry shrubs where feasible.* Before any ground-disturbing activity, the County will ensure that a temporary plastic mesh–type construction fence (Tensor Polygrid or equivalent), a minimum of 4 feet tall, is installed at least 20 feet from the driplines of elderberry shrubs adjacent to the study area that will be retained. The intent of requiring this fencing is to prevent encroachment by construction vehicles and personnel. The exact location of the fencing will be determined by a qualified biologist, with the goal of protecting habitat for VELB. The fencing will be strung tightly on posts set at a maximum interval of 10 feet. The fencing will be installed in a way that prevents equipment from enlarging the work area beyond the delineated area. The fencing will be checked and maintained weekly until all construction is completed. This buffer zone will be marked by signs stating, "This is habitat of the valley elderberry longhorn beetle, a threatened species, and it must not be disturbed. This species is

protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." Signs will be placed at intervals of 50 feet and must be readable at a distance of 20 feet. No construction activity, including grading, will be allowed until this condition is satisfied. No grading, clearing, storing of equipment or machinery, or other disturbance or activity may occur until a representative of the County has inspected and approved all temporary construction fencing. The fencing and a note reflecting this condition will be shown on the construction plans.

2. *Conduct mandatory contractor/worker awareness training for construction personnel.* Before any work occurs in the project area, including grading, a qualified wildlife biologist will conduct mandatory contractor/worker awareness training for construction personnel. The training will be provided to all construction personnel to brief them on the need to avoid impacts on biological resources and the penalties for not complying with biological mitigation requirements. If new construction personnel are added to the project, the contractor's superintendent will ensure they receive the mandatory training before starting work. An environmental awareness handout that describes and illustrates sensitive resources (i.e., nesting birds and raptors, elderberry shrubs, and native trees) that will be avoided during project construction, and that identifies all relevant permit conditions, will be provided to each person.

3. *Implement dust control measures.* The County will ensure that dust control measures are implemented for all ground-disturbing activities in the project area. These measures may include applying water to graded and disturbed areas that are unvegetated. To avoid attracting Argentine ants (*Linepithema humile*), water will not be sprayed within the driplines of elderberry shrubs at any time.

4. No insecticides, herbicides, fertilizers, or other chemicals will be applied during construction.

Pursuant to the USFWS Conservation Guidelines for the Valley Elderberry Longhorn Beetle, the County will implement the measures listed below to mitigate direct and indirect impacts on VELB.

Transplant Directly Affected Elderberry Shrubs - All shrubs that are directly affected by the proposed project will be transplanted to a USFWS approved conservation area (shrub numbers 2, 26, 27, and 34). Elderberry shrubs will be transplanted when the plants are dormant, from approximately November through the first two weeks of

February, and they have lost their leaves. Transplanting during the non-growing season will reduce shock to the plant and increase transplantation success. The County will follow the specific transplanting guidance provided in the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999).

Compensate for Direct Impacts on Elderberry Shrubs - The County will mitigate impacts on the shrubs by purchasing mitigation credits at a USFWS-approved conservation bank. Mitigation will be done according to the measures outlined in Table 1 of the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999). A summary of the required mitigation is presented below in **Table 2.28**. As shown in this table, the proposed project would require 266 elderberry seedlings and 270 associated native plants to be planted at a USFWS approved conservation bank. Currently, VELB conservation credits are available at River Ranch Conservation Bank. The service areas of this conservation bank include the project study area. Any shrubs identified for transplant may be transplanted to this conservation bank.

All transplanting or trimming shall occur in accordance with procedures outlined in the VELB Guidelines (USFWS 1999), and shall be protected and monitored according to the guidelines.

Central Valley Steelhead

The following avoidance and minimization efforts will be implemented to reduce impacts to the special-status fish species:

1. In-water activities proposed on the Stanislaus River will be limited to between June 15 and October 15.

2. The anticipated work schedule, including start and end dates, will be provided to the USFWS and NMFS one week in advance of construction start. NMFS may inspect the work site to evaluate and assist with the implementation of proposed avoidance and minimization measures.

3. The permanent loss of 0.002 acre of CV steelhead habitat, will be offset through the purchase of credits, at a 3:1 ratio, from a USFWS approved CV steelhead mitigation bank. Proof of purchase will be provided to the USFWS and NMFS prior to initiation of construction activities.

4. Prior to the initiation of construction activities, a Worker Environmental Awareness Program (WEAP) will be developed and implemented. All onsite project personnel will be required to complete the WEAP training prior to start of work. At a minimum, the training will include a description of all special-status species that have the potential to occur within the action area, their habitat requirements, the avoidance and minimization measures that are to be implemented and maintained for the conservation of the species, and the limits of construction/disturbance for the project.

5. The following components will be implemented, by qualified biologists, to reduce the potential for direct take of CV steelhead:

    a. An approximately 20-foot wide section of the river, representing the low-flow channel, will be left open during all in-water activities to facilitate upstream/downstream dispersal of fish populations within the Stanislaus River.

    b. Block nets will be installed around the limits of the in-water work areas, prior to the initiation of construction activities in all years. Netting mesh size will be chosen to provide exclusionary benefits to young-of-the year CV steelhead.

    c. Seine nets and/or electrofishers will then be utilized to relocate as many fish as possible within the containment area.

    d. Collected fish will be relocated to a suitable location within the Stanislaus River either upstream or downstream of the project site.

    e. Block nets will remain in place until such time as a turbidity/silt curtain (if required) is installed, or cofferdam construction has been completed.

    f. A qualified biologist, designated by San Joaquin County, will be present to monitor onsite compliance with all minimization measures.

6. All pumped water shall be routed to either: (1) a sedimentation pond located on a flat stable area above the Ordinary High Water Mark (OHWM), to prevent silt-laden runoff from entering the river; or (2) a sedimentation tank/holding facility that allows only clear water to return to the river, and includes disposal of settled solids at an appropriate offsite location.

7. The contractor shall prepare and implement a demolition containment plan to keep debris from entering the main channel of the river. Debris includes raw cement, concrete, concrete washes, asphalt, paint or other coating materials (including lead-based paint from the existing structure), oil and petroleum products, and any other substance that could be hazardous to aquatic life.

8. Downstream sedimentation and turbidity is harmful to aquatic life; therefore, a Stormwater Pollution Prevention Plan (SWPPP) shall be developed and implemented to ensure the proper installation and maintenance of sediment control measures. Implementation of the SWPPP shall be phased for the installation of dry-weather protective measures and rainy season protective measures.

9. To control sedimentation during and after project implementation, the permit holder will be responsible for implementation of Best Management Practices (BMP's) as outlined in any authorizations or permits issued for the project under the authority of the Clean Water Act. If BMP's are ineffective, the permit holder will attempt to remedy the situation immediately.

10. All refueling, maintenance, and staging of equipment and vehicles will occur at least 60 feet from riparian habitat or other water bodies and not in a location from where a spill would drain directly toward aquatic habitat. Refueling of construction equipment and vehicles will occur only within designated areas where possible spills shall be readily contained. The monitor will ensure contamination of habitat does not occur during such operations. Prior to the onsite of the work, the project proponent will ensure that the contractor's SWPPP includes provisions for prompt and effective response to any accidental spills. All workers will be informed of the importance of preventing spills and the appropriate measures to take should a spill occur. Any spills will be cleaned up immediately.

11. The number of access routes, size of staging areas, and total area of the activity will be limited to the minimum necessary to achieve the project goal. Environmentally sensitive areas will be established to confine access routes and construction areas to the minimum area necessary to complete construction and to minimize the impact to sensitive habitat; this goal includes locating access routes and construction areas outside of wetlands and/or riverine areas to the maximum extent practicable. Stockpiling construction materials, including portable equipment, vehicles, supplies, and chemicals, shall only be permitted in designated construction staging areas.

12. Litter and construction debris from below the OHWM will be removed and placed at an appropriate site not subject to flooding during the period from October 15 to May 15. Any spills of hazardous materials in riverine habitat will be immediately cleaned up and disposed of properly.

13. Pile driving and post-drilling will only occur from 8am to 5pm on weekdays. Restricted working hours will allow for relaxation periods and movement windows for special status fish present in the action area.

Swainson's Hawk

During project development, the size of the work area limits has been reduced to the smallest amount feasible within sensitive habitat areas.

- To prevent impacts to MBTA-protected birds and their nests, removal of trees would be limited to only those necessary to construct the proposed project.

- If construction or tree removal is proposed during the breeding/nesting season for Swainson's hawk (typically March 1 through September 15), a focused survey for active nests of raptors and migratory birds within and in the vicinity of (no less than 250 feet outside project boundaries, where possible) the project site would be conducted by a qualified biologist. Two surveys would be conducted, at least one week apart, with the second survey occurring no more than two days prior to tree removal or other construction activities. If no active nests are found, tree removal or construction activities may proceed.

- If an active nest is located during pre-construction surveys, the USFWS and/or the CDFG (as appropriate) would be notified regarding the status of the nest. Furthermore, construction activities would be restricted as necessary to avoid disturbance of the nest until it is abandoned or the biologist deems disturbance potential to be minimal. Restrictions may include establishment of exclusion zones (no ingress of personnel or equipment at a minimum radius of 100 feet around an active raptor nest) or alteration of the construction schedule.

- No action is necessary if no active nests are found or if construction would occur during the non-breeding season (generally September 1 through February 28).

2.3.5 Invasive Species

Regulatory Setting

On February 3, 1999, President Clinton signed Executive Order 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.” Federal Highway Administration guidance issued August 10, 1999, directs the use of the State’s invasive species list currently maintained by the California Invasive Species Council to define the invasive species that must be considered as part of the NEPA analysis for a proposed project**.**

Affected Environment

The annual grassland in the southern portion of the project study area, west of McHenry Avenue, is dominated by non-native grasslands and invasive broad-leaved pepperweed (*Lepidium latifolia*). Several introduced and invasive species are also common along the riparian corridor and underneath the Stanislaus River Bridge, such as Russian thistle (*Salsola tragus*), giant European reed (*Arundo donax*), tree of heaven (*Ailanthus altissima*), melon vines or calabazilla (*Cucurbita foetidissima*), pokeweed (*Phytolacca americana*), black locust (*Robinia pseudo-acacia*), and yellow star-thistle (*Centaurea solstitialis*). The project study area includes approximately 4.82 acres of invasive plant communities.

Environmental Consequences

The eight invasive plant species described above were identified in the project area during biological studies. Some of these invasive plant species might be removed due to construction of the project. The project build alternative would not promote the spread of invasive species, as none of the species identified on the California list of noxious weeds is currently used by Caltrans for erosion control or highway planting measures.

Avoidance, Minimization, and/or Mitigation Measures

In compliance with the Executive Order on Invasive Species, Executive Order 13112, and subsequent guidance from the Federal Highway Administration, the landscaping and erosion control included in the project would not use species listed as noxious weeds. In areas of particular sensitivity, extra precautions would be taken if invasive species were found in or adjacent to the construction areas. These measures include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

To prevent the further spread of invasive plant species, a noxious weed special provision would be adhered to during construction. In addition, any areas revegetated following disturbance would be seeded with a weed-free/native plant mixture following construction.

2.4 Climate Change Under the California Environmental Quality Act

The County of San Joaquin as CEQA lead agency has prepared the greenhouse gas analysis for the proposed project as part of the April 2011 Air Quality Study. The information presented in this section represents the County's decision-making on CEQA significance.

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gases (GHGs), particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to greenhouse gas emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs related to human activity that include carbon dioxide (CO_2), methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2-tetrafluoroethane), and HFC-152a (difluoroethane).

There are typically two terms used when discussing the impacts of climate change. Greenhouse gas (GHG) mitigation is a term for reducing GHG emissions in order to reduce or "mitigate" the impacts of climate change. Adaptation refers to the effort of planning for and adapting to impacts due to climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels).

Transportation sources (passenger cars, light-duty trucks, other trucks, buses, and motorcycles) in the state of California make up the largest source (second to electricity generation) of greenhouse-gas-emitting sources. Conversely, the main source of GHG emissions in the United States is electricity generation followed by transportation. The dominant GHG emitted is CO_2, mostly from fossil fuel combustion.

There are four primary strategies for reducing GHG emissions from transportation sources: (1) improve system and operation efficiencies, (2) reduce growth of vehicle miles traveled (VMT), (3) transition to lower GHG fuels, and (4) improve vehicle technologies. To be most effective, all four should be pursued collectively. The following Regulatory Setting section outlines state and federal efforts to comprehensively reduce GHG emissions from transportation sources.

Regulatory Setting

State

With the passage of several pieces of legislation including Senate Bills, Assembly Bills, and Executive Orders, California launched an innovative and proactive approach to dealing with greenhouse gas emissions and climate change at the state level.

- <u>Assembly Bill (AB) 1493, Pavley. Vehicular Emissions: Greenhouse Gases, 2002</u>: Requires the California Air Resources Board (ARB) to develop and implement regulations to reduce automobile and light truck greenhouse gas emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009 model year. In June 2009, the U.S. Environmental Protection Agency (USEPA) Administrator granted a Clean Air Act waiver of preemption to California. This waiver allowed California to implement its own GHG emission standards for motor vehicles beginning with model year 2009. California agencies would be working with federal agencies to conduct joint rulemaking to reduce GHG emissions for passenger cars model years 2017–2025.

- Executive Order S-3-05: (signed on June 1, 2005, by Governor Arnold Schwarzenegger). The goal of this Executive Order is to reduce California's GHG emissions to 2000 levels by 2010, 1990 levels by the 2020, and 80 percent below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.

- Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006: AB 32 sets the same overall GHG emissions reduction goals as outlined in Executive Order S-3-05, while further mandating that ARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the State's Climate Action Team.

- Executive Order S-01-07: Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this Executive Order, the carbon intensity of California's transportation fuels is to be reduced by at least 10% by 2020.

- Senate Bill 97 (Chapter 185, 2007): Required the Governor's Office of Planning and Research to develop recommended amendments to the State CEQA Guidelines for addressing greenhouse gas emissions. The amendments became effective on March 18, 2010.

Federal

Although climate change and GHG reduction is a concern at the federal level; currently there are no regulations or legislation that have been enacted specifically addressing GHG emissions reductions and climate change at the project level. Neither the United States Environmental Protection Agency (USEPA) nor the Federal Highway Administration (FHWA) has promulgated explicit guidance or methodology to conduct project-level greenhouse gas analysis. As stated on FHWA's climate change website (http://www.fhwa.dot.gov/hep/climate/index.htm), climate change considerations should be integrated throughout the transportation decision-making process — from planning through project development and delivery. Addressing climate change mitigation and adaptation upfront in the planning process would facilitate decision-making and improve efficiency at the program level and would inform the analysis and stewardship needs of project-level decision-making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

The four strategies set forth by the FHWA to lessen climate change impacts do correlate with efforts that the State has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours traveled.

Climate change and its associated effects are also being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the National Clean Car Program and Executive Order 13514, Federal Leadership in Environmental, Energy and Economic Performance.

Executive Order 13514 is focused on reducing greenhouse gases internally in federal agency missions, programs, and operations but also directs federal agencies to participate in the interagency Climate Change Adaptation Task Force, which is engaged in developing a U.S. strategy for adaptation to climate change.

On April 2, 2007, in *Massachusetts v. EPA*, 549 U.S. 497 (2007), the Supreme Court found that greenhouse gases are air pollutants covered by the Clean Air Act and that the USEPA has the authority to regulate greenhouse gases. The Court held that the USEPA Administrator must determine whether or not emissions of greenhouse gases from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision.

On December 7, 2009, the USEPA Administrator signed two distinct findings regarding greenhouse gases under Section 202(a) of the Clean Air Act:

- **Endangerment Finding:** The Administrator found that the current and projected concentrations of the six key well-mixed greenhouse gases — carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride — in the atmosphere threaten the public health and welfare of current and future generations.

- **Cause or Contribute Finding:** The Administrator found that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

Although these findings did not themselves impose any requirements on industry or other entities, this action was a prerequisite to finalizing the USEPA's Proposed Greenhouse Gas Emission Standards for Light-Duty Vehicles, which was published on September 15, 2009. On May 7, 2010, the final Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards were published in the Federal Register.

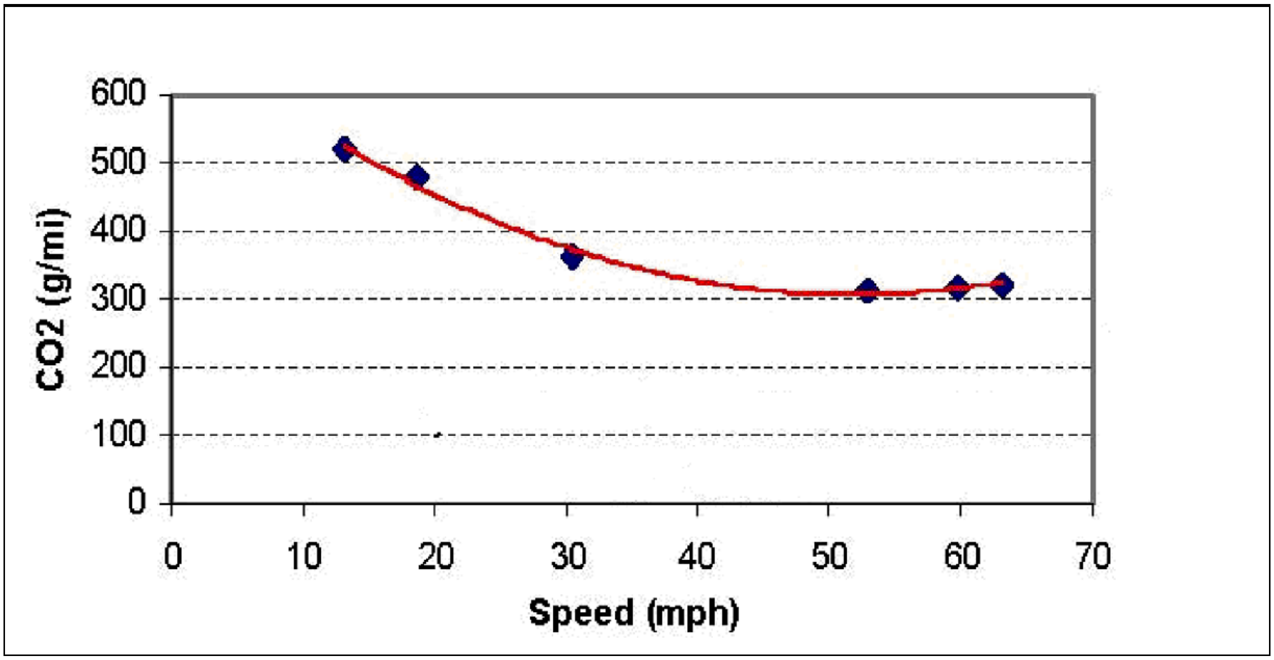
The USEPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle GHG regulations. These steps were outlined by President Obama in a memorandum on May 21, 2010. The final combined USEPA and NHTSA standards that make up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. Together, these standards would cut GHG emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012–2016).

On January 24, 2011, the USEPA, along with the U.S. Department of Transportation and the State of California, announced a single time frame for proposing fuel economy and greenhouse gas standards for model years 2017–2025 cars and light-duty trucks.

At the present time, neither the USEPA nor the FHWA have promulgated explicit guidance or methodology to conduct project-level greenhouse gas analysis.

The highest levels of CO_2 from mobile sources, such as automobiles, occur at stop-and-go speeds (0–25 miles per hour [mph]) and speeds over 55 mph; the most severe emissions occur from 0–25 mph (refer to **Figure 2-18**). To the extent that a project relieves congestion by enhancing operations and improving travel times in high-congestion travel corridors, GHG emissions, particularly CO_2, may be reduced.

Figure 2-18
Fleet CO_2 Emissions vs. Speed (Highway)



Source: Ambient 2011.

Environmental Consequences

GHG emissions for transportation projects can be divided into those produced during operations and those produced during construction. GHG emissions generated during operation and construction of the proposed build alternative are discussed below.

Permanent Impacts

Long-term operational emissions associated with the proposed project would be associated with the operation of motor vehicles on area roadways, including segments of McHenry Avenue and East River Road. Motor vehicle operational emissions were quantified using EMFAC 2007 emission factors for existing and design year (year 2030) conditions, based on data obtained from the Traffic Analysis prepared for the proposed build alternative. Estimated annual operational GHG emissions generated by vehicle traffic in the project study area are summarized in **Table 2.29**.

As noted in **Table 2.29** and in comparison to existing conditions, GHG emissions in the project study area in design year 2030 are projected to increase as compared to existing conditions. However, in comparison to the no build alternative, the increase in future year GHG emissions would be greater without the proposed project, an increase of approximately 8,971 metric tons of CO_2 equivalent; with the proposed project ($MTCO_2e$) the increase is nearly half-as-much as the no project, approximately 4,944 $MTCO_2e$ per year. Under design year 2030 conditions, the proposed project would reduce GHG emissions approximately 4,027 $MTCO_2e$ annually (-32.6%), in comparison to without the project. Emissions reductions attributable to the proposed project would be predominantly associated with improvements in vehicle circulation, including increased vehicle speeds (but less than 55 mph) and decreased intersection delay.

Table 2.29
Annual Greenhouse Gas Emissions in Project Study Area

Scenario	Greenhouse Gas Emissions ($MTCO_2e$/year)
Existing Conditions	3,395
Design Year 2030	
No Build Alternative	12,366
Change in Comparison to Existing Conditions	+8,971
Build Alternative	8,339
Change in Comparison to Existing Conditions	+4,944
Change in Comparison to No-Build Alternative 2030 Conditions:	-4,027 (-32.6%)

Source: Ambient 2011
Note: Based on emission factors obtained from the EMFAC2007 computer model and traffic data obtained from the Traffic Analysis prepared for this project. Includes running exhaust and idle emissions.

Reductions in mobile-source GHG emissions attributable to the proposed project would be projected to achieve reductions that would exceed the SJVAPCD's significance threshold of 29%, which is consistent with the AB 32 targeted GHG reductions by year 2020. It is important to note, however, that the estimated GHG emissions within the study area are only useful for a comparison between the build and no build alternatives. Actual GHG emissions would vary depending on multiple factors, such as fuel mix (EMFAC model emission rates are only for direct engine-out CO_2 emissions, not full fuel cycle; fuel cycle emission rates can vary dramatically depending on the amount of additives like ethanol and the source of the fuel components), rate of acceleration, and the aerodynamics and efficiency of the vehicles.

Temporary Impacts

Construction GHG emissions include emissions produced as a result of material processing, emissions produced by on-site construction equipment, and emissions arising from traffic delays due to construction. These emissions would be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases. In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events.

As discussed earlier in the Air Quality section of this report, construction-generated emissions were calculated using the Road Construction Emission Model, version 6.3.2. Construction-generated emissions are summarized in **Table 2.20**. As depicted in **Table 2.20**, implementation of the proposed project would result in annual emissions of approximately 643 U.S. tons per year of CO_2, which equates to approximately 583 $MTCO_2e$/year. Construction of the proposed project would not last more than five years and, as a result, construction-related emissions would be considered temporary.

Avoidance, Minimization, and/or Mitigation Measures

Long-Term Operational Emissions

Because the proposed project would result in a reduction of mobile-source GHG emissions in the project study area of approximately 32.6% as compared to without the project, the project is projected to achieve reductions that would exceed the SJVAPCD's significance threshold of 29%. As such, the proposed project would comply with applicable reductions thresholds for GHG emissions, and no avoidance, minimization, or mitigation measures are required.

Short-Term Construction Emissions

Caltrans Standard Specification Provisions state that construction contractor(s) must comply with the SJVAPCD's rules and regulations with regard to air quality restrictions. Compliance with Caltrans' Standard Specifications and the SJVAPCD's applicable rules and regulations would require the use of newer, lower-emissions equipment, which would help to reduce short-term construction-generated GHG emissions.

Chapter 3 Comments and Coordination

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process to determine the scope of environmental documentation, the level of analysis, potential impacts and mitigation measures, and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including project development team meetings and interagency coordination meetings. This chapter summarizes the results of Caltrans' and San Joaquin County's efforts to identify, address, and resolve project-related issues through early and continuing coordination.

3.1 Early Coordination

Since 2009, representatives from Caltrans, San Joaquin County, Stanislaus County, engineering and environmental consultants, and other members of the project development team have met on a regular basis. Both local agencies and Caltrans are interested in the project and support its construction.

3.2 U.S. Army Corps of Engineers

On February 12, 2010, a Preliminary Wetland Delineation was submitted to the Army Corps of Engineers. The Corps responded on March 29, 2010 with concurrence of the delineation.

On October 7, 2010, an Army Corps of Engineers 404 pre-application meeting was held to discuss the proposed project and any concerns the permitting agencies have regarding the project. The meeting included representatives from the Army Corps of Engineers, NOAA/NMFS, Caltrans, Stanislaus County, San Joaquin County, AECOM, and PMC.

3.3 U.S. Fish and Wildlife Service

On January 31, 2011, Caltrans sent the USFWS a letter requesting formal consultation for VELB and concurrence that the conservation measures identified by San Joaquin County are consistent with the Service's Guidelines. The Biological Assessment (BA) was also included in the initiation package.

On February 15, 2011, USFWS e-mailed Caltrans with questions and comments regarding information in the BA. Caltrans responded on February 23, 2011.

On March 2, 2011, USFWS e-mailed Caltrans with follow-up questions regarding the BA. Caltrans responded on March 8, 2011.

A Biological Opinion was issued on June 7, 2011, by the USFWS finding that the project and the cumulative effects, as proposed, are not likely to jeopardize the continued existence of the valley elderberry longhorn beetle (Biological Opinion for the McHenry Avenue Corridor Improvement Project, San Joaquin County, California. USFWS 81420-2011-F-0289-1).

3.4 National Marine Fisheries Service

On October 7, 2010, National Marine Fisheries Service (NMFS) and other resource agencies attended a pre-application meeting regarding the Project.

On February 1, 2011, NMFS received a letter from Caltrans requesting initiation of Section 7 consultation under the Endangered Species Act (ESA).

On April 14, 2011, NMFS attended a site meeting with other resource agencies to discuss construction effects to listed anadromous fish and address other concerns associated with the BA submittal.

On May 6, 2011, NMFS received a Technical Memorandum from Caltrans addressing the concerns outlined from the April 14, 2011, site visit.

On May 9, 2011, formal consultation was initiated by NMFS’ Central Valley Office.

On September 19, 2011, NMFS received another Technical Memorandum that addressed NMFS’ concerns regarding the pile driving analysis.

On June 28, 2012, Caltrans and their consultants met with NMFS to discuss the Project Description in a sufficient level of detail required to complete the Effects Analysis of the biological opinion (BO).

On July 24, 2012, Caltrans sent a Technical Memorandum containing an amended Project Description via email at NMFS’ request. Staff and the Section 7 Coordinator deemed the submittal sufficient enough to conduct a proper Effects Analysis on August 1, 2012.

A Biological Opinion from NOAA/NMFS was issued for the project on September 13, 2012, by finding that the McHenry Avenue Corridor Improvement Project, as proposed, is not likely to jeopardize the continued existence of California Central Valley steelhead, and is not likely to destroy or adversely modify their designated critical habitats.

Caltrans sent an e-mail to NOAA/NMFS on September 18, 2012 to propose minor changes and clarifications to the language of the BO. NOAA/NMFS responded in a letter on December 7, 2012 approving revisions to the terms and conditions in the BO.

3.5 U.S. Coast Guard

In January 2009 AECOM sent an e-mail to the U.S. Coast Guard describing the proposed project.

On February 17, 2009 the USCG responded with a letter stating that no Coast Guard bridge permit is required for the proposed project. The letter also gave advance approval to the location and plans of the bridges to be constructed across reaches of waterways considered navigable. No further coordination is required.

3.6 State Historic Preservation Office

Section 106 consultation was initiated with the State Historic Preservation Office (SHPO) on February 4, 2011. An assumption of concurrence was made on January 10, 2013 by Caltrans due to lack of formal response from SHPO.

3.7 Natural Resources Conservation Service

On April 15, 2011 Caltrans submitted a Farmland Conversion Impact Rating form to the Natural Resources Conservation Service (NRCS). The NRCS responded on April 20, 2011 with a total point value of less than 160 for the farmland to be converted by the project. Sites receiving a total score of less than 160 need not be given further consideration for protection. No further coordination is required.

3.8 Central Valley Flood Protection Board

On October 16, 2008 the Central Valley Flood Protection Board (CVFPB) and Avila Associates (consultant to San Joaquin County) met at the Department of Water Resources (DWR) offices to discuss the project.

On February 25, 2009 Avila Associates and CVFPB had a conference call to discuss jurisdiction limits of the project.

On April 9, 2009 an email was sent from CVFPB to confirm that the bridge across the Stanislaus River is within a designated floodway. In addition CVFPB had communicated with the USACE; they do not have an interest in the project as a Federal Flood Control feature but may have property rights adjacent to the site. Replacement of the existing structure on essentially the same alignment and for the same length would remain an encroachment/replacement permit. Replacement of the existing structure with a combination of embankment and a shorter structure could require substantial time as Board staff would have to review potential impacts to the designated floodway boundary.

On April 30, 2009 AECOM (consultant to San Joaquin County), Avila Associates, and CVFPB met at the DWR office to confirm the process required to acquire a permit from the Board for the bridge replacement once the design is to a level that an application could be submitted.

3.9 State Lands Commission

On April 14, 2006 San Joaquin County Public Works received a letter from the California State Lands Commission regarding the renewal of the General Lease for the Stanislaus Bridge that expired on January 23, 2007. The County received a fully executed General Lease for the existing bridge on December 14, 2006. The County will enter into a new agreement with the California State Lands Commission for a new General Lease for the new Stanislaus Bridge when construction is complete.

3.10 Public Participation

A public participation meeting was held at the Escalon Community Center on June 20, 2011. Construction related impacts of the project were discussed, including the traffic-related construction impacts.

Chapter 4 List of Preparers

This document was prepared and/or reviewed by the following people:

Pacific Municipal Consultants (PMC)

Jeannette Owen, Senior Biologist, PMC. B.S., Ecology and Systematic Biology, Wildlife Management Concentration, California Polytechnic University, San Luis Obispo; 12 years environmental planning experience. Contribution: Wrote Biology sections of Initial Study/Environmental Assessment and coordinated the environmental process for the project.

Melissa Logue, Senior Environmental Planner, PMC. B.A., History, California State University, Sacramento; 9 years environmental planning experience. Contribution: Wrote all sections of Initial Study/Environmental Assessment except Biology sections

Joyce Hunting. Director of Biological Services, PMC. M.S.C., Conservation Biology, California State University. B.A. Biology, Humboldt State University. 25 years environmental planning experience. Quality Assurance for first draft of Initial Study/Environmental Assessment and prepared second administrative Draft of Initial Study/Environmental Assessment.

James McLaughlin, Environmental Planner, PMC. B.A., Liberal Studies, Emphasis in Geology, California State University, Hayward; 5 years environmental planning experience. Contribution: Prepared second administrative Draft Hazardous Materials Chapter.

Kelly Jackson, NEPA Coordinator, PMC. B.S., Environmental Science, University of Washington, Tacoma: 8 years environmental planning experience. Contribution: Prepared third and fourth administrative Draft of Initial Study/Environmental Assessment.

San Joaquin County

Najee Zarif, Senior Engineer, San Joaquin County. Contribution: Managing Engineer for San Joaquin County and reviewed Initial Study/Environmental Assessment.

Mahmoud Saqqa, Senior Engineer, San Joaquin County. Contribution: Managing Engineer for San Joaquin County and reviewed Initial Study/Environmental Assessment.

Peter Nuon, Engineer, San Joaquin County. Contribution: Project Engineer for San Joaquin County and reviewed Initial Study/Environmental Assessment.

Stanislaus County

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AECOM

Tom Barnard, Senior Engineer, AECOM. Contribution: Engineering Project Manager for AECOM and reviewed Initial Study/Environmental Assessment.

California Department of Transportation

Kathy Ikeda, Associate Environmental Planner, Caltrans District 10. B.A. Biochemistry and Cell Biology, University of California, San Diego; graduate studies in biomedical illustration at California State University, Long Beach. 12 years of environmental planning experience. Contribution: Served as the Caltrans environmental coordinator for the project and conducted oversight coordinator review and edits of the Draft Initial Study/Environmental Assessment.

Jacqueline Wait, Associate Environmental Planner, Caltrans District 10. B.A. and graduate studies in Anthropology, California State University, Sacramento. 19 years experience in archaeology/cultural resources management. Contribution: Served as the Caltrans archaeologist, performed oversight review of cultural resource studies, and conducted interagency coordination with the SHPO, and performed cultural resource review of the Draft Initial Study/Environmental Assessment.

Julie Myrah, Senior Environmental Planner, Caltrans District 10. Contribution: Supervised Caltrans environmental review functions for the project and performed Environmental Branch Chief review of the Draft Initial Study/Environmental Assessment.

James P. Henke, Associate Environmental Planner – Biology, Caltrans District 10. B.S., Wildlife Biology, Humboldt State University. 13 years of experience in biological resource identification, biological impact analysis, and regulatory permitting. Contribution: Served as the Caltrans biologist for the project; performed oversight review of the Natural Environment Study and interagency coordination with USFWS and NOAA.

Kursten Sheridan, Associate Environmental Planner – Biology, Caltrans District 10. University of California, Berkeley. Contribution: Served as the Caltrans biologist for the project; performed oversight review of the Natural Environment Study and interagency coordination with NOAA; reviewed biological sections of the first administrative Draft Initial Study/Environmental Assessment.

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Clemens Goewert, Environmental Planner (Hazardous Waste Specialist), Caltrans Central Region. B.A., Geology, St. Louis University, St. Louis, Missouri; 39 years of combined experience in geology, engineering geology, environmental studies, and hazardous and nuclear waste management. Contribution: Served as the Caltrans hazardous waste specialist for the project; performed oversight review of the Phase One Assessment and Preliminary Site Investigation; reviewed hazardous waste sections of the Draft Initial Study/Environmental Assessment.

Allam Alhabaly, Transportation Engineer, Caltrans Central Region. B.S., California State University, Fresno, School of Engineering; 11 years of experience in environmental technical studies, with emphasis on noise studies. Contribution: Served as the Caltrans noise specialist for the project; performed oversight review of the Noise Study Report; reviewed noise sections of the Draft Initial Study/Environmental Assessment.

Abdulrahim N. Chafi, Transportation Engineer, Caltrans Central Region. Ph.D., P.E. Civil/Environmental Engineer. Registered Civil Engineer in the State of California. Ph.D., Environmental Engineering, California Coast University, Santa Ana; B.S., M.S., Chemistry and M.S. Civil/Environmental Engineering, California State University, Fresno; 15 years of environmental technical studies experience. Contribution: Served as the Caltrans air quality specialist for the project; performed oversight review of the Air Quality Study; reviewed air quality sections of the Draft Initial Study/Environmental Assessment.

Rajeev Dwivedi, Associate Engineering Geologist, Caltrans Central Region. Ph.D., Environmental Engineering, Oklahoma State University, Stillwater; 19 years of environmental technical studies experience. Contribution: Served as the Caltrans water quality specialist for the project; performed oversight review of the Water Quality Study; reviewed water quality sections of the Draft Initial Study/Environmental Assessment.

Srikanth Gopalkrishnarao, P.E – Hydraulics Engineer, Caltrans Central Region, M.S., Environmental Engineering, South Dakota State University; B.S., Transportation Engineering, Bangalore University, India. Registered Civil Engineer (RCE), 12 years experience as a Caltrans, hydraulics engineer and 5 years experience as a civil/environmental engineer. Contribution: Served as the Caltrans hydraulics specialist for the project; performed oversight review of the hydraulics and floodplains reports/forms; reviewed hydraulics/floodplains sections of the Draft Initial Study/Environmental Assessment.

Bill Duttera, Associate Landscape Architect, Caltrans District 10. B.S., Landscape Architecture, California Polytechnic State University, San Luis Obispo. 23 years of experience in landscape architecture; Registered Landscape Architect. Contribution: Served as the Caltrans landscape architect for the project and reviewed the visual/aesthetic sections of the Draft Initial Study/Environmental Assessment.

Jesus Serrano, Transportation Engineer, Caltrans District 10. Contribution: Served as the Caltrans local assistance engineer for the project and reviewed basic project information in the Draft Initial Study/Environmental Assessment

Brenda Powell-Jones, Senior Environmental Planner, Caltrans Headquarters. Contribution: Performed review of the climate change sections of the Draft Initial Study/Environmental Assessment.

Gail Miller, Senior Environmental Planner, Caltrans Central Region. B.A., Public Administration, California State University, Fresno; 20 years of land use and environmental planning experience. Contribution: Performed NEPA QC review of the first administrative Draft Initial Study/Environmental Assessment.

Haiyan Zhang, Senior Environmental Planner and HQ NEPA Delegation Coordinator for D10 and D4; M.S. Urban Planning, San Jose State University; Contribution: Performed NEPA QC review of the second administrative Draft Initial Study/Environmental Assessment.

Carrie Swanberg, Associate Environmental Planner, Caltrans Central Region. B.S., Biology, California State University, Fresno; 11 years of biology experience. Contribution: reviewed biology section of the first administrative Draft Initial Study/Environmental Assessment.

Chapter 5 Distribution List

The distribution list represents all the public officials, local agencies, and interested parties that were sent copies of the environmental document.

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Appendix A California Environmental Quality Act Checklist

The following checklist identifies physical, biological, social, and economic factors that might be affected by the proposed project. The California Environmental Quality Act impact levels include potentially significant impact, less than significant impact with mitigation, less than significant impact, and no impact.

Supporting documentation of all California Environmental Quality Act checklist determinations is provided in Chapter 2 of this Initial Study/Environmental Assessment. Documentation of No Impact determinations is provided at the beginning of Chapter 2. Discussion of all impacts, avoidance, minimization, and/or mitigation measures is under the appropriate topic headings in Chapter 2.

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
I. AESTHETICS: Would the project:				
a) Have a substantial adverse effect on a scenic vista	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐
II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☒	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☒	☐
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐
IV. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☒	☐	☐

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒
VI. GEOLOGY AND SOILS: Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
VII. GREENHOUSE GAS EMISSIONS: Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☐	☒

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒
VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒
IX. HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Result in inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒
X. LAND USE AND PLANNING: Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b)Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒
XI. MINERAL RESOURCES: Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒
XII. NOISE: Would the project result in:				

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
(f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
XIII. POPULATION AND HOUSING: Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
XIV. PUBLIC SERVICES:				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☐	☒
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
Other public facilities?	☐	☐	☐	☒
XV. RECREATION:				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒
XVI. TRANSPORTATION/TRAFFIC: Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒
XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☐	☒
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Appendix B Title VI Policy Statement

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY EDMUND G. BROWN Jr., Governor

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Flex your power!
Be energy efficient!

March 16, 2012

NON-DISCRIMINATION
POLICY STATEMENT

The California Department of Transportation, under Title VI of the Civil Rights Act of 1964 and related statutes, ensures that no person in the State of California shall, on the grounds of race, color, national origin, sex, disability, religion, sexual orientation, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

For information or guidance on how to file a complaint based on the grounds of race, color, national origin, sex, disability, religion, sexual orientation, or age, please visit the following web page: http://www.dot.ca.gov/hq/bep/title_vi/t6_violated.htm.

Additionally, if you need this information in an alternate format, such as in Braille or in a language other than English, please contact Mario Solis, Manager, Title VI and Americans with Disabilities Act Program, California Department of Transportation, 1823 14th Street, MS-79, Sacramento, CA 95811. Phone: (916) 324-1353, TTY 711, fax (916) 324-1869, or via email: *mario_solis@dot.ca.gov*.

MALCOLM DOUGHERTY
Acting Director

"Caltrans improves mobility across California"

Appendix C Minimization and/or Mitigation Summary

Environmental Commitments	Responsible Party	Timing
Traffic		
A Transportation Management Plan would be prepared before starting construction work and implemented by the San Joaquin County Department of Public Works throughout the construction of the project. This plan would include such elements as public information/public awareness, the location of access to the construction site, any driveway turn restrictions, temporary traffic control devices or flaggers, travel time restrictions for construction-related traffic to avoid peak travel periods on selected roadways, and designated parking and stain areas for workers and equipment.	San Joaquin County Department of Public Works and construction contractor.	Before the start of construction
Visual/Aesthetic Resource		
During project construction, construction materials and debris would be stored away from highly visible areas, which would include, but not be limited to, temporary construction easements located outside of the Stanislaus River floodplain.	San Joaquin County Department of Public Works and construction contractor.	Throughout project construction activities
During project construction, nighttime construction lighting would be faced downward and away from adjacent occupied properties. In addition, lighting would be directed away from traffic lanes and areas where lighting could disturb passing drivers and/or pedestrians. Adjacent residents would be provided with a County contact number in case nighttime lighting becomes disruptive.	San Joaquin County Department of Public Works and construction contractor	Throughout project construction activities
Bridge design would optimize views to Stanislaus River by bridge users by incorporating semi-transparent vehicle barrier for both new bridges. Solid Caltrans concrete barriers would be avoided where possible (Types 25-80). As appropriate for required roadway design, Caltrans Metal Rail Barriers should be considered with the objective to maintain existing views to Stanislaus River by motorists and cyclists (Caltrans Metal Rail Barriers: ST-30, ST-40, ST-10).	San Joaquin County Department of Public Works and construction contractor	During project design
Lighting poles and signs would be designed to minimize reflection to the extent feasible. All reflective surfaces would be painted with an anti-reflective coating or	San Joaquin County Department of Public Works and construction	During project design

Environmental Commitments	Responsible Party	Timing
otherwise treated to reduce light reflection.	contractor	
Lighting types and shading methods would be incorporated into the project to ensure that lighting impacts are reduced to the greatest extent feasible. Methods may include focusing lighting away from residential properties, using hooded lighting, and reducing the height of the lighting to the extent feasible, in addition to other feasible methods.	San Joaquin County Department of Public Works and construction contractor	During project design
Cultural Resources		
If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area would be diverted until a qualified archaeologist can assess the nature and significance of the find. If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities would cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner would notify the Native American Heritage Commission (NAHC) who would then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains would contact Jacqueline Wait, Environmental MPS / Local Assistance Branch Chief, California Department of Transportation, District 10, so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.	San Joaquin County Department of Public Works and construction contractor	Throughout project construction
Hydrology/Floodplain		
Temporary river diversions would be limited to dry-season months (June 15th to October 15th) to avoid potential for storm event flows to overtop diversion equipment. Additionally, diversion equipment would be designed with adequate capacity to accommodate anticipated river flows during the diversion period.	San Joaquin County Department of Public Works and construction contractor	Throughout project construction
Hazardous Materials		
An agrichemical impact assessment would be conducted within areas of proposed ground disturbance within the project footprint prior to ground disturbance within agricultural fields.	San Joaquin County Department of Public Works and construction contractor	Prior to start of construction

Environmental Commitments	Responsible Party	Timing
Surveys for asbestos-containing material and lead-based paint would be conducted prior to any building demolition within Project boundaries.	San Joaquin County Department of Public Works and construction contractor	Prior to start of construction
All aspects of the project associated with removal, storage, transportation, and disposal of yellow traffic stripes would be in strict accordance with appropriate California and Federal regulations. Disposal of the stripes would be at a Class I disposal facility.	San Joaquin County Department of Public Works and construction contractor	Throughout project construction
Air Quality		
The construction contractor would comply with Caltrans' Standard Specifications Section 7-1.01F and Section 10 of Caltrans' Standard Specifications (2006).	San Joaquin County Department of Public Works and construction contractor	Throughout project construction
The construction contractor would prepare and submit a Dust Control Plan to the San Joaquin Valley Air Pollution Control District for their approval at least 30 days prior to any earthmoving or construction activities.	San Joaquin County Department of Public Works and construction contractor	At least 30 days prior to the start of any earthmoving or construction activities.
The project would comply with San Joaquin Valley Air Pollution Control District Rule 9510, Indirect Source Review, which requires implementation of control measures and/or purchasing of emissions offsets to mitigate construction-related NOx and PM10 emissions from roadway projects in excess of 2.0 tons. Off-Site Emission Reduction Fees would be calculated, as dictated by Rule 9510, to reduce construction-related NOX emissions by 20 percent and PM10 emissions by 45 percent, compared to the statewide fleet average.	San Joaquin County Department of Public Works and construction contractor	Prior to and throughout project construction
Noise		
The construction contractor would substitute noise/vibration-generating equipment with equipment or procedures that would generate lower levels of noise/vibration. For instance, in comparison to impact piles, drilled piles or the use of a vibratory pile driver	San Joaquin County Department of Public Works and construction	Throughout project

Environmental Commitments	Responsible Party	Timing
are preferred alternatives where geological conditions would permit their use.	contractor	construction
Limit noise-generating construction activities, excluding those that would result in a safety concern to workers or the public, to the least noise-sensitive daytime hours. Construction activities would be prohibited on Sundays and federal/state-recognized holidays.	San Joaquin County Department of Public Works and construction contractor	Throughout project construction
All construction equipment would have sound-control devices that are no less effective than those provided on the original equipment. No equipment would have an unmuffled exhaust.	San Joaquin County Department of Public Works and construction contractor	Throughout project construction
As directed by Caltrans or San Joaquin County, the contractor would implement appropriate additional noise mitigation measures, including changing the location of stationary construction equipment, turning off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources.	San Joaquin County Department of Public Works and construction contractor	Throughout project construction
Biological Resource		
The County would avoid or minimize potential construction-related water quality impacts through compliance with the State Water Quality Control Board (SWQCB) National Pollutant Discharge Elimination System (NPDES) General Permit for construction activities. The County would be responsible for filing a Notice of Intent with the SWQCB and the contractor would prepare a storm water pollution prevention program (SWPPP), developed by a qualified SWPPP practitioner, and implement an appropriate suite of temporary construction BMPs.	San Joaquin County Department of Public Works and construction contractor	Prior to start of and throughout project construction
The contractor would be responsible for constructing permanent post-construction storm water BMPs in accordance with County standards, which would be identified and incorporated into the SWPPP. The SWPPP requirements would accommodate the additional drainage discharges generated by the project to avoid adverse effects such as off-site erosion, sedimentation, and water quality impairments. Construction specifications include the following measures to reduce potential impacts associated with accidental spills of pollutants (i.e., fuel, oil, grease, etc.) to vegetation and aquatic habitat resources.	San Joaquin County Department of Public Works and construction contractor	Throughout project construction

Environmental Commitments	Responsible Party	Timing
The project proposes to mitigate for the permanent loss of 0.45 acre of riparian habitat at a 2:1 ratio at a conservation bank approved by the CDFG and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA/NMFS). If a conservation bank is unavailable to satisfy the credit needs for the proposed project, an in-lieu fee program with both the NOAA/NMFS and the CDFG is proposed. If options 1 and 2 above are not deemed acceptable to the resource the County would undertake restoration on site within the Stanislaus River watershed no more than 5 miles from the project study area. Within the mitigation area, riparian habitat greater in size to the area impacted by implementation of the proposed project (minimum 2:1 ratio) would be reestablished and protected in perpetuity through a conservation easement. Plantings would have a minimal survival rate of 80% at the end of the five-year monitoring and maintenance period. If this rate is not met, the plan would require replanting and continued monitoring until a five-year success period is met. For areas of riparian habitat that require temporary disturbance, the County would prepare and implement an on-site riparian restoration plan for disturbed riparian habitat.	San Joaquin County Department of Public Works and construction contractor	Prior to and throughout project construction and post construction.
Impacts to woodland habitat and mitigation requirements would be addressed in a Habitat Mitigation Plan as described. The County would restore oak woodland at appropriate mitigation area no more than 10 miles from the project study area. Within the mitigation area, oak woodland greater in size to the area impacted by implementation of the proposed project (minimum 3:1 ratio = three acorns/trees planted for every one removed) would be reestablished and protected in perpetuity through a conservation easement. Plantings would have a minimal survival rate of 80% at for five consecutive years. The County may also pay in-lieu fees at an approved mitigation bank instead of undertaking a restoration project. For oaks that would be preserved on-site, construction activities may not compact soil or change grades or drainage near oaks. A fence must be installed during construction. Irrigation and paving near the dripline (area directly located under the outer circumference of the tree branches) would be minimized. Heritage trees may only be removed in the public interest and must be replaced 5:1 (5 acorns/trees planted for every one removed). Table 2.21 below outlines the proposed mitigation. At a minimum, nine acorns/trees consisting of native oak species would be planted as mitigation for the potential impact to three native oaks (tree tags 688, 689, 691) protected under the	San Joaquin County Department of Public Works and construction contractor	Prior to and throughout project construction and post construction.

Environmental Commitments	Responsible Party	Timing
San Joaquin County oak protection ordinance (Chapter 9 1505; Ordinance 36753). For areas of oak woodland that require temporary effects, implementation of an on-site restoration plan to mitigate temporary impacts would take place in accordance with the revegetation requirements established in the requirements of the environmental permits. Mitigation ratios, revegetation techniques, and success criteria areas must be included in these requirements. A restoration plan would be developed and provided to the appropriate resource agencies prior to implementation of the proposed project..		
The construction contractor would prepare a water diversion plan that complies with all regulatory permits and agreements for any diversion of water necessary for project implementation.	San Joaquin County Department of Public Works and construction contractor	Prior to project construction.
During project development, the size of the work area limits has been reduced to the smallest amount feasible within sensitive habitat areas.	San Joaquin County Department of Public Works and construction contractor	Prior to project construction.
Impacts to the water quality of the river would be minimized by implementing best management practices and an erosion and sediment control plan that minimize impacts to water quality in the river.	San Joaquin County Department of Public Works and construction contractor	Prior to project construction and throughout project construction.
To reduce potential impacts to vegetation and aquatic habitat associated with accidental spills of pollutants (i.e., fuel, oil, grease, etc.), the construction contractor would implement appropriate hazardous materials management practices to reduce the possibility of chemical spills or releases of contaminants, including any non-storm water discharge.	San Joaquin County Department of Public Works and construction contractor	Throughout project construction.
Construction activities within the Stanislaus River would be limited to the period between June 15 and October 15. To minimize risk of direct take, placement of the temporary in-river fill would be conducted outside of the peak migration period (November through May).	San Joaquin County Department of Public Works and construction contractor	Throughout project construction.
Before any activities begin on the project, a biologist would conduct a Worker	San Joaquin County	Prior to project

Environmental Commitments	Responsible Party	Timing
Environmental Awareness Program (WEAP) for all construction personnel.	Department of Public Works and construction contractor	construction.
Placement of the temporary fill would be done so that fish would be able to pass through the project site at all times.	San Joaquin County Department of Public Works and construction contractor	Throughout project construction.
All pumped water would be routed to either (1) a sedimentation pond located on a flat stable area above the ordinary high water mark that prevents silt-laden runoff from entering the river, or (2) a sedimentation tank/holding facility that allows only clear water to return to the river and includes disposal of settled solids at an appropriate off-site location.	San Joaquin County Department of Public Works and construction contractor	Throughout project construction.
The construction of the proposed bridge using cast-in-place concrete would require the installation of falsework to support the concrete forms within the active waterway of the Stanislaus River. Installation of falsework piling and access shoring within the active waterway area would be permitted only if a vibratory pile hammer is used. Furthermore, any in-water work would be confined within the work windows proposed in the January 2011 Biological Assessment and the Natural Environment Study.	San Joaquin County Department of Public Works and construction contractor	Throughout project construction.
A storm water pollution protection plan (SWPPP) would be created and implemented to ensure the proper installation and maintenance of sediment control measures. Implementation of the SWPPP would be phased for the suitable timing for dry-weather protective measures and rainy season protective measures.	San Joaquin County Department of Public Works and construction contractor	Prior to project construction and throughout project construction.
All refueling, maintenance, and staging of equipment and vehicles would occur at least 60 feet from riparian habitat or water bodies and not in a location from where a spill would drain directly toward aquatic habitat.	San Joaquin County Department of Public Works and construction contractor	Throughout project construction.
All temporary disturbed areas would be restored to pre-construction conditions upon completion of construction using appropriate seed mixes or plantings.	San Joaquin County Department of Public Works and construction	Throughout project construction

Environmental Commitments	Responsible Party	Timing
	contractor	and post construction.
Additional impacts from habitat disturbance would be avoided by installing protective silt fencing between the aquatic habitats and the construction area limits to prevent accidental disturbance during construction and to protect water quality within the aquatic habitats during construction.	San Joaquin County Department of Public Works and construction contractor	Prior to start of and during project construction.
Standard BMPs would be implemented during and after construction to protect water quality in sensitive habitat areas during construction.	San Joaquin County Department of Public Works and construction contractor	Throughout project construction
If construction or vegetation removal is proposed during the breeding/nesting season for local bird species (typically February 15 through August 31), a focused survey for active nests migratory birds within and in the vicinity of (no less than 250 feet outside project boundaries, where possible) the project site would be conducted by a qualified biologist. Two surveys would be conducted, at least one week apart, with the second survey occurring no more than two days prior to tree removal. If no active nests are found, vegetation removal or construction activities may proceed.	San Joaquin County Department of Public Works and construction contractor	Prior to start of and during project construction.
Construction activities would be restricted as necessary to avoid disturbance of the nest until it is abandoned or the biologist deems disturbance potential to be minimal. Restrictions may include establishment of exclusion zones (no ingress of personnel or equipment at a minimum radius of 100 feet (30 meters) around an active migratory bird nest) or alteration of the construction schedule.	San Joaquin County Department of Public Works and construction contractor	During project construction.
If construction is to begin during the nesting season (between February 1 and September 15), a survey would be conducted to determine if birds are nesting on the bridge undercrossings. Exclusionary barriers (netting) can be placed around the bridge structure to prohibit birds from building nests. The netting can be placed anytime between September 16 and January 31.	San Joaquin County Department of Public Works and construction contractor	Prior to start of and during project construction.

Environmental Commitments	Responsible Party	Timing
Prior to initiation of construction activity, a bat survey would be performed between March 1 to July 31 in the year prior to the removal of any trees or structures. If bat roosts are identified on site, the County would require that the bats be safely flushed from the sites where roosting habitat is planned to be removed prior to roosting season (typically May to August) of each construction phase prior to the onset of construction activities. If maternity roosts are identified during the maternity roosting season (typically May to August), they must remain undisturbed until a qualified biologist has determined the young bats are no longer roosting. If roosting is found to occur on-site, replacement roost habitat (e.g., bat boxes) would be provided on-site for roosting sites removed. If no bat roosts are detected, then no further action is required if the trees and buildings are removed prior to the next breeding season. If removal is delayed, then an additional pre-demolition survey would be conducted 30 days prior to removal to ensure that a new colony has not established itself.	San Joaquin County Department of Public Works and construction contractor	Prior to start of and during project construction.
Avoidance, minimization, and mitigation measures would be implemented according to the USFWS Conservation Guidelines for the Valley Elderberry Longhorn Beetle (1999). Mitigation compensation would be accomplished in accordance with the USFWS Conservation Guidelines (1999); the County would be responsible for the planting of 266 elderberry seedlings and 270 associated native plants. Planting would be achieved at an USFWS-approved conservation bank or within the project right-of-way, if feasible. Currently, VELB mitigation credits are available at the River Ranch Conservation Bank. The service area of this conservation bank includes the project study area.	San Joaquin County Department of Public Works and construction contractor	Prior to start of and during project construction.
The proposed project would implement standard best management practices (BMPs) and other water quality measures to protect riverine habitat. The project would implement a fish salvage program during dewatering of the river. In-water construction would be limited to the period between June 15 and October 15. In addition, any loss of Central Valley steelhead habitat (aquatic) as a result of the proposed project would be compensated at a minimum 3:1 ratio through purchase of credits at a nearby conservation bank for Central Valley steelhead approved by the National Oceanic and Atmospheric Administration/ National Marine Fisheries Service (NOAA/NMFS). Permanent impacts to riparian habitat would be mitigated at a minimum 2:1 ratio, either through establishment of a conservation easement or payment of in-lieu fees at an approved conservation bank. Riverine and riparian habitat would be restored to pre-	San Joaquin County Department of Public Works and construction contractor	Throughout project construction.

Environmental Commitments	Responsible Party	Timing
project conditions after project construction is complete.		
Permanent impacts to essential fish habitat would be mitigated through conservation measures outlined for the Central Valley steelhead. Riverine habitat (temporary impacts) would be restored to pre-project conditions after project construction is complete.	San Joaquin County Department of Public Works and construction contractor	San Joaquin County Department of Public Works and construction contractor
To prevent impacts to MBTA-protected birds and their nests, removal of trees would be limited to only those necessary to construct the proposed project. If construction or tree removal is proposed during the breeding/nesting season for Swainson's hawk (typically March 1 through September 15), a focused survey for active nests of raptors and migratory birds within and in the vicinity of (no less than 250 feet outside project boundaries, where possible) the project site would be conducted by a qualified biologist. Two surveys would be conducted, at least one week apart, with the second survey occurring no more than two days prior to tree removal or other construction activities. If no active nests are found, tree removal or construction activities may proceed. If an active nest is located during pre-construction surveys, the USFWS and/or the CDFG (as appropriate) would be notified regarding the status of the nest. Furthermore, construction activities would be restricted as necessary to avoid disturbance of the nest until it is abandoned or the biologist deems disturbance potential to be minimal. Restrictions may include establishment of exclusion zones (no ingress of personnel or equipment at a minimum radius of 100 feet around an active raptor nest) or alteration of the construction schedule. No action is necessary if no active nests are found or if construction would occur during the non-breeding season (generally September 1 through February 28).	San Joaquin County Department of Public Works and construction contractor	Prior to start of and during project construction.

Appendix D Species List/Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

November 27, 2012

Document Number: 121127114213

Joyce Hunting
PMC
2729 Prospect Park Drive Suite 220
Rancho Cordova, CA 95670

Subject: Species List for McHenry Avenue Corridor Improvemnt Project

Dear: Ms. Hunting

We are sending this official species list in response to your November 27, 2012 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be February 25, 2013.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found here.

Endangered Species Division

TAKE PRIDE IN AMERICA

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 121127114213

Database Last Updated: September 18, 2011

Quad Lists

Listed Species

Invertebrates

Branchinecta conservatio
- Conservancy fairy shrimp (E)

Branchinecta lynchi
- Critical habitat, vernal pool fairy shrimp (X)
- vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
- valley elderberry longhorn beetle (T)

Lepidurus packardi
- Critical habitat, vernal pool tadpole shrimp (X)
- vernal pool tadpole shrimp (E)

Fish

Hypomesus transpacificus
- delta smelt (T)

Oncorhynchus mykiss
- Central Valley steelhead (T) (NMFS)
- Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
- Central Valley spring-run chinook salmon (T) (NMFS)
- winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
- California tiger salamander, central population (T)
- Critical habitat, CA tiger salamander, central population (X)

Rana draytonii
- California red-legged frog (T)

Reptiles

Thamnophis gigas
- giant garter snake (T)

Mammals

Vulpes macrotis mutica
- San Joaquin kit fox (E)

Plants

Neostapfia colusana

Colusa grass (T)

Critical habitat, Colusa grass (X)

Orcuttia inaequalis

San Joaquin Valley Orcutt grass (T)

Tuctoria greenei

Critical habitat, Greene's tuctoria (=Orcutt grass) (X)

Greene's tuctoria (=Orcutt grass) (E)

Quads Containing Listed, Proposed or Candidate Species:

WATERFORD (442A)

RIVERBANK (442B)

SALIDA (443A)

BACHELOR VALLEY (460A)

FARMINGTON (460B)

ESCALON (460C)

OAKDALE (460D)

PETERS (461A)

AVENA (461D)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.

- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6520.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be February 25, 2013.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In Reply Refer To:
81420-2011-F-0289-1

7 June 2011

Ms. Jacqueline Wait
Chief, Environmental Maintenance and Planning Services, & Local Assistance Branch
California Department of Transportation, District 10
P.O. Box 2048
Stockton, California 95201

Subject: Biological Opinion for the McHenry Avenue Corridor Improvement Project, San Joaquin County, California (California Department of Transportation, Local Assistance RPSTPLE-5929(196), BRLS-5929(166), and BRLS-5929(167))

Dear Ms. Wait:

This is the U.S. Fish and Wildlife Service's (Service) response to the California Department of Transportation's (Caltrans) request for formal consultation on the proposed McHenry Avenue Corridor Improvement Project in San Joaquin County, California. Your letter initiating formal consultation, dated January 28, 2011, was received in this office on January 31, 2011. At issue are the potential effects of the proposed project on the federally-threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus;* VELB). This response has been prepared in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 *et seq.*) (Act).

The findings and recommendations in this biological opinion are based on: (1) the January 28, 2011, letter initiating formal consultation; (2) the *McHenry Avenue Corridor Improvement Project Biological Assessment* (BA) dated January 2011 and prepared by the consultant, PMC; (3) electronic mail (e-mail) correspondence and a telephone exchange between Caltrans and the Service; and (4) other information available to the Service.

Caltrans has requested concurrence that the implementation of the avoidance, protective, and compensation measures proposed by San Joaquin County as the local agency project proponent is consistent with measures described in the Service's 1999 *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (Guidelines). This biological opinion will address the appropriateness of these measures. Caltrans has determined that the project is likely to adversely affect the VELB; 10 elderberry shrubs (*Sambucus* sp.) are found within 20 feet (ft) of the project footprint; four of these are located in the path of construction and so will require removal, while the remaining six will be affected by project activities but will not require removal. A further 23 elderberry shrubs/clusters are located within 100 ft of the project footprint but are unlikely to be adversely affected given the implementation of the conservation measures proposed by San Joaquin County. The Service concurs with this determination.

Consultation History

January 31, 2011. The Service received a letter from Caltrans requesting formal consultation for the VELB and concurrence that the conservation measures identified by San Joaquin County are consistent with the Service's Guidelines. The BA was also included in the initiation package.

February 2, 2011. Caltrans telephoned the Service to inquire whether the project initiation package had reached the staff level - it had not at that time. Caltrans mentioned it would also be consulting with the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service) on the Central Valley steelhead (*Oncorhynchus mykiss*; CVS) and essential fish habitat for the Chinook salmon (*Oncorhynchus tshawytscha*).

February 15, 2011. The Service e-mailed Caltrans with questions and comments regarding information in the BA.

February 23, 2011. Caltrans e-mailed responses to the Service and included copies of revisions to several pages in the BA.

March 2, 2011. The Service e-mailed Caltrans with several follow-up questions regarding the BA.

March 8, 2011. Caltrans replied with responses to the follow-up questions.

BIOLOGICAL OPINION

Description of the Proposed Action

San Joaquin County, in cooperation with Stanislaus County and with oversight provided by Caltrans, proposes to widen and improve McHenry Avenue from 200 ft south of Jones Road in San Joaquin County to 1, 700 ft south of East River Road in Stanislaus County. McHenry Avenue is a two-lane, undivided, north-south road that runs through San Joaquin and Stanislaus Counties. It serves as a principal arterial for local traffic and as a connector between State Route (SR) 120 in the City of Escalon and SR 108 in Stanislaus County. There are two bridges and one major intersection within this 1.1 mile (mi) segment of roadway. The overall project is a grouping of three component projects:

1. Widening of McHenry Avenue: The proposal is to accommodate a two-way center left-turn lane from just south of Jones Road to south of the Stanislaus River, and to improve the McHenry Avenue/East River Road intersection.

2. Replacement of the Stanislaus River Bridge (bridge number 38C-0032) on McHenry Avenue over the Stanislaus River: The proposal is to accommodate the anticipated roadway improvements.

3. Replacement of the South San Joaquin Irrigation District (SSJID) Bridge (bridge number 29C-0166) on McHenry Avenue over the SSJID/Oakdale Irrigation District (OID) Main Canal: The proposal is also to accommodate the anticipated roadway improvements.

The roadway widening is dictated by the location of the existing SSJID/OID Main Canal and the Union Pacific Railroad (UPRR) facilities to the north of the Stanislaus River and so all widening will be to the east to avoid impacts to irrigation district and railroad facilities. Roadway improvements include:

- The signalization of the McHenry Avenue/East River Road intersection: addition of improvements along East River Road east and west of the intersection to accommodate the turning movements of traffic approaching McHenry Avenue.

- The addition of a two-way center left turn lane on McHenry Avenue, from 200 ft north of the McHenry Avenue/East River Road intersection to approximately 200 ft south of Jones Road: widening of McHenry Avenue north of the intersection, along the eastern right-of-way (ROW) to provide three 12-ft wide lanes (two travel lanes and a center, two-way turn lane) with 5 ft wide shoulders to accommodate bicycles and pedestrians.

- The replacement of the existing bridges across the Stanislaus River and the SSJID/OID Main Canal: replacement and widening of both bridge structures to accommodate the future ultimate five-lane configuration for McHenry Avenue (four 12-ft wide travel lanes, one 12-ft wide median/left turn lane, and 5-ft wide shoulders). The SSJID Bridge will be striped for the interim three-lane configuration and the Stanislaus River Bridge will be striped to conform to the existing two-lane configuration at its southern terminus.

- The modifications to the intersection approaches on East River Road to accommodate turning movements, but with no change to the number of through-lanes.

- The modifications to existing property access features as required to conform to the improvements.

According to the BA, the purpose of the proposed project is to address specific traffic safety and congestion issues stemming from the McHenry Avenue/East River Road intersection. Additionally, safety improvements for the two nearby bridge structures are required by state and federally-mandated programs. The project anticipates that it will relieve traffic congestion and reduce traffic delays at the aforementioned intersection, provide for safe left-turn movements, support federal, state, and local policies that mandate safety improvements for the two bridges, accommodate the planned five-lane width of McHenry Avenue at the bridges over the

SSJID/OID Main Canal and the Stanislaus River, and reduce emissions from transportation sources.

Utility Relocation

The Modesto Irrigation District (MID) supplies both power and water to the area. There are overhead transmission lines on the east side of McHenry Avenue that parallel the Stanislaus River Bridge, crossing into San Joaquin County to the north side of East River Road, then to the west side of McHenry Avenue where the distribution lines share poles with the Pacific Gas & Electric Company (PG&E). PG&E overhead power facilities also parallel East River Road. The SSJID/OID Main Canal crosses McHenry Avenue near Meyers Road, then parallels the west side of McHenry Avenue until it turns to the west at East River Road. Existing overhead and underground utilities within or adjacent to any proposed improvements will be protected, relocated, or removed as necessary. The portion of the MID's existing transmission lines on the east side of McHenry Avenue in Stanislaus County will be permanently relocated to the east to accommodate the construction of the Stanislaus River Bridge. Temporary relocations or protection in place may be required for both the MID and PG&E distribution lines north of the Stanislaus River in San Joaquin County.

Project Schedule

The proposed project is estimated to take three years to complete, beginning in 2013 and ending in 2015. The sequence of construction activities will be ultimately determined by the various restrictions imposed on the construction of the bridge replacements due to timing constraints, i.e. the period during which the SSJID/OID Main Canal will not deliver water to the district, and the work windows for construction activity within the limits of the Stanislaus River channel and the adjacent floodway. The sequence of activities also will be driven by the environmental resources that need to be avoided and protected, i.e. water quality, impacts to aquatic resources, and the restriction of activity within the designated floodway and SSJID/OID Main Canal; and by the date on which the contractor is informed to proceed with activities. The following is a breakdown of activities that can be expected to occur during each year of construction:

<u>First Year</u>: Prior to the start of construction, signage will be installed to inform the traveling public of the anticipated work. Utility relocation, such as the MID transmission line will also be completed prior to the beginning of work.

The construction of temporary pavement on the north side of East River Road will be used to move traffic away from the east side of the existing Stanislaus River Bridge in order to permit construction of the first stage of the north bridge abutment. Access into the work area on the south side of the river crossing will be created and the footprint of the work will be cleared. Fill material for the first stage of the south bridge abutment will be deposited, while the temporary work pad necessary to support drilling equipment for foundation construction of the river crossing will be constructed.

The south section of the Stanislaus River bridge is anticipated to be supported on precast/pre-stressed (PC/PS) concrete pilings that will be driven into the ground by use of a diesel-powered pile hammer. The north portion will consist of cast-in-drilled-hole (CIDH) or cast-in-steel-shell (CISS) piling with cast-in-place (CIP) concrete column extensions and a CIP pre-stressed concrete box girder superstructure.

Once the contractor has completed placement of the fill, installation of the piling, and the necessary abutment and column construction, the falsework or forming system required to build the girders and deck will be constructed. The falsework structure will likely include the use of temporary piling to provide stable support for the construction loads; it will also likely be kept in place during the winter and so will be designed accordingly. Once the eastern half of the bridge is constructed, traffic will be moved back to this new segment, the existing bridge will be removed, and the remainder of the new bridge will start construction.

Second Year: Construction will focus on the building of the second stage of the bridge. This will require the erection of a work platform and falsework in a manner consistent with those of the first stage of work. Once removal operations are completed, placement of the foundations will begin, followed by installation of the remaining substructure elements, abutments and columns. Then will come construction of the falsework and then of the bridge superstructure.

The area on the south side of East River Road to the west of McHenry Avenue will be isolated from active traffic to permit construction of the abutment and superstructure. To account for this, it will be necessary to widen East River Road to the south in order to provide a right-turn lane during this period.

There is no anticipated replacement of the spillway carrying canal overflow or water releases from the SSJID/OID Main Canal's box culvert. However, the roadway box culvert will be extended and will match the dimensions of the existing channel.

Third Year: Construction will involve finishing the bridge superstructure and the roadway work. Activities will include the removal of falsework and remaining temporary works; bridge deck closure pours (cross bracing) to join the two construction stages together; removal of temporary road closures and temporary pavement; final grading and drainage work at driveways and at points of access to agricultural fields; improving the intersection at McHenry Avenue/East River Road intersection, including installation of lighting and signal systems; completion of remaining roadway signage, striping, and pavement markings; and the restoration of the site in compliance with conservation measures and the monitoring plan.

Staging and Access

Staging areas on both sides of the Stanislaus River will likely be used by the contractor to store construction equipment and materials and to access the site. The edge of the staging areas will be at least 50 ft from the channel in order to minimize impacts to the riparian corridor.

Water-based work/Dewatering

Diversion of the Stanislaus River at the site will be required in order to remove the existing bridge structure, to place temporary falsework, and to construct the new bridge. The use of cofferdams and temporary work trestles is not anticipated. Instead, temporary embankment/work pad(s) used to divert the river's flow and maintain dry work area conditions will be constructed of clean, local cobble and gravel substrate material approved both by the US Army Corps of Engineers (Corps) and the NOAA Fisheries Service. Flows will be diverted either into temporary culvert pipes that pass through the embankment/work pad or to a channel opening provided between the end of the temporary embankment and the north bank of the river.

The temporary work pad will be used to support drilling equipment for the construction of the CIDH piles which will have either temporary or permanent steel casing placed to support the walls of each hole during drilling. Below the CIDH foundation, a slurry displacement method will be used to control groundwater intrusion into the pile excavation; drilling fluids will be controlled using special equipment and BMPs for these activities.

Project construction activities outside the river channel, the designated floodway boundary, or the SSJID/OID Main Canal, such as roadway embankments and paving may occur throughout the year with no seasonal restrictions. Erosion control materials will be stockpiled on site for immediate deployment if necessary to control stormwater within the construction work areas.

Fill Material and Borrow Site

Temporary fill material to be used within the Stanislaus River will be native material similar to that within the action area. Imported fill will be consistent with Caltrans' standard specifications. Material will be brought to the site from approved borrow pits which will be determined at a later date, since the contractor will be responsible for the selection and compliance of the selected site(s) prior to construction activities.

<u>Proposed Avoidance and Minimization Measures</u>

According to the BA and further discussion with one of Caltrans' biologists, San Joaquin County, in cooperation with Stanislaus County, and with oversight provided by Caltrans, also proposes to implement the following measures to minimize and avoid effects to sensitive resources and to the species that occur within the project area.

General Construction Guidelines:

1. Schedules for work activities within the designated Stanislaus River floodway and SSJID/OID Main Canal will be restricted.

    a. Work within the wetted perimeter of the river channel will occur between June 15 and October 15 when the CVS is least likely to be present and so this will minimize impacts to the species and other aquatic resources.

b. Work within the area of the designated floodway that is governed by the Central Valley Flood Protection Board (Board) will be limited to the period from April 15 to October 31 for flood protection issues, unless otherwise authorized by the Board.

c. Work within the SSJID/OID Main Canal will be restricted to October 15 through February 15 of any given year, as this is when the canal shuts off delivery of water to its district customers.

d. The same schedule restrictions for work within the SSJID/OID Main Canal will govern the extension work on the roadway box culvert that carries canal overflow or water releases to the existing spillway and then to the river.

2. Temporary construction Best Management Practices (BMPs) will be implemented in accordance with the project plans and specifications and the approved stormwater pollution prevention plan (SWPPP); BMPs may include, but are not limited to, silt fences, fiber rolls, straw bales, sandbag barriers, check dams, and sediment basins.

3. Concrete truck washout locations will be provided on-site, outside of the main channel areas, pursuant to BMPs and in accordance with all applicable permits.

4. Material and equipment storage will not be permitted within the floodway and river channel areas after October 31 of each year. Equipment may enter into the floodway but will be removed daily and stored outside of the areas subject to flooding.

Valley Elderberry Longhorn Beetle:

1. San Joaquin County and Caltrans will follow the Service's 1999 Guidelines.

2. Temporary plastic mesh-type fencing (e.g. Tensor Polygrid) will be installed around the perimeter (at least 20 ft from the driplines) of all elderberry plants that will be retained on-site or are located adjacent to the project area. This is to prevent encroachment by construction vehicles and personnel. The exact location of fencing will be determined by a Service-approved biologist. The fencing will be strung tightly on posts set at a maximum interval of 10 ft and will be installed so as to prevent equipment from expanding the work area beyond the demarcated area.

    a. Fencing will be checked and maintained weekly until all construction is completed.

    b. Signs that are clearly visible from a distance of 20 ft will be posted every 50 ft along the perimeter of the buffer area fencing stating, "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs will be maintained for the duration of the project. No construction activity, including grading, will be allowed until this condition is met.

c. No grading, clearing, storing of equipment or machinery, or other disturbance or activity will occur until a representative of San Joaquin County has inspected and approved all temporary construction fencing.

3. Prior to the commencement of work, a qualified Service-approved biologist will conduct an environmental education program for construction employees and contractors covering the status of the VELB, how to avoid damaging elderberry shrubs, the importance of avoiding impacts to the VELB, and the penalties for not complying with biological minimization requirements. New construction personnel who are added to the project after the training is first conducted will also be required to take the training before starting work. An environmental awareness handout that describes sensitive resources to be avoided during construction will be provided to each worker.

4. Dust control measures such as water spraying to graded and disturbed areas that are un-vegetated will be implemented. This way, dirt will be prevented from becoming airborne and accumulating on elderberry shrubs. To avoid attracting Argentine ants (*Linepithema humile*), water will not be sprayed within the driplines of elderberry shrubs.

5. No insecticides, herbicides, fertilizers, or other chemicals will be applied during construction.

6. Ten directly affected elderberry shrubs (four within the project footprint and six within 20 ft of the footprint) will be transplanted when the shrubs are dormant, from approximately the beginning of November through the first two weeks of February.

7. San Joaquin County proposes to compensate for the habitat loss of four shrubs, the direct effects to six additional shrubs during the course of construction, and for resulting direct effects to the VELB by planting a total of 266 elderberry seedlings and 270 associated native plants (Table 1) within a minimum area of 2.23 ac at the River Ranch Conservation Bank (RRCB), French Camp Conservation Bank (FCCB), or at another available Service-approved bank; this equates to the purchase of 54 credits at one of the aforementioned conservation banks, and will take place prior to groundbreaking.

Table 1. The number of elderberry stems directly affected by the project; proposed compensation, as based on ratios in the Service's Guidelines.

# Shrubs	Stem Size	# of Stems	Exit Holes	Riparian Habitat	Elderberry Seedling Ratio	# Elderberry Seedlings	Associated Native Ratio	# Associated Natives
10	≥1"- ≤3"	71	No	No	1:1	71	1:1	71
	>3" & <5"	15	No	No	2:1	30	1:1	30
	>3" & <5"	1	Yes	No	4:1	4	2:1	8
	≥5"	3	No	No	3:1	9	1:1	9
	≥1"- ≤3"	65	No	Yes	2:1	130	1:1	130
	>3" & <5"	6	No	Yes	3:1	18	1:1	18
	≥5"	1	No	Yes	4:1	4	1:1	4
	Total	**162**				**266**		**270**

Action Area

The action area is defined in 50 CFR § 402.02 as, "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The action area for the proposed project encompasses an area of 43.7 acres (ac) and includes the project footprint, defined in the BA as the maximum construction area plus an approximate 200-ft buffer around the footprint in which additional project effects may occur such as staging set-up and downstream water effects from work at the bridge locations. The action area consists of habitat types including orchards, ruderal/urban land, annual grassland, valley oak woodland, valley foothill riparian forest, riverine habitat, and open water. Additionally, the action area includes the borrow site(s), from which fill material will be obtained but which is not yet identified, as well as the 2.23 ac of land proposed as compensation area for plantings at one of the Service-approved VELB conservation banks.

Analytical Framework for the Jeopardy/No Jeopardy Determination

In accordance with policy and regulation, the following analysis relies on four components to support the jeopardy/no jeopardy determination for the VELB: (1) the *Status of the Species*, which evaluates the range-wide condition of the VELB, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the VELB in the action area, the factors responsible for that condition, and the role of the action area in the VELB's survival and recovery; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the VELB; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the VELB.

In accordance with policy and regulation, the jeopardy/no jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the VELB's current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the VELB in the wild.

The following analysis places an emphasis on consideration of the range-wide survival and recovery needs of the VELB and the role of the action area in meeting those needs as the context for evaluating the significance of the effects of the proposed Federal action, combined with cumulative effects, for purposes of making the jeopardy/no jeopardy determination. In short, a non-jeopardy determination is warranted if the proposed action is consistent with maintaining the role of habitat and the VELB population in the action area for the survival and recovery of the species.

Status of the Species

The VELB was listed as a threatened species under the Act on August 8, 1980 with designated critical habitat (Service, 1980). Two areas along the American River in the Sacramento metropolitan area have been designated as critical habitat for the VELB. The first area designated as critical habitat for this species is along the lower American River at River Bend (Goethe) and Ancil Hoffman parks (American River Parkway Zone) and the second area is at the Sacramento Zone, an area about a half mile from the American River downstream from the American River Parkway Zone. In addition, an area along Putah Creek, Solano County, and the area west of Nimbus Dam along the American River Parkway, Sacramento County, are considered essential habitat, according to *The Valley Elderberry Longhorn Beetle Recovery Plan* (Service, 1984). These critical habitat areas and essential habitat areas within the American River parkway and Putah Creek support large numbers of mature elderberry shrubs with extensive evidence of use by the VELB.

Life History

The elderberry shrub is the sole host plant for the VELB. Elderberries are locally common components of the remaining riparian forest and savannah landscapes, and to a lesser extent the mixed chaparral-foothill woodlands of the Central Valley. The occupancy rates of the VELB are reduced in non-riparian habitats (e.g., Talley *et al.*, 2007), indicating that riparian elderberry habitat an important habitat type for the VELB. Use of elderberry shrubs by the VELB, a wood borer, is rarely apparent. Frequently, the only exterior evidence of the shrub's use by the VELB is an exit hole created by the larva emerging just prior to the pupal stage. Observations of elderberry shrubs along the Cosumnes River and in the Folsom Lake area indicate that larval VELB can be found in elderberry stems with no apparent exit holes; the larvae either succumb prior to constructing an exit hole or are not developed sufficiently to construct one. Larvae appear to be distributed in stems which are one inch or greater in diameter at ground level and can occur in living stems. *The Valley Elderberry Longhorn Beetle Recovery Plan* (Service, 1984) and Barr (1991) further describe the VELB's life history.

Population Structure

The VELB is a specialist on elderberry plants, and tends to have small population sizes and occurs in low densities (Barr, 1991; Collinge *et al.*, 2001). It has been observed feeding upon both blue and red elderberry (Service, 1984; Barr, 1991) with stem sizes greater than or equal to one inch in diameter (Barr, 1991). Sightings of the VELB are rare and in most circumstances, evidence of the VELB is derived from the observation of the exit holes left when adults emerge from elderberry stems. The VELB tends to occur in areas with higher elderberry densities, but has lower exit-hole densities than those of a closely related species, the California elderberry longhorn beetle (Collinge *et al., 2001).*

Distribution, Range, and Status with respect to Recovery

When the VELB was listed in 1980, the species was known from less than ten localities along the American River, the Merced River, and Putah Creek. By the time the *Valley Elderberry Longhorn Beetle Recovery Plan* was prepared in 1984, additional occupied localities had been found along the American River and Putah Creek. As of 2005, the California rangewide distribution extended from the Sacramento River in Shasta County, southward to an area along Caliente Creek in Kern County (California Natural Diversity Database, 2006). The California Natural Diversity Database (CNDDB) contained 190 occurrences for this species in 44 drainages throughout the Central Valley. However, the number of records should be viewed with caution as a record does not necessarily indicate a unique population. In many cases, there are multiple records within close proximity to one another within the same watershed or river.

The VELB is considered a poor disperser based on the spatial distribution of occupied shrubs (Barr, 1991; Collinge *et al.*, 2001). Huxel and Hastings (1999) used computer simulations of colonization and extinction patterns based on differing dispersal distances, and found that the short dispersal simulations best matched the 1997 census data in terms of site occupancy. This suggests that dispersal and colonization are limited to nearby sites.

At spatial scales greater than 6.2 miles, such as across drainages, VELB occupancy appears to be strongly influenced by regional extinction and colonization processes, and colonization is constrained by limited dispersal (Collinge *et al.*, 2001; Huxel and Hastings, 1999). Except for one occasion, drainages examined by Barr that were occupied in 1991, remained occupied in 1997 (Collinge *et al.*, 2001; Huxel and Hastings, 1999). The one exception was Stoney Creek, which was occupied in 1991, but not in 1997. All drainages found to be unoccupied in 1991 by Barr (1991), were also unoccupied in 1997. Collinge *et al.* (2001) further found that while the proportions of occupancy were similar, the number of sites examined containing elderberry and the density of elderberry at sites had both decreased since Barr's findings, resulting in fewer occupied sites and groups. Studies suggest that the VELB is unable to re-colonize drainages where the species has been extirpated because of its limited dispersal ability (Barr, 1991; Collinge *et al.*, 2001). This data suggests that drainages unoccupied by the VELB remain unoccupied.

Threats to the Species

The VELB continues to be threatened by habitat loss and fragmentation, predation by the non-native Argentine ant *(Linepithema humile)* (Holway, 1998; Huxel, 2000; Huxel and Hastings, 1999; Huxel *et al.*, 2001; Ward, 1987), and possibly other factors such as pesticide drift, non-native plant invasion, improper burning regimes, off-road vehicle use, rip-rap bank protection projects, wood cutting, and over-grazing by livestock.

Habitat Loss: Habitat destruction is one of the most significant threats to the VELB. Riparian forests, the primary habitat for the VELB, have been severely depleted throughout the Central Valley over the last two centuries as a result of expansive agricultural and urban development (Huxel *et al.*, 2001; Katibah, 1984; Roberts *et al.*, 1977; Thompson, 1961). In 1849, the rivers and larger streams of the Central Valley were largely undisturbed. They supported continuous bands of riparian woodland four to five miles in width along some major drainages such as the lower Sacramento River, and generally about two miles wide along the lesser streams (Thompson, 1961). Most of the riverine floodplains supported riparian vegetation to about the 100-year flood line (Katibah, 1984).

A large human population influx occurred after 1849, however, and much of the Central Valley riparian habitat was rapidly converted to agriculture and used as a source of wood for fuel and construction to serve a wide area (Thompson, 1961). The clearing of riparian forests for fuel and construction made this land available for agriculture (Thompson, 1961). Natural levees bordering the rivers, once supporting vast tracts of riparian habitat, became prime agricultural land (Thompson, 1961). As agriculture expanded in the Central Valley, needs for increased water supply and flood protection spurred water development and reclamation projects. Artificial levees, river channelization, dam building, water diversion, and heavy groundwater pumping further reduced riparian habitat to small, isolated fragments (Katibah, 1984).

In recent decades, these riparian areas have continued to decline as a result of ongoing agricultural conversion as well and urban development and stream channelization. As of 1989, there were over 100 dams within the Central Valley drainage basin, as well as thousands of miles of water delivery canals and stream-bank flood control projects for irrigation, municipal and industrial water supplies, hydroelectric power, flood control, navigation, and recreation (Frayer *et al.*, 1989). Riparian forests in the Central Valley have dwindled to discontinuous strips of widths currently measurable in yards rather than miles.

Some accounts state that the Sacramento Valley supported approximately 775,000 to 800,000 acres of riparian forest as of approximately 1848, just prior to statehood (Smith, 1977; Katibah, 1984). No comparable estimates are available for the San Joaquin Valley. Based on early soil maps, however, more than 921,000 acres of riparian habitat are believed to have been present throughout the Central Valley under pre-settlement conditions (Huxel *et al.*, 2001; Katibah, 1984). Another source estimates that of approximately 5,000,000 ac of wetlands present in the Central Valley in the 1850s, approximately 1,600,000 ac were riparian wetlands (Warner and Hendrix, 1985; Frayer *et al.*, 1989). Based on a California Department of Fish and Game riparian vegetation distribution map, by 1979, there were approximately 102,000 ac out of an estimated 922,000 ac of riparian vegetation remaining in the Central Valley. This represents a decline in acreage of approximately 89 percent (Katibah, 1984). More extreme figures were given by Frayer *et al.*, (1989), who reported that woody riparian forests in the Central Valley had declined to 34,600 acres by the mid-1980s (from 65,400 acres in 1939).

A more recent analysis, completed by The Central Valley Historic Mapping Project, observed similar decreases in the amount of riparian habitat (Geographic Information Center, 2003). Loss of riparian habitat between 1900 and 1990 in the Central Valley was about 96 percent in the southern portion of the Valley (Kern County to Fresno County) (16,000 ac remaining), 84 percent in the middle Valley (Merced County to San Joaquin County) (21,000 ac remaining) and 80 percent in the northern Valley (Sacramento and Solano counties to Shasta County) (96,000 ac remaining). Although these studies have differing findings in terms of the number of acres lost (most likely explained by differing methodologies), they attest to a dramatic historic loss of riparian habitat in the Central Valley.

<u>Habitat Fragmentation</u>: Destruction of riparian habitat in central California has resulted not only in significant acreage loss, but also has resulted in habitat fragmentation. Fahrig (1997) states that habitat fragmentation is only important for habitats that have suffered greater than 80 percent loss. Riparian habitat in the Central Valley, which has experienced greater than 90 percent loss by most estimates, would meet this criterion as habitat vulnerable to effects of fragmentation. Existing data suggests that VELB populations, specifically, are affected by habitat fragmentation. Barr (1991) found that small, isolated habitat remnants were less likely to be occupied by the VELB than larger patches, indicating that VELB subpopulations are extirpated from small habitat fragments. Barr (1991) and Collinge *et al.* (2001) consistently found VELB exit holes occurring in clumps of elderberry bushes rather than isolated bushes, suggesting that isolated shrubs do not typically provide long-term viable habitat for this species.

Habitat fragmentation can be an important factor contributing to species decline because: (1) it divides a large population into two or more small populations that become more vulnerable to direct loss, inbreeding depression, genetic drift, and other problems associated with small populations; (2) it limits a species' potential for dispersal and colonization; and (3) it makes habitat more vulnerable to outside influences by increasing the edge: interior ratio (Primack, 1998).

Small, isolated subpopulations are susceptible to extirpation from random demographic, environmental, and/or genetic events (Shaffer, 1981; Lande, 1988; Primack, 1998). While a large area may support a single large population, the smaller subpopulations that result from habitat fragmentation may not be large enough to persist over a long time period. As a population becomes smaller, it tends to lose genetic variability through genetic drift, leading to inbreeding depression and a lack of adaptive flexibility. Smaller populations also become more vulnerable to random fluctuations in reproductive and mortality rates, and are more likely to be extirpated by random environmental factors. When a sub-population becomes extinct, habitat fragmentation reduces the chance of recolonization from any remaining populations. The effect of habitat fragmentation likely is exacerbated by the poor dispersal abilities of the VELB (Collinge *et al.*, 2001; Talley, 2005).

Habitat fragmentation not only isolates small populations, but also increases the interface between habitat and urban or agricultural land, increasing negative edge effects such as the invasion of non-native species (Huxel *et al.*, 2001; Huxel, 2000) and pesticide contamination (Barr, 1991). Several edge effect-related factors may be related to the decline of the VELB.

Invasive Species: The invasive Argentine ant *(Linepithema humile)* is a potential threat to the VELB (Huxel, 2000). This ant is both an aggressive competitor and predator on native fauna that is spreading throughout riparian habitats in California and displacing assemblages of native arthropods (Ward, 1987; Human and Gordon, 1997; Holway, 1998). The Argentine ant requires moisture and it may thrive in riparian or irrigated areas. A negative association between the presence of the ant and VELB exit holes was observed along Putah Creek in 1997 (Huxel, 2000). This aggressive ant could interfere with adult mating or feeding behavior, or prey on eggs and larvae (e.g., Way *et al.*, 1992). Surveys along Putah Creek found VELB presence where Argentine ants were not present or had recently colonized, but the VELB was absent from otherwise suitable sites where Argentine ants had become well-established (Huxel, 2000). Between 1998 and 2002, the number of sites infested by the Argentine ant increased by three along Putah Creek and the American River (30 sites in total were examined) (Huxel, 2000; Holyoak and Talley, 2001).

The Argentine ant has been expanding its range throughout California since its introduction around 1907, especially in riparian woodlands associated with perennial streams (Holway, 1998; Ward, 1987). Huxel (2000) concluded that given the potential for Argentine ants to spread with the aid of human activities such as movement of plant nursery stock and agricultural products, this species may come to infest most drainages in the Central Valley along the valley floor in which the VELB is found.

The VELB is also likely preyed upon by insectivorous birds, lizards, and European earwigs *(Forficularia auricularia)* (Klasson *et al.*, 2005). These three predators move freely up and down elderberry stems searching for food. The European earwig is a scavenger and omnivore that is often found feeding on tethered mealworm *(Tenebrio monitor)* larvae. The earwig may be common in riparian areas and it may lay its eggs in dead elderberry shrubs. The earwig, like the Argentine ant, requires moisture and is often found in large numbers in riparian and urban areas. Earwig presence and densities tended to be highest in mitigation sites likely because of the irrigation, although this needs to be statistically tested (Klasson *et al.*, 2005).

Invasive exotic plant species may significantly alter the habitat of the VELB. Without adequate eradication and control measures these non-native species may eliminate elderberry shrubs and other native plants. Pest plants of major importance in Central Valley riparian systems include black locust *(Robinia pseudoacacia),* giant reed *(Arundo donax),* red sesbania *(Sesbania punicea),* Himalaya blackberry *(Rubus arm en iacus)*, tree of heaven *(Ailanthus aitissima),* Spanish broom *(Spartiumjunceum),* Russian olive *(Eleagnus angustifolia),* edible fig *(Ficus carica),* and Chinese tallow tree *(Sapium sebiferum).* Non-woody invasives such as ripgut brome *(Bromus diandrus),* foxtail barley *(Hordeum murinum),* Italian ryegrass (*Lolium multiflorum),* and star thistle knapweed *(Centaurea* spp.) also may impair elderberry germination or establishment, or elevate the risk of fire. Invasive plant control efforts often are limited by funding, labor, coordination with landowners, and the resilience and spread of their target plants.

No rangewide assessment has been completed on the overall degree of impact of invasive plants on the VELB and its habitat. However, there are a number of local efforts to control invasive riparian plant species. For example, the American River Parkway has invasive species removal efforts by Sacramento Weed Warriors (a community stewardship project associated with the California Native Plant Society) and others, and the Cosumnes River Preserve has a group of volunteers who regularly remove exotics and restore native habitats (Talley *et al., 2006).*

Other Threats: Several other factors may threaten the VELB including fire, flooding, and over-grazing by livestock. The condition of elderberry shrubs can be adversely affected by fire, which is often common at the urban-wildland interface. Brush fires initially have a negative effect on shrub condition and, therefore, VELB larvae through direct burning and stem die-off. A year after a fire however, surviving elderberries re-sprout and display rapid stem growth (Crane, 1989). Fires often scar the hard elderberry seed coat leading to germination of seedlings the following season (Crane, 1989). Frequent or repeated fire, however, may kill remaining shoots, root crowns and seeds, causing elderberry to be eliminated from an area for many years since recruitment by seeds is patchy and generally slow (Crane, 1989). Elderberry shrubs appeared suitable for the VELB two to six years after burning, but were often uninhabited, with the presence of old, burned exit holes suggesting pre-burn occupancy and post-burn vacancy (Talley *et al.*, 2006.). The post-fire lag in occupancy is likely the result of the limited movements of the VELB. VELB were present six to seven years post burn; as in the alluvial plain of the American River Parkway, occupancy is about the same within the post-burn areas compared with unburned areas (Talley *et al.*, 2007). No quantitative studies of the net effects of fire on the VELB have been undertaken (e.g., examining VELB and elderberries through time after burns or in areas with varying burn frequencies and magnitude).

The VELB can tolerate flooding of its riparian habitat. It has higher occupancy rates in riparian than non-riparian habitats, and associations between the VELB and proximity to rivers were either not observed or there was a weak positive correlation with proximity to the river (Halstead and Oldham, 1990; Talley, 2005; *Talley et al.*, 2007). These findings illustrate that the VELB is not likely harmed by flooding and that higher habitat quality may be associated with rivers. In addition, if the elderberry, a facultative riparian shrub, can withstand flooding, then the VELB likely will survive these events as well. Most floods occur during winter or early spring when the VELB is in its early life history stages, so that the effects of floods are even less likely to affect the VELB. If the shrub is exposed to prolonged flooding (i.e., anoxia) and becomes severely stressed, then the VELB may be affected. The duration and magnitude of flooding at which an elderberry shrub stresses is uncertain and the levels of stress that affect the VELB are also unknown. Elderberry shrubs have adaptations that plants use to persist with flooding such as lenticels and aerenchyma, demonstrating that it is probably at least somewhat flood tolerant. Finally, if an area is flooded too frequently so that elderberries cannot survive then no VELB would be able to inhabit the area (Talley, 2005).

Another potential factor in the VELB's decline is the effects of inappropriate levels of livestock grazing, which can result in destruction of entire elderberry plants and inhibition of elderberry regeneration. Cattle, sheep and goats readily forage on new elderberry growth, and goats will consume even decadent growth. Well-manicured stands of elderberries, as can occur due to livestock grazing, have generally been shown to have a relative absence of VELB (Service, 1984). The effects on the VELB of both grazing and exotic plant invasions are likely significantly exacerbated by the problem of habitat fragmentation of elderberries. Such fragmentation increases the edge: interior ratio of habitat patches, thereby facilitating the adverse effects of these outside influences.

Environmental Baseline

According to the California Natural Diversity Database (CNDDB, 2011), there are two previously recorded occurrences of the VELB located within three miles of the approximate center of the action area, of which one dating from 1996 is located approximately one mile downstream from the action area at the McHenry Recreation Area. A separate record, dating from 1989, is located within the action area on the southeast bank of the Stanislaus River by the bridge site. This observation reported that 50% of the shrubs at that locale contained exit holes. It is likely that since there have been previously recorded sightings both within and adjacent to the action area, there is greater potential for the VELB to inhabit shrubs in the vicinity of the action area.

Protocol-level surveys for the VELB conducted on August 30 and September 1, 2009, in accordance with the Service's Guidelines, revealed the presence of numerous elderberry shrubs within and surrounding the action area along the riparian corridor of the Stanislaus River. Due to the inaccessibility of some shrubs resulting from the steepness of the riverbank and the dense understory, surveys for approximately 20% of the shrubs within the action area were estimated by averaging shrub size and estimated stem counts with shrubs that were accessible and of the same size. Based on these estimates, 33 elderberry shrubs/clusters were determined to be present within the action area. They have a total of seven observed exit holes and a total stem count of 611 stems (510 with a diameter of greater than or equal to one and less than or equal to three inches at ground level; 83 with a diameter of four inches; and 18 with a diameter of greater than or equal to five inches at ground level). A cluster is defined as all the stems or shoots within 10 to 30 ft of each other without a significant break in canopy cover.

Since existing roadway, bridge infrastructure, and man-made/enhanced water channels are already present in the action area, changes in overall baseline effects to the elderberry shrubs and the VELB resulting from this action are unlikely to be significant. We are unaware of any unrelated Federal actions that have been subject to prior section 7 formal or informal consultation that have specifically occurred within the action area, and that have affected the environmental baseline of the species. Neither are we cognizant of any prior or contemporaneously occurring State, local, or private actions specific to the action area.

Effects of the Proposed Action

Four elderberry shrubs/clusters are situated either within the grading limit or directly in the path of construction activities, and so they will be transplanted prior to the start of construction. Six shrubs/clusters are located within 20 ft of the project footprint and so are likely to be adversely affected by activities pertaining to the widening of the roadway and Stanislaus River bridge superstructure; however, they will not be displaced by the project. Twenty-three shrubs/clusters are located within a 20-100 ft buffer of construction activity and are not likely to be adversely affected, and so will continue to live and provide habitat for the VELB. Despite some temporary construction activities that may take place in the vicinity of these shrubs/clusters (e.g. staging), implementation of minimization measures such as establishing perimeter buffers around the shrubs/clusters, conducting personnel education, and utilizing dust control measures will reduce effects from such construction activities within the vicinity of these 23 elderberry shrubs/clusters to an insignificant or discountable level. There are an additional three elderberry shrubs/clusters located outside the 100 ft buffer from the project footprint that will not be adversely affected by construction activities.

Because four of the 10 directly affected shrubs/clusters will be transplanted during their dormant phase (between the beginning of November and mid-February), effects to the shrubs/clusters from the transplantation process will likely be reduced. However, it is possible that any VELB occupying the shrubs/clusters at that time may be harmed or harassed during any trimming that takes place, or killed once removal methods have been employed to uproot and move the plants.

The approximately 120 linear foot portion of the Stanislaus River within the action area is undeveloped. Efforts will be made to minimize disturbance to riparian vegetation in this portion of the action area, which consists of 4.82 ac of habitat. However, a total of 2.25 ac of riparian habitat above the Ordinary High Water Mark of the river will be impacted, with 0.45 ac permanently affected and 1.80 ac temporarily affected.

The four shrubs/clusters proposed for transplantation currently contain a total of 66 stems; 61 with a diameter of greater than or equal to one and less than or equal to three inches at ground level; and five stems with a diameter of four inches. The remaining six affected shrubs/clusters within the 20 ft project footprint buffer contain a total of 96 stems; 75 stems with a diameter of greater than or equal to one and less than or equal to three inches at ground level, 17 stems with a diameter of four inches, and four stems with a diameter of greater than or equal to five inches at ground level. San Joaquin County, in cooperation with Stanislaus County, will minimize the potential for losing all VELB within these 10 elderberry shrubs/clusters by planting 266 elderberry seedlings and 270 associated native plants at the RRCB or another appropriate and available Service-approved conservation bank, in accordance with the Guidelines (see Table 1). The proposed preservation of suitable elderberry habitat, along with plantings of new elderberry seedlings and natives will minimize the effects of the permanent loss of the shrubs/clusters considered in this biological opinion. The compensation measures will help protect and manage the habitat for the conservation of the species in perpetuity. The protected land purchased through credits will provide habitat to offset that lost as a result of the project, ensuring that the VELB can continue to breed, feed, and develop in conjunction with its host plant.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed project are not considered in this section, because they require separate consultation pursuant to section 7 of the Act.

The Service is not aware of any non-Federal actions currently planned in or around the McHenry Avenue action area that would directly remove or further disturb VELB habitat.

Conclusion

After reviewing the current status of the VELB, the environmental baseline for the action area, the project-specific effects of the McHenry Avenue Corridor Improvement Project, and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the VELB. We base this determination on the fact that the number of VELB likely to be taken is low; this derives from several factors, including the current survey observations, the proposed implementation of minimization measures such as protective buffers and dust control, and compensation for lost and disturbed elderberry shrub habitat through plantings of elderberry seedlings and associated native plants. The extent of take is such that it is anticipated to be minimal in regards to the rangewide population of the species.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

Caltrans has a continuing duty to regulate the activity that is covered by this incidental take statement. If Caltrans (1) fails to require the applicant or any of its contractors to adhere to the terms and conditions of the incidental take statement through enforceable terms, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service has determined that implementation of the proposed project will result in the incidental take of all VELB inhabiting 10 elderberry shrubs containing 162 stems measuring one inch or greater in diameter at ground level. The incidental take is anticipated to take the form of harm and harassment resulting from the trimming or pruning of elderberry shrubs, as well as from bridge and road-widening activities occurring within 20 ft of the project footprint. It is also anticipated to take the form of mortality, resulting from the removal methods used to displace and transplant four of the shrubs so that road widening and bridge construction activities can proceed.

Effect of the Take

The Service has determined that this level of anticipated take is not likely to jeopardize the continued existence of the VELB. The proposed conservation measures will minimize the effect of the take on the species.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize the adverse effects of the project on the VELB.

1. All of the avoidance and minimization measures proposed in the BA and in the *Project Description* must be fully implemented.

2. Trash removal must be implemented in a manner so as to minimize the potential for take of the VELB.

3. Appropriate measures regarding usage of borrow and fill materials must be undertaken, so as to minimize the potential for take of the VELB.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, Caltrans and San Joaquin County, as well as any contractor acting on its behalf, must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

The following Terms and Conditions implement Reasonable and Prudent Measure one:

1. Caltrans shall provide oversight to San Joaquin County and shall ensure that all proposed conservation measure commitments are met. Caltrans shall notify the Service in a written post-construction report regarding how the measures were satisfied.

2. San Joaquin County, in cooperation with Stanislaus County, shall implement all the proposed measures designed to protect and minimize effects to the VELB and shall include Special Provisions covering these measures in any solicitation for bid information.

The following Term and Condition implements Reasonable and Prudent Measure two:

1. To minimize opportunistic predatory effects to the VELB from Argentine ants that could be attracted to trash left on-site, Caltrans shall oversee that garbage is removed daily from the project site and associated staging areas and disposed of off-site.

The following Term and Condition implements Reasonable and Prudent Measure three:

1. Since use of borrow/fill material is planned, Caltrans shall require documentation from the contractor that aggregate, fill, and/or borrow material provided for the project is obtained in compliance with the Act. Evidence of compliance with the Act shall be demonstrated by providing the Resident Engineer with any one of the following:

    a. A letter from the Service stating that use of the borrow pit area shall not result in the incidental take of listed species;

    b. An incidental take permit for contractor-related activities issued by the Service pursuant to section 10(a)(1)(B) of the Act;

    c. A biological opinion or a letter concurring with a 'not likely to adversely affect' determination issued by the Service to Caltrans.

    d. Contractor submittal of information to the Caltrans Resident Engineer indicating compliance with the State Mining and Reclamation Act (SMARA) and providing the County land use permits and California Environmental Quality Act (CEQA) clearance.

    e. Report to the Service where the fill/borrow materials will be taken from, once it is identified.

Reporting Requirements

1. Before construction starts on this project, the Service shall be provided with the final documents related to protection of conservation acres/plantings, including but not limited to, proof of a credit purchase at an available Service-approved conservation bank.

2. Caltrans shall submit a post-construction report detailing compliance with the project design criteria described under the *Description of the Proposed Action* section of this biological opinion shall be provided to the Service within 30 calendar days of completion of the project. The report shall include: (1) dates of project groundbreaking and

completion; (2) pertinent information concerning the success of the project in meeting compensation and other conservation measures; (3) an explanation of failure to meet such measures, if any; (4) known project effects on the VELB, if any; (5) occurrences of incidental take of the VELB, and; (6) any other pertinent information.

3. New sightings of the VELB, VELB exit holes, or any other sensitive animal species shall be reported to the CDFG's CNDDB. A copy of each reporting form and a topographic map clearly marked with the location in which the species were observed also should be provided to the Service.

Disposition of Individuals Taken

In the case of injured and/or dead VELB, the Service shall be notified within one day and they shall only be handled by a Service-approved, permitted biologist. In the case of a dead VELB, the individual shall be preserved, as appropriate, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen or until the Service takes custody of the specimen. Caltrans must report to the Service within one calendar day any information about take or suspected take of federally-listed species not considered in this opinion. Notification must include the date, time, and location of the incident or of the finding of a dead or injured species. The Service contacts are Mr. Daniel Russell, Deputy Assistant Field Supervisor, Endangered Species Program, Sacramento, at (916) 414-6600; and Mr. Daniel Crum, the Resident Agent-in-Charge of the Service's Law Enforcement Division at (916) 414-6660. The CDFG contact is Mr. Paul Hoffman, Wildlife Biologist, at (530) 934-9309.

Any contractor or employee who, during routine operations and maintenance activities inadvertently kills or injures a listed wildlife species must immediately report the incident to his representative at his contracting/employment firm or to Caltrans. This representative must contact the Service within one calendar day in the case of a federally-listed species and/or contact the CDFG in the case of a dead or injured State-listed species.

CONSERVATION RECOMMENDATIONS

Conservation recommendations are suggestions by the Service regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, or regarding the development of new information. These measures may serve to minimize or avoid further adverse effects of a proposed action on listed, proposed, or candidate species, or on designated critical habitat. They may also serve as suggestions on how action agencies can assist species conservation in furtherance of their responsibilities under section 7(a)(1) of the Act, or recommend studies improving an understanding of a species' biology or ecology. Wherever possible, conservation recommendations should be tied to tasks identified in recovery plans.

There are no conservation recommendations for this project.

RE-INITIATION--CONCLUSION

This concludes the Service's review of the proposed McHenry Avenue Corridor Improvement Project outlined in your request. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or, (4) a new species is listed or critical habitat designated that may be affected by the action.

If you have any questions pertaining to this letter regarding the McHenry Avenue Corridor Improvement Project, please contact Jen Schofield or Thomas Leeman, San Joaquin Valley Division Chief, at (916) 414-6600.

Sincerely,

for Susan K. Moore
Field Supervisor

cc:
Mr. Zachary Parker, Caltrans District 6, Fresno, California
Mr. Dan Gifford, California Department of Fish and Game, Rancho Cordova, California

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Enclosure 1

BIOLOGICAL OPINION

ACTION AGENCY: California Department of Transportation

ACTION: McHenry Avenue Corridor Improvement Project

CONSULTATION
CONDUCTED BY: Southwest Region, National Marine Fisheries Service

FILE TRACKING NUMBER: 151422SWR2011SA00165 (TN2011/001137)

DATE ISSUED: SEPTEMBER 13, 2012

I. CONSULTATION HISTORY

The California Department of Transportation (Caltrans) is proposing to construct the McHenry Avenue Corridor Improvement Project (Project) in Stanislaus County, California. The Project is an aggregate of three component projects: (1) McHenry Avenue Widening; (2) replacement of the Stanislaus River Bridge; and (3) replacement of the South San Joaquin Irrigation District (SSJID) Bridge on McHenry Avenue.

On October 7, 2010, National Marine Fisheries Service (NMFS) and other resource agencies attended a pre-application meeting regarding the Project.

On February 1, 2011, NMFS received a letter from Caltrans requesting initiation of section 7 consultation under the Endangered Species Act (ESA).

On April 14, 2011, NMFS attended a site meeting with other resource agencies to discuss construction effects to listed anadromous fish and address other concerns associated with the Project Biological Assessment (BA) submittal.

On May 6, 2011, NMFS received a Technical Memorandum from Caltrans addressing the concerns outlined from the April 14, 2011, site visit.

On May 9, 2011, formal consultation was initiated by NMFS' Central Valley Office.

On September 19, 2011, NMFS received another Technical Memorandum that addressed NMFS' concerns regarding the pile driving analysis.

On June 28, 2012, Caltrans and their consultants met with NMFS to discuss the Project Description in a sufficient level of detail required to complete the Effects Analysis of the biological opinion (BO).

On July 24, 2012, Caltrans sent a Technical Memorandum containing an amended Project Description via email at NMFS' request. Staff and the Section 7 Coordinator deemed the submittal sufficient enough to conduct a proper Effects Analysis on August 1, 2012.

II. DESCRIPTION OF THE PROPOSED ACTION

McHenry Avenue is a two-lane, undivided, north-south road that runs through San Joaquin and Stanislaus counties. It serves as a principal arterial for local traffic and as a connector between State Route 120 in Escalon and State Route 108 in unincorporated Stanislaus County. San Joaquin County, in cooperation with Stanislaus County, proposes to widen and improve McHenry Avenue from 200 feet south of Jones Road in San Joaquin County to 1,700 feet south of East River Road in Stanislaus County. There are two bridges and one major intersection within this 1.1-mile-long segment of McHenry Avenue. The McHenry Avenue Corridor Improvement Project is an aggregate of three component projects with three distinct federal aid numbers:

(1) RPSTPLE-5929(196): Widening of McHenry Avenue to accommodate a two-way center left turn lane from just south of Jones Road to south of Stanislaus River, and improvement of the McHenry Avenue and East River Road intersection.
(2) BRLS-5929(166): Replacement of the Stanislaus River Bridge (No. 38C-0032) on McHenry Avenue over the Stanislaus River to accommodate the proposed roadway improvements.
(3) BRLS-5929(167): Replacement of the South San Joaquin Irrigation District Bridge (No. 29C-0166) on McHenry Avenue over the South San Joaquin Irrigation District/Oakdale Irrigation District (SSJID/OID)Main Canal to accommodate proposed roadway improvements.

A. Project Location

The proposed project is located along McHenry Avenue in the southeast portion of San Joaquin County, south of the city of Escalon, and crosses the Stanislaus River directly south of the intersection at East River Road, at the border of San Joaquin and Stanislaus counties, California (Figure 1). The proposed action is located within the Escalon, California, U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (USGS 1976) within portions of 4, 5, 8, 9, 16, 17, 20, 21, 28 and 29 of Township 2 South, Range 9 East, Mount Diablo Baseline and Meridian (Figure 2). The project limits are approximately 1,700 feet south of East River Road to 4,000 feet north of East River Road and extend east 1,300 feet along East River Road and west 700 feet along East River Road.

B. Construction Activities

The proposed project is estimated to take three years to complete; construction is scheduled to commence in year 2013 and end in year 2015. The type of equipment to be used includes excavators, backhoes, large haul trucks, concrete trucks, truck and flatbed trailers, large cranes, and pile-driving equipment.

The sequence of construction activities will be dictated by the date on which the contractor is given notice to proceed; however, the overall timeline will be driven by the various restrictions imposed on the construction of the bridge replacements. Construction within the Stanislaus River will be limited to the period between June 15 and October 15. Work within the river channel may include the construction of falsework, bridge piers, and footings. Work within the designated floodway that is governed by Central Valley Flood Protection Board (Board) will be restricted to the period from April 15 to October 31 unless otherwise authorized by the Board. Staging areas on both sides of the river will be used by the contractor to store construction equipment and materials and to access the construction site. The edge of the staging areas will be at least 50 feet from the channel in order to minimize impacts to the riparian corridor.

Project construction activities outside of the river channel, the designated floodway boundary, or the SSJID canal, such as roadway embankments, paving, etc., may occur throughout the year.

Diversion of the Stanislaus River at the construction site would be required to remove the existing bridge superstructure and piers, place temporary falsework, and construct the new bridge. Some form of cofferdam must be constructed to facilitate dewatering for construction of temporary embankments/work platforms; temporary falsework/trestles; and to protect the waterway during demolition and removal of the existing Stanislaus River Bridge. Temporary embankment/work pad(s) will be constructed of clean, local cobble and gravel substrate material approved by the U.S. Army Corps of Engineers and NMFS. Temporary embankment/work pad(s) are proposed for use to divert the flow and maintain dry conditions around the work area. Culvert pipes would not be sufficient to handle the flow of the Stanislaus River if flows during the allowable in-water work window are higher than anticipated; therefore, no culverts will be used for diversion. Instead, a channel opening will be utilized. The temporary work pad will be used to support drilling equipment for the construction of cast-in-drilled-hole (CIDH) piles. Either temporary or permanent steel casing will be placed to support the walls of each hole during drilling. Below the bottom of the casing for the CIDH-type foundation, a slurry displacement method will be used to control groundwater intrusion into the pile excavation, with the drilling fluids controlled using special equipment and typical Best Management Practices (BMPs) for these activities.

The proposed project includes permanent or temporary steel pipe casing that will be used for the installation of the CIDH concrete piling. A total of eight piles will be driven via the vibratory hammer method (located at Bent 23 & 24) method and are 72-inch diameter steel pipe casing (in-water or placed through temporary embankment) in size. Eight additional piles will be driven with a vibratory hammer (located at Bent 22 & 25) and are 48-inch diameter steel pipe casing (land-based) in size. A total of 180 land-driven piles will be driven with a diesel impact hammer and are 24-inch precast/prestressed (PC/PS) hexagonal concrete piles (land-based) in size.

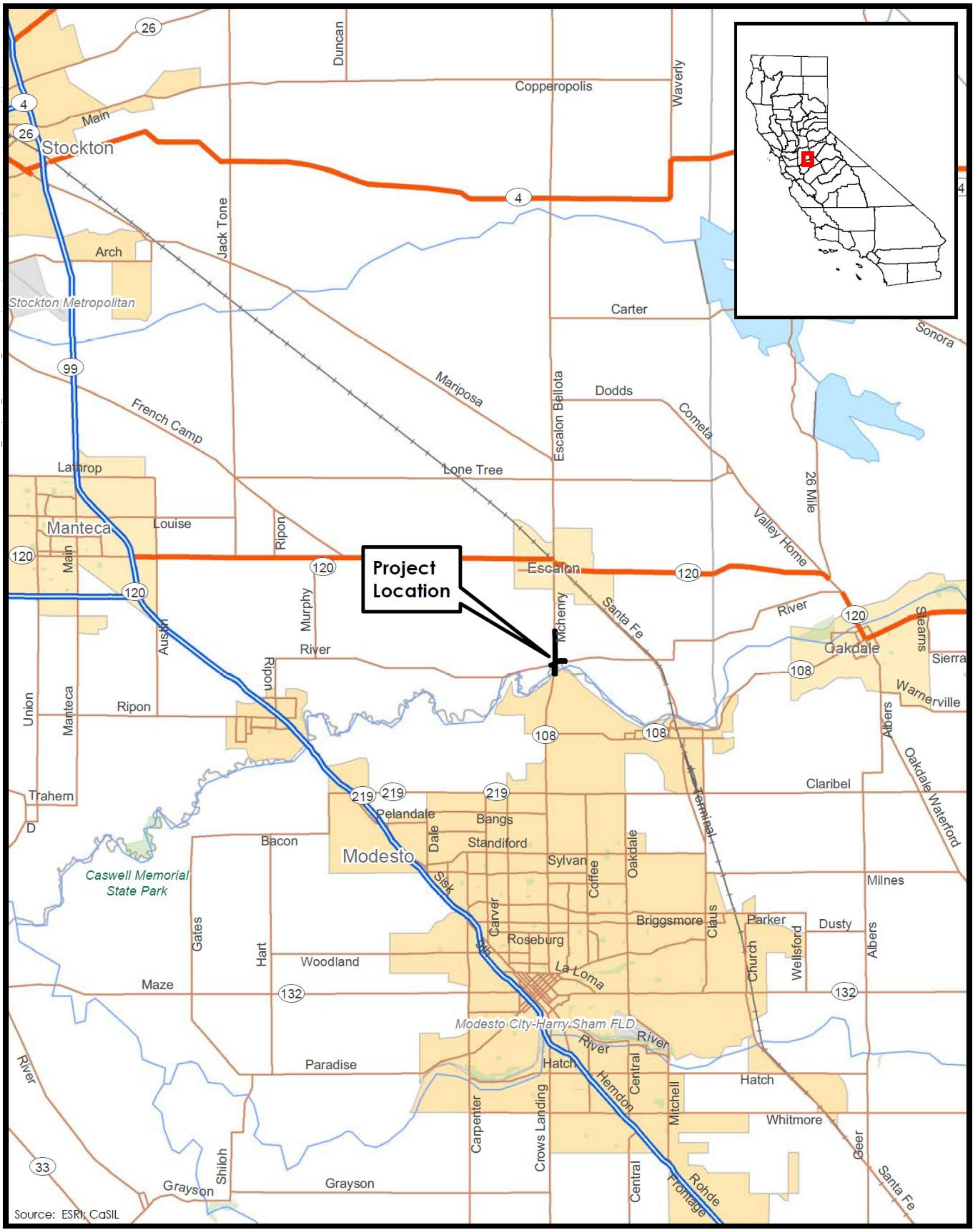

Figure 1. Regional Vicinity Map

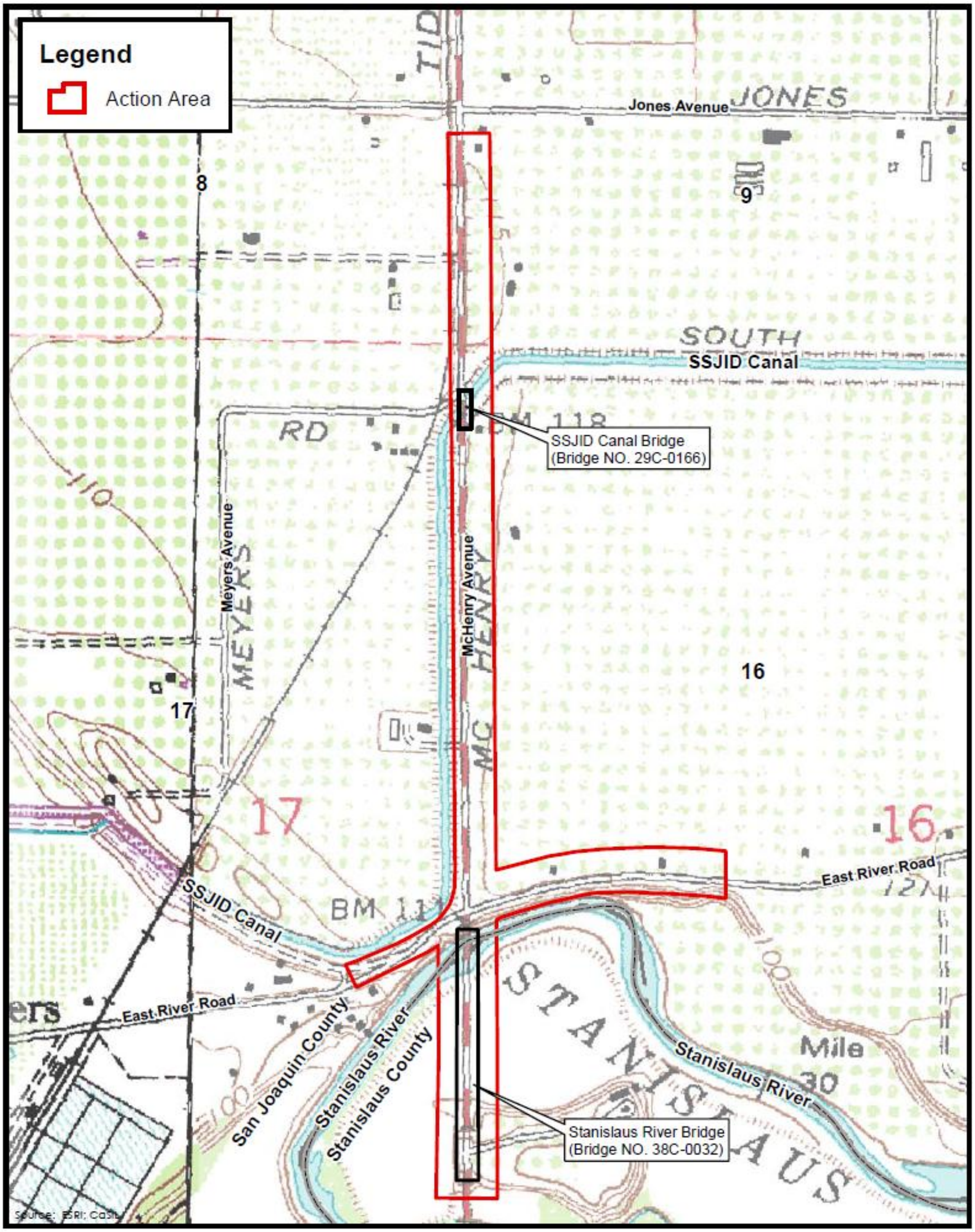

Figure 2. Project Location Map

Approximately two steel pipe casings, either 72-inch or 48-inch and five to ten 24-inch PC/PS concrete piles are anticipated to be installed per day (clock resets only after a 12 hour break or more occurs). Actual installation rates for the PC/PS piling will vary depending on a number of factors, including staging, associated construction activities, and substrate conditions. Strikes required per pile vary depending on pile size and type, and underlying substrate conditions. Geotechnical analyses indicate that 24-inch concrete piles installed with a diesel impact hammer will rapidly seat into the soil upon placement with minimal resistance. The need for impact hammering is expected to be needed only during the final few feet of seating the pile. As a result, a conservative estimate of approximately 250 strikes per pile is anticipated for the 24-inch concrete piles. The 48- and 72-inch diameter steel pipe casings will be driven the majority of the distance with a vibratory hammer. It is anticipated that each pile will require approximately 10 minutes of vibratory driving time.

For in-water casing installation, depth of water is anticipated to range from approximately 0 to 10 feet deep (depending on use of temporary embankment, location of casing installation, and water stage elevation). Distance to water for 24-inch concrete piles driven on land varies (closest piles are located 31.5 feet from water).

C. Construction Summary of Events

The south portion of the Stanislaus River replacement structure is anticipated to be supported on 24-inch hexagonal PC/PS concrete piling that would be driven into the ground by use of a diesel powered pile hammer. A total of 180 piles (not in addition to the 180 piles discussed above) will be driven with a diesel impact hammer over two years (construction seasons). All 180 concrete piles will be installed on dry land adjacent to the river with varying distance to the river’s edge.

The northern portion of the river bridge will consist of CIDH piling (48- and 72-inch steel pipes) with cast-in-place (CIP) concrete column extensions and a CIP pre-stressed concrete box girder superstructure. A total of eight 72-inch steel pipe casings (in-water) and eight 48-inch steel pipe casings (adjacent to or in-water) will be driven with vibratory hammer over two years (construction seasons).

The proposed project will temporarily affect 0.443 acre and permanently affect (or fill) 0.002 acre of riverine habitat. Activities related to the construction of the proposed project will result in localized loss of vegetation (permanent loss of 0.45 acre of riparian vegetation) general disturbance to the soil, and an increase in impervious surfaces.

D. Construction Sequencing and Schedule

The sequence of construction activities will be dependent on when the contractor is given a notice to proceed with the work and on the various permit requirements. It is anticipated that the schedule will be driven by both bridge sites. That is, the period of time the SSJID canal will not be delivering water to customers and the proposed work windows for construction within the limits of the Stanislaus River channel and adjacent floodway. The general sequence work is anticipated to be:

(1) Relocate the existing Modesto Irrigation District (MID) transmission line on the east side of McHenry Avenue.
(2) Install construction area signage.
(3) Create temporary local detours to control traffic at McHenry Avenue/East River Road.
(4) Maintain two-way traffic on existing McHenry Avenue pavement and construct an embankment and structural section for new northbound lane.
(5) Construct the new east halves of both the Stanislaus River Bridge and the SSJID Bridge.
(6) Shift traffic to the new portions of the bridges and demolish and remove the existing bridges.
(7) Construct the west halves of the new bridges and close bridge decks as required.
(8) Install traffic signal equipment and facilities at the McHenry Avenue/East River Road intersection.
(9) Complete approach work and stripe new structures for three-lane configuration.
(10) Shift traffic to permanent lane configuration and remove temporary local detours.
(11) Complete miscellaneous site work; conform work at field entrances and property access; clean up.

Year One

During this construction season, one-half of the proposed new Stanislaus River Bridge would be built upstream of and immediately adjacent to the existing bridge. This portion of the bridge would eventually carry northbound traffic on McHenry Avenue. Traffic on McHenry Avenue would continue to use the existing Stanislaus River Bridge during this first stage of construction. In-water work would be limited to the period between June 15 and October 15. Details of work would include (see Figure 3):

- Construction of coffer dams to allow partial dewatering of the Stanislaus River in the immediate project area. Coffer dams would extend from the south bank of the river within the shallow areas of the riverbed (areas with water depths less than 6 feet during periods of low flow). The deepest part of the river channel; or low flow channel shown in Figure 3., with typical water depths of 6 to 10 feet (during periods of low flow) would be left open during construction to allow upstream and downstream fish passage. The open channel would be approximately 20 feet wide, and would be wide enough to accommodate low flows in the Stanislaus River without the use of culverts. Two possible types of coffer dams might be used:

  (1) Ones that can be installed on the surface of the riverbed, such as those constructed of steel frames covered by a membrane (i.e. "PORTADAM™") or those made of a series of water-filled bladders; or
  (2) Ones that must penetrate the riverbed, such as sheet pile coffer dams. If this type of coffer dam is utilized, sheet piles would be vibrated, not impact driven, into position after which the area enclosed by the coffer dam would be dewatered.

- The total area to be dewatered would range between 4,000 to 8,500 square feet depending on the amount of activity in a given stage. Water would be pumped out and handled in a way to prevent silt from entering the river. A fish recovery plan would be implemented to salvage and relocate any fish trapped within the boundaries of the coffer dams.

- Construction of a temporary work platform within the dewatered area for use by construction equipment. Two of the possible types of platforms might be used:

  (1) An earthen embankment built of gravel and other clean local fill material. Such a platform would be approximately 175 feet long and 50 feet wide, depending on the size of equipment to be supported; or
  (2) A temporary work trestle consisting of steel supports with timber decking. Steel pipe or H-pile supports be installed using vibratory pile hammers if the pile would be in direct contact with the water.

* Construction of elements of the first half of the new bridge structure that must be built within the limits of the river channel. This includes eight CIDH concrete piles and columns within the active waterway limits, CIDH piles for the bents outside the waterway and all the PC/PS piles needed for the portion of the new bridge in the overflow area to the south of the river.

- Construction of falsework to be used for bridge construction activities. Vibratory pile hammers would be utilized to install falsework support piles where the piles would be in direct contact with water in the active waterway. Falsework piles to be installed on the dry overbank or in dewatered areas of the river channel could be driven in using an impact hammer.

- Removal of all work pads and dewatering materials from the river channel by October 15. Falsework piles would remain in place through the remainder of the year to allow construction of the above-water portions of the northbound half of the new bridge to continue outside the in-water work window.

Year Two

During this construction season, all traffic on McHenry Avenue would be diverted to the new half of the Stanislaus River Bridge, and the existing Stanislaus River Bridge would be demolished. The second half of the proposed new Stanislaus River Bridge would then be built adjacent to the half of bridge built in Year One, on the same alignment as the existing bridge. This portion of the bridge would eventually carry traffic southbound on McHenry Avenue. Similar to Year 1, in-water work would be limited to the period between June 15 and October 15. Details of work would include (see Figure 4):

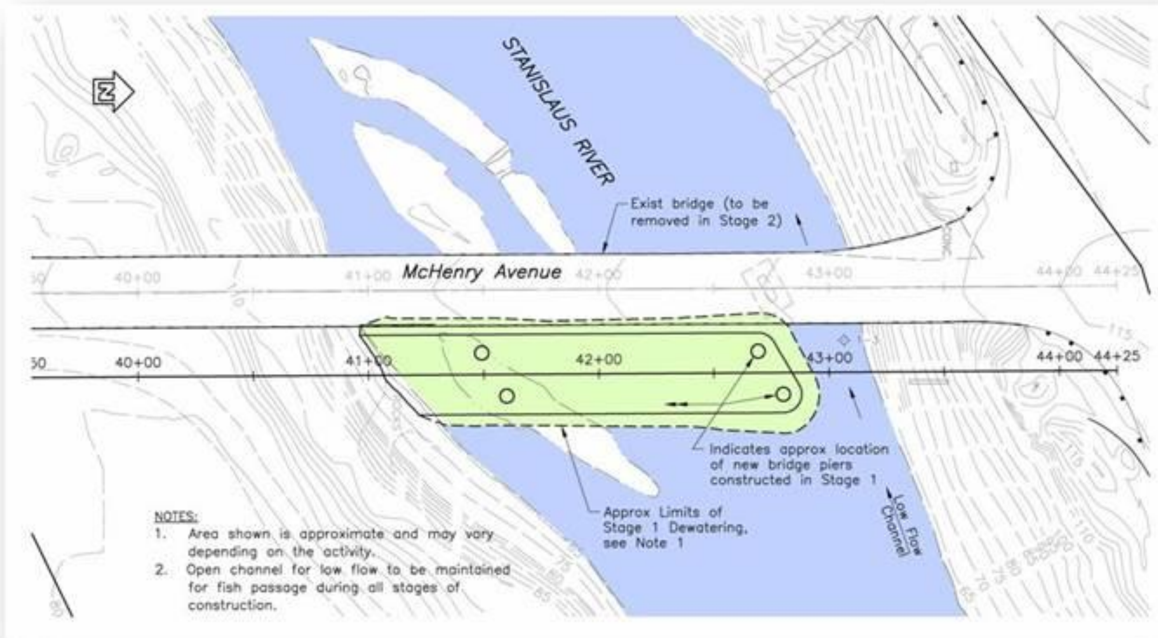

Figure 3. Approximate limits of in-water work area during the first year of construction

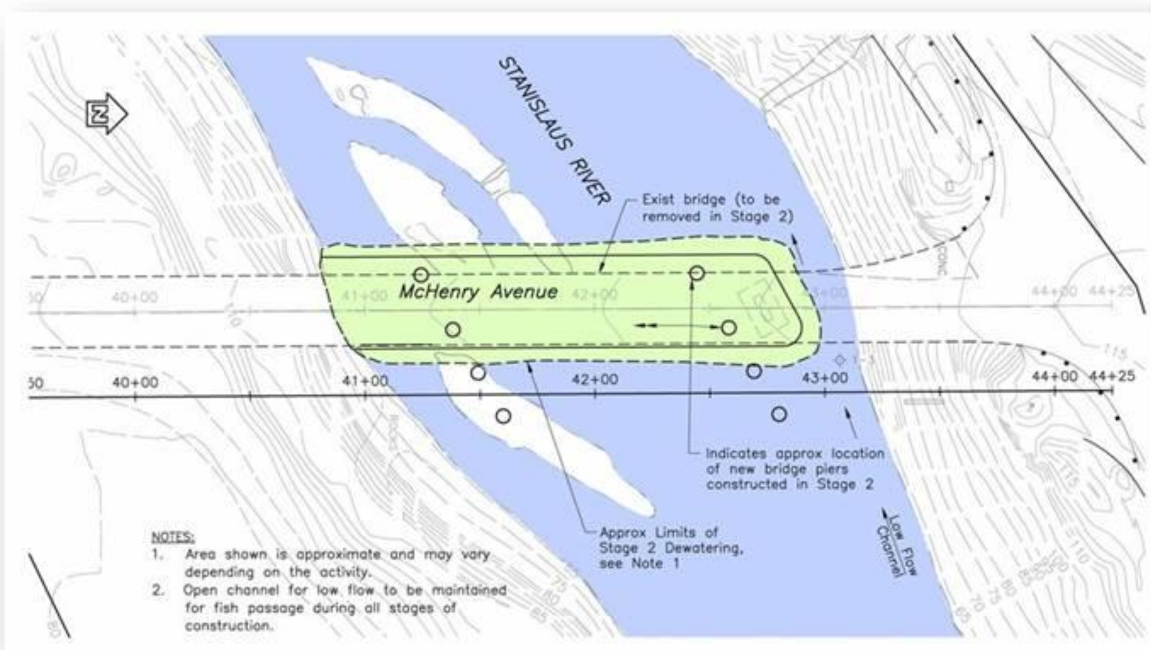

Figure 4. Approximate limits of in-water work area during the second year of construction

- Construction of coffer dams necessary to isolate construction activity from the active waterway will consist of the same types and configurations described for use in Year 1.

- Figure 4 describes the approximate area to be protected during the in-water work windows.

- As in the first year, the total area to be dewatered would range between approximately 4,000 to 8,500 square feet, depending on the activity. Similarly water would be pumped out and handled in a way to prevent silt from entering the river.

- During demolition of the existing Stanislaus River Bridge, appropriate containment measures will be used to prevent debris from entering the water.

- Construction of falsework for bridge demolition and other construction activities will follow the same guidelines established for the construction of the Stage 1 half of the new structure.

- Removal of all work pads and dewatering materials from the river channel by October 15. Falsework piles required to support the on-going above-water construction activity would remain in place through the remainder of the year

Year Three

During this construction season, bridge construction and roadway work would be completed. This would include the following activities in/near the Stanislaus River:

- Construction activities needed to join the two halves of the new Stanislaus River Bridge

- Removal of falsework and in-river piles supporting falsework

- Site restoration work in/near the river channel.

E. Proposed Conservation Measures

The following measures will be implemented to ensure impacts to California Central Valley (CV) steelhead (*Oncorhynchus mykiss*) Distinct Population Segment (DPS) are minimized to the greatest extent possible.

1. In-water activities proposed on the Stanislaus River will be limited to between June 15 and October 15.

2. The anticipated work schedule, including start and end dates, will be provided to the USFWS and NMFS one week in advance of construction start. NMFS may inspect the work site to evaluate and assist with the implementation of proposed avoidance and minimization measures.

3. The permanent loss of 0.002 acre of CV steelhead habitat, will be offset through the purchase of credits, at a 3:1 ratio, from a USFWS approved CV steelhead mitigation

bank. Proof of purchase will be provided to the USFWS and NMFS prior to initiation of construction activities.

4. Prior to the initiation of construction activities, a Worker Environmental Awareness Program (WEAP) will be developed and implemented. All onsite project personnel will be required to complete the WEAP training prior to start of work. At a minimum, the training will include a description of all special-status species that have the potential to occur within the action area, their habitat requirements, the avoidance and minimization measures that are to be implemented and maintained for the conservation of the species, and the limits of construction/disturbance for the project.

5. The following components will be implemented, by qualified biologists, to reduce the potential for direct take of CV steelhead:

    a. An approximately 20-foot wide section of the river, representing the low-flow channel, will be left open during all in-water activities to facilitate upstream/downstream dispersal of fish populations within the Stanislaus River.
    b. Block nets will be installed around the limits of the in-water work areas, prior to the initiation of construction activities in all years. Netting mesh size will be chosen to provide exclusionary benefits to young-of-the year CV steelhead.
    c. Seine nets and/or electrofishers will then be utilized to relocate as many fish as possible within the containment area.
    d. Collected fish will be relocated to a suitable location within the Stanislaus River either upstream or downstream of the project site.
    e. Block nets will remain in place until such time as a turbidity/silt curtain (if required) is installed, or cofferdam construction has been completed.
    f. A qualified biologist, designated by San Joaquin County, will be present to monitor onsite compliance with all minimization measures.

6. All pumped water shall be routed to either: (1) a sedimentation pond located on a flat stable area above the Ordinary High Water Mark (OHWM), to prevent silt-laden runoff from entering the river; or (2) a sedimentation tank/holding facility that allows only clear water to return to the river, and includes disposal of settled solids at an appropriate offsite location.

7. The contractor shall prepare and implement a demolition containment plan to keep debris from entering the main channel of the river. Debris includes raw cement, concrete, concrete washes, asphalt, paint or other coating materials (including lead-based paint from the existing structure), oil and petroleum products, and any other substance that could be hazardous to aquatic life.

8. Downstream sedimentation and turbidity is harmful to aquatic life; therefore, a Stormwater Pollution Prevention Plan (SWPPP) shall be developed and implemented to ensure the proper installation and maintenance of sediment control measures.

Implementation of the SWPPP shall be phased for the installation of dry-weather protective measures and rainy season protective measures.

9. To control sedimentation during and after project implementation, the permit holder will be responsible for implementation of Best Management Practices (BMP's) as outlined in any authorizations or permits issued for the project under the authority of the Clean Water Act. If BMP's are ineffective, the permit holder will attempt to remedy the situation immediately.

10. All refueling, maintenance, and staging of equipment and vehicles will occur at least 60 feet from riparian habitat or other water bodies and not in a location from where a spill would drain directly toward aquatic habitat. Refueling of construction equipment and vehicles will occur only within designated areas where possible spills shall be readily contained. The monitor will ensure contamination of habitat does not occur during such operations. Prior to the onsite of the work, the project proponent will ensure that the contractor's SWPPP includes provisions for prompt and effective response to any accidental spills. All workers will be informed of the importance of preventing spills and the appropriate measures to take should a spill occur. Any spills will be cleaned up immediately.

11. The number of access routes, size of staging areas, and total area of the activity will be limited to the minimum necessary to achieve the project goal. Environmentally sensitive areas will be established to confine access routes and construction areas to the minimum area necessary to complete construction and to minimize the impact to sensitive habitat; this goal includes locating access routes and construction areas outside of wetlands and/or riverine areas to the maximum extent practicable. Stockpiling construction materials, including portable equipment, vehicles, supplies, and chemicals, shall only be permitted in designated construction staging areas.

12. Litter and construction debris from below the OHWM will be removed and placed at an appropriate site not subject to flooding during the period from October 15 to May 15. Any spills of hazardous materials in riverine habitat will be immediately cleaned up and disposed of properly.

13. Pile driving and post-drilling will only occur from 8am to 5pm on weekdays. Restricted working hours will allow for relaxation periods and movement windows for special status fish present in the action area.

F. Action Area

The proposed project action area consists of two components:

(1) The terrestrial component of the action area is defined by:
    (a) The project footprint, including all cleared areas, and staging areas; and
    (b) The area where construction noise levels are in excess of ambient conditions.
(2) The aquatic component of the action area is defined by:

(a) The segment of the Stanislaus River upstream and downstream of bridge construction sites where pile driving sound noise levels are expected to exceed ambient conditions;
(b) Construction-related water quality impacts in excess of ambient conditions; and
(c) Operational stormwater quality impacts in excess of ambient conditions.

The proposed project action area consists of the Stanislaus river miles (RM) 29 and 30, extending 1,500 feet upstream and 1,500 feet downstream of the bridge site, but does not include the railroad tracks (Tidewater Southern Railroad) or the SSJID/OID Main Canal to the west of McHenry Avenue in the northern portion of the action area. The proposed project action area encompasses approximately 43.7 acres. represents the area within and adjacent to the Stanislaus River that is used by California (CV) steelhead and where these fish could potentially be exposed to construction related effects including changes in water turbidity, near shore impacts to riparian habitat, the acoustic sounds of pile driving within the water column and the area of potential fish rescue actions.

III. STATUS OF THE SPECIES AND CRITICAL HABITAT

The following listed species and it's designated critical habitat occur in the action area and may be affected by the proposed action:

California Central Valley distinct population segment (DPS) (*Oncorhynchus mykiss*)
(referred to as Central Valley steelhead or CV steelhead throughout this BO)
threatened (January 5, 2006, 71 FR 834)

Central Valley steelhead designated critical habitat
(September 2, 2005, 70 FR 52488)

A. Species and Critical Habitat Listing Status

1. CV steelhead

The California Central Valley (CV) steelhead (*Oncorhynchus mykiss*) Distinct Population Segment (DPS) was originally listed as threatened on March 19, 1998, (63 FR 13347). This DPS consists of steelhead populations in the Sacramento and San Joaquin river basins in California's Central Valley. In June 2004, after a complete status review of 27 west coast salmonid evolutionarily significant units (ESUs) and DPSs, NMFS proposed that CV steelhead remain listed as threatened (69 FR 33102; June 14, 2004). On January 5, 2006, after reviewing the best available scientific and commercial information, NMFS issued its final decision to retain the status of CV steelhead as threatened (71 FR 834). This decision also included the Coleman National Fish Hatchery and Feather River Hatchery (FRH) steelhead populations. These populations were previously included in the DPS but were not deemed essential for conservation and thus not part of the listed steelhead population. Critical habitat was designated for CV steelhead on September 2, 2005, (70 FR 52488). Critical habitat includes the stream channels to the ordinary high water line within designated stream reaches such as those of the American, Feather, and Yuba rivers, and Deer, Mill, Battle, Antelope, and Clear creeks in the Sacramento

River basin; the Mokelumne, Calaveras, Stanislaus, Tuolumne, and Merced rivers in the San Joaquin River basin; and, the Sacramento and San Joaquin rivers and Delta. Designated critical habitat for CV steelhead occurs within the proposed project's action area.

B. Species Life History, Population Dynamics, and Likelihood of Survival and Recovery

<u>CV steelhead</u>

a. General Life History

Steelhead can be divided into two life history types, summer-run steelhead and winter-run steelhead, based on their state of sexual maturity at the time of river entry and the duration of their spawning migration, stream-maturing and ocean-maturing. Only winter-run steelhead currently are found in California Central Valley rivers and streams (McEwan and Jackson 1996), although there are indications that summer-run steelhead were present in the Sacramento River system prior to the commencement of large-scale dam construction in the 1940s (Interagency Ecological Program [IEP] Steelhead Project Work Team 1999). At present, summer-run steelhead are found only in North Coast drainages, mostly in tributaries of the Eel, Klamath, and Trinity river systems (McEwan and Jackson 1996).

CV steelhead generally leave the ocean from August through April (Busby *et al.* 1996) and enter freshwater from August to November and spawn from December to April in small streams and tributaries where cool, well oxygenated water is available year-round (Table 1; Williams 2006; Hallock *et al.* 1961; McEwan and Jackson 1996). Timing of upstream migration is correlated with higher flow events, such as freshets or sand bar breaches, and associated lower water temperatures. Unlike Pacific salmon, steelhead are iteroparous, which are capable of spawning more than once before death (Busby *et al.* 1996). However, it is rare for steelhead to spawn more than twice before dying; most that do so are females (Busby *et al.* 1996). Iteroparity is more common among southern steelhead populations than northern populations (Busby *et al.* 1996). Although one-time spawners are the great majority, Shapovalov and Taft (1954) reported that repeat spawners are relatively numerous (17.2 percent) in California streams.

Spawning occurs during winter and spring months. The length of time it takes for eggs to hatch depends mostly on water temperature. Hatching of steelhead eggs in hatcheries takes about 30 days at 51 degrees Fahrenheit (F). Fry emerge from the gravel usually about four to six weeks after hatching, but factors such as redd depth, gravel size, siltation, and temperature can speed or retard this time (Shapovalov and Taft 1954). Newly emerged fry move to the shallow, protected areas associated with the stream margin (McEwan and Jackson 1996) and they soon move to other areas of the stream and establish feeding locations, which they defend (Shapovalov and Taft 1954).

Steelhead rearing during the summer takes place primarily in higher velocity areas in pools, although young-of-the-year also are abundant in glides and riffles. Productive steelhead habitat is characterized by complexity, primarily in the form of large and small woody debris. Cover is an important habitat component for juvenile steelhead both as velocity refugia and as a means of

Table 1. The temporal occurrence of adult (a) and juvenile (b) CV steelhead in the Central Valley. Darker shades indicate months of greatest relative abundance.

(a) Adult

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
[1,3]Sac. River												
[2,3]Sac R at Red Bluff												
[4]Mill, Deer Creeks												
[6]Sac R. at Fremont Weir												
[6]Sac R. at Fremont Weir												
[7]San Joaquin River												

(b) Juvenile

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
[1,2]Sacramento River												
[2,8]Sac. R at Knights Land												
[9]Sac. River @ KL												
[10]Chipps Island (wild)												
[8]Mossdale												
[11]Woodbridge Dam												
[12]Stan R. at Caswell												
[13]Sac R. at Hood												

Source: [1]Hallock et al. 1961; [2]McEwan 2001; [3]USFWS unpublished data; [4]CDFG 1995; [5]Hallock et al. 1957; [6]Bailey 1954; [7]CDFG Steelhead Report Card Data; [8]CDFG unpublished data; [9]Snider and Titus 2000; [10]Nobriga and Cadrett 2003; [11]Jones & Stokes Associates, Inc., 2002; [12]S.P. Cramer and Associates, Inc. 2000 and 2001; [13]Schaffter 1980, 1997.

Relative Abundance: = High = Medium = Low

avoiding predation (Meehan and Bjornn 1991).

Juvenile steelhead emigrate episodically from natal streams during fall, winter, and spring high flows. Emigrating CV steelhead use the lower reaches of the Sacramento River and the Delta for rearing and as a migration corridor to the ocean. Juvenile CV steelhead feed mostly on drifting aquatic organisms and terrestrial insects and will also take active bottom invertebrates (Moyle 2002). Some may utilize tidal marsh areas, non-tidal freshwater marshes, and other shallow water areas in the Delta as rearing areas for short periods prior to their final emigration to the sea. Hallock *et al.* (1961) found that juvenile steelhead in the Sacramento River basin migrate downstream during most months of the year, but the peak period of emigration occurred in the spring with a much smaller peak in the fall. Nobriga and Cadrett (2003) also have verified these temporal findings based on analysis of captures at Chipps Island.

(1) Population Dynamics. Historic CV steelhead run sizes are difficult to estimate given the paucity of data, but may have approached one to two million adults annually (McEwan 2001). By the early 1960s the steelhead run size had declined to about 40,000 adults (McEwan 2001). Over the past 30 years, the naturally-spawned steelhead populations in the upper Sacramento River have declined substantially. Hallock *et al.* (1961) estimated an average of 20,540 adult steelhead through the 1960s in the Sacramento River, upstream of the Feather River. Steelhead counts at the Red Bluff Diversion Dam (RBDD) declined from an average of 11,187 for the period of 1967 to 1977, to an average of approximately 2,000 through the early 1990s, with an estimated total annual run size for the entire Sacramento-San Joaquin system, based on RBDD counts, to be no more than 10,000 adults (McEwan and Jackson 1996; McEwan 2001). Steelhead escapement surveys at RBDD ended in 1993 due to changes in dam operations.

Recent estimates from trawling data in the Delta indicate that approximately 100,000 to 300,000 (mean 200,000) smolts emigrate to the ocean per year, representing approximately 3,600 female steelhead spawners in the Central Valley basin (Good *et al*. 2005). This can be compared with McEwan's (2001) estimate of one million to two million spawners before 1850, and 40,000 spawners in the 1960s.

Existing wild steelhead stocks in the Central Valley are mostly confined to the upper Sacramento River (below Red Bluff Diversion Dam) and its tributaries, including Antelope, Deer, and Mill creeks and the Yuba River. Populations may exist in Big Chico and Butte creeks and a few wild steelhead are produced in the American and Feather rivers (McEwan and Jackson 1996). Snorkel surveys (1999 to 2002) indicated that steelhead are present in Clear Creek (Good *et al*. 2005). Because of the large resident *O. mykiss* population in Clear Creek, steelhead spawner abundance has not been estimated.

Until recently, CV steelhead were thought to be extirpated from the San Joaquin River system. Recent monitoring has detected small self-sustaining populations of steelhead in the Stanislaus, Mokelumne, and Calaveras rivers, and other streams previously thought to be devoid of steelhead (McEwan 2001). On the Stanislaus River, steelhead smolts have been captured in rotary screw traps at Caswell State Park and Oakdale each year since 1995 (S.P. Cramer and Associates Inc. 2000, 2001).

It is possible that naturally-spawning populations exist in many other streams but are undetected due to a lack of monitoring programs (IEP Steelhead Project Work Team 1999). Incidental catches and observations of steelhead juveniles also have occurred on the Tuolumne and Merced rivers during fall-run Chinook salmon monitoring activities, indicating that steelhead are widespread throughout accessible streams and rivers in the Central Valley (Good *et al*. 2005). CDFG staff has prepared juvenile migrant CV steelhead catch summaries on the San Joaquin River near Mossdale representing migrants from the Stanislaus, Tuolumne, and Merced rivers. Based on trawl recoveries at Mossdale between 1988 and 2002, as well as rotary screw trap efforts in all three tributaries, CDFG staff stated that it is "clear from this data that rainbow trout do occur in all the tributaries as migrants and that the vast majority of them occur on the

Stanislaus River" (CDFG 2003). The documented returns on the order of single fish in these tributaries suggest that existing populations of CV steelhead on the Tuolumne, Merced, and lower San Joaquin rivers are severely depressed.

Lindley *et al*. (2006) indicated that prior population census estimates completed in the 1990s found the CV steelhead spawning population above RBDD had a fairly strong negative population growth rate and small population size. Good *et al.* (2005) indicated the decline was continuing as evidenced by new information (Chipps Island trawl data). CV steelhead populations generally show a continuing decline, an overall low abundance, and fluctuating return rates.

(2) Viable Population Summary for CV Steelhead. In order to determine the current likelihood of viability of the CV steelhead DPS, we used the historical population structure of CV steelhead presented in Lindley *et al*. (2006) and the viable salmonid population (VSP) concept for evaluating populations described by McElhany *et al.* (2000). While McElhany *et al.* (2000) introduced and described the concept of VSP, Lindley *et al*. (2007) applied the concept to the CV steelhead DPS. The following provides the evaluation of the likelihood of viability for the threatened CV steelhead DPS based on the VSP parameters of abundance, productivity, spatial structure, and diversity.

Abundance. All indications are that natural CV steelhead have continued to decrease in abundance and in the proportion of natural fish over the past 25 years (Good *et al.* 2005); the long-term trend remains negative. There has been little steelhead population monitoring despite 100 percent marking of hatchery steelhead since 1998. Hatchery production and returns are far greater than those of natural fish and include significant numbers of non-DPS-origin Eel River steelhead stock.

Productivity. An estimated 100,000 to 300,000 natural juvenile steelhead are estimated to leave the Central Valley annually, based on rough calculations from sporadic catches in trawl gear (Good *et al.* 2005). Concurrently, one million in-DPS hatchery steelhead smolts and another half million out-of-DPS hatchery steelhead smolts are released annually in the Central Valley. The estimated ratio of non-clipped to clipped steelhead has decreased from 0.3 percent to less than 0.1 percent, with a net decrease to one-third of wild female spawners from 1998 to 2000 (Good *et al.* 2005).

Spatial Structure. Steelhead appear to be well-distributed throughout the Central Valley (Good *et al.* 2005). Until recently, there was very little documented evidence of steelhead due to the lack of monitoring efforts. Since 2000, steelhead have been confirmed in the Stanislaus and Calaveras rivers.

Diversity. Analysis of natural and hatchery steelhead stocks in the Central Valley reveal genetic structure remaining in the DPS (Nielsen *et al.* 2003). There appears to be a great amount of gene flow among upper Sacramento River basin stocks, due to the post-dam, lower basin distribution of steelhead and management of stocks. Recent reductions in natural population sizes have created genetic bottlenecks in several CV steelhead stocks (Good *et al.* 2005; Nielsen *et al.* 2003). The out-of-basin steelhead stocks of the Nimbus and Mokelumne River hatcheries are not included in the CV steelhead DPS.

Lindley *et al*. (2007) indicated that prior population census estimates completed in the 1990s found the CV steelhead spawning population above RBDD had a fairly strong negative population growth rate and small population size. Good *et al.* (2005) indicated the decline was continuing as evidenced by new information (Chipps Island trawl data). CV steelhead populations generally show a continuing decline, an overall low abundance, and fluctuating return rates. The future of CV steelhead is uncertain due to limited data concerning their status. However, Lindley *et al.* (2007) concluded that there is sufficient evidence to suggest that the DPS is at moderate to high risk of extinction.

C. CV steelhead Critical Habitat and Function for Species' Conservation

Critical habitat for CV steelhead includes stream reaches such as those of the Sacramento, Feather, and Yuba rivers, and Deer, Mill, Battle, and Antelope creeks in the Sacramento River basin; the San Joaquin River basin, including its tributaries, and the waterways of the Delta. Critical habitat includes the stream channels in the designated stream reaches and the lateral extent as defined by the ordinary high water line. In areas where the ordinary high-water line has not been defined, the lateral extent will be defined by the bankfull elevation (defined as the level at which water begins to leave the channel and move into the floodplain; it is reached at a discharge that generally has a recurrence interval of one to two years on the annual flood series) (Bain and Stevenson 1999; 70 FR 52488). Critical habitat for CV steelhead is defined as specific areas that contain the primary constituent elements (PCE) and physical habitat elements essential to the conservation of the species. Freshwater rearing habitat and migration corridors are the inland habitat types used as PCEs that are present in the action area for CV steelhead.

1. <u>Freshwater Rearing Habitat</u>

Freshwater rearing sites are those with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large woody material, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks. Both spawning areas and migratory corridors comprise rearing habitat for juveniles, which feed and grow before and during their outmigration. Non-natal, intermittent tributaries also may be used for juvenile rearing. Rearing habitat condition is strongly affected by habitat complexity, food supply, and the presence of predators of juvenile salmonids. Some complex, productive habitats with floodplains remain in the system (*e.g.*, the lower Cosumnes River, Sacramento River reaches with setback levees [*i.e.*, primarily located upstream of the City of Colusa]) and flood bypasses (*i.e.*, Yolo and Sutter bypasses). However, the channelized, leveed, and riprapped river reaches and sloughs that are common in the Sacramento-San Joaquin system typically have low habitat complexity, low abundance of food organisms, and offer little protection from either fish or avian predators. Freshwater rearing habitat also has a high conservation value even if the current conditions are significantly degraded from their natural state. Juvenile life stages of salmonids are dependant on the function of this habitat for successful survival and recruitment.

2. Freshwater Migration Corridors

Ideal freshwater migration corridors are free of migratory obstructions, with water quantity and quality conditions that enhance migratory movements. They contain natural cover such as riparian canopy structure, submerged and overhanging large woody objects, aquatic vegetation, large rocks and boulders, side channels, and undercut banks which augment juvenile and adult mobility, survival, and food supply. Migratory corridors are downstream of spawning and rearing areas and include the lower mainstems of the Sacramento and San Joaquin rivers and the Delta. These corridors allow the upstream passage of adults, and the downstream emigration of outmigrant juveniles. Migratory habitat condition is strongly affected by the presence of barriers, which can include dams (*i.e.*, hydropower, flood control, and irrigation flashboard dams), unscreened or poorly screened diversions, degraded water quality, or behavioral impediments to migration. For successful survival and recruitment of salmonids, freshwater migration corridors must function sufficiently to provide adequate passage. For this reason, freshwater migration corridors are considered to have a high conservation value even if the migration corridors are significantly degraded compared to their natural state.

D. Factors Affecting CV steelhead

1. Habitat Blockage

Hydropower, flood control, and water supply dams of the Central Valley Pumps (CVP), State Water Pumps (SWP), and other municipal and private entities have permanently blocked or hindered salmonid access to historical spawning and rearing grounds. Clark (1929) estimated that originally there were 6,000 linear miles of salmon habitat in the Central Valley system and that 80 percent of this habitat had been lost by 1928. Yoshiyama *et al.* (1996) calculated that roughly 2,000 linear miles of salmon habitat was actually available before dam construction and mining, and concluded that 82 percent is not accessible today.

As a result of migrational barriers, steelhead populations have been confined to lower elevation mainstems that historically only were used for migration. Population abundances have declined in these streams due to decreased quantity and quality of spawning and rearing habitat. Higher temperatures at these lower elevations during late-summer and fall are also a major stressor to adult and juvenile salmonids. CV steelhead historically had at least 81 independent populations based on Lindley *et al.*'s (2006) analysis of potential habitat in the Central Valley. However, due to dam construction, access to 38 percent of all spawning habitat has been lost as well as access to 80 percent of the historically available habitat.

2. Water Development

The diversion and storage of natural flows by dams and diversion structures on Central Valley waterways have depleted streamflows and altered the natural cycles by which juvenile and adult salmonids base their migrations. As much as 60 percent of the natural historical inflow to Central Valley watersheds and the Delta have been diverted for human uses. Depleted flows have contributed to higher temperatures, lower dissolved oxygen (DO) levels, and decreased recruitment of gravel and large woody debris (LWD). More uniform flows year round have resulted in diminished natural channel formation, altered food web processes, and slower regeneration of riparian vegetation. These stable flow patterns have reduced bed load movement (Mount 1995; Ayers 2001), caused spawning gravels to become embedded, and decreased channel widths due to channel incision, all of which has decreased the available spawning and rearing habitat below dams. The storage of unimpeded runoff in these large reservoirs also has altered the normal hydrograph for the Sacramento and San Joaquin river watersheds. Rather than seeing peak flows in these river systems following winter rain events (Sacramento River) or spring snow melt (San Joaquin River), the current hydrology has truncated peaks with a prolonged period of elevated flows (compared to historical levels) continuing into the summer dry season.

Water withdrawals, for agricultural and municipal purposes have reduced river flows and increased temperatures during the critical summer months, and in some cases, have been of a sufficient magnitude to result in reverse flows in the lower San Joaquin River (Reynolds *et al*. 1993). Direct relationships exist between water temperature, water flow, and juvenile salmonid survival (Brandes and McLain 2001). Elevated water temperatures in the Sacramento River have limited the survival of salmonids in those waters.

Water diversions for irrigated agriculture, municipal and industrial use, and managed wetlands are found throughout the Central Valley. Thousands of small and medium-size water diversions exist along the Sacramento River, San Joaquin River, and their tributaries. Although efforts have been made in recent years to screen some of these diversions, many remain unscreened. Depending on the size, location, and season of operation, these unscreened diversions entrain and kill many life stages of aquatic species, including juvenile salmonids. For example, as of 1997, 98.5 percent of the 3,356 diversions included in a Central Valley database were either unscreened or screened insufficiently to prevent fish entrainment (Herren and Kawasaki 2001). Most of the 370 water diversions operating in Suisun Marsh are unscreened (Herren and Kawasaki 2001).

Outmigrant juvenile salmonids in the Delta have been subjected to adverse environmental conditions created by water export operations at the CVP and SWP facilities. Specifically, juvenile salmonid survival has been reduced by the following: (1) water diversion from the mainstem Sacramento River into the Central Delta via the Delta Cross Channel; (2) upstream or reverse flows of water in the lower San Joaquin River and southern Delta waterways; (3) entrainment at the CVP/SWP export facilities and associated problems at Clifton Court Forebay; and (4) increased exposure to introduced, non-native predators such as striped bass (*Morone saxatilis*), largemouth bass (*Micropterus salmoides*), and sunfishes (Centrarchidae).

3. <u>Water Conveyance and Flood Control</u>

The development of the water conveyance system in the Delta has resulted in the construction of more than 1,100 miles of channels and diversions to increase channel elevations and flow capacity of the channels (Mount 1995). Levee development in the Central Valley affects spawning habitat, freshwater rearing habitat, freshwater migration corridors, and estuarine habitat PCEs. As Mount (1995) indicates, there is an “underlying, fundamental conflict inherent in this channelization.” Natural rivers strive to achieve dynamic equilibrium to handle a watershed's supply of discharge and sediment (Mount 1995). The construction of levees disrupts the natural processes of the river, resulting in a multitude of habitat-related effects.

Many of these levees use angular rock (riprap) to armor the bank from erosive forces. The effects of channelization, and riprapping, include the alteration of river hydraulics and cover along the bank as a result of changes in bank configuration and structural features (Stillwater Sciences 2006). These changes affect the quantity and quality of nearshore habitat for juvenile salmonids and have been thoroughly studied (USFWS 2000; Schmetterling *et al.* 2001; Garland *et al*. 2002). Simple slopes protected with rock revetment generally create nearshore hydraulic conditions characterized by greater depths and faster, more homogeneous water velocities than occur along natural banks. Higher water velocities typically inhibit deposition and retention of sediment and woody debris. These changes generally reduce the range of habitat conditions typically found along natural shorelines, especially by eliminating the shallow, slow-velocity river margins used by juvenile fish as refuge and escape from fast currents, deep water, and predators (Stillwater Sciences 2006).

Prior to the 1970s, there was so much debris resulting from poor logging practices that many streams were completely clogged and were thought to have been total barriers to fish migration. As a result, in the 1960s and early 1970s it was common practice among fishery management agencies to remove woody debris thought to be a barrier to fish migration (NMFS 1996b). However, it is now recognized that too much LWD was removed from the streams resulting in a loss of salmonid habitat and it is thought that the large scale removal of woody debris prior to 1980 had major, long-term negative effects on rearing habitats for salmonids in northern California (NMFS 1996b). Areas that were subjected to this removal of LWD are still limited in the recovery of salmonid stocks; this limitation could be expected to persist for 50 to 100 years following removal of debris.

Large quantities of downed trees are a functionally important component of many streams (NMFS 1996b). LWD influences stream morphology by affecting channel pattern, position, and geometry, as well as pool formation (Keller and Swanson 1979; Bilby 1984; Robison and Beschta 1990). Reduction of wood in the stream channel, either from past or present activities, generally reduces pool quantity and quality, alters stream shading which can affect water temperature regimes and nutrient input, and can eliminate critical stream habitat needed for both vertebrate and invertebrate populations. Removal of vegetation also can destabilize marginally stable slopes by increasing the subsurface water load, lowering root strength, and altering water flow patterns in the slope.

In addition, the armoring and revetment of stream banks tends to narrow rivers, reducing the amount of habitat per unit channel length (Sweeney *et al*. 2004). As a result of river narrowing, benthic habitat decreases and the number of macroinvertebrates, such as stoneflies and mayflies, per unit channel length decreases affecting salmonid food supply.

4. Land Use Activities

Land use activities continue to have large impacts on salmonid habitat in the Central Valley watershed. Until about 150 years ago, the Sacramento River was bordered by up to 500,000 acres of riparian forest, with bands of vegetation extending outward for 4 or 5 miles (California Resources Agency 1989). Starting with the gold rush, these vast riparian forests were cleared for building materials, fuel, and to clear land for farms on the raised natural levee banks. The degradation and fragmentation of riparian habitat continued with extensive flood control and bank protection projects, together with the conversion of the fertile riparian lands to agriculture outside of the natural levee belt. By 1979, riparian habitat along the Sacramento River diminished to 11,000 to 12,000 acres, or about 2 percent of historic levels (McGill 1987). The clearing of the riparian forests removed a vital source of snags and driftwood in the Sacramento and San Joaquin River basins. This has reduced the volume of LWD input needed to form and maintain stream habitat that salmon depend on in their various life stages. In addition to this loss of LWD sources, removal of snags and obstructions from the active river channel for navigational safety has further reduced the presence of LWD in the Sacramento and San Joaquin rivers, as well as the Delta.

Increased sedimentation resulting from agricultural and urban practices within the Central Valley is one of the primary causes of salmonid habitat degradation (NMFS 1996a). Sedimentation can adversely affect salmonids during all freshwater life stages by: clogging or abrading gill surfaces, adhering to eggs, hampering fry emergence (Phillips and Campbell 1961), burying eggs or alevins, scouring and filling in pools and riffles, reducing primary productivity and photosynthesis activity (Cordone and Kelley 1961), and affecting intergravel permeability and DO levels. Excessive sedimentation over time can cause substrates to become embedded, which reduces successful salmonid spawning and egg and fry survival (Waters 1995).

Land use activities associated with road construction, urban development, logging, mining, agriculture, and recreation have significantly altered fish habitat quantity and quality through the alteration of streambank and channel morphology; alteration of ambient water temperatures; degradation of water quality; elimination of spawning and rearing habitat; fragmentation of available habitats; elimination of downstream recruitment of LWD; and removal of riparian vegetation, resulting in increased streambank erosion (Meehan 1991). Urban stormwater and agricultural runoff may be contaminated with herbicides and pesticides, petroleum products, sediment, *etc.* Agricultural practices in the Central Valley have eliminated large trees and logs and other woody debris that would otherwise be recruited into the stream channel (NMFS 1998).

Since the 1850s, wetlands reclamation for urban and agricultural development has caused the cumulative loss of 79 and 94 percent of the tidal marsh habitat in the Delta downstream and upstream of Chipps Island, respectively (Conomos *et al.* 1985; Nichols *et al.* 1986; Wright and Phillips 1988; Monroe *et al.* 1992; Goals Project 1999). Prior to 1850, approximately 1400 km^2 of freshwater marsh surrounded the confluence of the Sacramento and San Joaquin rivers, and another 800 km^2 of saltwater marsh fringed San Francisco Bay's margins. Of the original 2,200 km^2 of tidally influenced marsh, only about 125 km^2 of undiked marsh remains today. In Suisun Marsh, saltwater intrusion and land subsidence gradually has led to the decline of agricultural production. Presently, Suisun Marsh consists largely of tidal sloughs and managed wetlands for duck clubs, which first were established in the 1870s in western Suisun Marsh (Goals Project 1999). Even more extensive losses of wetland marshes occurred in the Sacramento and San Joaquin river basins. Little of the extensive tracts of wetland marshes that existed prior to 1850 along the valley's river systems and within the natural flood basins exist today. Most has been "reclaimed" for agricultural purposes, leaving only small remnant patches.

Dredging of river channels to enhance inland maritime trade and to provide raw material for levee construction has significantly and detrimentally altered the natural hydrology and function of the river systems in the Central Valley. Starting in the mid-1800s, the U.S Army Corps of Engineers (Corps) and private consortiums began straightening river channels and artificially deepening them to enhance shipping commerce. This has led to declines in the natural meandering of river channels and the formation of pool and riffle segments. The deepening of channels beyond their natural depth also has led to a significant alteration in the transport of bedload in the riverine system as well as the local flow velocity in the channel (Mount 1995). The Sacramento Flood Control Project at the turn of the nineteenth century ushered in the start of large scale Corps actions in the Delta and along the rivers of California for reclamation and flood control. The creation of levees and the deep shipping channels reduced the natural tendency of the San Joaquin and Sacramento rivers to create floodplains along their banks with seasonal inundations during the wet winter season and the spring snow melt periods. These annual inundations provided necessary habitat for rearing and foraging of juvenile native fish that evolved with this flooding process. The armored riprapped levee banks and active maintenance actions of Reclamation districts precluded the establishment of ecologically important riparian vegetation, introduction of valuable LWD from these riparian corridors, and the productive intertidal mudflats characteristic of the undisturbed Delta habitat.

Urban stormwater and agricultural runoff may be contaminated with pesticides, oil, grease, heavy metals, polycyclic aromatic hydrocarbons (PAHs), and other organics and nutrients (California Regional Water Quality Control Board-Central Valley Region [Regional Board] 1998) they can potentially destroy aquatic life necessary for salmonid survival (NMFS 1996a, b). Point source (PS) and non-point source (NPS) pollution occurs at almost every point that urbanization activity influences the watershed. Impervious surfaces (*i.e.*, concrete, asphalt, and buildings) reduce water infiltration and increase runoff, thus creating greater flood hazard (NMFS 1996a, b). Flood control and land drainage schemes may increase the flood risk downstream by concentrating runoff. A flashy discharge pattern results in increased bank erosion with subsequent loss of riparian vegetation, undercut banks and stream channel widening. In addition to the PS and NPS inputs from urban runoff, juvenile salmonids are exposed to increased water temperatures as a result of thermal inputs from municipal, industrial, and agricultural discharges.

Past mining activities routinely resulted in the removal of spawning gravels from streams, the straightening and channelization of the stream corridor from dredging activities, and the leaching of toxic effluents into streams from mining operations. Many of the effects of past mining operations continue to impact salmonid habitat today. Current mining practices include suction dredging (sand and gravel mining), placer mining, lode mining and gravel mining. Present day mining practices are typically less intrusive than historic operations (hydraulic mining); however, adverse impacts to salmonid habitat still occur as a result of present-day mining activities. Sand and gravel are used for a large variety of construction activities including base material and asphalt, road bedding, drain rock for leach fields, and aggregate mix for concrete to construct buildings and highways.

Most aggregate is derived principally from pits in active floodplains, pits in inactive river terrace deposits, or directly from the active channel. Other sources include hard rock quarries and mining from deposits within reservoirs. Extraction sites located along or in active floodplains present particular problems for anadromous salmonids. Physical alteration of the stream channel may result in the destruction of existing riparian vegetation and the reduction of available area for seedling establishment (Stillwater Sciences 2002). Loss of vegetation impacts riparian and aquatic habitat by causing a loss of the temperature moderating effects of shade and cover, and habitat diversity. Extensive degradation may induce a decline in the alluvial water table, as the banks are effectively drained to a lowered level, affecting riparian vegetation and water supply (NMFS 1996b). Altering the natural channel configuration will reduce salmonid habitat diversity by creating a wide, shallow channel lacking in the pools and cover necessary for all life stages of anadromous salmonids. In addition, waste products resulting from past and present mining activities, include cyanide (an agent used to extract gold from ore), copper, zinc, cadmium, mercury, asbestos, nickel, chromium, and lead.

Juvenile salmonids are exposed to increased water temperatures in the Delta during the late spring and summer due to the loss of riparian shading, and by thermal inputs from municipal, industrial, and agricultural discharges. Studies by the California Department of Water Resources (DWR) on water quality in the Delta over the last 30 years show a steady decline in the food sources available for juvenile salmonids and sturgeon and an increase in the clarity of the water due to a reduction in phytoplankton and zooplankton. These conditions have contributed to increased mortality of juvenile Chinook salmon, steelhead, and sturgeon as they move through the Delta.

5. <u>Water Quality</u>

The water quality of the Delta has been negatively impacted over the last 150 years. Increased water temperatures, decreased DO levels, and increased turbidity and contaminant loads (as described in *Land Use Activities*) have degraded the quality of the aquatic habitat for the rearing and migration of salmonids. The Regional Board, in its 1998 Clean Water Act §303(d) list characterized the Delta as an impaired waterbody having elevated levels of chlorpyrifos, dichlorodiphenyltrichlor (*i.e.* DDT), diazinon, electrical conductivity, Group A pesticides (aldrin, dieldrin, chlordane, endrin, heptachlor, heptachlor epoxide, hexachlorocyclohexanes [including lindane], endosulfan and toxaphene), mercury, low DO, organic enrichment, and unknown toxicities (Regional Board 1998, 2001).

In general, water degradation or contamination can lead to either acute toxicity, resulting in death when concentrations are sufficiently elevated, or more typically, when concentrations are lower, to chronic or sublethal effects that reduce the physical health of the organism, and lessens its survival over an extended period of time. Mortality may become a secondary effect due to compromised physiology or behavioral changes that lessen the organism's ability to carry out its normal activities. For example, increased levels of heavy metals are detrimental to the health of an organism because they interfere with metabolic functions by inhibiting key enzyme activity in metabolic pathways, decrease neurological function, degrade cardiovascular output, and act as mutagens, teratogens or carcinogens in exposed organisms (Rand *et al*. 1995; Goyer 1996). For listed species, these effects may occur directly to the listed fish or to its prey base, which reduces the forage base available to the listed species.

In the aquatic environment, most anthropogenic chemicals and waste materials including toxic organic and inorganic chemicals eventually accumulate in sediment (Ingersoll 1995). Direct exposure to contaminated sediments may cause deleterious effects to listed salmonids or the threatened Southern green sturgeon DPS. This may occur if a fish swims through a plume of the resuspended sediments or rests on contaminated substrate and absorbs the toxic compounds through one of several routes: dermal contact, ingestion, or uptake across the gills. Elevated contaminant levels may be found in localized "hot spots" where discharge occurs or where river currents deposit sediment loads. Sediment contaminant levels can thus be significantly higher than the overlying water column concentrations (Environmental Protection Agency 1994). However, the more likely route of exposure to salmonids or sturgeon is through the food chain, when the fish feed on organisms that are contaminated with toxic compounds. Prey species become contaminated either by feeding on the detritus associated with the sediments or dwelling in the sediment itself. Therefore, the degree of exposure to the salmonids and green sturgeon depends on their trophic level and the amount of contaminated forage base they consume. Response of salmonids and green sturgeon to contaminated sediments is similar to water borne exposures.

Low DO levels frequently are observed in the portion of the Stockton deep water ship channel (DWSC) extending from Channel Point, downstream to Turner and Columbia cuts. Over a 5-year period, starting in August 2000, a DO meter has recorded channel DO levels at Rough and Ready Island (Dock 20 of the West Complex). Over the course of this time period, there have been 297 days in which violations of the 5 mg/L DO criteria for the protection of aquatic life in the San Joaquin River between Channel Point and Turner and Columbia cuts have occurred during the September through May migratory period for salmonids in the San Joaquin River. The data derived from the California Data Exchange Center files indicate that DO depressions occur during all migratory months, with significant events occurring from November through March when listed CV steelhead adults and smolts would be utilizing this portion of the San Joaquin River as a migratory corridor.

Potential factors that contribute to these DO depressions are reduced river flows through the ship channel, released ammonia from the City of Stockton Wastewater Treatment Plant, upstream contributions of organic materials (*e.g.*, algal loads, nutrients, agricultural discharges) and the increased volume of the dredged ship channel. During the winter and early spring emigration period, increased ammonia concentrations in the discharges from the City of Stockton Waste Water Treatment Facility lowers the DO in the adjacent DWSC near the West Complex. In addition to the adverse effects of the lowered DO on salmonid physiology, ammonia is in itself toxic to salmonids at low concentrations. Likewise, adult fish migrating upstream will encounter lowered DO in the DWSC as they move upstream in the fall and early winter due to low flows and excessive algal and nutrient loads coming downstream from the upper San Joaquin River watershed. Levels of DO below 5 mg/L have been reported as delaying or blocking fall-run Chinook salmon in studies conducted by Hallock *et al.* (1970).

6. <u>Hatchery Operations and Practices</u>

Five hatcheries currently produce Chinook salmon in the Central Valley and four of these also produce steelhead. Releasing large numbers of hatchery fish can pose a threat to wild Chinook salmon and steelhead stocks through genetic impacts, competition for food and other resources between hatchery and wild fish, predation of hatchery fish on wild fish, and increased fishing pressure on wild stocks as a result of hatchery production (Waples 1991). The genetic impacts of artificial propagation programs in the Central Valley primarily are caused by straying of hatchery fish and the subsequent interbreeding of hatchery fish with wild fish. In the Central Valley, practices such as transferring eggs between hatcheries and trucking smolts to distant sites for release contribute to elevated straying levels (Department of the Interior [DOI] 1999). For example, Nimbus Hatchery on the American River rears Eel River steelhead stock and releases these fish in the Sacramento River basin. One of the recommendations in the Joint Hatchery Review Report (NMFS and CDFG 2001) was to identify and designate new sources of steelhead brood stock to replace the current Eel River origin brood stock.

Hatchery practices as well as spatial and temporal overlaps of habitat use and spawning activity between spring- and fall-run fish have led to the hybridization and homogenization of some subpopulations (CDFG 1998). As early as the 1960s, Slater (1963) observed that early fall- and spring-run Chinook salmon were competing for spawning sites in the Sacramento River below Keswick Dam, and speculated that the two runs may have hybridized. The FRH spring-run Chinook salmon have been documented as straying throughout the Central Valley for many years (CDFG 1998), and in many cases have been recovered from the spawning grounds of fall-run Chinook salmon, an indication that FRH spring-run Chinook salmon may exhibit fall-run life history characteristics. Although the degree of hybridization has not been comprehensively determined, it is clear that the populations of spring-run Chinook salmon spawning in the Feather River and counted at RBDD contain hybridized fish.

The management of hatcheries, such as Nimbus Hatchery and FRH, can directly impact spring-run Chinook salmon and steelhead populations by oversaturating the natural carrying capacity of the limited habitat available below dams. In the case of the Feather River, significant redd superimposition occurs in-river due to hatchery overproduction and the inability to physically separate spring- and fall-run Chinook salmon adults. This concurrent spawning has led to hybridization between the spring- and fall-run Chinook salmon in the Feather River. At Nimbus Hatchery, operating Folsom Dam to meet temperature requirements for returning hatchery fall-run Chinook salmon often limits the amount of water available for steelhead spawning and rearing the rest of the year.

The increase in Central Valley hatchery production has reversed the composition of the steelhead population, from 88 percent naturally-produced fish in the 1950s (McEwan 2001) to an estimated 23 to 37 percent naturally-produced fish currently (Nobriga and Cadrett 2003). The increase in hatchery steelhead production proportionate to the wild population has reduced the viability of the wild steelhead populations, increased the use of out-of-basin stocks for hatchery production, and increased straying (NMFS and CDFG 2001). Thus, the ability of natural populations to successfully reproduce and continue their genetic integrity likely has been diminished.

The relatively low number of spawners needed to sustain a hatchery population can result in high harvest-to-escapements ratios in waters where fishing regulations are set according to hatchery population. This can lead to over-exploitation and reduction in the size of wild populations existing in the same system as hatchery populations due to incidental bycatch (McEwan 2001).

Hatcheries also can have some positive effects on salmonid populations. Artificial propagation has been shown to be effective in bolstering the numbers of naturally spawning fish in the short term under specific scenarios. Artificial propagation programs can also aid in conserving genetic resources and guarding against catastrophic loss of naturally spawned populations at critically low abundance levels, as was the case with the Sacramento River winter-run Chinook salmon population during the 1990s. However, relative abundance is only one component of a viable salmonid population.

7. Over Utilization

a. ***Ocean Commercial and Sport Harvest – Chinook salmon and steelhead***

Extensive ocean recreational and commercial troll fisheries for Chinook salmon exist along the Northern and Central California coast, and an inland recreational fishery exists in the Central Valley for Chinook salmon and steelhead. However, there is essentially no ocean harvest of steelhead.

b. ***Inland Sport Harvest –steelhead***

There is little information on steelhead harvest rates in California. Hallock *et al.* (1961) estimated that harvest rates for Sacramento River steelhead from the 1953-1954 through 1958-1959 seasons ranged from 25.1 percent to 45.6 percent assuming a 20 percent non-return rate of tags. The average annual harvest rate of adult steelhead above RBDD for the 3-year period from 1991-1992 through 1993-1994 was 16 percent (McEwan and Jackson 1996). Since 1998, all hatchery steelhead have been marked with an adipose fin clip allowing anglers to distinguish hatchery and wild steelhead. Current regulations restrict anglers from keeping unmarked steelhead in Central Valley streams. Overall, this regulation has greatly increased protection of naturally produced adult steelhead; however, the total number of CV steelhead contacted might be a significant fraction of basin-wide escapement, and even low catch-and-release mortality may pose a problem for wild populations (Good *et al*. 2005).

8. Disease and Predation

Infectious disease is one of many factors that influence adult and juvenile salmonid survival. Salmonids are exposed to numerous bacterial, protozoan, viral, and parasitic organisms in spawning and rearing areas, hatcheries, migratory routes, and the marine environment (NMFS 1996a, 1996b, 1998). Specific diseases such as bacterial kidney disease, C*eratomyxosis shasta* (C-shasta), columnaris, furunculosis, infectious hematopoietic necrosis, redmouth and black spot disease, whirling disease, and erythrocytic inclusion body syndrome are known, among others, to affect steelhead (NMFS 1996a, 1996b, 1998). Very little current or historical information exists to quantify changes in infection levels and mortality rates attributable to these diseases; however, studies have shown that wild fish tend to be less susceptible to pathogens than are hatchery-reared fish. Nevertheless, wild salmonids may contract diseases that are spread through the water column (*i.e*., waterborne pathogens) as well as through interbreeding with infected hatchery fish. The stress of being released into the wild from a controlled hatchery environment frequently causes latent infections to convert into a more pathological state, and increases the potential of transmission from hatchery reared fish to wild stocks within the same waters.

Human-induced habitat changes such as alteration of natural flow regimes and installation of bank revetment and structures such as dams, bridges, water diversions, piers, and wharves often provide conditions that both disorient juvenile salmonids and attract predators (Stevens 1961; Decato 1978; Vogel *et al.* 1988; Garcia 1989). On the mainstem Sacramento River, high rates of predation are known to occur at the RBDD, Anderson-Cottonwood Irrigation District's (ACID) diversion dam, Glenn Colusa Irrigation District's diversion facility, areas where rock revetment has replaced natural river bank vegetation, and at South Delta water diversion structures (*e*.g., Clifton Court Forebay; CDFG 1998). USFWS found that more predatory fish were found at rock revetment bank protection sites between Chico Landing and Red Bluff than at sites with naturally eroding banks (Michny and Hampton 1984). From October 1976 to November 1993, CDFG conducted 10 mark/recapture studies at the SWP's Clifton Court Forebay to estimate pre-screen losses using hatchery-reared juvenile salmonids. Pre-screen losses ranged from 69 percent to 99 percent. Predation by striped bass is thought to be the primary cause of the loss (Gingras 1997; DWR 2009).

Predation on juvenile salmonids has increased as a result of water development activities which have created ideal habitats for predators and non-native invasive species (NIS). Turbulent conditions near dam bypasses, turbine outfalls, water conveyances, and spillways disorient juvenile salmonid migrants and increase their predator avoidance response time, thus improving predator success. Increased exposure to predators has also resulted from reduced water flow through reservoirs; a condition which has increased juvenile travel time. Other locations in the Central Valley where predation is of concern include flood bypasses, post-release sites for salmonids salvaged at the CVP and SWP Fish Facilities, and the Suisun Marsh Salinity Control Gates (SMSCG). Predation on salmon by striped bass and Sacramento pikeminnow (*Ptychocheilus grandis*) at salvage release sites in the Delta and lower Sacramento River has been documented (Orsi 1967; Pickard *et al.* 1982); however, accurate predation rates at these sites are difficult to determine. CDFG conducted predation studies from 1987 to 1993 at the SMSCG to determine if the structure attracts and concentrates predators. The dominant predator species at the SMSCG was striped bass, and the remains of juvenile salmonids were identified in their stomach contents (Edwards *et al.* 1996; Tillman *et al.* 1996; NMFS 1997).

Avian predation on fish contributes to the loss of migrating juvenile salmonids by constraining natural and artificial production. Fish-eating birds that occur in the California Central Valley include great blue herons (*Ardea herodias*), gulls (*Larus* spp.), osprey (*Pandion haliaetus*), common mergansers (*Mergus merganser*), American white pelicans (*Pelecanus erythrorhynchos*), double-crested cormorants (*Phalacrocorax* spp.), Caspian terns (*Sterna caspia*), belted kingfishers (*Ceryle alcyon*), black-crowned night herons (*Nycticorax nycticorax*), Forster's terns (*Sterna forsteri*), hooded mergansers (*Lophodytes cucullatus*), and bald eagles (*Haliaeetus leucocephalus*) (Stephenson and Fast 2005). These birds have high metabolic rates and require large quantities of food relative to their body size.

Mammals can also be an important source of predation on salmonids within California's Central Valley. Predators such as river otters (*Lutra canadensis*), raccoons (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and western spotted skunk (*Spilogale gracilis*) are common. Other mammals that take salmonids include: badger (*Taxidea taxus*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), long-tailed weasel (*Mustela frenata*), mink (*Mustela vison*), mountain lion (*Felis concolor*), red fox (*Vulpes vulpes*), and ringtail (*Bassariscus astutus*). These animals, especially river otters, are capable of removing large numbers of salmon and *O. mykiss* from the aquatic habitat (Dolloff 1993). Mammals have the potential to consume large numbers of salmonids, but generally scavenge post-spawned salmon. In the marine environment, pinnipeds, including harbor seals (*Phoca vitulina*), California sea lions (*Zalophus californianus*), and Steller's sea lions (*Eumetopia jubatus*) are the primary marine mammals preying on salmonids (Spence *et al*. 1996). Pacific striped dolphin (*Lagenorhynchus obliquidens*) and killer whale (*Orcinus orca*) can also prey on adult salmonids in the nearshore marine environment, and at times become locally important. Although harbor seal and sea lion predation primarily is confined to the marine and estuarine environments, they are known to travel well into freshwater after migrating fish and have frequently been encountered in the Delta and the lower portions of the Sacramento and San Joaquin rivers. All of these predators are opportunists, searching out locations where juveniles and adults are most vulnerable, such as the large water diversions in the South Delta.

9. Environmental Variation

Natural changes in the freshwater and marine environments play a major role in salmonid abundance. Recent evidence suggests that marine survival among salmonids fluctuates in response to 20- to 30-year cycles of climatic conditions and ocean productivity (Hare *et al*. 1999; Mantua and Hare 2002). This phenomenon has been referred to as the Pacific Decadal Oscillation. In addition, large-scale climatic regime shifts, such as the El Niño condition, appear to change productivity levels over large expanses of the Pacific Ocean. A further confounding effect is the fluctuation between drought and wet conditions in the basins of the American west. During the first part of the 1990s, much of the Pacific Coast was subject to a series of very dry years, which reduced inflows to watersheds up and down the west coast.

"El Niño" is an environmental condition often cited as a cause for the decline of West Coast salmonids (NMFS 1996b). El Niño is an unusual warming of the Pacific Ocean off South America and is caused by atmospheric changes in the tropical Pacific Ocean (Southern Oscillation-ENSO) resulting in reductions or reversals of the normal trade wind circulation patterns. The El Niño ocean conditions are characterized by anomalous warm sea surface temperatures and changes to coastal currents and upwelling patterns. Principal ecosystem alterations include decreased primary and secondary productivity in affected regions and changes in prey and predator species distributions. Cold-water species are displaced towards higher latitudes or move into deeper, cooler water, and their habitat niches are occupied by species tolerant of warmer water that move upwards from the lower latitudes with the warm water tongue.

A key factor affecting many West Coast stocks has been a general 30-year decline in ocean productivity. The mechanism whereby stocks are affected is not well understood, partially because the pattern of response to these changing ocean conditions has differed among stocks, presumably due to differences in their ocean timing and distribution. It is presumed that survival in the ocean is driven largely by events occurring between ocean entry and recruitment to a sub-adult life stage.

10. Ecosystem Restoration

a. *CALFED Bay-Delta Program and Delta Stewardship Council (CALFED)*

Two programs included under CALFED; the Ecosystem Restoration Program (ERP) and the Environmental Water Account (EWA), were created to improve conditions for fish, including listed salmonids, in the Central Valley (CALFED 2000). Restoration actions implemented by the ERPP include the installation of fish screens, modification of barriers to improve fish passage, habitat acquisition, and instream habitat restoration. The majority of these actions address key factors affecting listed salmonids and emphasis has been placed in tributary drainages with high potential for steelhead and spring-run Chinook salmon production. Additional ongoing actions include new efforts to enhance fisheries monitoring and directly support salmonid production through hatchery releases. Recent habitat restoration initiatives sponsored and funded primarily by the CALFED-ERP Program have resulted in plans to restore ecological function to 9,543 acres of shallow-water tidal and marsh habitats within the Delta. Restoration of these areas primarily involves flooding lands previously used for agriculture, thereby creating additional rearing habitat for juvenile salmonids. Similar habitat restoration is imminent adjacent to Suisun Marsh (*i.e.*, at the confluence of Montezuma Slough and the Sacramento River) as part of the Montezuma Wetlands project, which is intended to provide for commercial disposal of material dredged from San Francisco Bay in conjunction with tidal wetland restoration.

The EWA is designed to provide water at critical times to meet ESA requirements and incidental take limits without water supply impacts to other users, particularly south of Delta water users. In early 2001, the EWA released 290 thousand acre feet of water from San Luis Reservoir at key times to offset reductions in south Delta pumping implemented to protect winter-run Chinook salmon, delta smelt (*Hypomesus transpacificus*), and Sacramento splittail (*Pogonichthys macrolepidotus*). However, the benefit derived by this action to winter-run Chinook salmon in terms of number of fish saved was very small. The anticipated benefits to other Delta fisheries from the use of the EWA water are much higher than those benefits ascribed to listed salmonids by the EWA release. Under the long term operations of the CVP and SWP, EWA assets have declined to 48 thousand acre feet after carriage water costs. The RPA actions developed within NMFS' 2009 Biological Opinion on the long-term operations of the Central Valley Project and State Water Project (NMFS 2009) are designed to minimize or remove the adverse impacts associated with many of the OCAP project related stressors. Within the Delta, stressors such as the Delta Cross Channel (DCC) gates and export operations have been modified to reduce the hydraulic changes created by the project operations. Earlier closures of the DCC gates prevent early emigrating listed salmonids from entering the Delta interior through the open DCC gates. Management of the Old and Middle river flows prevents an excessive amount of negative flow towards the export facilities from occurring in the channels of the Old and Middle rivers. When flows are negative, water moves in the opposite direction than would occur naturally, drawing fish into the south Delta and towards the export facilities or delaying their migration through the system.

b. *Central Valley Project Improvement Act (CVPIA)*

The CVPIA, implemented in 1992, requires that fish and wildlife get equal consideration with other demands for water allocations derived from the CVP. From this act arose several programs that have benefited listed salmonids: the Anadromous Fish Restoration Program (AFRP), the Anadromous Fish Screen Program (AFSP), and the Water Acquisition Program (WAP). The AFRP is engaged in monitoring, education, and restoration projects geared toward recovery of all anadromous fish species residing in the Central Valley. Restoration projects funded through the AFRP include fish passage, fish screening, riparian easement and land acquisition, development of watershed planning groups, instream and riparian habitat improvement, and gravel replenishment. The AFSP combines Federal funding with State and private funds to prioritize and construct fish screens on major water diversions mainly in the upper Sacramento River. The goal of the WAP is to acquire water supplies to meet the habitat restoration and enhancement goals of the CVPIA and to improve the DOI's ability to meet regulatory water quality requirements. Water has been used successfully to improve fish habitat for spring-run Chinook salmon and steelhead by maintaining or increasing instream flows in Butte and Mill creeks and the San Joaquin River at critical times.

c. *State Water Project Delta Pumping Plant Fish Protection Agreement (Four-Pumps Agreement)*

The Four Pumps Agreement Program has approved about $49 million for projects that benefit salmon and steelhead production in the Sacramento-San Joaquin basins and Delta since the agreement inception in 1986. Four Pumps projects that benefit steelhead include water exchange programs on Mill and Deer creeks; enhanced law enforcement efforts from San Francisco Bay upstream to the Sacramento and San Joaquin rivers and their tributaries; design and construction of fish screens and ladders on Butte Creek; and screening of diversions in Suisun Marsh and San Joaquin tributaries. Predator habitat isolation and removal, and spawning habitat enhancement projects on the San Joaquin tributaries benefit steelhead.

d. *San Joaquin River Restoration Program (SJRRP)*

In 1988, a coalition of environmental groups, led by the Natural Resources Defense Council (NRDC), filed a lawsuit challenging the renewal of long-term water service contracts between the United States and the CVP Friant Division Contractors. After more than 18 years of litigation of this lawsuit, known as *NRDC, et al. v. Kirk Rodgers, et al.*, a settlement was reached. On September 13, 2006, the Settling Parties, including NRDC, Friant Water Users Authority, and the U.S. Departments of the Interior and Commerce, filed a stipulation of the terms and conditions of the settlement, which was subsequently approved by the U.S. District Court, Eastern District of California, on October 23, 2006. The settlement establishes restoration and management goals. The Restoration Goal is to restore and maintain fish populations in "good condition" in the mainstem San Joaquin River below Friant Dam to the confluence with the Merced River, including naturally reproducing and self-sustaining of salmon and other fish. The Water Management Goal is to reduce or avoid water supply impacts to all of the Friant Division long-term contractors that may result from the Interim and Restoration Flows provided for in the Settlement. President Obama signed the San Joaquin River Restoration Settlement Act

(Act) on March 30, 2009, which authorized implementation of the settlement, as part of the Omnibus Public Land Management Act of 2009. Pub. L. No. 111-11, 123 Stat. 991.

To achieve the Restoration Goal, the settlement calls for a combination of channel and structural modifications along the San Joaquin River below Friant Dam, releases of water from Friant Dam to the confluence of the Merced River, and the reintroduction of spring-run Chinook salmon prior to December 31, 2012. Title X, section 10011(b) of the Act states that spring-run Chinook salmon shall be reintroduced in the San Joaquin River below Friant Dam pursuant to section 10(j) of the ESA, provided that a permit for the reintroduction may be issued pursuant to section 10(a)(1)(A) of the ESA. In addition, Title X, section 10011(c)(2) of the Act states that the Secretary of Commerce shall issue a final rule pursuant to section 4(d) of the ESA governing the incidental take of reintroduced Central Valley spring-run Chinook salmon prior to the reintroduction. Furthermore, Title X, section 10011(c)(3) of the Act states that the rule issued under paragraph 2 shall provide that the reintroduction will not impose more than de minimus: water supply reductions, additional storage releases, or bypass flows on unwilling third parties due to such reintroduction.

11. Non-Native Invasive Species (NIS)

As currently seen in the San Francisco estuary, NIS can alter the natural food webs that existed prior to their introduction. Perhaps the most significant example is illustrated by the Asiatic freshwater clams *Corbicula fluminea* and *Potamocorbula amurensis*. The arrival of these clams in the estuary disrupted the normal benthic community structure and depressed phytoplankton levels in the estuary due to the highly efficient filter feeding of the introduced clams (Cohen and Moyle 2004). The decline in the levels of phytoplankton reduces the population levels of zooplankton that feed upon them, and hence reduces the forage base available to salmonids transiting the Delta and San Francisco estuary which feed either upon the zooplankton directly or their mature forms. This lack of forage base can adversely impact the health and physiological condition of these salmonids as they emigrate through the Delta region to the Pacific Ocean.

Attempts to control the NIS also can adversely impact the health and well-being of salmonids within the affected water systems. For example, the control programs for the invasive water hyacinth (*Eichhornia crassipes*) and Brazilian Elodea (*Egeria densa*) plants in the Delta must balance the toxicity of the herbicides applied to control the plants to the probability of exposure to listed salmonids during herbicide application. In addition, the control of the nuisance plants can have negative effects on certain physical parameters that must be accounted for in the treatment protocols, particularly the decrease in DO resulting from the decomposing vegetable matter left by plants that have died.

12. Summary

For CV steelhead, the construction of high dams for hydropower, flood control, and water supply resulted in the loss of vast amounts of upstream habitat (*i.e.*, approximately 80 percent, or a minimum linear estimate of over 1,000 stream miles), and often resulted in precipitous declines in affected salmonid populations. For example, the completion of Friant Dam in 1947 has been linked with the extirpation of CV spring-run Chinook salmon in the San Joaquin River upstream of the Merced River within just a few years. The reduced populations of steelhead that remain below Central Valley dams are forced to spawn in lower elevation tailwater habitats of the mainstem rivers and tributaries that were previously not used for this purpose. This habitat is entirely dependent on managing reservoir releases to maintain cool water temperatures suitable for spawning, and/or rearing of salmonids. This requirement has been difficult to achieve in all water year types and for all life stages of affected salmonid species. Steelhead, in particular, seem to require the qualities of small tributary habitat similar to what they historically used for spawning; habitat that is largely unavailable to them under the current water management scenario. All salmonid species considered in this consultation have been adversely affected by the production of hatchery fish associated with the mitigation for the habitat lost to dam construction (*e.g.*, from genetic impacts, increased competition, exposure to novel diseases, *etc*.).

Land-use activities such as road construction, urban development, logging, mining, agriculture, and recreation are pervasive and have significantly altered fish habitat quantity and quality for steelhead through alteration of streambank and channel morphology; alteration of ambient water temperatures; degradation of water quality; elimination of spawning and rearing habitat; fragmentation of available habitats; elimination of downstream recruitment of LWD; and removal of riparian vegetation resulting in increased streambank erosion. Human-induced habitat changes, such as: alteration of natural flow regimes; installation of bank revetment; and building structures such as dams, bridges, water diversions, piers, and wharves, often provide conditions that both disorient juvenile salmonids and attract predators. Harvest activities, ocean productivity, and drought conditions provide added stressors to listed salmonid populations. In contrast, various ecosystem restoration activities have contributed to improved conditions for listed salmonids (*e.g.*, various fish screens).

IV. ENVIRONMENTAL BASELINE

The environmental baseline "includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process" (50 CFR §402.02).

The New Melones Dam operates in conjunction with Tulloch Reservoir and Goodwin Dam on the Stanislaus River (figure 5-20). Goodwin Dam, completed in 1912, is an impassible barrier to upstream fish migration at RM 59. Water is released from New Melones to satisfy senior water right entitlements, instream and Delta water quality standards specified under D-1641, CDFG fish agreement flows, CVP water contracts and b(2) or CVPIA 3406(b)(3) [hereafter referred to b(3)] fishery flows.

The San Joaquin River is one of the two major rivers that flow into the Sacramento-San Joaquin Delta and ultimately San Francisco Bay. Its headwaters originate on the slopes of Mt. Goddard in Kings Canyon National Park and flow first northwest, and then southwest out of the Sierra Nevada. Behind Friant Dam (a project of Reclamation), the river forms Millerton Lake which is a popular recreation area. Below the Dam, the river flows northwesterly through the Central Valley and towards Stockton before joining the Sacramento River. The San Joaquin River is a major component of the Delta. It offers a continuous flow of water, and a variety of natural aquatic environments including riverine and estuarine habitats.

Within the project/action area, several anadromous fish species use the Stanislaus River as a migration corridor including fall-run Chinook salmon and CV steelhead. During the summer, water temperatures can increase significantly due to lack of bank shading (from insufficient riparian habitat) and shallow water depths.

A. Status of the Species and Critical Habitat within the Action Area

1. Status of the Species within the Action Area

CV steelhead is the only anadromous ESA-listed species that occurs in the Stanislaus River. Spring-run and summer-run steelhead have been extirpated from this watershed (Yoshiyama *et al*. 1996). Steelhead populations in the Stanislaus, Tuolumne, Merced, and Calaveras rivers are the only remaining representatives of the San Joaquin River diversity group of the CV steelhead. None of these populations are considered to be viable at this time (Lindley *et al*. 2007). Anadromous *O. mykiss* populations may have been extirpated from their entire historical range in the San Joaquin Valley owing to dam construction, but current populations survive on these rivers in tailwater conditions controlled by the dams. Based on information from a variety of sources (rotary screw trap sampling, trawling at Mossdale, direct and angler observations) in all three tributaries of the San Joaquin River, CDFG (2003) stated that it is "clear from this data that rainbow trout do occur in all the tributaries as migrants and that the vast majority of them occur on the Stanislaus River." Documented returns of single digit numbers of fish into the tributaries suggest that existing populations of CV steelhead on the Stanislaus, Tuolumne, Merced, Calaveras, and lower San Joaquin rivers are severely depressed.

Information regarding steelhead numbers on the Stanislaus River is very limited and has typically been gathered incidental to existing monitoring activities for fall-run. A counting weir for fall-run also has recorded passage of steelhead. In the 2006-2007 counting season, 12 steelhead were observed passing through the counting weir, coincidental with the observation of 3,078 adult salmon (Anderson *et al*. 2007). An adipose fin-clipped steelhead was observed at the counting weir, indicating some opportunity for genetic introgression from hatchery operations on other Central Valley rivers. On the Stanislaus River, steelhead smolts have been captured in rotary screw traps at Caswell State Park and Oakdale each year since 1995 (S.P. Cramer and Associates Inc. 2000, 2001), but the numbers are very low, ranging from 10 to 30 annually, compared to annual catches of fall-run in the range of hundreds. The low juvenile steelhead numbers likely indicate a much smaller steelhead population than fall-run, but steelhead smolts are considerably larger than fall-run smolts, and can avoid capture by the traps (Stillwater Sciences 2000). Most of the steelhead smolts are captured from January to mid-April, and are 175 to 300 mm fork length. The raw data from rotary screw trapping show *O. mykiss* in a smolted stage being trapped in late May at both the Oakdale and Caswell trap locations. These fish are physiologically prepared to leave the river at a time well after the scheduled Vernalis Adaptive Management Plan (VAMP) pulse flows, but not later than when historical unimpaired rain-on-snow events would have provided out migration flows.

Zimmerman *et al.* (2008) have documented CV steelhead in the Stanislaus, Tuolumne and Merced rivers based on otolith microchemistry.

Juvenile steelhead reside in freshwater year round. Steelhead rearing in the Stanislaus River occurs upstream of Orange Blossom Bridge (RM 47) where gradients are highest. The highest rearing densities are upstream of Knights Ferry (RM 54.7, Kennedy and Cannon 2002).

Juvenile steelhead migrate during the winter and spring from the above-described rearing areas downstream through the rivers and the Delta to the ocean. The habitat conditions they encounter from the upstream reaches of the rivers downstream to the Delta become generally further from their preferred habitat requirements with respect to cover, temperature, water quality, and exposure to predatory fishes such as striped bass and non-native black bass. Emigration conditions for juvenile steelhead in the Stanislaus River down through the San Joaquin River and the south Delta tend to be less suitable than conditions for steelhead emigrating from the Sacramento River and its tributaries.

CDFG staff has prepared catch summaries for juvenile migrant steelhead on the San Joaquin River near Mossdale, which represents migrants from the Stanislaus, Tuolumne, and Merced rivers. These trawl recoveries at Mossdale between 1988 and 2002 ranged from a minimum of 1 fish per year to a maximum of 29 fish in 1 year (Figure 5).

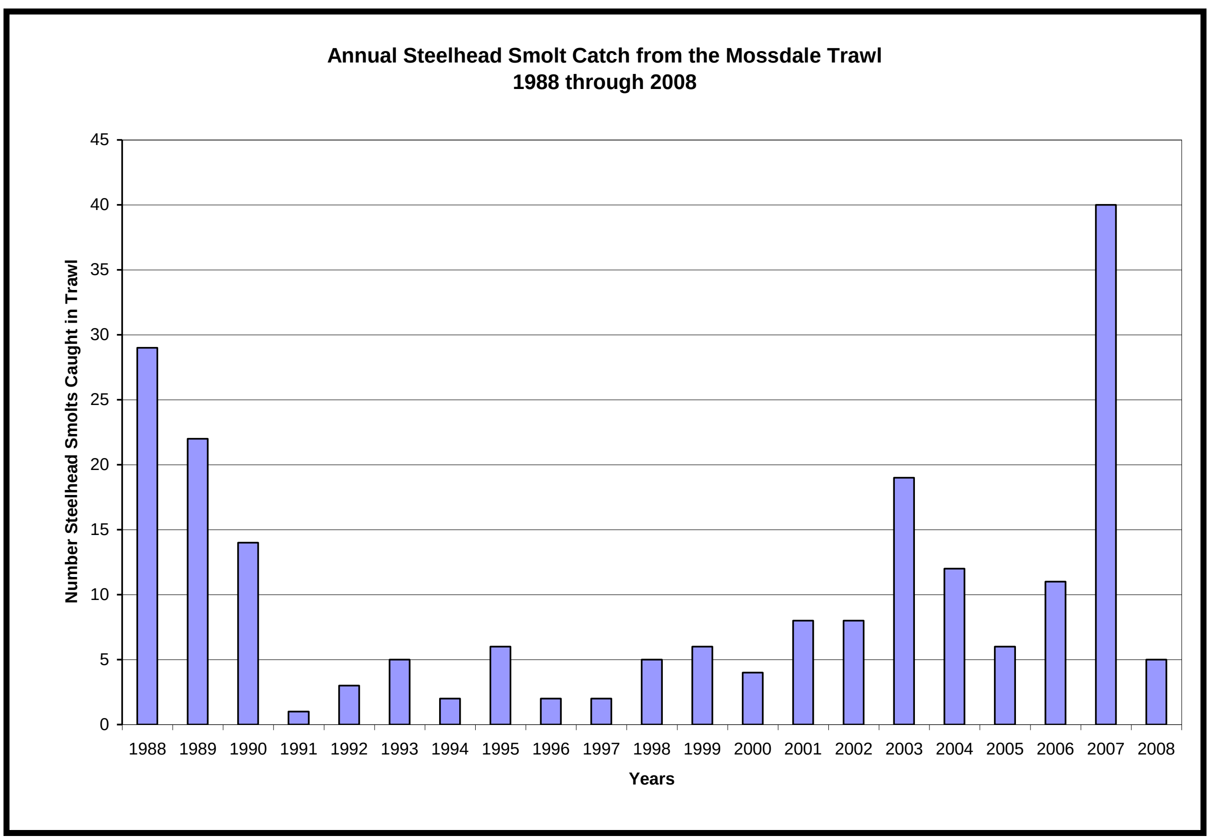

Figure 5. Annual number of Central Valley steelhead smolts caught while Kodiak trawling at the Mossdale monitoring location on the San Joaquin River (Marston 2004, SJRGA 2007, Speegle 2008).

Adult steelhead migrate upstream from the ocean to their spawning grounds near the terminal dams primarily during the fall and winter months. Flows are generally lower during the upstream migrations than during the outmigration period. Adult steelhead may occur in the Stanislaus River earlier than in other Central Valley rivers when fall attraction flows are released in October for the benefit of fall-run. The general temporal occurrence of steelhead and fall-run in the Stanislaus River at various life history stages is illustrated in Figure 6.

Construction of Goodwin Dam in 1912 has excluded steelhead from 100 percent of its historical spawning and rearing habitat on the Stanislaus River (Lindley *et al*. 2006). Critical habitat has been designated up to Goodwin Dam, to include currently occupied areas. Extension of critical habitat above the dams was deemed premature until recovery planning determines a need for these areas in the recovery of the DPS (September 2, 2005, 70 FR 52488).

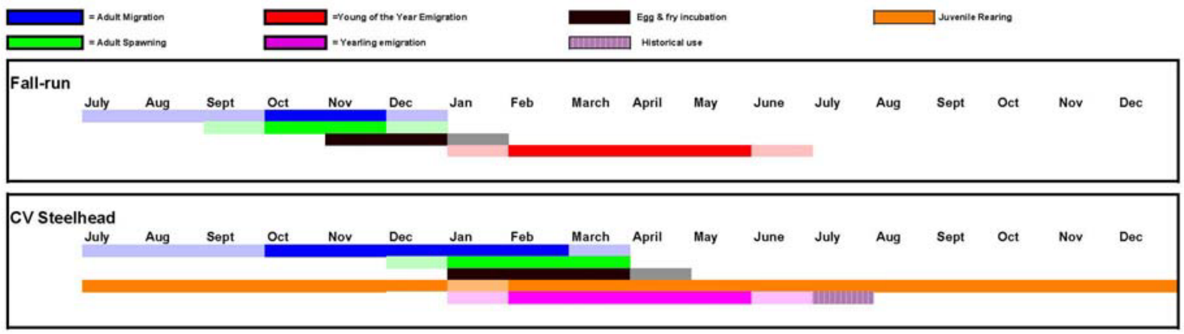

Figure 6. Temporal occurrence of fall-run Chinook salmon and steelhead in the Stanislaus River, California. Darker shading indicates peak use.

The construction of the East Side Division Dams (New Melones, Tulloch, and Goodwin) blocked the downstream transport of spawning gravel that would replenish gravel below the dams. Past East Side Division operations have mobilized gravel remaining below the dams, which has led to a degradation of the quality and quantity of available steelhead spawning gravels (Kondolf *et al*. 2001). Gravel replenishment projects funded by CVPIA have offset some of this habitat loss, but the rate of replenishment is not sufficient to offset ongoing loss rates, nor to offset losses from past years of operations.

Past operations of the East Side Division have eliminated channel forming flows and geomorphic processes that maintain and enhance steelhead spawning beds and juvenile spawning areas associated with floodplains and channel complexity. Since the construction and operation of New Melones Dam, operational criteria have resulted in channel incision, as much as 1-3 feet (Kondolf *et al*. 2001). This downcutting, combined with operational criteria, have effectively cut off overbank flows which would have inundated floodplain rearing habitat, as well as providing areas for fine sediment deposition, rather than within spawning gravels, as occurs now. Operational flow patterns in late spring and summer, combined with lack of overbank flows has severely constrained recolonization of large riparian trees that are needed for riparian shading and LWD contribution.

2. Status of Critical Habitat within the Action Area

Steelhead critical habitat on the Stanislaus River has been designated up to Goodwin Dam. The PCEs of critical habitat for Stanislaus River steelhead include freshwater rearing and freshwater migration. Although Stanislaus River water temperatures are generally suitable for rearing, during the smolt emigration life stage (January through June), steelhead may beexposed to water temperatures that would prohibit successfully completing transformation to the smolt stage. In addition, steelhead spawning and rearing habitat on the Stanislaus River is affected by the limited occurrence of flows that are sufficient to carry out natural geomorphic processes. As such, sediment deposition on spawning habitats has decreased the availability of suitable spawning areas. The relatively low and uniform releases in the Stanislaus River reduces the conservation value of rearing habitat by reducing habitat complexity and decreasing connectivity with floodplains, which are proven to be high quality rearing habitats (Sommer *et al*. 2005).

B. Factors affecting the species and critical habitat in the action area

The action area encompasses a small portion of the area utilized by the CV steelhead DPS. Many of the range-wide factors affecting CV steelhead are discussed in the *Status of the Species and Critical Habitat* section of this biological opinion, and are considered the same in the action area. This section will focus on the specific factors in the action area that are most relevant to the proposed Project.

The magnitude and duration of peak flows during the winter and spring, which affects listed salmonids in the action area, are reduced by water impoundment in upstream reservoirs. Instream flows during the summer and early fall months have increased over historic levels for deliveries of municipal and agricultural water supplies. Overall, water management now reduces natural variability by creating more uniform flows year-round. Current flood control practices require peak flood discharges to be held back and released over a period of weeks to avoid overwhelming the flood control structures downstream of the reservoirs (*i.e.,* levees) and low lying terraces under cultivation (*i.e.*, orchards and row crops) in the natural floodplain along the basin tributaries. Consequently, managed flows in the mainstem of the river often truncate the peak of the flood hydrograph and extend the reservoir releases over a protracted period. These actions reduce or eliminate the scouring flows necessary to mobilize sediments and create natural riverine morphological features within the action area.

High water temperatures also limit habitat availability for listed salmonids in the San Joaquin River and the lower portions of the tributaries feeding into the mainstem of the river. High summer water temperatures in the lower San Joaquin River frequently exceed 72^{o}F, and create a thermal barrier to the migration of adult and juvenile salmonids (California Data Exchange Center database).

Levee construction and bank protection have affected salmonid habitat availability and the processes that develop and maintain preferred habitat by reducing floodplain connectivity, changing riverbank substrate size, and decreasing riparian habitat and shaded riverine aquatic (SRA) cover. Such bank protection generally results in two levels of impacts to the environment: (1) site-level impacts which affect the basic physical habitat structure at individual

bank protection sites; and (2) reach-level impacts which are the cumulative impacts to ecosystem functions and processes that accrue from multiple bank protection sites within a given river reach (USFWS 2000). Revetted embankments result in loss of sinuosity and braiding and reduce the amount of aquatic habitat. Impacts at the reach level result primarily from halting erosion and controlling riparian vegetation. Reach-level impacts which cause significant impacts to fish are reductions in new habitats of various kinds, changes to sediment and organic material storage and transport, reductions of lower food-chain production, and reduction in LWD.
The use of rock armoring limits recruitment of LWD (*i.e.*, from non-riprapped areas), and greatly reduces, if not eliminates, the retention of LWD once it enters the river channel. Riprapping creates a relatively clean, smooth surface which diminishes the ability of LWD to become securely snagged and anchored by sediment. LWD tends to become only temporarily snagged along riprap, and generally moves downstream with subsequent high flows. Habitat value and ecological functioning aspects are thus greatly reduced, because wood needs to remain in place for extended periods to generate maximum values to fish and wildlife (USFWS 2000). Recruitment of LWD is limited to any eventual, long-term tree mortality and whatever abrasion and breakage may occur during high flows (USFWS 2000). Juvenile salmonids are likely being impacted by reductions, fragmentation, and general lack of connectedness of remaining near-shore refuge areas.

PS and NPS of pollution resulting from agricultural discharge and urban and industrial development occur upstream of, and within the action area. The effects of these impacts are discussed in detail in the *Status of the Species and Critical Habitat* section. Environmental stresses as a result of low water quality can lower reproductive success and may account for low productivity rates in fish (*e.g.* green sturgeon, Klimley 2008). Organic contaminants from agricultural drain water, urban and agricultural runoff from storm events, and high trace element (*i.e.*, heavy metals) concentrations may deleteriously affect early life-stage survival of fish in the Central Valley watersheds (USFWS 1995). Other impacts to adult migration present in the action area, such as migration barriers, water conveyance factors, water quality, NIS, *etc.*, are discussed in the *Status of Species and Critical Habitat* section.

V. EFFECTS OF THE ACTION

A. Approach to the Assessment

Pursuant to section 7(a)(2) of the ESA (16 U.S.C. §1536), Federal agencies are directed to ensure that their activities are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. This biological opinion assesses the effects of the proposed Project on threatened CV steelhead and their designated critical habitat (Caltrans 2011). The Project is likely to adversely affect threatened CV steelhead and their designated critical habitat through the removal of the temporary cofferdam, bypass pumping, and fish rescue in the event that the San Joaquin River naturally over-tops the cofferdam. In the *Description of the Proposed Action* section of this BO, NMFS provided an overview of the action. In the *Status of the Species* and *Environmental Baseline* sections of this BO, NMFS provided an overview of the threatened and endangered species and critical habitat that are likely to be adversely affected by the activity under consultation.

Regulations that implement section 7(b)(2) of the ESA require biological opinions to evaluate the direct and indirect effects of Federal actions and actions that are interrelated with or interdependent to the Federal action to determine if it would be reasonable to expect them to appreciably reduce listed species' likelihood of surviving and recovering in the wild by reducing their reproduction, numbers, or distribution (16 U.S.C. §1536; 50 CFR 402.02). Section 7 of the ESA and its implementing regulations also require biological opinions to determine if Federal actions would destroy or adversely modify the conservation value of critical habitat (16 U.S.C. §1536). This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat.

NMFS generally approaches "jeopardy" analyses in a series of steps. First, NMFS evaluates the available evidence to identify direct and indirect physical, chemical, and biotic effects of the proposed actions (these effects include direct impacts to a species habitat; modifications to something in the species' environment - such as reducing a species' prey base, enhancing populations of predators, altering its spawning substrate, altering its ambient temperature regimes; or adding something novel to a species' environment - such as introducing exotic competitors or disruptive noises). Once NMFS has identified the effects of the action, the available evidence is evaluated to identify a species' likelihood and extent of exposure to any adverse effects caused by the action (*i.e.* the extent of spatial and temporal overlap between the species and the effects of the action). Once NMFS has identified the level of exposure that a species will have to the effects of the action, the available evidence is evaluated to identify the species' probable response, including physical and behavioral reactions, to these effects. These responses then will be assessed to determine if they can reasonably be expected to reduce a species' reproduction, numbers, or distribution (for example, by changing birth, death, immigration, or emigration rates; increasing the age at which individuals reach sexual maturity; or decreasing the age at which individuals stop reproducing). The available evidence is then used to determine if these reductions, if there are any, could reasonably be expected to appreciably reduce a species' likelihood of surviving and recovering in the wild.

1. Information Available for the Assessment

To conduct the assessment, NMFS examined an extensive amount of evidence from a variety of sources. Detailed background information on the status of the species and critical habitat has been published in a number of documents including peer reviewed scientific journals, primary reference materials, governmental and non-governmental reports, the biological assessment for this project, and project meeting notes. Additional information investigating the effects of the project's actions on the listed species in question, their anticipated response to these actions, and the environmental consequences of the actions as a whole was obtained from the aforementioned resources. For information that has been taken directly from published, citable documents, those citations have been referenced in the text and listed at the end of this document.

2. Assumptions Underlying This Assessment

In the absence of definitive data or conclusive evidence, NMFS must make a logical series of assumptions to overcome the limits of the available information. These assumptions will be made using sound, scientific reasoning that can be logically derived from the available information. The progression of the reasoning will be stated for each assumption, and supporting evidence cited.

B. Assessment

The proposed Project includes actions that may adversely affect several life stages of CV steelhead. Adverse effects to these species and their habitat may result from changes in water quality from temporary water diversion construction, acoustic effects associated with pile driving, and handling of fish from fish rescue. The project includes integrated design features to avoid and minimize many of these potential impacts.

1. <u>Presence of CV steelhead</u>

Adult CV steelhead migrate upstream into the region's watersheds (San Joaquin, Stanislaus, Tuolumne, and Merced rivers) between September and February, particularly when increased flows are being released from upstream reservoirs to enhance fall-run Chinook salmon spawning habitat in the tributaries, or early winter rains cause increased flows in the system. Therefore, adult CV steelhead may be present if the temporary water diversion is removed between September and October. Juvenile CV steelhead migrate downstream through the San Joaquin River between February and early June as they make their way towards the Delta. Therefore, juvenile presence may occur during pile driving, temporary water diversion removal, and fish rescue if these activities occur between March and early June.

2. <u>Water Quality Impacts Associated with Temporary Water Diversion Construction</u>

During construction diversion of the Stanislaus River at the project site will be required to remove the existing bridge superstructure and piers, place temporary falsework, and construct the new bridge. A temporary embankment/work pad(s) will be constructed of water bladders, clean local fill material, and other methods that will not result in notably degraded water quality and are proposed for use to divert the flow and maintain dry conditions around the work area. The flows will be diverted into temporary culvert pipes that pass through the embankment/work pad. The fill will be temporary and will be removed after the completion of the project or need for falsework.

NMFS anticipates that some local increases in turbidity and suspended sediment above baseline levels will result from water diversion removal. NMFS expects these water quality impacts to be minor, short term increases in turbidity and sedimentation and only lasting the duration of the project. Water quality impacts are unlikely to affect migrating adults to the extent of injuring them, but may injure some juvenile fish, which are smaller and less mobile and actively feeding and growing, by temporarily disrupting normal behaviors that are essential to growth and survival.

NMFS expects turbidity to affect steelhead in much the same way that it affects salmon in the studies mentioned below, due to similar physiological and life history requirements between these species. Therefore, NMFS will use these studies as a surrogate to CV steelhead. Responses of salmonids to elevated levels of suspended sediments often fall into three major categories: physiological effects, behavioral effects, and habitat effects (Bash *et al.* 2001). The severity of the effect is a function of concentration and duration (Newcombe and MacDonald 1991; Newcombe and Jensen 1996) so that low concentrations and long exposure periods are frequently as deleterious as short exposures to high concentrations of suspended sediments. A review by Lloyd (1987) indicated that several behavioral characteristics of salmonids can be altered by even relatively small changes in turbidity (10 to 50 Nephelometric Turbidity Units [NTUs]). Salmonids exposed to slight to moderate increases in turbidity exhibited avoidance, loss of station in the stream, reduced feeding rates and reduced use of overhead cover. Short-term increases in turbidity and suspended sediment may disrupt feeding activities of fish or result in temporary displacement from preferred habitats. Numerous studies show that suspended sediment and turbidity levels moderately elevated above natural background values can result in non-lethal detrimental effects to salmonids. Suspended sediment affects salmonids by decreasing reproductive success, reducing feeding success and growth, causing avoidance of rearing habitats, and disrupting migration cues (Bash *et al.* 2001). Sigler *et al.* (1984 *in* Bjornn and Reiser 1991) found that prolonged turbidity between 25 and 50 NTUs reduced growth of juvenile coho salmon and steelhead. MacDonald *et al.* (1991) found that the ability of salmon to find and capture food is impaired at turbidities from 25 to 70 NTUs. Reaction distances of *O. mykiss* to prey were reduced with increases of turbidity of only 15 NTUs over an ambient level of 4 to 6 NTUs in experimental stream channels (Barrett *et al.* 1992). Bisson and Bilby (1982) reported that juvenile coho salmon avoid turbidities exceeding 70 NTUs. Increased turbidity, used as an indicator of increased suspended sediments, also is correlated with a decline in primary productivity, a decline in the abundance of periphyton, and reductions in the abundance and diversity of invertebrate fauna in the affected area (Lloyd 1987; Newcombe and MacDonald 1991). Increased sediment delivery can also fill interstitial substrate spaces and reduce cover for juvenile fish (Platts *et. al.* 1979) and abundance and availability of aquatic invertebrates for food (Bjornn and Reiser 1991).

3. <u>Effects Associated with Fish Capture and Relocation</u>

The proposed Project conservation measures will include preparation of a fish rescue plan and implementation of the plan in the event that the Stanislaus River water over-tops the temporary water diversion construction. This may occur as early as April to early June. Beach seines and dip nets will be used to rescue fish and transfer them to an oxygenated holding tank. Fish will be transported to an appropriate downstream release site for juveniles and upstream site for adults. The effects of a fish rescue are generally beneficial because it will minimize the mortality of juveniles entrapped around the water diversion site. Entrainment of juvenile CV steelhead in the water diversion zone and subsequent rescue operations using beach seining can affect their behavior by causing them to alter their migration routes, sheltering or feeding patterns, or may cause physical damage relating to the hauling, collecting, and handling of the fish and potential death caused by being crushed or left in the seine after sampling. However, mortality as a result of beach seining and dip netting is typically rare.

4. Pile Driving

Pile driving consists of driving steel pile columns and sheets into the riverbed with a mechanical hammer. The force of the hammer hitting a pile forms a sound wave that travels down the pile and causes the pile to resonate radially and longitudinally. Acoustic energy is formed as the walls0 of the steel pile expand and contract, forming a compression wave that moves through the pile. The outward movement of the pipe pile wall sends a pressure wave propagating outward from the pile and through the riverbed and water column in all directions.

The south portion of the Stanislaus River replacement structure is anticipated to be supported on 24-inch hexagonal PC/PS concrete piling that would be driven into the ground by use of a diesel powered pile hammer. A total of 180 piles would be driven with a diesel impact hammer over two years (construction seasons). All 180 concrete piles would be installed on dry land adjacent to the river with varying distance to the river's edge.

The northern portion of the river bridge will consist of CIDH piling (48- and 72-inch steel pipes) with cast-in-place (CIP) concrete column extensions and a CIP pre-stressed concrete box girder superstructure. A total of eight 72-inch steel pipe casings (in-water) and eight 48-inch steel pipe casings (adjacent to or in-water) would be driven with vibratory hammer over two years (construction seasons).

The effect pile driving has on fish depends upon the pressure, measured in dB, of a sound or compression wave. Rasmussen (1967) found that immediate mortality of juvenile salmonids may occur at sound pressure levels exceeding 208 dB. Sustained sound pressures (four hours) in excess of 187 dB damaged the hair cells in the inner ear of cichlids (Hastings *et al.* 1996).

Feist *et al.* (1992) found that abundance of juvenile salmon near pile driving rigs in Puget Sound was two-fold greater on non-pile driving days as on pile-driving days, indicating that juveniles were startled by the activity and that pile driving caused a temporary avoidance of habitat at the project site. Although the pile-driving created sound that could be detected at least 1848 m away from the source at a level within the range of salmonid hearing, salmon at this range did not always exhibit a reaction to the sound (Feist *et al.* 1992). McKinley and Patrick (1986) found that salmon smolts exposed to pulsed sound (similar to pile driving) demonstrated a startle or avoidance response, and Anderson (1990) observed a startle response in salmon smolts at the beginning of a pile driving episode but found that after a few poundings fish were no longer startled.

The effect of pile driving on free swimming fish depends on the duration, frequency (Hz), and pressure (dB) of the compression wave. Rassmusen (1967) found that immediate mortality of juvenile salmonids may occur at sound pressure levels exceeding 208 dB. Due to their size, adult salmon and steelhead can tolerate higher pressure levels and immediate mortality rates for adults are expected to be less than those experienced by juveniles (Hubbs and Rechnitzer 1952). As sound pressure levels are not expected to exceed 187 dB, no immediate mortality of juvenile or adult fish is expected.

The startling of juvenile salmonids causes injury by temporarily disrupting normal behaviors that are essential to growth and survival such as feeding, sheltering, and migrating. Injury is caused when disrupting these behaviors increases the likelihood that individual fish will face increased competition for food and space, and experience reduced growth rates or possibly weight loss. Disruption of these behaviors may also result in the death of some individuals to increased predation if fish are disoriented or concentrated in areas with high predator densities. Disruption of these behaviors will occur between June 15 and October 15 of each construction year, during weekday daylight operation hours (8 a.m. to 5 p.m.) of the hydraulic hammer. Because of their nocturnal migratory behavior, daily migration delays are expected only to impact the portion of each ESU that migrates during daylight hours. On similar bridge projects, such as the replacement of the I-5 bridge over the Sacramento River near Anderson, lapses in pile driving activity are common throughout the day because construction crews suspend hammer work for equipment maintenance, to shift from one pile to another, and to take breaks (D. Whitley, Caltrans, pers. comm., 2002). These construction lapses, including daily breaks and nighttime non-working periods will allow fish to migrate through the action area and minimize the extent of injury that occurs to populations.

Adult CV steelhead that are migrating upstream in May and June may be startled by pile driving and may experience daily migration delays of up to eight hours by holding downstream of the bridge until the pile driving stops. These migration delays are not expected to injure adults because adult fish commonly hold in deep pools while migrating upstream, and because they do not begin spawning until September, at least three months after any migration delay might occur.

NMFS anticipates that pile driving will be detectable to salmonids up to 215 meters from the source, and that the sounds generated will harass juvenile steelhead by causing injury from temporary disruption of normal behaviors such as feeding, sheltering, and migrating that may contribute to reduced or negative growth. Disruption of these behaviors may also lead to increased predation if fish become disoriented or concentrated in areas with high predator densities. These effects should be small because pile driving will occur during the day, enabling unhindered fish passage at night during peak migration times. The June 15 through October 15 work window will further minimize the extent of the impacts on listed anadromous fish by avoiding the peaks of adult and juvenile migration periods.

5. Effects on Designated Critical Habitat Primary Constituent Elements (PCEs)

As described earlier, the removal of temporary water diversion construction from the Stanislaus River will affect critical habitat for CV steelhead.

The basic premise to the conservation value of an overall critical habitat designation is the sum of the values of the components that comprise the habitat. For example, the conservation value of listed salmonid critical habitat is determined by the conservation value of the watersheds that make up the designated area. In turn, the conservation value of the specific watershed is comprised of the sum of the value of the PCEs that make up the area. PCEs are specific areas or functions, such as spawning or rearing habitat, that support different life history stages or requirements of the species. The conservation value of the PCE is the sum of the quantity, quality, and availability of the essential features of that PCE. Essential features are the specific processes, variables or elements that comprise a PCE. Thus, an example of a PCE would be spawning habitat and the essential features of that PCE are conditions such as clean spawning gravels, appropriate timing and duration of certain water temperatures, and water quality free of pollutants.

Therefore, reductions in the quantity, quality, or availability of one or more essential feature reduce the value of the PCE, which in turn reduces the function of the sub-area (*e.g.*, watersheds), which in turn reduces the function of the overall designation. In the strictest interpretation, reductions to any one essential feature or PCE would equate to a reduction in the value of the whole. However, there are other considerations. We look to various factors to determine if the reduction in the value of an essential feature or PCE would affect higher levels of organization. For example:

- The timing, duration and magnitude of the reduction;
- The permanent or temporary nature of the reduction; and
- Whether the essential feature or PCE is limiting (in the action area or across the designation) to the recovery of the species or supports a critical life stage in the recovery needs of the species (for example, juvenile survival is a limiting factor in recovery of the species and the habitat element supports juvenile survival).

In our assessment, we combine information about the contribution of constituent elements of critical habitat (or of the physical, chemical, or biotic phenomena that give the designated area value for the conservation of listed species) to the conservation value of those areas of critical habitat that occur in the action area, given the physical, chemical, biotic, and ecological processes that produce and maintain those constituent elements in the action area. We use the conservation value of those areas of designated critical habitat that occur in the action area as our point of reference for this comparison. For example, if the critical habitat in the action area has limited current value or potential value for the conservation of listed species, that limited value is our point of reference for our assessment of the consequences of the added effects of the proposed action on that conservation value.

a. Freshwater Migratory Corridor

Safe and unobstructed migratory pathways are necessary for adult salmonids to migrate to and from spawning habitats, and for larval and juveniles to migrate downstream from spawning/rearing habitats within freshwater rivers to rearing habitats within the estuaries.
The removal of the water diversion construction will not obstruct the migratory pathway for exposed fish. In addition, the water diversion channel will be temporary and will be designed to still allow fish passage during construction. Fish that use the action area as a migratory corridor will be able to continue using the channel during and after construction of the proposed action.

b. Freshwater rearing habitat

Freshwater rearing habitat provides water quantity, quality, and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility. Rearing habitat condition is strongly affected by habitat complexity, food supply, and presence of predators of juvenile salmonids. Freshwater rearing habitats have a high intrinsic value to salmonids, as the juvenile life stages are dependent on the function of this habitat for successful survival and recruitment.

The removal of the temporary water diversion may result in elevated turbidity levels and increased suspended sediment, resulting in a temporary localized direct disturbance and potential indirect disturbance which may decrease water quality downstream of the project site. Increased sedimentation may reduce primary and secondary river productivity, interfere with feedings, cause behavioral avoidance, and cause a breakdown of social organization to native species downstream of the discharge area. A silt curtain will be in place during the removal of the temporary water diversion to minimize any water quality impacts.

The proposed project will temporarily affect 0.443 acre and permanently affect (or fill) 0.002 acre of riverine habitat, which is designated critical habitat for the CV steelhead. The temporary impacts include water diversion with the use of temporary fill for work within the OHWM of the Stanislaus River. The dewatering of the river and placement of the temporary fill may adversely affect CV steelhead, as salvaging fish during dewatering may induce stress on individual fish (take through harassment) or result in death of individual fish during salvage and transport. Permanent modification to 0.002 acre of CV steelhead critical habitat may affect, but is not likely to adversely affect, the CV steelhead due to the very insignificant loss of habitat quantity and quality. No adverse modification to CV steelhead or its habitat will result due to implementation of the proposed project.

In addition to impacts to the Stanislaus River, the proposed project will also impact riparian vegetation associated with the Stanislaus River, which could indirectly affect Central Valley steelhead in the river. Activities related to the construction of the proposed project will result in localized loss of vegetation (permanent loss of 0.45 acre of riparian vegetation), general disturbance to the soil, and an increase in impervious surfaces. Removal of vegetation and soil can accelerate erosion processes within the action area and increase the potential for sediment to enter into the river, which has the potential to contain special-status species. Aquatic organisms are generally not directly affected by suspended solids and turbidity unless they reach extremely high levels (i.e., levels of suspended solids reaching 25 milligrams/liter) (Bilotta and Brazier 2008). At these high levels, suspended solids can adversely affect the physiology of aquatic organisms and may suppress photosynthetic activity at the base of food webs, thereby impacting aquatic organisms either directly or indirectly. The soils on the north bank are particularly susceptible to erosion. It should be noted that the loss of riparian vegetation will be offset to a degree by the construction of the widened bridge over the Stanislaus River. The new bridge will provide approximately an additional 0.16 acres of shade along the vegetated bank of the river and an addition of approximately 0.22 acre of shade on the river.

5. Summary

NMFS does not anticipate that turbidity levels associated with water diversion removal will increase to deleterious levels due to the placement of silt curtains, and any increase in NTU levels would be short term and only lasting the duration of the project. Mitigation measures such as the implementation of a silt curtain around the action area will minimize the amount of increased turbidity and sediment introduced to the waterway. If a fish rescue is necessary in the event that the San Joaquin River water over-tops the temporary water diversion, the effects will generally be beneficial, but it can affect juvenile steelhead behavior or may cause physical damage, or even potential death. However, mortality as a result of beach seining and dip netting is rare. Upon beach seining, dip netting, and holding tank placement, fish will be returned to the river. Therefore, these activities are not expected to result in appreciable reductions in the species' likelihood of surviving and recovering in the wild. NMFS expects that these activities will not result in appreciable reduction to the value of the designated critical habitat for the conservation of the species in the action area due to the placement of silt curtain and the short term nature of the project. In addition, NMFS anticipates that pile driving will be detectable to salmonids up to 215 meters from the source, and these effects should be small because pile driving will occur during the day. The June 15 through October 15 work window will further minimize the extent of the impacts on listed anadromous fish by avoiding the peaks of adult and juvenile migration periods.

VI. CUMULATIVE EFFECTS

For purposes of the ESA, cumulative effects are defined as the effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR §402.02). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultations pursuant to section 7 of the ESA.

A. Agricultural Practices

Agricultural practices in and upstream of the Stanislaus River may adversely affect riparian and wetland habitats through upland modifications of the watershed that lead to increased siltation or reductions in water flow in stream channels flowing into the San Joaquin River. Agricultural practices in the Delta may adversely affect riparian and wetland habitats through upland modifications of the watershed that lead to increased siltation or reductions in water flow in stream channels flowing into the Delta. Unscreened agricultural diversions throughout the Delta entrain fish including juvenile salmonids. Grazing activities from dairy and cattle operations can degrade or reduce suitable critical habitat for listed salmonids by increasing erosion and sedimentation as well as introducing nitrogen, ammonia, and other nutrients into the watershed, which then flow into the receiving waters of the San Joaquin River and Delta. Stormwater and irrigation discharges related to both agricultural and urban activities contain numerous pesticides and herbicides that may adversely affect salmonid reproductive success and survival rates (Dubrovsky *et al.* 1998, 2000; Daughton 2003).

B. Increased Urbanization

The Delta, East Bay, and Sacramento regions, which include portions of Contra Costa, Alameda, Sacramento, San Joaquin, Solano, Stanislaus, and Yolo counties, are expected to increase in population by nearly 3 million people by the year 2020. Increases in urbanization and housing developments can impact habitat by altering watershed characteristics, and changing both water use and stormwater runoff patterns. For example, the General Plans for the cities of Stockton, Brentwood, Lathrop, Tracy and Manteca and their surrounding communities anticipate rapid growth for several decades to come. City of Manteca (2007) anticipated 21 percent annual growth through 2010 reaching a population of approximately 70,000 people. City of Lathrop (2007) expects to double its population by 2012, from 14,600 to approximately 30,000 residents. The anticipated growth will occur along both the I-5 and US-99 transit corridors in the east and Highway 205/120 in the south and west. Increased growth will place additional burdens on resource allocations, including natural gas, electricity, and water, as well as on infrastructure such as wastewater sanitation plants, roads and highways, and public utilities. Some of these actions, particularly those which are situated away from waterbodies, will not require Federal permits, and thus will not undergo review through the ESA section 7 consultation process with NMFS.

Increased urbanization also is expected to result in increased wave action and propeller wash in the San Joaquin River due to increased recreational boating activity. This potentially will degrade riparian and wetland habitat by eroding channel banks, thereby causing an increase in siltation and turbidity. Wakes and propeller wash also churn up benthic sediments thereby potentially re-suspending contaminated sediments and degrading areas of submerged vegetation. This in turn would reduce habitat quality for the invertebrate forage base required for the survival of juvenile salmonids. Increased recreational boat operation on the San Joaquin River is anticipated to result in more contamination from the operation of engines on powered craft entering the river and its tributaries. In addition to recreational boating, commercial vessel traffic is expected to increase with the redevelopment plans of the Port of Stockton. Portions of this redevelopment plan have already been analyzed by NMFS for the West Complex (formerly Rough and Ready Island) but the redevelopment of the East Complex, which currently does not have a Federal action associated with it, will also increase vessel traffic as the Port becomes more modernized. Commercial vessel traffic is expected to create substantial entrainment of aquatic organisms through ship propellers as the vessels transit the shipping channel from Suisun Bay to the Port and back again. In addition, the hydrodynamics of the vessel traffic in the confines of the channel will create sediment re-suspension, and localized zones of high turbulence and shear forces. These physical effects are expected to adversely affect aquatic organisms, including both listed salmonids and North American green sturgeon resulting in death or injury.

C. Global Climate Change

The world is about 1.3°F warmer today than a century ago and the latest computer models predict that, without drastic cutbacks in emissions of carbon dioxide and other gases released by the burning of fossil fuels, the average global surface temperature may rise by two or more degrees in the 21st century (Intergovernmental Panel on Climate Change [IPCC] 2001). Much of that increase likely will occur in the oceans, and evidence suggests that the most dramatic changes in ocean temperature are now occurring in the Pacific (Noakes 1998). Using objectively analyzed data Huang and Liu (2000) estimated a warming of about 0.9°F per century in the northern Pacific Ocean.

Sea levels are expected to rise by 0.5 to 1.0 meters in the northeastern Pacific coasts in the next century, mainly due to warmer ocean temperatures, which lead to thermal expansion much the same way that hot air expands. This will cause increased sedimentation, erosion, coastal flooding, and permanent inundation of low-lying natural ecosystems (*e.g.*, salt marsh, riverine, mud flats) affecting salmonid PCEs. Increased winter precipitation, decreased snow pack, permafrost degradation, and glacier retreat due to warmer temperatures will cause landslides in unstable mountainous regions, and destroy fish and wildlife habitat, including salmon-spawning streams. Glacier reduction could affect the flow and temperature of rivers and streams that depend on glacier water, with negative impacts on fish populations and the habitat that supports them.

Summer droughts along the South Coast and in the interior of the northwest Pacific coastlines will mean decreased stream flow in those areas, decreasing salmonid survival and reducing water supplies in the dry summer season when irrigation and domestic water use are greatest. Global warming may also change the chemical composition of the water that fish inhabit: the amount of oxygen in the water may decline, while pollution, acidity, and salinity levels may increase. This will allow for more invasive species to overtake native fish species and impact predator-prey relationships (Peterson and Kitchell 2001; Stachowicz *et al.* 2002).

In light of the predicted impacts of global warming, the Central Valley has been modeled to have an increase of between 35.6^{o}F and 44.6^{o}F by 2100 (Dettinger *et al.* 2004; Hayhoe *et al.* 2004; Van Rheenen *et al.* 2004; Dettinger 2005), with a drier hydrology predominated by precipitation rather than snowfall. This will alter river runoff patterns and transform the tributaries that feed the Central Valley from a spring/summer snowmelt dominated system to a winter rain dominated system. It can be hypothesized that summer temperatures and flow levels will become unsuitable for salmonid survival. The cold snowmelt that furnishes the late spring and early summer runoff will be replaced by warmer precipitation runoff. This should truncate the period of time that suitable cold-water conditions exist below existing reservoirs and dams due to the warmer inflow temperatures to the reservoir from rain runoff. Without the necessary cold water pool developed from melting snow pack filling reservoirs in the spring and early summer, late summer and fall temperatures below reservoirs, such as Lake Shasta, could potentially rise above thermal tolerances for juvenile and adult salmonids (*i.e.* Sacramento River winter-run Chinook salmon and CV steelhead) that must hold below the dam over the summer and fall periods.

The near term effects of global climate change are unlikely to result in any perceptible declines to the overall health or distribution of the listed CV steelhead within the action area that are the subject of this consultation.

VII. INTEGRATION AND SYNTHESIS

This section integrates the current conditions described in the *Environmental Baseline* with the effects of the proposed action and the cumulative effects of future actions. The purpose of this synthesis is to develop an understanding of the likely short term and long term response of listed species and critical habitat to the proposed project.

A. Impacts of the Proposed Action on Central Valley Steelhead, and its Designated Critical Habitat

NMFS finds that the effects of the Project on California CV steelhead and its designated critical habitat will include a temporary increase in suspended sediment and turbidity, a short-term reduction of SRA habitat, harassment, injury, and possible predation-related mortality of individuals from pile driving, and harassment, injury and potential mortality of individuals entrained or salvaged from water diversion construction. With the exception of loss of SRA habitat, the June 15 to October 15 in water work window will minimize project-related effects by avoiding the peak migration periods of adult and juvenile salmonid migrations.

The most likely effects to listed salmonids from the proposed action are harassment of juvenile CV steelhead resulting from the noise of pile driving, and entrainment of juveniles into culvert pipes via water diversion. Pile driving is expected to result in temporary disruptions in the feeding, sheltering, and migratory behavior of adult juvenile salmon and steelhead. This disruption may injure or kill juveniles by causing reduced growth and increased susceptibility to predation. Adults should not be injured because the disruptions should only include temporary migration delays that should not prevent successful spawning. Pile driving is also not expected to prevent salmonids from passing upstream or downstream because pile driving will not be continuous through the day, and will not occur at night, when the majority of fish migrate. Pile driving effects will be minimized by avoiding the peak migration periods of listed anadromous salmonids. Death as a result of entrainment is expected to be minimized by salvaging and relocating fish away from the project site. A low mortality rate of juveniles (<10 percent) is expected to result from fish salvage.

Turbidity changes that are within the Regional Board standards may result in sudden localized turbidity increases that could injure juvenile salmonids by temporarily impairing their migration, rearing, feeding, or sheltering behavior. Project-related turbidity increases may also contribute to the susceptibility of juvenile salmonids to increased predation. Turbidity related injury and predation will be minimized by implementing the avoidance and contingency measures of the SWPPP, and by scheduling in-water work to avoid peak migration periods of listed anadromous salmonids.

The temporary loss of 0.443 acre of riparian vegetation will result in a small reduction of nearshore cover and food production until the vegetation in the disturbed areas is re-established (five to ten years). Revegetating the project area at a 3:1 ratio will minimize the effect of this habitat loss. Because of the diverse habitat conditions in the action area, and other forms of cover and food production available to salmon and steelhead within the action area, the loss of 0.443 acre of vegetation is not expected to significantly impair the essential behavioral patterns of listed anadromous fish and will, therefore, not result in a reduction in numbers. There will be a permanent loss of 0.002 acre of riverine habitat from the increased size of the bridge columns. To compensate for the loss of critical habitat, Caltrans will mitigate at a minimum 2:1 ratio through establishment of a conservation easement or payment of in-lieu fees at an approved NMFS conservation bank.

B. Impacts of the Proposed Action on CV steelhead DPS Survival and Recovery

The adverse effects to listed species within the action area are not expected to affect the overall survival and recovery of the DPS. This is largely due to the fact that although construction may cause adverse effects to some listed salmonids, the impacts will avoid the largest proportions of listed anadromous fish that migrate through the action area by limiting in-water work to months that do not coincide with peak migration periods. Additionally, most of the effects are not lethal. Construction-related harassment will be temporary and will not impede adult fish from reaching upstream spawning and holding habitat, or juvenile fish from migrating downstream. The project will compensate for temporary and permanent losses of critical habitat by planting riparian vegetation at the project site at a 3:1 ratio and at a nearby riverside NMFS approved mitigation site at a minimum 2:1 ratio. Riverine and riparian habitat will be restored to pre-project conditions after project construction is complete. No effects from interrelated or interdependent actions are anticipated to occur to the CV steelhead as a result of implementing the proposed project. The project does not contribute to cumulative effects to CV steelhead due to the implementation of avoidance, minimization, and mitigation measures that will help reduce those effects.

VIII. CONCLUSION

After reviewing the best available scientific and commercial information, the current status CV steelhead, and its designated critical habitat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is NMFS' BO that the McHenry Avenue Corridor Improvement Project, as proposed, is not likely to jeopardize the continued existence of California CV steelhead, and is not likely to destroy or adversely modify their designated critical habitats.

IX. INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by NMFS as an act which kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not the purpose of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by Caltrans so that they become binding conditions of any contracts or permits, as appropriate, for the exemption in section 7(o)(2) to apply. Caltrans has a continuing duty to regulate the activity covered by this incidental take statement. If Caltrans (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant and its contractor(s) to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, Caltrans or the applicant must report the progress of the action and its impact on the species to NMFS as specified in the incidental take statement (50 CFR §402.14(i)(3)).

A. Amount or Extent of Take

NMFS anticipates incidental take of California CV steelhead from impacts directly related to pile driving, dewatering, and impairment of essential behavior patterns as a result of these activities. The incidental take is expected to be in the form of harm, harassment, or mortality of California CV steelhead resulting from the installation and removal of temporary and permanent piles and water diversion construction. Incidental take is expected to occur for any in-water work window seasons, from June 15 to October 15, when individuals of California CV steelhead could potentially be in the action area. Take is expected on migrating adults, and migrating, rearing and smolting juveniles.

NMFS cannot, using the best available information, quantify the anticipated incidental take of individual CV steelhead because of the variability and uncertainty associated with the population size of the species, annual variations in the timing of migration, and uncertainties regarding individual habitat use of the project area. However, it is possible to describe the ecological surrogates that will lead to the take:

1. Dewatering Activities

Although abundance of juvenile California CV steelhead is expected to be very low in the project action area, take of stranded juveniles during the dewatering activities from June 15 to October 15 will likely occur. Stranded juveniles will be captured and relocated directly downstream of the project site. There is potential for listed juvenile fish to be directly killed or injured as a result of handling during relocation. Kennedy (2008) observed 5 individuals per 100 square meters at the Oakdale Recreation reach of the Stanislaus River (just upstream of the project area). Since the total area to be dewatered will not be greater than 8,500 square feet, non-lethal take for this Project will be limited to 40 individuals and lethal take will be limited to less than five individuals. The mortality rate (expected to be less than 10 percent if consistent with the results of fish handling in similar fish salvage efforts) is a standard expected from the capturing, handling, and relocation of fish.

2. Pile Driving

The analysis of the effects of the Project anticipates the installation of 8 permanent 72-inch diameter steel pipe casings (in-water or placed through temporary embankment) and 8 permanent 48-inch diameter steel pipe casings (land-based) to be driven with a vibratory hammer. 180 permanent, 24-inch diameter PC/PS hexagonal concrete piles (land-based) will be driven with an impact hammer. All piles will be driven during the in-water work window between June 15 and October 15, during daylight hours, for two construction seasons.

Pile driving with an impact hammer is expected to result in incidental take in the form of injury and mortality to salmonids through exposure to temporary high SPLs (> 206 dB peak SPL or 187 dB SEL) within the water column during the installation of the temporary falsework and bridge pier and column activities. The number of salmonids that may be incidentally taken during activities is expected to be small. NMFS will use the area of sound pressure wave impacts extending into the water column from each pile, and the time period for pile driving as a surrogate for number of fish.

For the purposes of this analysis, sound pressure levels for the 48-inch steel pipe casings are conservatively assumed to have the same sound pressures as the 72-inch steel pipe casings. The estimates for sound pressures assume casing will be installed directly into the bed of the river. If temporary embankment/work pad(s) are installed prior to installing the pipe casing, sound pressures will be expected to be reduced. Based on the analysis, peak and cumulative sound pressures are estimated to be below thresholds for injury and/or mortality of listed fish, therefore no sound attenuation measures or monitoring will be required.

For listed salmonids located within a 104 m diameter from the pile during unattenuated pile driving of the 72-inch (and therefore 48-inch) CIDH piles, and within a 42, 20, 12, and 8 m diameter from the pile (based on their varying distances from the riverbank at 21, 33, 45, and 57 m respectively) during unattenuated pile driving of the 24-inch PC/PS concrete piles may be injured or killed. Beyond these distances, extending out to 430 m (for CIDH piles), and 124 m, 58 m, 36 m, and 24 m diameters respectively (for PC/PS concrete piles) corresponding with SPLs > 150 dB RMS, of the above events fish may exhibit behavioral responses such as agitation or rapid bursts in swimming speeds. If Caltrans' monitoring indicates that sound pressure levels greater than 206 dB peak (re: 1 μPa), or 187 dB SEL (re: 1 μPa^2sec), or 150 dB RMS (re: 1 μPa) extend beyond these distances the amount of incidental take may be exceeded.

The analysis of the effects of the proposed project anticipates that the turbidity levels produced by installation and removal of piles will not exceed those permitted under the project SWPPP and that if turbidity levels approach or exceed the acceptable criteria established by the Regional Board, construction activities will be halted until turbidity levels return to within acceptable levels.

If these ecological surrogates are not met and maintained, the proposed project will be considered to have exceeded anticipated take levels, thus requiring Caltrans to coordinate with NMFS within 24 hours on ways to reduce the amount of take down to anticipated levels. Anticipated incidental take will be exceeded if the criteria described above are not met, the Project is not implemented as described in the Biological Assessment (BA) prepared for this project, all conservation measures are not implemented as described in the BA (including successful completion of monitoring and reporting criteria), or the project is not implemented in compliance with the terms and conditions of this incidental take statement. If take is exceeded formal consultation must be reinitiated (50 C.F.R. § 402.16(a)).

B. Effect of Take

NMFS has determined that the aforementioned level of take resulting from the McHenry Avenue

Corridor Improvement Project is not likely to jeopardize California CV steelhead, and is not likely to destroy or adversely modify designated critical habitat.

C. Reasonable and Prudent Measures

NMFS has determined that the following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize the incidental take of listed California CV steelhead resulting from the Project. These reasonable and prudent measures also would minimize adverse effects on designated critical habitat.

1. Measures shall be taken to minimize incidental take of listed anadromous fish by restricting the in-water work to avoid vulnerable life stages.
2. Measures shall be taken to minimize incidental take of listed anadromous fish during water diversion construction.
3. Measures shall be taken to validate that erosion, sediment, and turbidity controls and contingency measures are effective.
4. Measures shall be taken to minimize the effect of temporary habitat loss of riverine and riparian habitat.
5. Measures shall be taken to maintain fish passage for salmonids through the project site.
6. Caltrans shall provide a report of project activities to NMFS by December 31 of each construction year.
7. Caltrans shall report any incidence of take to NMFS.
8. Measures shall be taken to minimize the amount and duration of pile driving and its potential impacts on listed salmonids, and to monitor the range and magnitude of compression shock waves generated by pile driving operations.

D. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, Caltrans must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting and monitoring requirements. These terms and conditions are non-discretionary and must be incorporated as binding conditions of any contracts or permits between Caltrans and their contractors:

(1) Measures shall be taken to minimize incidental take of listed anadromous fish by restricting the in-water work to avoid vulnerable life stages.

Conditions: Any construction work occurring below the Ordinary High Water Mark (OHWM) will occur from June 15 to October 15 of each construction year. This is a time when listed species are least likely to be impacted.

(2) Measures shall be taken to minimize incidental take of listed anadromous fish during water diversion construction.

Conditions: Caltrans will have a fish biologist prepare a fish salvage plan to recover any individual salmonids entrapped or entrained during water diversion construction process. In addition, Caltrans will submit the plan to NMFS prior to project initiation.

(3) Measures shall be taken to validate that erosion, sediment, and turbidity controls and contingency measures are effective.

Conditions: Caltrans shall ensure that proper sediment control and retention structures are effective and in place throughout the rainy season. Also, Caltrans shall obtain all appropriate permits through the appropriate Regional Board and have on file a SWPPP.

(4) Measures shall be taken to minimize the effect of temporary habitat loss of riverine and riparian habitat.

Conditions:
Caltrans shall develop a revegetation plan for the project that compensates for the removal of riparian vegetation at the proposed ratio of 3:1. This plan shall include a maintenance schedule for assuring successful revegetation.

a. For areas that cannot be restored onsite, Caltrans shall purchase riparian credits at a NMFS approved anadromous fish conservation bank at a 6:1 ratio for riparian habitat affected by the action to offset temporal impacts incurred from project activities.
b. Caltrans shall monitor and maintain all riparian plantings for five years, and provide irrigation, fertilization and replacement plantings as necessary to ensure full and rapid recovery of disturbed riparian habitat features.
c. Caltrans shall provide NMFS a post-construction field review and yearly field reviews for five years of the proposed project site, to assure conservation measures were adequately implemented and whether additional plantings are needed to establish adequate riparian vegetation. The first review should occur the year following construction completion. The field review shall include the following elements:

    i. Seasonal surveys to determine adequate cover and plant survival throughout the year is being met.
    ii. A survival ratio to ensure planting of new vegetation is implemented during the first five years when necessary.
    iii. Photo point monitoring shots at the established repair site to be used as a tool to determine success and survival rates. The photos shall be taken annually on the same date, as much as practicable.

(5) Measures shall be taken to maintain fish passage for salmonids through the project site.

Conditions: A temporary embankment/work pad(s) will be constructed of water bladders, clean, local fill material, and/or other methods that will not result in notably degraded water quality and will also divert the flow and maintain dry conditions around the work area. The flows will be diverted into temporary culvert pipes that pass through the embankment/work pad in order to provide ample passage for listed fish to move up and down the river channel. In addition, Caltrans shall establish non-work periods of at least eight hours at night to allow for quiet migration conditions for listed salmonids. Absence of in-water work during the night time will allow for unimpeded movement through the action area by listed salmonids.

(6) Caltrans shall provide a report of project activities to NMFS by December 31 of each construction year.

Conditions: This report shall include a summary description of in-water constraint activities, avoidance and minimization measures taken, and any observed take incidents.

(7) Caltrans shall report any incidence of take to NMFS.

Conditions: Caltrans shall record the date, number, and specific location of all steelhead that are relocated for each construction-related activity in the project area in addition to any direct mortalities observed during dewatering and relocation. If a listed species is observed injured or killed by project activities, Caltrans shall contact NMFS within 48 hours at 650 Capitol Mall, Suite 5-100, Sacramento, CA 95814. Notification shall include species identification, the number of fish, and a description of the action that resulted in take. If possible, dead individuals shall be collected, placed in an airtight bag, and refrigerated with the aforementioned information until further direction is received from NMFS.

(8) Measures shall be taken to minimize the amount and duration of pile driving and its potential impacts on listed salmonids, and to monitor the range and magnitude of compression shock waves generated by pile driving operations.

Conditions:

a. All in-water pile driving work will occur from June 15 to October 15 each construction year. Real-time monitoring shall be conducted to ensure that underwater sound levels analyzed in this biological opinion do not exceed the established distances described for pile driving construction. These distances are:

    i. Unattenuated 72-inch (and 48-inch) permanent CIDH piles: 206 dB peak SPL at 0 m (0 m diameter), 187 dB accumulated SEL at 52 m (104 m diameter), and 150 dB RMS at 215 m (430 m diameter);
    ii. Unattenuated 24-inch PC/PS concrete piles at 21 m from riverbank: 206 dB peak SPL at 0 m (0 m diameter), 187 dB accumulated SEL at 21 m (42 m diameter), and 150 dB RMS at 62 m (124 m diameter);
    iii. Unattenuated 24-inch PC/PS concrete piles at 33 m from riverbank: 206 dB peak SPL at 0 m (0 m diameter), 187 dB accumulated SEL at 10 m (20 m diameter), and 150 dB RMS at 29 m (58 m diameter);
    iv. Unattenuated 24-inch PC/PS concrete piles at 45 m from riverbank: 206 dB peak SPL at 0 m (0 m diameter), 187 dB accumulated SEL at 6 m (12 m diameter), and 150 dB RMS at 18 m (36 m diameter);

v. Unattenuated 24-inch PC/PS concrete piles at 57 m from riverbank: 206 dB peak SPL at 0 m (0 m diameter), 187 dB accumulated SEL at 4 m (8 m diameter), and 150 dB RMS at 12 m (24 m diameter).

b. Caltrans shall monitor underwater sound during all impact hammer pile driving activities. If underwater sound exceeds the established thresholds at the distances provided above from the piles being driven, then NMFS must be contacted within 24 hours before continuing to drive additional piles.

c. Caltrans shall submit to NMFS a hydroacoustic monitoring report plan for approval at least 60 days prior to the start of construction activites. In addition, Caltrans shall submit to NMFS a daily hydroacoustic monitoring report (by COB of the day following the pile driving activities) that provide real-time data regarding the distance (actual or estimated using propagation models) to the thresholds (150 dB RMS, 187 dB accumulated SEL, and 206 dB peak SPL) stated in this BO to determine adverse effects to listed species. Specifically, the reports shall:

   i. Describe the locations of hydroacoustic monitoring stations that were used to document the extent of the underwater sound footprint during pile-driving activities, including the number, location, distances, and depths of hydrophones and associated monitoring equipment;
   ii. Include the total number of pile strikes per pile, the interval between strikes, the peak SPL and SEL per strike, and accumulated SEL per day for each hydroacoustic monitor deployed.
   iii. Include a monitoring and reporting program that will incorporate provisions to provide daily, monthly, and seasonal summaries of the hydroacoustic monitoring results (real-time data) to NMFS during the pile-driving season.

d. Pile driving shall occur only during restricted weekday working hours from 8 a.m to 5 p.m. This is to ensure that pile driving does not occur at dawn or dusk, during peak salmonid migration and feeding times. In addition, potential impacts incurred by juvenile salmonids during this time will be at a minimum.

e. Caltrans shall submit to NMFS a final hydroacoustic monitoring summary due 30 days following pile driving events for each temporary structure required for bridge construction (see Condition (8)(c)(iii) above). The reports must provide a review of the daily monitoring data and process, as well as any problems that were encountered.

Additionally, Caltrans shall maintain, monitor, and adaptively manage all conservation measures throughout the life of the project to ensure their effectiveness. For example, assurances shall be taken to ensure the success of revegetation efforts. Caltrans, for the purposes of agency review and approval, shall provide the finalized project plans to NMFS at least 14 days prior to implementation, which will include the following:

(1) Confirmation of in-water work window from June 15 to October 15;
(2) Use details for any chemically-treated substances that will be used during the in-stream

construction window;
(3) Compliance to SWPPP and other Regional Board requirements;
(4) Compliance with all pile driving requirements; and
(5) Notification strategy for informing NMFS upon initiation and conclusion of in-water work.

Caltrans shall provide a project summary and compliance report to NMFS within 60 days of completion of construction. This report shall describe construction dates, implementation of proposed project conservation measures, and the terms and conditions of the final biological opinion; observed or other known effects on California CV steelhead, and any occurrences of incidental take.

Updates and reports required by these terms and conditions shall be submitted by December 31 of each year during the construction period to:

Supervisor
Central Valley Office
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814-4607
FAX: (916) 930-3629
Phone: (916) 930-3600

X. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. NMFS proposes the following conservation recommendations that would avoid or reduce adverse impacts to listed anadromous fish species:

(1) Caltrans should support and promote aquatic and riparian habitat restoration within the California's CV, and implement practices that avoid or minimize negative impacts to salmon, steelhead, and sturgeon on all of their project sites within critical habitat.

(2) Caltrans should provide fiscal and staffing support to anadromous salmonid and sturgeon monitoring programs throughout the Delta to improve the understanding of migration and habitat utilization by salmonids and sturgeon in this region.

In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, NMFS requests notification of the implementation of any conservation recommendations.

XI. REINITIATION NOTICE

This concludes formal consultation on the McHenry Avenue Cooridor Improvement project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, formal consultation shall be reinitiated immediately.

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Enclosure 2

Magnuson-Stevens Fishery Conservation and Management Act

ESSENTIAL FISH HABITAT CONSERVATION RECOMMENDATIONS

I. IDENTIFICATION OF ESSENTIAL FISH HABITAT

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended (16 U.S.C. § 1801 et seq.), requires that Essential Fish Habitat (EFH) be identified and described in Federal fishery management plans (FMPs). Federal action agencies must consult with NOAA's National Marine Fisheries Service (NMFS) on any activity which they fund, permit, or carry out that may adversely affect EFH. NMFS is required to provide EFH conservation and enhancement recommendations to the Federal action agencies.

EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. For the purpose of interpreting the definition of EFH, "waters" includes aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means habitat required to support a sustainable fishery and a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers all habitat types used by a species throughout its life cycle. The action area of the Stanislaus River, McHenry Avenue Corridor Improvement project is within the area identified as EFH for Pacific Coast Salmon species identified in Amendment 14 of the Pacific Salmon FMP [Pacific Fishery Management Council (PFMC) 1999].

PFMC (1999) has identified and described EFH, and has identified adverse impacts and recommended conservation measures for salmon in amendment 14 to the Pacific Coast Salmon FMP. Freshwater EFH for Pacific salmon in the California Central Valley includes waters currently or historically accessible to salmon within the Central Valley ecosystem as described in Myers et al. (1998). Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley (CV) spring-run Chinook salmon (*O. tshawytscha*), and CV fall-/late fall-run Chinook salmon (*O. tshawytscha*) are species managed under the Pacific Coast Salmon FMP that occur in the CV. However, this project is located on the Stanislaus River, where Sacramento River winter-run Chinook are not and have not been present historically; thus EFH will be discussed for only habitat utilized by CV spring-run Chinook salmon and CV fall-/late fall-run Chinook salmon.

Factors limiting salmon populations in the Stanislaus River include periodic reversed flows due to high water exports (drawing juveniles into large diversion pumps), loss of fish into unscreened agricultural diversions, predation by introduced species, and reduction in the quality and quantity of rearing habitat due to channelization, pollution, rip-rapping, *etc*. (Dettman *et al.*1987; California Resources Agency 1989).

A. Life History and Habitat Requirements

1. Pacific Salmon

General life history information for CV fall-run Chinook salmon is summarized below. Further detailed information on the other CV Chinook salmon evolutionarily significant units (ESUs) are available in the enclosed biological opinion, the NMFS status review of Chinook salmon from Washington, Idaho, Oregon, and California (Myers *et al.* 1998), and the NMFS proposed rule for listing several ESUs of Chinook salmon (63 FR 11482).

Adult CV fall-run Chinook salmon enter the Sacramento and San Joaquin rivers from July through December and spawn from October through December while adult CV late fall-run Chinook salmon enter the Sacramento and San Joaquin rivers from October to April and spawn from January to April (U.S. Fish and Wildlife Service [USFWS] 1998). Chinook salmon spawning generally occurs in clean loose gravel in swift, relatively shallow riffles or along the edges of fast runs (NMFS 1997).

Egg incubation occurs from October through March (Reynolds *et al.* 1993). Shortly after emergence from their gravel nests, most fry disperse downstream towards the Delta and into the San Francisco Bay and its estuarine waters (Kjelson *et al.* 1982). The remaining fry hide in the gravel or station in calm, shallow waters with bank cover such as tree roots, logs, and submerged or overhead vegetation. These juveniles feed and grow from January through mid-May, and emigrate to the Delta and estuary from mid-March through mid-June (Lister and Genoe 1970). As they grow, the juveniles associate with coarser substrates along the stream margin or farther from shore (Healey 1991). Along the emigration route, submerged and overhead cover in the form of rocks, aquatic and riparian vegetation, logs, and undercut banks provide habitat for food organisms, shade, and protect juveniles and smolts from predation. These smolts generally spend a very short time in the Delta and estuary before entry into the ocean. Whether entering the Delta or estuary as fry or larger juveniles, CV Chinook salmon depend on passage through the Delta for access to the ocean.

II. PROPOSED ACTION

Caltrans, in cooperation with San Joaquin County and Stanislaus County, proposes to widen and improve McHenry Avenue from 200 feet south of Jones Road in San Joaquin County to 1,700 feet south of East River Road in Stanislaus County. There are two bridges and one major intersection within this 1.1-mile-long segment of McHenry Avenue. Caltrans also proposes to replace the bridge on McHenry Avenue over the Stanislaus River to accommodate proposed roadway improvements. In addition, Caltrans proposes to replace the South San Joaquin Irrigation District Bridge on McHenry Avenue over the South San Joaquin Irrigation District/Oakdale Irrigation District Main Canal to accommodate proposed roadway improvements.

III. EFFECTS OF THE PROPOSED ACTION

The effects of the proposed action is described in detail on salmonid habitat are described at length in *Effects of the Action* of the preceding biological opinion, and generally are expected to apply to Pacific salmon EFH.

Effects to EFH stemming from construction activities that may contribute sediment and increase turbidity will be avoided or minimized by meeting Regional Water Quality Board objectives, Caltrans water pollution specifications, implementing applicable BMPs, staging equipment outside of the riparian corridor, limiting the amount of riparian vegetation removal, and replacing (if any) lost riparian vegetation at the project site.

EFH will be adversely affected by the disturbance of up to 0.45 acres of riparian vegetation as a result of construction activities. The majority of these impacts are expected to be temporary, as all disturbed areas outside the actual footprint of the new bridge would be restored to preconstruction conditions and any areas of disturbed vegetation would be replanted with native riparian vegetation. Additionally, all disturbed riparian areas will have the vegetation cut at ground level to encourage re-sprouting.

These effects to EFH may result in a temporary redistribution of some individuals, primarily migrating and rearing juvenile salmonids, but, due to the temporary nature of these disturbances, the adverse effects that are anticipated to result from the proposed project are not of the type, duration, or magnitude that would be expected to adversely modify EFH to the extent that it could lead to an appreciable reduction in the function and conservation role of the affected habitat. NMFS expects that nearly all of the adverse effects to EFH from this project will be of a short term nature and will not affect any associated Pacific salmon EFH beyond the construction period of the project.

IV. CONCLUSION

Based on our review of the material provided, and the best scientific and commercial information currently available, NMFS has determined that the proposed action would adversely affect EFH for Pacific salmon. However, the proposed action includes adequate measures (described in Enclosure 1 above) to avoid, minimize, or otherwise offset the adverse effects to EFH.

V. EFH CONSERVATION RECOMMENDATIONS

Considering that the habitat requirements of fall-run within the action area are similar to the Federally listed species addressed in the preceding biological opinion, NMFS recommends that Terms and Conditions 1-4, as well as the Conservation Recommendations in the preceding biological opinion prepared for the California Central Valley steelhead ESU be adopted as EFH Conservation Recommendations.

Those terms and conditions which require the submittal of reports and status updates can be disregarded for the purposes of this EFH consultation as there is no need to duplicate those submittals.

VI. STATUTORY REQUIREMENTS

Section 305 (b) 4(B) of the MSA requires that the Federal lead agency provide NMFS with a detailed written response within 30 days, and 10 days in advance of any action, to the EFH conservation recommendations, including a description of measures adopted by the lead agency for avoiding, minimizing, or mitigating the impact of the project on EFH (50 CFR '600.920[j]). In the case of a response that is inconsistent with our recommendations, the lead agency must explain its reasons for not following the recommendations, including the scientific justification for any disagreement with NMFS over the anticipated effects of the proposed action and the measures needed to avoid, minimize, or mitigate such effects.

VII. SUPPLEMENTAL CONSULTATION

Pursuant to 50 CFR 600.920(l), Caltrans must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendations.

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
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SEP 1 3 2012

In Response Refer To:
2011/01137

Jacqueline M. Wait, Chief
Environmental MPS and Local Assistance Branch
California Department of Transportation
1976 E. Charter Way/ 1976 E. Dr. Martin Luther King Jr. Blvd.
Stockton, California 95205

Dear Ms. Wait:

Enclosed is NOAA's National Marine Fisheries Service's (NMFS) biological and conference opinion (BO) (Enclosure 1) for the proposed McHenry Avenue Corridor Improvement project (Project) located in San Joaquin County, California, and its effects on California Central Valley (CV) steelhead (*Oncorhynchus mykiss*) and its designated critical habitat, in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Your initial request for formal section 7 consultation and conferencing on this project was received on February 1, 2011. On May 9, 2011, formal consultation and conferencing was initiated by NMFS' Central Valley Office.

This biological and conference opinion is based primarily on the biological assessment (BA) provided on February 1, 2011. The BA incorporated recommendations and addressed NMFS comments as discussed in meetings, correspondence, and emails.

Based on the best available scientific and commercial information, the biological and conference opinion concludes that the Project, as presented by the California Department of Transportation, is not likely to jeopardize the continued existence of the listed species or destroy or adversely modify designated or proposed critical habitat. NMFS anticipates that the proposed project will result in the incidental take of CV steelhead. An incidental take statement that includes reasonable and prudent measures and non-discretionary terms and conditions that are intended to minimize the impact of the anticipated incidental take of CV steelhead is included with the BO.

It is important to note than an experimental population of Chinook salmon will be present in the upper reaches of the San Joaquin River as part of the San Joaquin River Restoration Program. This is scheduled to occur no later than December 31, 2012. Pursuant to ESA section 10(j), with limited exceptions, each member of an experimental population shall be treated as a threatened species. The re-introduction of spring-run Chinook salmon and the specific processes therein are currently under development. It is reasonable to assume that reintroduced spring-run Chinook salmon juveniles will be present in the San Joaquin River and within the proposed project action area. As the proposed project is scheduled for completion in the fall of 2012, this should not be an issue. However, if the project is delayed, impacts of the proposed project on spring-run Chinook salmon may need to be assessed.

Also enclosed are NMFS' Essential Fish Habitat (EFH) conservation recommendations for Pacific salmon (*O. tshawytscha*) as required by the Magnuson-Stevens Fishery Conservation and Management Act as amended (16 U.S.C. 1801 *et seq.*; Enclosure 2). The document concludes that the Project will adversely affect the EFH of Pacific salmon in the action area and adopts certain terms and conditions of the incidental take statement and the ESA conservation recommendations of the biological opinion as the EFH conservation recommendations.

Please contact Dylan Van Dyne at our Central Valley Office at (916) 930-3725, or via e-mail at Dylan.VanDyne@noaa.gov, if you have any questions regarding this response or require additional information.

Sincerely,

for

Rodney R. McInnis
Regional Administrator

Enclosures (2)

cc: Copy to file – ARN 151422SWR2011SA00165
NMFS-PRD, Long Beach, CA
Bryan Chesney, Long Beach, CA

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814-4700

DEC 7 2012

In response refer to:
2011/001137

Jacqueline M. Wait, Chief
Environmental MPS and Local Assistance Branch
California Department of Transportation
1976 E. Charter Way/ 1976 E. Dr. Martin Luther King Jr. Blvd.
Stockton, California 95205

Dear Ms. Wait:

This is in response to a September 18, 2012, email to NOAA's National Marine Fisheries Service (NMFS) from the California Department of Transportation (Caltrans) requesting clarification on the hydroacoustic monitoring conditions included in the September 13, 2012, Biological Opinion (BO) issued for the McHenry Avenue Corridor Improvement Project (project). Caltrans proposed minor changes in a September 18, 2012, email to NMFS, and in a follow up email on November 4, 2012, to address comments and suggestions to modify the terms and conditions outlined for reasonable and prudent measure (RPM) (8) in the BO, as follows:

(1) Each condition as stated in the BO requires monitoring at three hydrophone location/distances. Monitoring using two hydrophones is standard for this type of Caltrans project. The 150 decibel (dB) RMS can be calculated using the two existing hydrophone locations.

(2) The standard for monitoring distance from the pile is 10 meters (m). Impacts from 0-10 m can be extrapolated from the data.

(3) The first hydrophone location should be at 10 m and the second hydrophone location should be at the isopleth of anticipated impacts (187 dB accumulated SEL).

NMFS has reviewed the proposed comments and suggestions provided by Caltrans and has clarified the terms and conditions for RPM (8) in the BO, as follows:

a. Real-time monitoring shall be conducted to ensure that underwater sound levels analyzed in this BO do not exceed the established distances described for pile driving construction. Monitoring shall follow NMFS standard practices of 1-2 hydrophones used, the first being placed at 10 m from the pile, mid-depth in the water column, and the second being placed further away near the isopleth estimated for the cumulative SEL distance;

i. If the unattenuated 72-inch (and 48-inch) permanent cast-in-drilled-hole piles require the use of an impact hammer at any time, Caltrans will prepare an analysis of estimated impacts, including use of sound attenuation methodology, and submit to NMFS for review prior to use of an impact hammer for these piles. Monitoring will be required if an impact hammer is used and will be conducted as described below for underwater sound monitoring and reporting (see Condition (8)(c) below);

ii. Unattenuated 24-inch precast/prestressed (PC/PS) concrete piles at 21 m from riverbank: 206 dB peak SPL at 0 m (0 m diameter), 187 dB accumulated SEL at 21 m (42 m diameter), and 150 dB RMS at 62 m (124 m diameter);

iii. Unattenuated 24-inch PC/PS concrete piles at 33 m from riverbank: 206 dB peak SPL at 0 m (0 m diameter), 187 dB accumulated SEL at 10 m (20 m diameter), and 150 dB RMS at 29 m (58 m diameter);

iv. Unattenuated 24-inch PC/PS concrete piles at 45 m from riverbank: 206 dB peak SPL at 0 m (0 m diameter), 187 dB accumulated SEL at 6 m (12 m diameter), and 150 dB RMS at 18 m (36 m diameter); and

v. Unattenuated 24-inch PC/PS concrete piles at 57 m from riverbank: 206 dB peak SPL at 0 m (0 m diameter), 187 dB accumulated SEL at 4 m (8 m diameter), and 150 dB RMS at 12 m (24 m diameter).

b. Caltrans shall monitor underwater sound during all impact hammer pile driving activities. If underwater sound exceeds the established thresholds at the distances provided above from the piles being driven, then NMFS must be contacted within 24 hours before continuing to drive additional piles.

c. Caltrans shall submit to NMFS a hydroacoustic monitoring report plan for approval at least 60 days prior to the start of construction activities. In addition, Caltrans shall submit to NMFS a daily hydroacoustic monitoring report (by close of business of the day following the pile driving activities) that provides real-time data regarding the distance (actual or estimated using propagation models) to the thresholds (187 dB accumulated SEL and 150 dB RMS) stated in this BO to determine adverse effects to listed species. Specifically, the reports shall:

i. Describe the locations of hydroacoustic monitoring stations that were used to document the extent of the underwater sound footprint during pile-driving activities, including the number, location, distances, and depths of hydrophones and associated monitoring equipment;

ii. Include the total number of pile strikes per pile, the interval between strikes, the peak SPL and SEL per strike, and accumulated SEL and 150 dB RMS per day for each hydroacoustic monitor deployed; and

iii. Include a monitoring and reporting plan that will incorporate provisions to provide daily, monthly, and seasonal summaries of the hydroacoustic monitoring results (real-time data) to NMFS during the pile-driving season.

d. Pile driving shall occur only during restricted weekday working hours from 8 a.m. to 5 p.m. This is to ensure that pile driving does not occur at dawn or dusk, during peak salmonid migration and feeding times.

e. Caltrans shall submit to NMFS a final hydroacoustic monitoring summary due 30 days following pile driving events for each temporary structure required for bridge construction (see Condition (8)(c)(iii) above). The reports must provide a review of the daily monitoring data and process, as well as any problems that were encountered.

These are minor clarifications that are consistent with the objective of RPM (8), which is to ensure that underwater sound levels do not exceed established distances for pile driving construction. As such, these clarifications do not require re-initiation of section 7 consultation, but instead are provided as technical assistance.

Please contact Dylan Van Dyne at our Central Valley Office at (916) 930-3725, or via e-mail at Dylan.VanDyne@noaa.gov, if you have any questions regarding this response or require additional information.

Sincerely,

Maria Rea

Maria Rea
Supervisor, Central Valley Office

cc: File to ARN 151422SWR2004SA9131
NMFS-PRD, Long Beach, CA

Kathy Ikeda/D10/Caltrans/CAGov

12/19/2012 09:55 AM

To: Dylan VanDyne - NOAA Federal <dylan.vandyne@noaa.gov>

cc: pnuon@sjgov.org, msaqqa@sjgov.org, aja.verburg@stancounty.com, kjackson@pmcworld.com, thomas.barnard@aecom.com, Jesus

bcc:

Subject: Re: Details of BO clarification letter for McHenry Avenue Corridor

Thank you very much, Dylan. By way of this e-mail, I'm forwarding your confirmation to key members of the project team so that they can also include this in their files.

Kathy Ikeda , Assoc. Environmental Planner
Caltrans District 10, Environmental MPS and Local Assistance Branch
1976 E. Dr. Martin Luther King Jr. Blvd., Stockton, CA 95205
(209) 948-3825

Dylan VanDyne - NOAA Federal <dylan.vandyne@noaa.gov>

Dylan VanDyne - NOAA Federal <dylan.vandyne@noaa.gov>

12/13/2012 05:04 PM

To: Kathy Ikeda <kathy_ikeda@dot.ca.gov>

cc: Julie Myrah <julie_myrah@dot.ca.gov>

Subject: Re: Details of BO clarification letter for McHenry Avenue Corridor

Kathy, the clarification letter was meant to address acoustics only. Per your request to confirm what's stated in 1. and 2. below:

NMFS agrees with the statements made by Caltrans in their 12/13/12 email below. This amended language will replace the original text on pgs. 3, 38, and 46 of the 9/13/12 issued BO. Please make a copy of this correspondence to include with the BO. Thanks,

Dylan

--
Dylan R. Van Dyne
National Oceanic and Atmospheric Administration Biologist
Sacramento River Basin Conservation Banking Representative
Central Valley Office Outreach Coordinator
650 Capitol Mall, Ste. 5-100
Sacramento, CA 95814-4607
(916) 930-3725 (direct)
(916) 930-3629 (facsimile)
(530) 521-1243 (mobile)
http://www.swr.nmfs.noaa.gov/

On Thu, Dec 13, 2012 at 9:28 AM, Kathy Ikeda <kathy_ikeda@dot.ca.gov> wrote:

Good morning, Dylan,

There were a couple of inaccuracies in the September 13, 2012 Biological Opinion that were not addressed in the BO clarification letter. For the record, can you please confirm that:

1. The affected river is the Stanislaus River, not the San Joaquin River (as stated on pages 38 and 46 of the BO), and

2. San Joaquin County will not be held to the construction window stated in in the BO ("construction is scheduled to commence in year 2013 and end in year 2015"). Project construction is currently anticipated to begin in 2014 and end in 2017.

Thank you,
Kathy

Kathy Ikeda , Assoc. Environmental Planner
Caltrans District 10, Environmental MPS and Local Assistance Branch
1976 E. Dr. Martin Luther King Jr. Blvd., Stockton, CA 95205
(209) 948-3825

List of Technical Studies That Are Bound Separately

Air Quality Report
Noise Study Report
Noise Abatement Decision Report
Water Quality Report
Natural Environment Study
Biological Assessment
Design Hydraulic Study
Historical Property Survey Report
- Archaeological Survey Report
- Historic Resource Evaluation Report

Hazardous Waste Reports:
- Initial Site Assessment
- Phase II Environmental Site Assessment
- Geotechnical Report

Visual Impact Assessment
Farmland Conversion Impact Rating Form (NRCS-CPA-106)
Traffic Analysis