Draft

WEST STANISLAUS IRRIGATION DISTRICT FISH SCREEN INTAKE

Initial Study/Environmental Assessment

Prepared for
West Stanislaus Irrigation District
United States Bureau of Reclamation

August 2017

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2600 Capitol Avenue
Suite 200
Sacramento, CA 95816
916.564.4500
www.esassoc.com

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NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION AND AVAILABILITY OF INITIAL STUDY/ENVIRONMENTAL ASSESSMENT

West Stanislaus Irrigation District (WSID), in cooperation with the U.S. Bureau of Reclamation (Reclamation), has directed the preparation of an Initial Study/Environmental Assessment (IS/EA) for the WSID Fish Screen Intake Project, in compliance with the California Environmental Quality Act (CEQA) and State CEQA Guidelines and the National Environmental Policy Act (NEPA). WSID is the CEQA lead agency and Reclamation is the lead agency for the Proposed Project/ Action under NEPA.

Project Description. The Proposed Project/Action would include installation and operation of a new 347 cubic feet per second capacity screened intake with a low-lift pump station located on the bank of the San Joaquin River adjacent to the mouth of the WSID intake canal. The screened intake would replace WSID's existing unscreened diversion. The Proposed Project/Action would also include approximately 2,100 feet of underground pipeline from the proposed pump station to the intake canal; sediment removal and management along the length of the existing intake canal; upgrading existing roads along the intake canal; two wildlife crossings of the intake canal, one of which would also allow flood conveyance; facilities for providing late fall-water deliveries to the San Joaquin River National Wildlife Refuge (Refuge); and a flood connectivity structure to support the U.S. Fish and Wildlife Service's management of the Refuge for floodplain reconnection; WSID will not operate the spillway structure as part of this project.

Project Location. The Proposed Project/Action is located adjacent to the San Joaquin River in a rural area of the unincorporated community of Grayson in northwestern Stanislaus County. WSID provides irrigation water to approximately 20,166 acres within its service area as well as 2,207 acres within the White Lake Mutual Water Company service area. WSID's existing intake canal from existing Pump Station 1A to the proposed fish screen intake is located on an easement within the Refuge. The Refuge's Lara Tract is located to the south of the intake canal and the Hagemann Tract is located to the north of the intake canal. The nearest city is Modesto, California, approximately 9 miles northeast of the project site. Interstate 5 (I-5) is located approximately 6 miles southwest of the project site.

Summary of Significant Environmental Effects: The IS/EA found that all potentially significant impacts would be mitigated to a less-than-significant level.

Environmental Review Process. The IS/EA was released for public review on September 1, 2017 and the 30-day public review period will extend through October 2, 2017. The lead agencies would like to receive your comments on the Proposed Project/Action. Please mail or email comments to Shelly Hatleberg (shatleberg@usbr.gov), Bureau of Reclamation – Mid-Pacific Region, 2800 Cottage Way, MP-410, Sacramento, CA 95825 by August 30, 2017. Comments may also be faxed to 916-978-5059. For additional information or to request a copy of the Draft IS/EA, please contact Ms. Hatleberg at 916-978-5050. Copies of the Draft IS/EA may also be viewed at Reclamation's Sacramento office at the above address, at WSID's office at 116 E Street, Westley, CA 95387, and online at:

https://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=30029.

Due to the time limits mandated by state law, your written comments on the IS/EA need to be received no later than **Monday, October 2, 2017 at 5 p.m.**

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List of Acronyms and Abbreviations

$\mu g/m^3$	micrograms per cubic meter
AB	Assembly Bill
AF	acre-feet
AFSP	Anadromous Fish Screen Program
AG	Agriculture (designation)
AMP	archaeological monitoring plan
ASCE	American Society of Civil Engineers
Basin Plan	Water Quality Control Plan for the Sacramento River and San Joaquin River Basins
BAU	business-as-usual
BMP	Best Management Practice
BMWD	Blewett Mutual Water District
BP	before present
BPS	Best Performance Standards
CAAQS	California Ambient Air Quality Standards
Cal/EPA	California Environmental Protection Agency
CalEEMod	California Emissions Estimator Model
California Register	California Register of Historical Resources
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CCAP	Climate Change Action Plan
CCIC	Central California Information Center
CDFW	California Department of Fish and Wildlife
CE	Listed as “endangered” under the California Endangered Species Act
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CH_4	methane
CHRIS	California Historical Resources Information System
CHSC	California Health and Safety Code
CIWMB	California Integrated Waste Management Board
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalents
Corps	U.S. Army Corps of Engineers
Cortese List	Cal/EPA Cortese List Data Resources

CSC	California Department of Fish and Wildlife designated “species of special concern”
CT	Listed as “threatened” under the California Endangered Species Act
CVFPB	Central Valley Flood Protection Board
CVFPP	Central Valley Flood Protection Plan
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
dBpeak	peak decibel level
dBSEL	decibel sound exposure level
Delta	Sacramento-San Joaquin Delta
DMC	Delta Mendota Canal
DNL	Day-Night Noise Level, also L_{dn}
DO	dissolved oxygen
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EC	electrical conductivity
E. coli	Escherichia coli
EFH	essential fish habitat
EPA	U.S. Environmental Protection Agency
ESWD	El Solyo Water District
FCAA	Federal Clean Air Act
FE	Listed as “endangered” under the federal Endangered Species Act
FESA	federal Endangered Species Act
FMP	Fishery Management Plan
fps	feet per second
FT	Listed as “threatened” under the federal Endangered Species Act
FTA	Federal Transit Administration
GHG	greenhouse gas
GWP	global warming potential
HAP	Hazardous Air Pollutant
HCP	habitat conservation plan
HDPE	high-density polyethylene
HFC	hydrofluorocarbon
Hz	hertz
I-5	Interstate 5
IBC	International Building Code
IPCC	International Panel on Climate Change
IS/EA	Initial Study/Environmental Assessment

ITA	Indian Trust Asset
JFSP	Joint Use Fish Screen Project
kV	kilovolt
L_{dn}	Day-Night Noise Level, also DNL
LEA	Local Enforcement Agency
L_{eq}	energy-equivalent sound level
LUST	Leaking Underground Storage Tank
MAF	million acre-feet
mg/L	milligram per liter
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
National Register	National Register of Historic Places
NCCP	natural community conservation plan
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO	nitric oxide
NO_2	nitrogen dioxide
NO_3	nitrate
NOI	Notice of Intent
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NTU	nephelometric turbidity units
OEHHA	Office of Environmental Health Hazard Assessment
OES	Office of Emergency Services
OHP	California Office of Historic Preservation
OHWM	Ordinary High-Water Mark
PFC	perfluorocarbon
pH	potential of hydrogen
PL	Public Law
PM_{10}	particulate matter that is 10 microns or less in diameter
$PM_{2.5}$	particulate matter that is 2.5 microns or less in diameter
ppb	parts per billion
ppm	parts per million
PPV	peak particle velocity
PRC	California Public Resources Code
Reclamation	U.S. Bureau of Reclamation
Refuge	San Joaquin River National Wildlife Refuge, or SJRNWR
RHA	Rivers and Harbors Act
RM	River Mile
RMS	root mean square

ROG	reactive organic gases
RTU	Remote Terminal Unit
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCADA	Systematic Control and Data Acquisition
SF_6	sulfur hexafluoride
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SJRNWR	San Joaquin River National Wildlife Refuge, or Refuge
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLF	Sacred Lands File
SO_2	sulfur dioxide
SPCP	Spill Prevention and Control Plan
SPFC	State Plan of Flood Control
SR	State Route
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TDS	total dissolved solids
tpy	tons per year
UBC	Uniform Building Code
UCMP	University of California Museum of Paleontology
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VdB	Decibel notation commonly used to measure RMS
VELB	valley elderberry longhorn beetle
WDR	waste discharge requirement
WSID	West Stanislaus Irrigation District

SECTION 1
Purpose and Need

1.1 Introduction

In accordance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) this Initial Study/Environmental Assessment (IS/EA) discloses potential environmental impacts of constructing a 347 cubic feet per second (cfs) screened intake and low-lift pump station on the San Joaquin River. This facility includes state-of-the-art fish screens providing safe passage for fish while meeting diversion needs of West Stanislaus Irrigation District (WSID), White Lake Mutual Water Company and the San Joaquin River National Wildlife Refuge (SJRNWR or Refuge). For the purposes of CEQA, the fish screen intake project is the Proposed Project; for the purposes of NEPA, it is the Proposed Action. The fish screen intake project is referred to as the Proposed Project/Action throughout this document. Additional information on specific project facilities and components is included in Section 2, Description of Proposed Project/Action.

This document was prepared as a joint CEQA/NEPA document because the Proposed Project/ Action is a discretionary project of a local lead agency with federal involvement. WSID is the local lead agency under CEQA and would construct, own, and operate the screened intake facility. The United States Department of Interior Bureau of Reclamation (Reclamation) is the federal lead agency under NEPA, because construction of the Proposed Project/Action could involve federal funds through the Anadromous Fish Screen Program (AFSP). Reclamation and the U.S. Fish and Wildlife Service (USFWS) jointly manage the AFSP, which was established in 1994 to help meet the fish restoration objectives required in the Central Valley Project Improvement Act (CVPIA) Section 3406 (b)(21). The screening of WSID's diversion is listed as a priority by the California Department of Fish and Wildlife (CDFW) and by the AFSP through the CVPIA. A list of other state and federal agencies that may have discretionary approval over the proposed project is provided in Section 1.4, Anticipated Regulatory Requirements and Permits for the Project.

This IS/EA is a public document that analyzes the environmental impacts of the Proposed Project/ Action, presents feasible measures to reduce or avoid potential environmental impacts, and evaluates alternatives to the project. It complies with environmental requirements established by both CEQA and NEPA. This IS/EA serves as an informational document to be used in the decision-making process and does not recommend either approval or denial of the Proposed Project/Action.

1.2 Background

1.2.1 West Stanislaus Irrigation District

WSID was established in 1920 for the purpose of providing water for area farmers to grow crops in the San Joaquin Valley. WSID provides irrigation water to approximately 20,166 acres within its service area as well as 2,207 acres within the White Lake Mutual Water Company service area (see **Figure 1-1**). Crops grown in WSID's service area are primarily row crops and orchards including alfalfa, almonds, apricots, beans, cherries, corn, grapes, melons, tomatoes, walnuts and wheat. The average farm in WSID's service area is about 160 acres.

Currently, 347 cfs is diverted into the WSID intake canal from the San Joaquin and Tuolumne Rivers in Stanislaus County. The 347 cfs includes 262 cfs diverted in accordance with WSID's License Number 3957 (Permit 2758, Application 1987), ("License") 45 cfs diverted to meet the WSID's 1939 contractual obligation to provide White Lake Mutual Water Company with 45 cfs to meet its riparian right, and 40 cfs diverted to convey riparian water to the Refuge, located adjacent to the intake canal (see **Figure 1-1**). In 1997, the federal government acquired the lands where the intake canal is located to form the SJRNWR. WSID's easement runs with the land and remains intact.

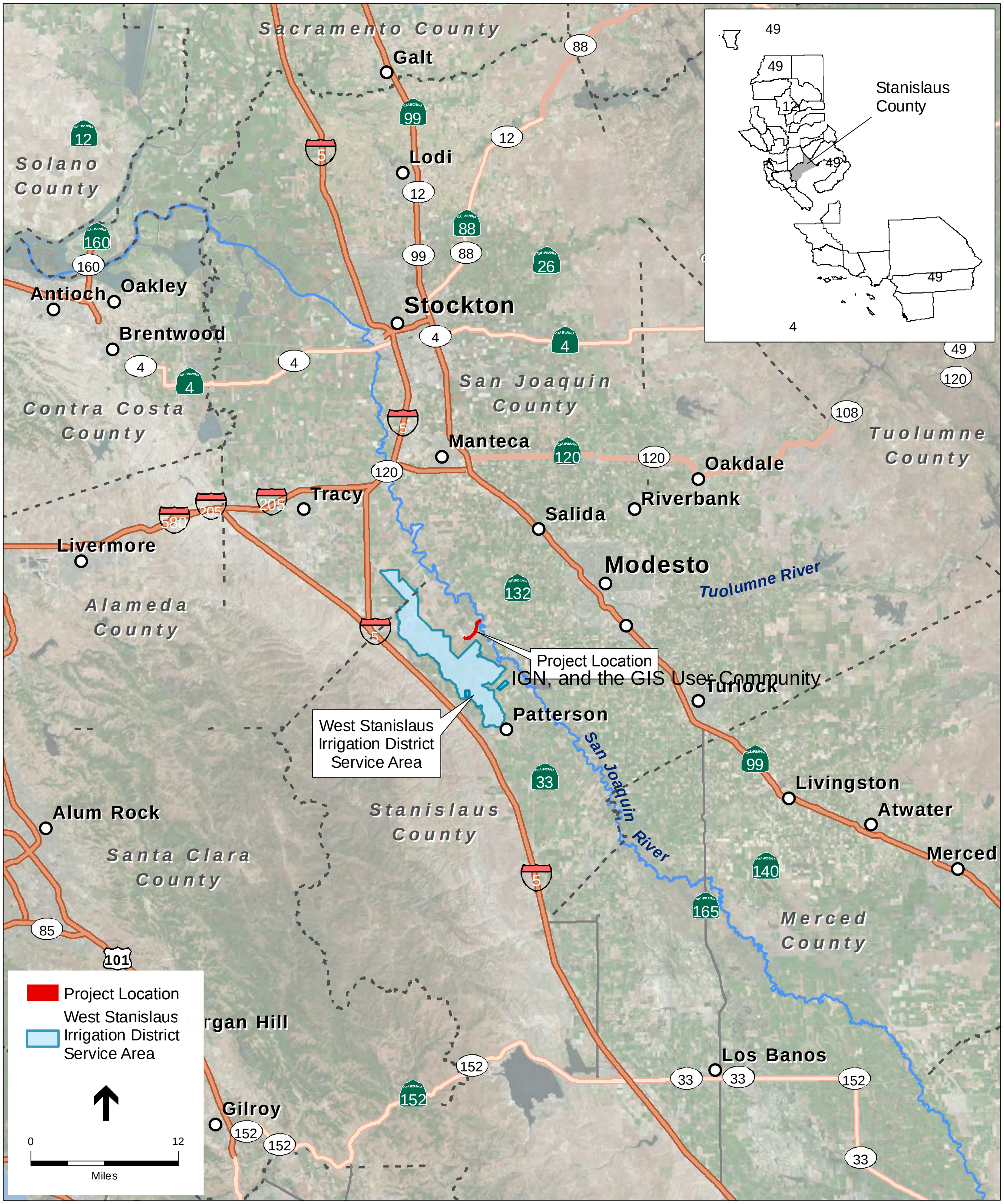
WSID also receives Central Valley Project (CVP) water from the Delta Mendota Canal (DMC) per their contract 14-06-200-1072-LTR. The contract provides for delivery up to 50,000 acre-feet (AF) of project water annually used to supplement crop delivery requirements from March 1 through February 28. WSID's point of diversion under its License is located on the San Joaquin River just upstream of the confluence of the Tuolumne and San Joaquin Rivers. Water from the point of diversion gravity flows through the approximately two-mile-long unlined intake canal to WSID's Lift Station No. 1. In addition, WSID facilities include three miles of concrete lined main lift canal, 45 miles of concrete lined laterals, 14 miles of unlined laterals, 22 miles of concrete pipe sub laterals and approximately 4,000 feet of concrete pipe connecting to the DMC turnout. WSID has six lift pumps within their system for moving San Joaquin River and CVP water throughout the service area.

Along the intake canal, there are four small pumps with capacities of 10 cfs each that are owned by USFWS to maintain wetlands and to irrigate the riparian habitats on the SJRNWR (shown in Figure 2-1 in Section 2, Description of Proposed Project/Action).

1.2.2 Previous Fish Screen Feasibility Studies

2010 WSID Fish Screen Feasibility Study

WSID released a feasibility study in December 2010 (MWH 2010). The study goal was to determine if water diverted from the San Joaquin River could be screened effectively. Initially, several sites upstream of WSID's intake channel were evaluated. As the feasibility study work progressed, it became apparent that changing the point of diversion to an upstream location would



SOURCE: ESRI, 2012; MWH, 2016: ESA, 2017

WSID Fish Screen Intake . 120642

Figure 1-1
Vicinity Map

adversely affect water quality by reducing the comingling effects of flows from the Tuolumne River. The study concluded that the preferred alternative for WSID was a V-Screen facility located within WSID's existing intake channel, maintaining the existing point of diversion on the west side of the San Joaquin River (approximate River Mile [RM] 81.6). The proposed fish screen design, however, raised concerns over fish predation, and would have required a pumped fish return outfall on the San Joaquin River and within the WSID intake canal.

20l2 Supplemental Fish Screen Feasibility Study

WSID prepared a Supplemental Fish Screen Feasibility Study (MWH 2012) to evaluate additional locations for the intake and types of fish screen design. The 2012 supplemental feasibility study concluded that there is only one on-river location near WSID's existing intake canal where a positive barrier fish screen facility (vertical flat-plate screen) could be built that would satisfy WSID water supply and operational needs while also satisfying USFWS and National Marine Fisheries Service (NMFS) concerns with fish predation. This proposed on-river site was to be located on the outside (west bank) of the sharp bend immediately downstream of the existing inlet to the WSID intake channel at approximate RM 81.5.

Joint Fish Screen Project

During 2013 and 2014, due to uncertainties and the complexities involved in siting the fish screen intake on Refuge land, WSID decided to evaluate locating the fish screen intake down river near RM 75 in the vicinity of the Highway 132 Bridge (i.e., Maze Boulevard) at the El Solyo Water District (ESWD) and Blewett Mutual Water District (BMWD) diversions on the River. The Joint Use Fish Screen Project (JFSP) was intended to consolidate the three river diversions (WSID, BMWD, and ESWD) into a single diversion capable of pumping up to 375 cfs with positive barrier fish screens (vertical flat-plate screens). The JFSP included a conveyance system approximately five miles in length to deliver water to WSID, piping to convey water to ESWD, and a main lift canal/pipeline to support BMWD. WSID evaluated the project to a 30 percent design level, but the project was not supported by the other districts. WSID decided to develop a project back at WSID's existing intake canal but with a new type of fish screen – cone screens, which is the Proposed Project/Action under consideration that is evaluated in this IS/EA. This is the only alternative that meets the project purpose and need and project objectives.

1.3 Purpose and Need and Project Objectives

Under NEPA, the purpose of the Proposed Project/Action is to avoid or minimize adverse effects to anadromous juvenile fish due to existing water diversions on the lower San Joaquin River by installing a new 347 cfs state-of-the-art fish screen that meets NMFS and CDFW fish screen design requirements. In addition, the Proposed Project/Action would be consistent with the priorities of CDFW and the AFSP for screening unscreened diversions in the California Central Valley.

The Proposed Project/Action is needed to minimize diversion impacts to migrating anadromous fish in the San Joaquin River without impairing WSID ability to divert water consistent with their existing water rights and contractual obligations. Specifically, the need for the Proposed Project/ Action is to:

- Ensure that WSID can continue to divert water from the San Joaquin River in order to implement its long-term objectives and deliver long-term water supplies to its service area;
- Maintain adequate water quality for San Joaquin and Tuolumne River diversions;
- Maintain water supplies from the San Joaquin and Tuolumne Rivers; and
- Provide a fish screen that meets NMFS and CDFW fish screen design requirements.

Under CEQA, WSID has the following project objectives for the Proposed Project/Action:

- Continue delivering licensed water supplies from the San Joaquin River in order to implement WSID's long-term objectives and provide long-term, reliable water supplies to the WSID service area without adversely impacting water quality or source of water; and
- Construct and operate an intake that meets current NMFS and CDFW fish screen design requirements.

In addition, the following are goals to be achieved to the extent they are consistent with the purpose and need and project objectives:

- Protect and reduce maintenance costs of water supplies delivered to the SJRNWR;
- Provide for safe WSID vehicle passage as well as appropriate voluntary migration pathways over WSID's intake canal for terrestrial wildlife helping to improve and sustain habitat connectivity and populations within the SJRNWR, while at the same time protecting WSID's ability to operate and maintain its pumping station and intake canal; and
- Integrate desirable floodplain connectivity features that support San Joaquin Valley flood management and riparian restoration projects.

1.4 Anticipated Regulatory Requirements and Permits for the Project

The permits and approvals that may be required for the Proposed Project/Action, as well as the regulatory agencies that may rely on this document and the aforementioned permits and/or approvals for consideration, are identified in **Table 1-1**. Some state and federal agencies will use this document for compliance with NEPA and CEQA, to the extent applicable, to issue necessary federal and state permits and approvals.

TABLE 1-1
ANTICIPATED REGULATORY REQUIREMENTS AND PERMITS FOR PROJECT IMPLEMENTATION

Agency	Type of Approval
Federal Agencies	
U.S. Bureau of Reclamation	NEPA Lead Agency, Funding Approval
U.S. Army Corps of Engineers	NEPA Lead Agency Clean Water Act Section 404 Permit
	Rivers and Harbors Act Section 10 Permit
	Rivers and Harbors Act Section 408 Permit
U.S. Fish and Wildlife Service	Federal Endangered Species Act compliance (Section 7)
National Marine Fisheries Service	Federal Endangered Species Act compliance (Section 7)
U.S. Coast Guard	Aids to Navigation Permit
State Agencies	
WSID	CEQA Lead Agency, Project Approval, Funding Approval AB 52 Compliance
California Department of Fish and Wildlife	State Endangered Species Act Compliance (Section 2081)
	Section 1601 Streambed Alteration Agreement
Central Valley Flood Protection Board	Encroachment Permit
Central Valley Regional Water Quality Control Board	National Pollutant Discharge Elimination System General Construction Storm Water Permit (Section 402)
	Clean Water Act Section 401 Water Quality Certification
	General Order for Dewatering and Other Low Threat Discharges to Surface Waters Permit
State Historic Preservation Office	National Historic Preservation Act Section 106
State Lands Commission	Encroachment Permit
Local/Other Agencies	
San Joaquin Valley Air Pollution Control District	Authority to Construct
	Permit to Operate
Stanislaus County	Encroachment Permit
	Development and Land Use Permit
	Building Permit

1.5 Scope and Organization

This IS/EA describes the affected environment, identifies and discloses potential environmental impacts of the Proposed Project/Action and alternatives, and describes mitigation measures to avoid, minimize, or compensate for potentially significant impacts. Section 2 describes the Proposed Project/Action. Section 3 describes the resources that would be affected by implementation of the Proposed Project/Action, including the environmental setting, impacts, and mitigation measures to reduce these impacts. Section 4 provides a list of agencies and individuals involved in the report preparation and Section 5 provides the references for the IS/EA.

The CEQA Environmental Checklist for the Proposed Project/Action is provided as Appendix A. The Environmental Checklist summarizes the level of significance of potential impacts associated with the Proposed Project/Action as required by CEQA.

This IS/EA is being circulated for review and comment by the public and other interested parties, agencies, and organizations for a 30-day review period. During the review period copies of the IS/EA will be available for review at the following locations during normal business hours.

U.S. Bureau of Reclamation
Mid-Pacific Region
2800 Cottage Way
Sacramento, CA 95825

West Stanislaus Irrigation District
116 E Street
Westley, CA 95387

Copies of the IS/EA will also be circulated through the Office of Planning and Research State Clearinghouse to state agencies.

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SECTION 2
Description of Proposed Project/Action

2.1 No Action Alternative

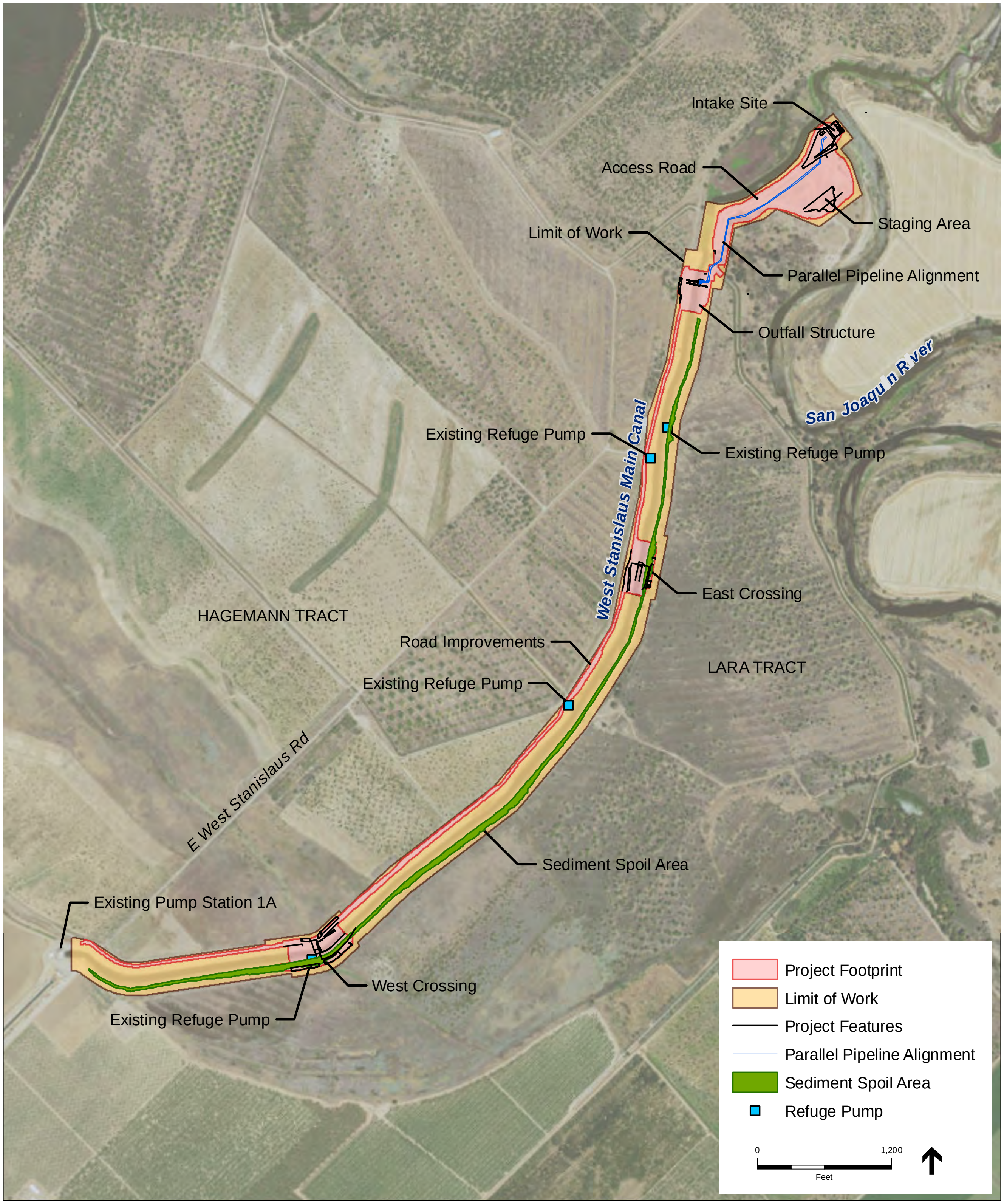
Under the No Action Alternative, the proposed fish screen intake, pump station, conveyance facilities, intake canal improvements, and flood and wildlife enhancements would not be constructed. The proposed fish screen would not be installed and the existing unscreened intake system would continue to operate as it does currently.

2.2 Proposed Project/Action

The Proposed Project/Action consists of the following elements which are described in more detail below: (1) cone screens located at the mouth of the existing intake canal; (2) a low-lift pump station at the same location; (3) approximately 2,100 feet of underground pipeline from the proposed pump station to the intake canal; (4) sediment removal and management along the length of the intake canal; (5) upgrading of existing roads along the intake canal; (6) two wildlife crossings of the intake canal, one of which would also allow flood conveyance; (7) facilities for providing late fall-water deliveries to the Refuge; and (8) a flood connectivity structure to support the USFWS' management of the Refuge for floodplain reconnection; WSID will not operate the spillway structure as part of this project. The project footprint measures approximately 26.7 acres, with an additional approximately 57.8 acres within areas designated operations and access routes; these areas are illustrated in **Figure 2-1**. The following section discusses the Proposed Project/Action elements in more detail and construction considerations that would be incorporated into the Proposed Project/Action.

2.2.1 Fish Screen Intake and Pump Station

The Proposed Project/Action would include installation and operation of a new 347 cfs capacity screened intake with a low-lift pump station located on the bank of the San Joaquin River adjacent to the mouth of the WSID intake canal. Five vertical axial-flow pumps would be located in five separate concrete structures (circular caissons) connected by high-density polyethylene (HDPE) pipe conduits to the cone-type fish screens (cone screens). The cone screens would be installed on a pile-supported steel frame located approximately 70 feet in front of the pump station structure; the cone screens would extend a total of approximately 97 feet into the river and rip rap would be placed between the cone screens and pump station structure (**Figures 2-2 and 2-3**).



SOURCE: ESRI, 2012: MWH, 2017; USFWS, 2006; ESA 2017

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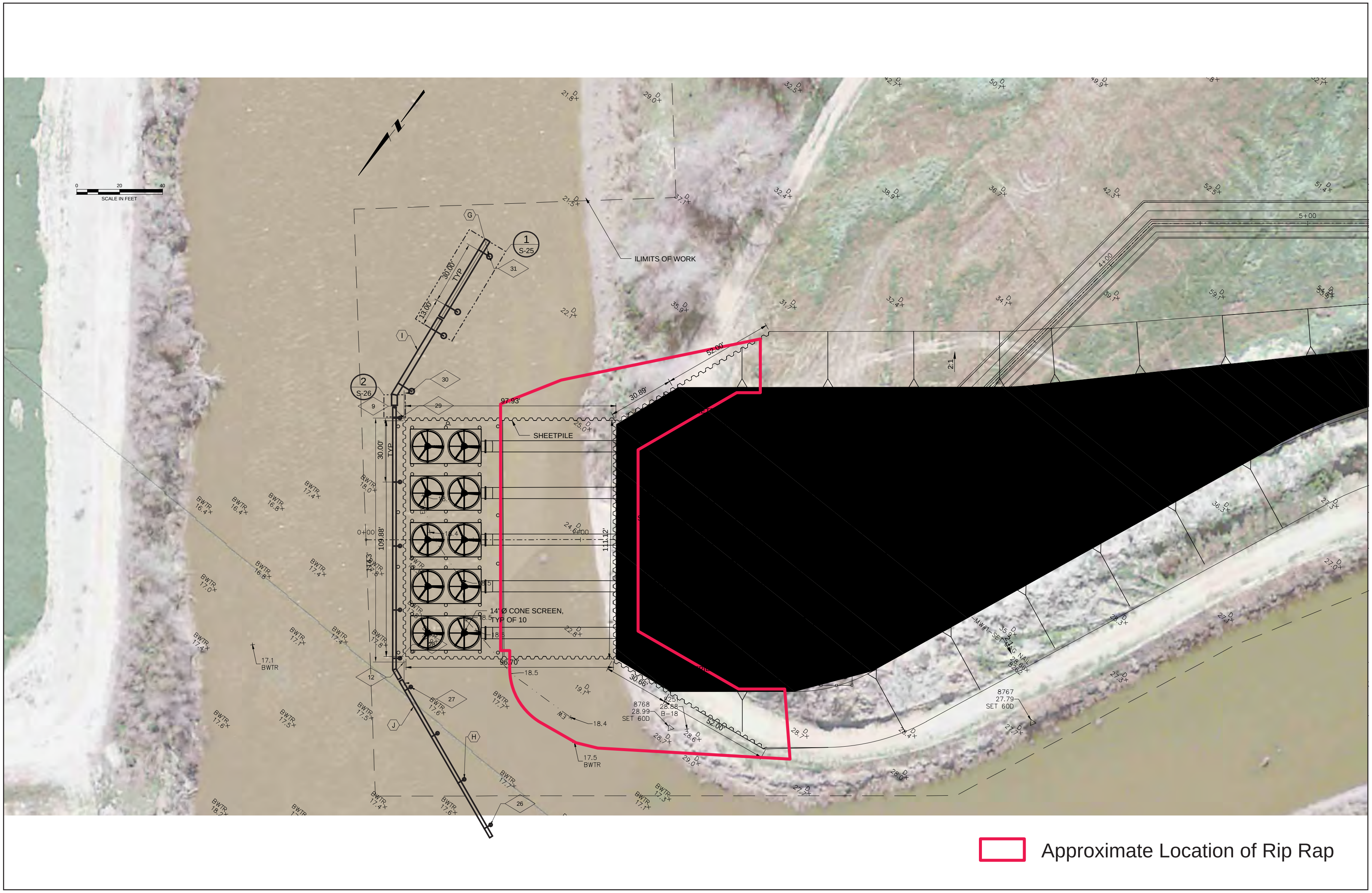
Figure 2-1
Project Location



SOURCE: MWH, 2016

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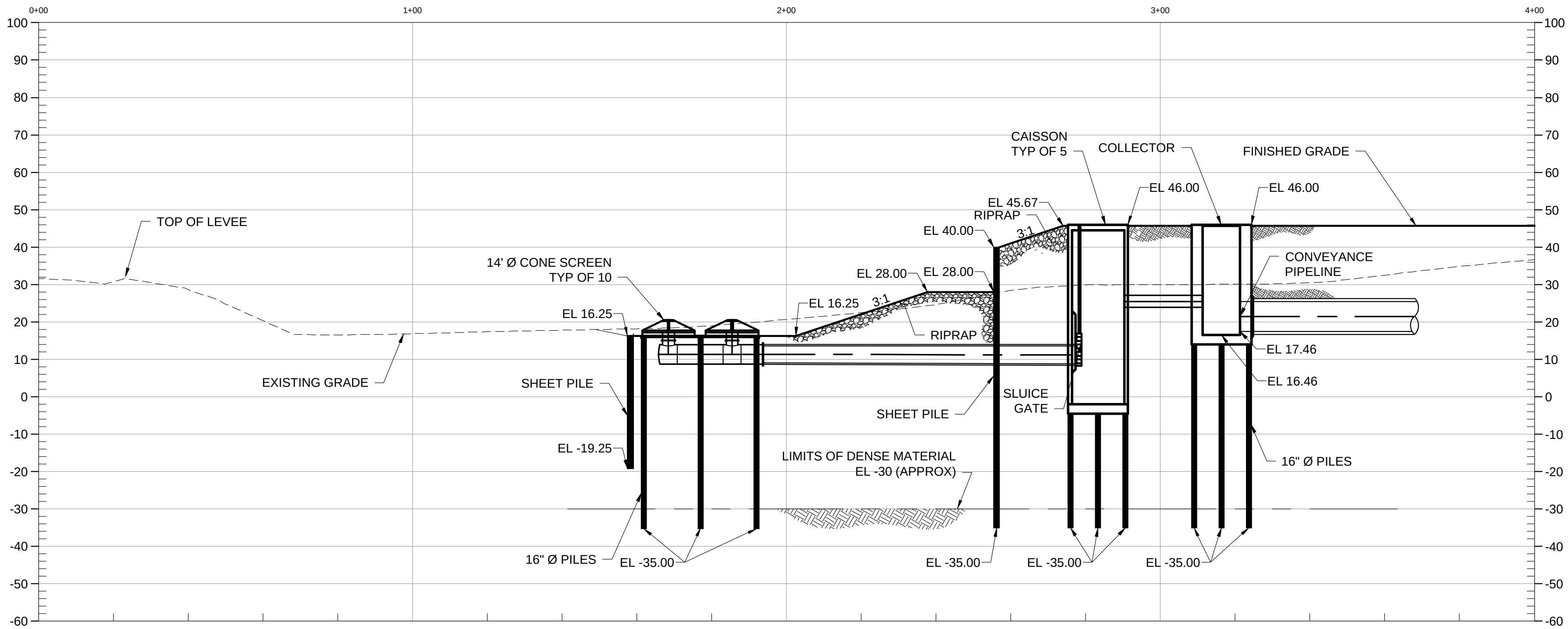
Figure 2-2
Intake Site Plan



SOURCE: MWH, 2016

WSID Fish Screen Intake . 120642

Figure 2-3
Intake Cross Section

A log boom would be installed on the river side (in front of) the fish screen intake to deflect debris away from the intake. The log boom would be steel or high density plastic material.

A permanent sheet pile wall would be installed to retain the pump station embankments and would serve to isolate the pump station structure from the river. Separate permanent sheet piles, with a top elevation approximately matching the river bed, would extend into the river to form an enclosure around the cone screen platform for scour protection.

The pumps would discharge into a common concrete structure from which the flow would be directed via one or both of a 60-inch diameter and 96-inch diameter pipeline to convey water into the intake canal at the abandoned Corps levee. The intake and pump station's facilities are further described below.

Fish Screen Intake

The proposed fish screens would be designed for an approach velocity not to exceed 0.33 feet per second (fps) over the range of foreseeable operating scenarios in accordance with NMFS (NMFS 1997) and CDFW fish screen design criteria for the key fish species of concern at the project site: Central Valley steelhead (federally listed as threatened), fall-run Chinook salmon, and late-fall-run Chinook salmon.

Ten 14-foot diameter stainless steel wedgewire cone screens with 1.75-millimeter slot openings would be mounted on a pile-supported steel frame in the river, with top of platform elevation at 16.75 feet. The screens would be attached to a 1-foot-tall steel ring which could be removed if the river water level drops in the future. An additional 6-inch tall steel ring would be provided to accommodate sediment control system piping. The cone screens would include an electrically actuated rotating brush cleaning system and an internal baffle system to facilitate even velocity distribution across the screen face.

Two screens would provide flow to each independently operating, 70 cfs design capacity pump. Each screen has sufficient screen area to divert up to 50 cfs while meeting NMFS and CDFW approach velocity design criteria when fully submerged; however, the system would be limited to a maximum capacity of 347 cfs at river elevation 20, which equates to the river elevation at the 90 percentile flow rate past the screen location. Thus, the screen elevation would be set such that with river water surface elevation at the design minimum of 20 feet, the screens would have sufficient submergence to provide 35 cfs each at 0.33 fps approach velocity. At higher river stage, the capacity of the cone screens could increase while still meeting the 0.33 fps approach velocity design criteria. With variable frequency drives, a combination of cone screens would be operated, but maximum diversions would not exceed 347 cfs and in accordance with the terms of WSID's water right license; the 347 cfs includes 262 cfs diverted in accordance with WSID's water right License Number 3957, 45 cfs diverted by WSID to meet its contractual obligation with White Lake Mutual Water Company, and 40 cfs of riparian water conveyed to the Refuge. The design capacity accommodates lower river depths during summer months by providing for a greater screen area per unit water depth. At higher river water elevations the approach velocity through the screens would be reduced.

Pump Station

The flow from each pair of fish screens would be routed to one of five separate pump structures via a 63-inch diameter HDPE pipe (**Figure 2-2**). Each pump structure would include a variable frequency drive driven pump and motor. The motor would be capable operating through a range of speeds by way of a variable frequency drive. The flow capacity "design point" for each pump would be 70 cfs. However, the pump would have a pumping range starting at flows less than 70 cfs to flows of approximately 100 cfs. The flows higher than 70 cfs would occur only at river levels sufficient to submerge the cone screens.

The flow rates used would be at WSID's discretion and dependent on demands, river levels, and power-use efficiency.

The pump structure floor would be set at elevation -0.25 feet, which incorporates the required submergence depth below the incoming concrete conduit.

Electrical Systems, Power Supply, and Security

The electrical systems of the proposed screened intake would include power distribution, motor control, lighting and convenience receptacles, auxiliary systems, and grounding.

Electric energy to power the pump station would be delivered via extension of WSID's existing12.47 kilovolt (kV) distribution line. The power line extension would be underground (buried in the intake canal road) and would extend from WSID's Pump Station 1A to an approximately 18 by 43 foot electrical control building on the landside of the screened intake site (see **Figure 2-2**). The 12.47 kV would be transformed at the control building to 480 volts by a pad mounted transformer. The screen intake electric power loading is estimated to be in the range of 1,200 to 1,600 horsepower.

The pump station would be lighted for safety and operation. A combination of surveillance lighting and safety lighting would be installed at the pump station, control building interior, and on exterior areas. Surveillance lighting would be designed to deter intruders, would be angled away from the river, and would turn on only when triggered by motion. Safety lighting would be installed to allow for safe movement of authorized personnel during maintenance activities. Security and area lighting would be LED with level control.

An eight-foot tall fence would be installed around the intake and pump station site. Vehicle and pedestrian access would be by electrically operated gates actuated by remote devices with secure coding. Vehicle speeds within the project site would generally be limited to 15 miles per hour during in the day and 10 miles per hour at night.

The site would have cameras to monitor the general area, which could be viewed from the WSID office. The camera system would use the Systematic Control and Data Acquisition (SCADA) system.

SCADA and camera communication would occur via a newly installed fiber optic line and wireless radio. The fiber line and wireless radio would connect the newly constructed fish screen/ pump station at the Control Room to WSID's currently operated Pumping Plan 1A where the data would tie directly into WSID's existing SCADA system. The purpose of the fiber optic line and wireless radio is to provide needed capacity for surveillance monitoring data and to provide reliable communications to WSID's SCADA system for remote monitoring of operations and security.

Sediment Control System

The proposed fish screen intake and pump station facilities would include a pumped water jet system to prevent sediment from accumulating and impacting facility hydraulics. Sediment control system pumps would be submersible or vertical turbine and would be located in the common pump discharge area. Pump discharge would be piped to stainless steel spray jet manifolds in four general areas to re-suspend any accumulated sediment: common pump discharge area, pump bays, concrete conduits from the fish screens, and the fish screens.

The common pump discharge area would be treated as a single sediment control area and the pump bays would also be treated as a single sediment control area. Each of the five concrete conduits would be separate sediment control areas, and each pair of fish screens would be separate sediment control areas. Pump discharge piping would be valved and routed to each separate sediment control area, with six valved areas per pump, to facilitate efficient sediment re-suspension. In addition, a valved 10-inch diameter pipe would connect the two pump discharges to provide backup in case of a pump failure. The sediment control pumps would be approximately 70 horsepower and would produce approximately 1,120 gallons per minute at 120 feet of head in order to maintain 50 pounds per square inch at the spray jet manifolds.

2.2.2 Conveyance Facilities

Conveyance from the pump station to approximately 200 feet west of the abandoned Corps levee would be made in two approximately 2,100 foot long parallel underground steel pipelines with welded joints. The 60-inch and 96-inch diameter pipelines would be installed in an existing disturbed area adjacent to an existing maintenance road (**Figure 2-1**). They would be operated separately or in combination to maintain self-cleaning velocities, depending on the quantity of flow required to meet the irrigation delivery demand.

2.2.3 Intake Canal Improvements and Flood and Wildlife Habitat Enhancements

Outfall Structure

An outfall structure at the abandoned Corps levee would be constructed prior to the construction of the fish screen intake and other proposed facilities, and would consist of four 9-foot-wide-by-8-foot high gated box culverts for conveyance of irrigation water during construction of the Proposed Project/Action and after construction if the system cannot operate as designed. Operational issues include items such as damage to facilities making the system inoperable or as a result of design failure making operation of the system impractical.

Four 7-foot by 7-foot sluice gates (one for each box) would be installed on the downstream headwall (**Figure 2-4**). Sluice gates would be tested once a year to assure proper operation. In order to isolate the box culverts and assure no unscreened water enters the intake canal, stop log guides would be installed on the upstream side of the box culverts.

The 60-inch diameter and 96-inch diameter conveyance pipelines would be installed adjacent to and parallel with the box culverts and would terminate at the common headwall (common with the box culverts). The ends of the 60-inch diameter and 96-inch diameter pipelines would be gated with 5-foot by 5-foot and 8-foot by 8-foot sluice gates, respectively.

Rip rap would be placed around the conveyance pipelines and outfall structure as shown in **Figure 2-4**.

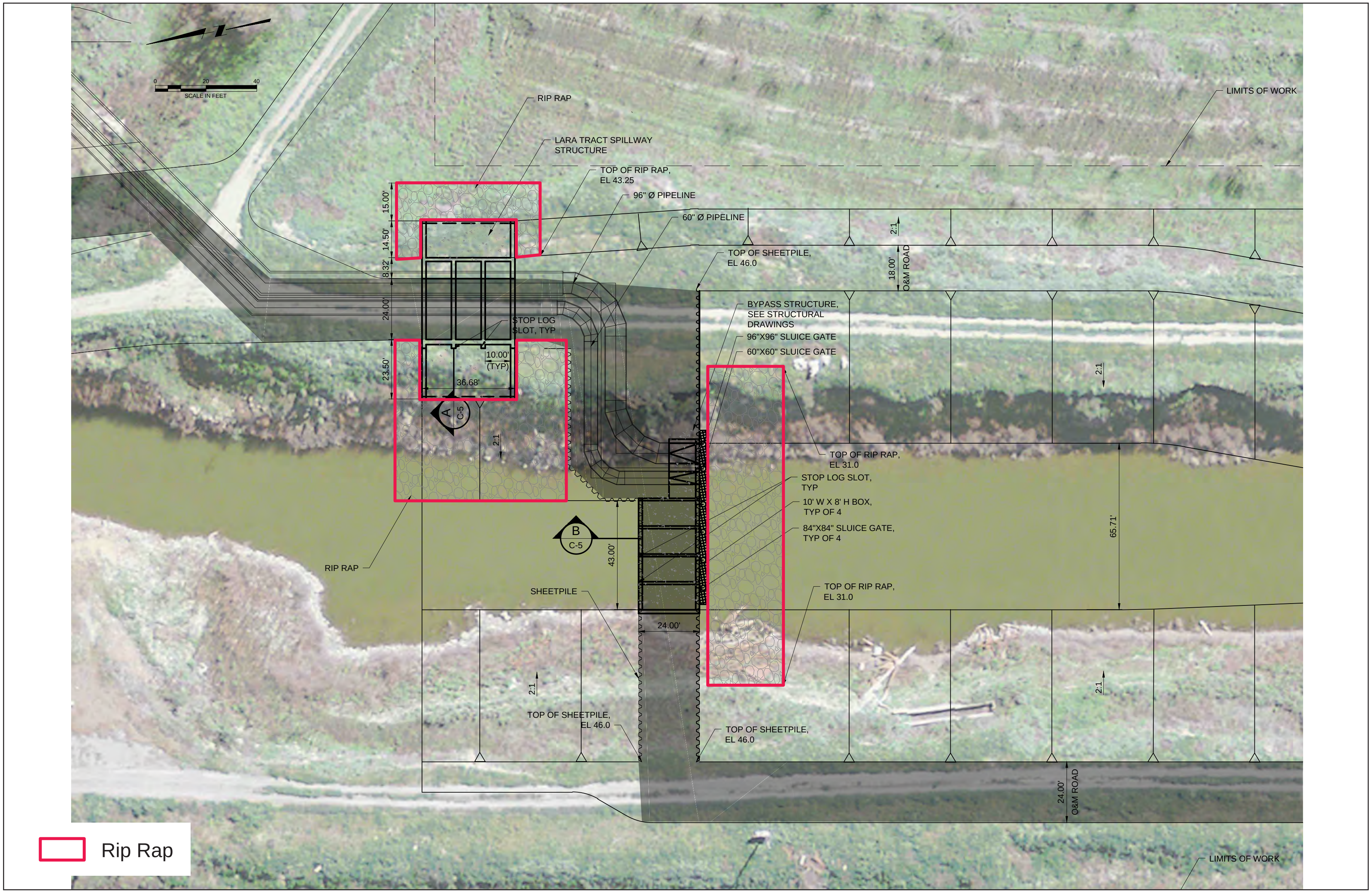
The elevation of the top of the common outlet headwall would be 46 feet and the embankment over the box culverts and pipelines would match the elevations of the existing Corps levee, eliminating the need for the remainder of the intake canal to have the 100-year flood protection.

The six outfall sluice gates would be electrically actuated but not automated, and the operators would be installed at an elevation above the 100-year flood event.

Floodplain Connectivity and Wildlife Passage

The Proposed Project/Action includes the construction of two crossings of the WSID intake canal. Both would allow wildlife passage and one would allow for vehicular passage and for flood waters to cross the canal without intermingling screened diversion water with floodplain water. Both crossings are supported by earthen fill contained by two sheet pile walls driven perpendicular to the WSID canal and penetrated by four culverts to convey canal flows.

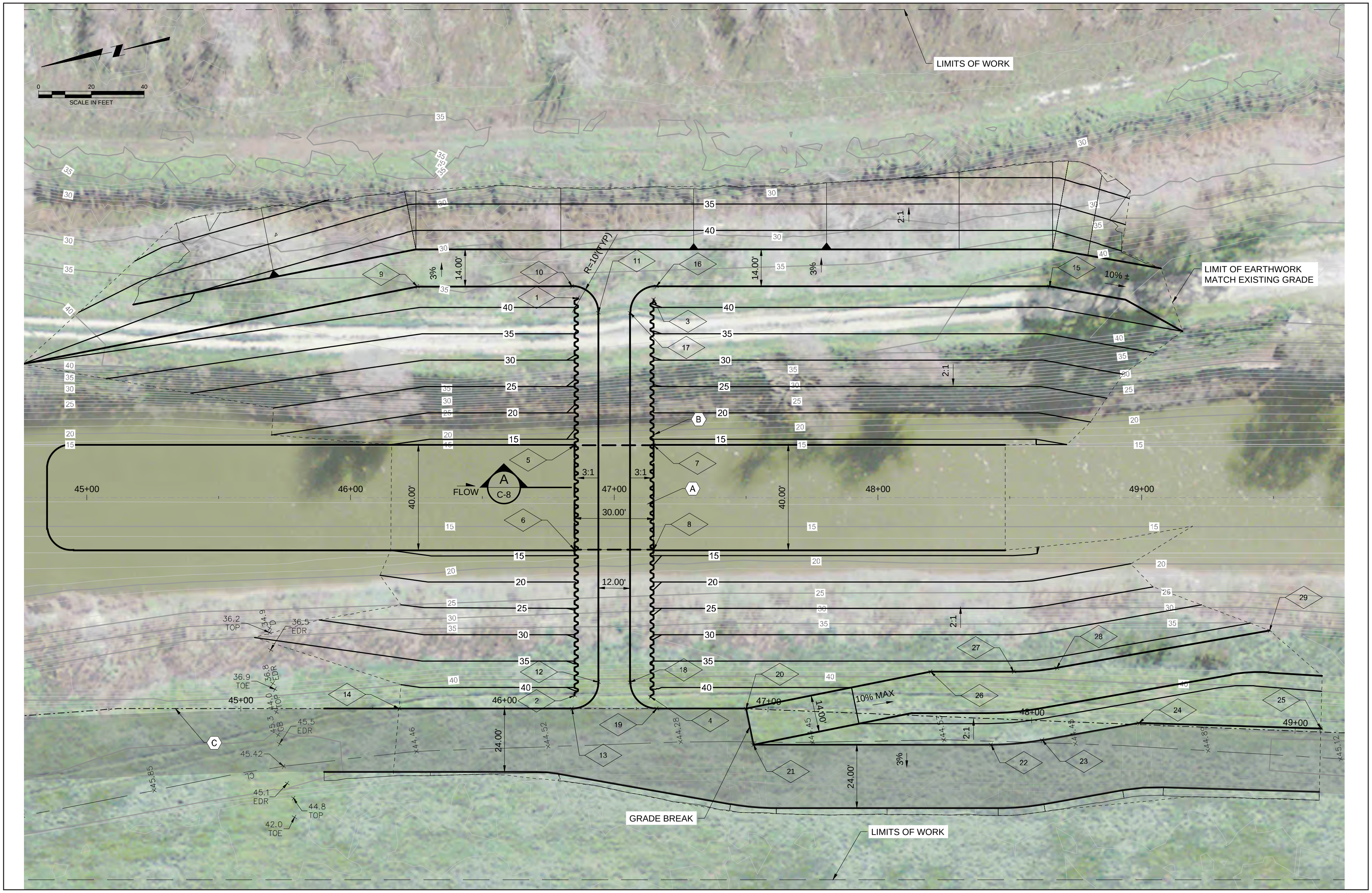
The easternmost crossing of the intake canal, referred to as East Crossing, is shown in **Figure 2-1** and would be vegetated to provide a wildlife crossing. The area is shown in more detail in **Figure 2-5**.



SOURCE: MWH, 2016

WSID Fish Screen Intake . 120642

Figure 2-4
Outfall Structure



SOURCE: MWH, 2017

WSID Fish Screen Intake . 120642

Figure 2-5
East Crossing

The second crossing is referred to as West Crossing in **Figure 2-1**. The area is shown in more detail in **Figure 2-6**. The West Crossing is sited at the natural low point along the intake canal where flood flows would concentrate. To allow flood waters to flow across the WSID intake canal, this crossing would include four 10-foot-wide-by-8-foot-high box culverts aligned perpendicular to the canal and installed with the culvert invert set at the existing ground elevation.

At both locations, the WSID intake canal deliveries would be conveyed in four ungated, 9-foot-wide-by-8-foot-high box culverts installed below the flood and wildlife passage culverts. Slots to receive stop logs would be designed and constructed at the West Crossing culverts to facilitate Pump Station 1A dewatering.

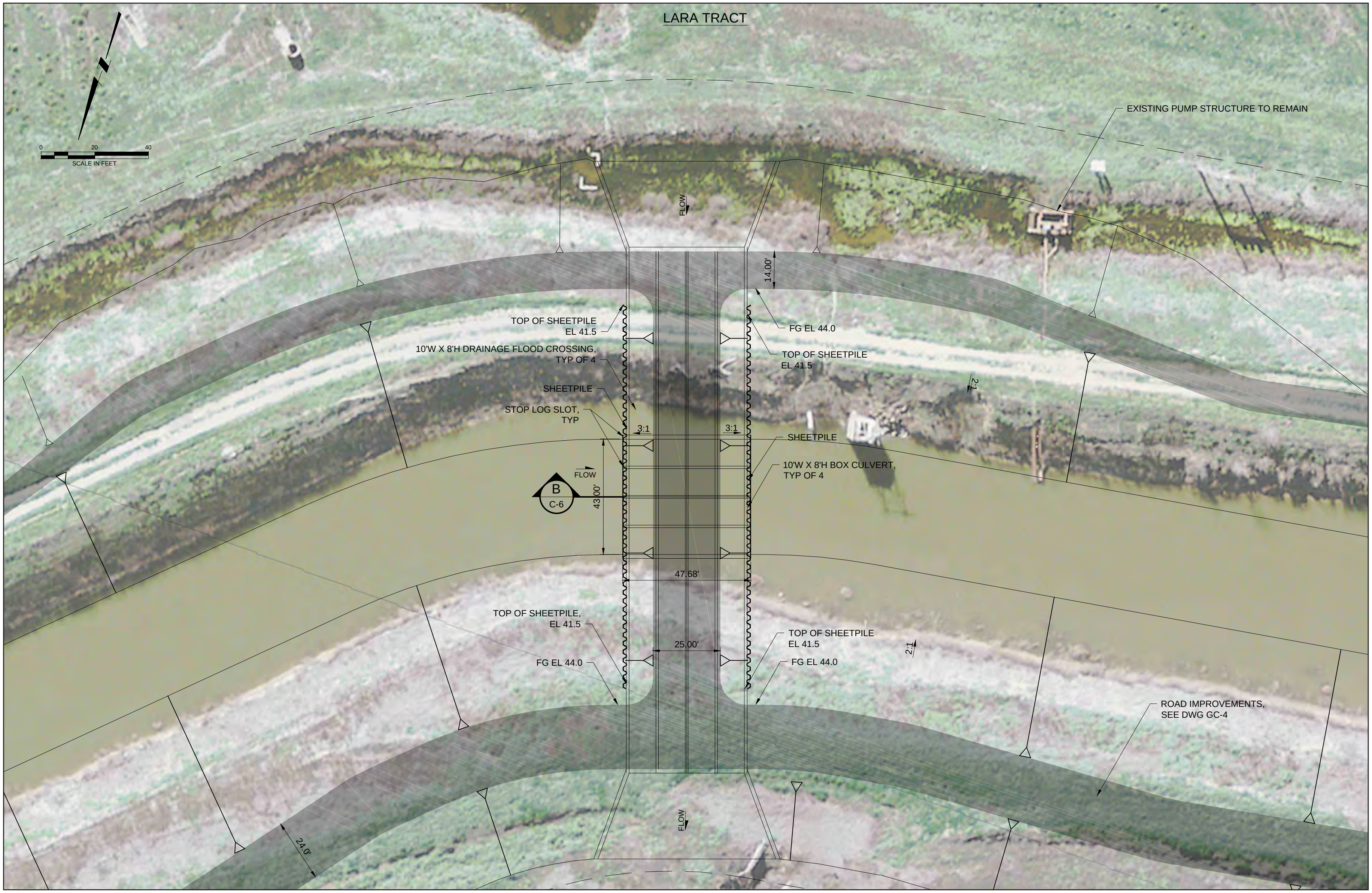
San Joaquin River National Wildlife Refuge Flood Connectivity

A spillway structure would be constructed to allow flood water to enter the Refuge from the San Joaquin River. WSID will not operate the spillway structure as part of this project.

Riparian Woodland Restoration

Once project construction is complete, the staging area southeast of the fish screen intake and access road would be restored into riparian woodland habitat using a mix of plant species similar to the restored woodlands present within the SJRNWR, including canopy tree species Fremont cottonwood (*Populus fremontii*), black willow (*Salix gooddingii*), and valley oak (*Quercus lobata*); subcanopy trees white alder (*Alnus rhombifolia*), box elder (*Acer negundo*), and Oregon ash (*Fraxinus latifolia*); and an understory shrub layer including wild grape (*Vitis californica*), California rose (*Rosa californica*), California blackberry (*Rubus ursinus*), blue elderberry (*Sambucus mexicana*) and shrubby willows (*Salix* spp.).

Under current conditions, flood flows entering the Lara Tract within the SJRNWR generally drain to the Hagemann Tract by gravity flow. Upon entering the Hagemann Tract, flood waters are preferentially directed into the perennial White Lake, which currently drains through an existing 3-foot culvert before returning to the San Joaquin River. The Proposed Project/Action would support the USFWS' management of the SJRNWR for floodplain reconnection; however, WSID will not operate the spillway structure as part of this project and, therefore, the associated impacts are not included in this environmental review and are not part of the agency consultation. When and if WSID comes forward to operate the structure – to provide flood flows to Lara Tract in support of allowing fish to return to the river after accruing nutrients in the floodplain – that would be an independent project subject to environmental documentation and agency consultation.



SOURCE: MWH, 2016

WSID Fish Screen Intake . 120642

Figure 2-6
West Crossing

Refuge Water Deliveries

Riparian water diversion to the Refuge may also be made from the intake canal into the SJRNWR's Hagemann Tract at its low point along the intake canal. Deliveries to the Hagemann Tract would be made by gravity flow from the intake canal when intake canal water surface elevation is at 28 feet or higher. The 28 foot elevation would be controlled using the pumps located at the cone screens. It is anticipated that water deliveries could be made with a water surface in the intake canal of approximately 28 feet and greater. Existing USFWS diversion pumps (shown in **Figure 2-1**) would not change with the Proposed Project/Action.

Intake Canal Road Improvements

Year-round access would be provided to the intake facility through an improved intake canal levee road beginning at Pump Station 1A and continuing to the intake site. The existing maintenance roads along each side of the intake canal vary with regard to top-of-bank elevation. From Pump Station 1A to the new Corps levee crossing, the north maintenance road would be raised where necessary to elevation of 44 feet to provide all-weather access to the fish screen intake and pump station.

From the Corps levee crossing to the fish screen intake site, the south maintenance road would be constructed to an elevation of 46 feet, which is the required height for the design-established 100-year floodwater surface elevation plus necessary freeboard. The completed road would provide all-weather access to the fish screen intake and pump station.

2.3 Operation and Maintenance

WSID would be responsible for the operation and maintenance of the proposed project facilities which are described below.

Fish Screen Intake Operation and Maintenance Activities

Routine operation and maintenance for the proposed fish screen would include the following activities.

Supervisory Control and Data Acquisition System

Monitoring and control of the fish screen intake would be incorporated into WSID's existing SCADA system. A Remote Terminal Unit (RTU) would be housed in the Control Building for local control of the fish screen. Data from the fish screen intake would then be transmitted to WSID's office utilizing fiber optic cable and wireless radio. The fiber optic cable and wireless radio would be used to transmit SCADA information and video surveillance data.

Pumps located at the intake site would be operated to maintain a constant target level in the intake canal. All five pumps would be controlled using variable frequency drives. Two water level sensors would be installed in a stilling well located at the outfall of the conveyance pipes, which would be located at the head of the intake canal. Data from the sensor would be hardwired back to RTU utilizing buried cables. Sensors located at the intake canal would be inspected monthly at a minimum, cleaned and calibrated.

Intake Screen Operation and Maintenance

It is anticipated that WSID personnel would visit the intake site daily at a minimum for general inspection of equipment and site security. The intake screen would be equipped with a cleaning system that would include a brush mechanism driven by an electric drive unit. The speed of the brush would be controlled by the electric drive unit. The Local Control Panel would allow operation and testing of the brush assembly.

The starting, stopping, and operating time of the cleaning would be adjustable and would be controlled by the difference in water surface elevation between pre-screen and post-screen measurements and/or time of day. When the elevation difference exceeds a preselected value, the screen brush would be activated to clean the screen. Screen cleaning would also be possible through a pre-determined schedule. The selection of water level difference or schedule of operation would be available on the Operator Interface Terminal screen of the RTU.

The screen cleaning would reduce debris accumulations and help maintain uniform approach velocities over the screen surface, thereby avoiding turbulence and “velocity hot spots”, which increase the vulnerability of fish to localized impingement on the screen surface. The screen cleaning system would continue to function throughout project operations.

It is anticipated that intake screen maintenance would be performed at least annually during times when the river levels are relatively low. At times the screens may require removal for repair. Operating staff would maintain a stock of replacement screens that would be installed rapidly in case repair is needed. Long-term operation is therefore expected to be reliable and periods of non-function would be brief. The removal operation would require WSID staff to access the screens by boat or wade into the river to the fish screen platform. The screens would physically be removed utilizing a crane operating from the site crane pad. The intake would be capped when the screens are removed.

Sediment control at the intake screens would be maintained using a pumped water jet system to prevent sediment from accumulating on the screen deck. It is anticipated that after higher than normal flow rates at 5,000 cfs and above, additional sediment control maintenance would be needed. Sediment would be excavated using mechanical shovels or a suction system once flows reduce to average or low levels, as needed, and would be stockpiled adjacent to where it was dredged to dry, then would be loaded onto a dump truck and spread and compacted at low points on the south access road of the intake canal.

Following a flood event, the inlet of the intake would be inspected for damage, including identification of any potential scour holes. The rip rap protection would be evaluated and if required, rip rap would be replaced. Rip rap quantities would be determined by the amount required to replace damaged or missing rip rap. The replacement of the rip rap would be accomplished utilizing a long-reach excavator staged out of the water to transfer and place the rip rap as required.

Pump, Motor, and Caisson Operation and Maintenance

Pumps would be accessed daily for inspection and to refill oil reservoirs. Pump caissons would be dewatered annually for inspection and sediment removal. To dewater the caissons, the intake pipes would be isolated by closing a slide gate on the inside of the caisson. Using installed pumps, the caisson would be dewatered. Caissons would be entered using permanently installed ladders and a maintenance deck. If sediment were present, it would be removed and spread and compacted at low points on the south access road of the intake canal.

Pumps would be removed every 10 years for inspection and repair. This maintenance would occur outside of the river.

Collector Box Maintenance

The collector box would be accessed annually for inspection and sediment removal as needed. Isolation of the collector box would occur by closing the slide gate in the pump caissons to assure no river water enters. Slide gates located at the Corps structure would be closed to isolate water in the intake canal. Utilizing permanently installed ladders in the collector, the collector would be entered for inspection and sediment removal as needed. If sediment were present, it would be removed and spread and compacted at low points on the south access road of the intake canal.

Sediment control pumps installed in the collector would be inspected annually and removed for repair at an estimated 10-year interval. One pump would be removed at a time so that sediment resuspension operations would be maintained at all times. This maintenance would occur outside of the river.

Access for the Fish Screen, Pump Station, and Intake Canal

The electrical/control building and the pump station top deck would be accessible from the gravel area constructed on the land-side of the pump station at 100-year flood elevation. This area would also accommodate a pneumatic tire crane to enable the vertical pumps to be removed for future major overhaul/maintenance activities.

The valves for the sediment control system and the fish screen hydraulic unit's brush cleaner would be accessible from the pump station top deck. Removable grating on the top deck would allow access to sluice gates, flap gates, and sediment control system pumps for future major maintenance or removal actions.

Access to the pump structures and pump discharge pipe would be provided by two 4-foot square hatches and permanent ladders. The ladders would lead to a grated access deck at the pump discharge level. From this deck the pump discharge flanges could be removed to allow pump removal. The grating at this deck would be removable to allow access down to the HDPE conduits routed from the pump bays to the fish screens.

Intake Canal Operation and Maintenance Activities

Routine operation and maintenance for the intake canal, the responsibility of WSID, would include the following activities.

Terrestrial Weed Control

Operation and maintenance activities for the intake canal are currently performed by WSID, and WSID would continue to be responsible for them after implementation of the Proposed Project/Action. WSID performs pre- and post-emergent herbicide applications along the intake canal per recommendations from a Certified Pest Control Advisor. Herbicides are applied using a variable rate, direct nozzle injection system mounted to a truck. Applications are typically performed twice a year.

Discing activities are typically performed during the spring months using a tractor. Discing occurs on the shoulders of access roads located on both sides of the intake canal.

Inspection and Repair of Washout Areas

Intake canal banks are inspected annually for washout areas. Areas of concern are repaired by hauling in native soil using a 10-yard dump truck or transfers. Material is stockpiled adjacent to the repair area and is then placed and compacted by an excavator and steel drum sheepsfoot or vibratory roller.

Tree Trimming/Removal

Trees are routinely trimmed and/or removed from the inner banks of the intake canal to protect the integrity of the inside banks and to maintain free access along the operations and maintenance roads. Two half-ton pickups are typically used for this activity. Vegetation removal generally occurs between September 1 and January 1; however, activity may occur at any time during the year if required to support irrigation deliveries.

Installation, Removal and Maintenance of Log Booms

A log boom is installed in the intake canal to prevent a large amount of vegetation from entering WSID's pump station. The log boom is typically removed, inspected, and reinstalled annually in the summer months when flows are reduced using a truck and excavator.

Inspection of Intake Site

Fencing around the intake site would be inspected annually and repaired as needed. Weed control would be performed using pre and post-emergent herbicide applications per recommendations from a Certified Pest Control advisor. Herbicides would be applied using a variable rate, direct nozzle injection system mounted to a truck. Applications would be typically performed twice a year. Structures would be inspected annually and repairs would be performed as needed. The heating, venting, and air conditioning located in the Control Building would be serviced annually at a minimum and cleaned monthly.

In-Canal Operation and Maintenance

Water level sensors are installed and maintained along the intake canal. These sensors are accessed once a week using a truck to clean the sensor and download water level data.

The intake canal would require periodic dredging along its entire length similar to past maintenance activities. It is anticipated that more concentrated dredging activities would be required just downstream of the outfall structure where sediment would settle out after being transported from the conveyance pipelines. The sediment removed from the canal would be spread and compacted in low points along the south maintenance road and within WSID easements (**Figure 2-6**).

It is anticipated that periodic dredging would be required around the fish screen steel deck (discussed above under Intake Screen Operation and Maintenance). Sediment removed from this area would be deposited at low points along the south maintenance road.

Sediment removal methods would be selected based on the condition and may include methods such as manual removal, clamshell or suction dredge from a barge, use of a long-reach excavator, or dragline operations. The frequency of sediment removal would be dependent on the hydrological conditions for any given year or sequence of years. In general, there would likely be the need for sediment removal every four or five years at a minimum.

Outfall Structure and SJRNWR Lara Tract Spillway Operation and Maintenance

As noted previously, WSID will not operate the spillway structure as part of this project and, therefore, the associated impacts are not included in this environmental review and are not part of the agency consultation.

Sluice gates located on the downstream side of the conveyance pipe outfall structure would be normally open and would only be closed when the collector box needs to be isolated. Sluice gates would be operated annually, at a minimum, to ensure proper operation.

Stop logs would be installed on the upstream side of the gravity supply culverts and would be replaced on an as needed basis. There are also sluice gates installed on the downstream side of the structure that would be operated annually to assure proper operation. The structure would operate primarily during construction of the intake structures to supply water to the WSID. After operation of the newly constructed intake facilities, the gravity supply culverts would not be operated unless the intake facilities were to become inoperable. Sluice gates located on the downstream side of the structure would be operated annually to ensure proper operation. Stop logs would be installed on the upstream side of the structure when the intake screens are operated to prevent unscreened water from entering the intake canal.

East and West Crossing Structure Maintenance

The roadway over the West Crossing structure would be graded annually at the same time the access roads along the intake canal are graded.

Stop logs installed on the upstream side of the West Crossing structure would need to be replaced as needed. Stop logs would normally be removed from the structure to allow water to flow to WSID's pump station. When the intake canal downstream of this structure needs to be dewatered, stop logs would be inserted into the guides to isolate the downstream side.

2.4 Construction Considerations

2.4.1 Water-Side Construction

All water-side construction activities associated with the fish screen intake would be confined within a sheet-pile cofferdam, which would be put in place and removed during the low-flow period from June 15 to November 1, except by extension approved by CDFW and NMFS. The sheet-pile cofferdam would remain in place following construction of the fish screen intake and pump station (anticipated to take a total of approximately 12 months) and would either be driven into the riverbed for additional scour protection or cut off flush with the riverbed during the dry season (June 15 to November 1). The sheet pile cofferdam would be installed with a vibratory pile driver to minimize underwater sound pressures and associated effects to fish species present in the project area.

Sediment curtains and silt fences would be used where construction activities could possibly cause sediment to enter the river. Sediment curtains would be placed around the construction or maintenance zone to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone. Silt fencing would be installed in all upland areas where construction occurs within 100 feet of known or potential steelhead or Chinook salmon habitat.

Fresh concrete would be isolated from wetted channels for a period of 30 days after it is poured. If a 30-day curing period is not feasible, a concrete sealant as approved by USFWS, NMFS, and CDFW may be applied to the surfaces of the concrete structure. If a sealant is used, the manufacturer's guidelines for drying times would be followed before reestablishing surface flows within the work area.

Spoil sites and other debris areas such as a concrete wash site would be located so they do not drain directly into the San Joaquin River. The concrete wash site would be lined with plastic and waste concrete would be removed from the site after construction operations are complete. If a spoil site drains into the San Joaquin River, catch basins would be constructed to intercept sediment before it reaches the channel. Spoil sites would be graded to reduce the potential for erosion.

Well-graded riprap would be placed behind the sheet pile wall to cover piping between the cone screens and pump caissons, and it would be placed by the outfall structure (**Figure 2-2** and **Figure 2-4**); smaller rock would be mixed in with the riprap to fill any gaps.

Dewatering Construction Area

The work area within the cofferdam would be dewatered on a continuous basis using dewatering wells. Dewatering would also be required for excavation associated with the installation of the 60-inch diameter and 96-inch diameter pipelines, outfall structure, and culvert box structures of the East and West Crossings.

The contractor would be responsible for selecting the appropriate range of groundwater levels and equipment for the dewatering system used during construction, based on site conditions. The dewatering system would: lower the water table inside the excavation or intercept seepage which would emerge from the sides or the bottom of the excavation; improve the stability of the excavation and prevent disturbance of the bottom of the excavation; provide a reasonably dry working area in the bottom of the excavation; and provide for collection and removal of surface water and rainfall (AGS 2017).

Water from dewatering activities would be discharged back into the San Joaquin River or intake canal in accordance with regulatory permits. WSID would apply and receive coverage under National Pollutant Discharge Elimination System (NPDES) No. CAG995001 Waste Discharge Requirements General Order for Dewatering and Other Low Threat Discharges to Surface Waters.

A Fish Rescue Plan (Appendix C, Pile Driving, Dewatering, and Fish Rescue Plan) would be implemented, in coordination with and approved by CDFW and NMFS, prior to dewatering and if overtopping of the cofferdam occurs during construction, which would minimize potential construction-related effects to fish species present in the project area.

Fish Screen Intake and Pump Station

The fish screen intake would be constructed of cast-in-place reinforced concrete or precast concrete that would be delivered to the intake site. The cone screens would be supported by 18 structural steel piles 16 inches in diameter, and 10 16-inch diameter piles would support connecting pipes between the cone screens and pump caissons. Pile driving would be used to install the piles. Installation of the piles, sheet piles (630 linear feet) and beams during construction of the cofferdam would be performed primarily using a vibrating method. In the event that river bottom substrate does not allow installation of sheet piles and beams using the vibrating technique, use of an impact hammer would be required. Depths would be based on a sediment transport evaluation that would be completed prior to construction.

Each of the five pump stations would require an open pit excavation and the pump caissons would be supported by 80 16-inch diameter piles. The collector structure adjacent to the pump stations would be supported by 24 16-inch diameter piles. The pump stations would be constructed in the excavation and then the excavation would be backfilled. Following installation of the pump station structures, pumping equipment (e.g., pumps, motors, valves, and piping) and motor control system improvements would be installed. An electrical power line extension would be buried in the intake canal road and would extend from existing Pump Station 1A to the proposed electrical control building by the intake site.

The electrical control building would be constructed of reinforced concrete block masonry. The roof system would consist of a light-gauge pre-engineered truss steel joist or structural steel beams with metal roof decking.

Disturbed areas would be restored to pre-construction conditions by replanting emergent vegetation and planting native vegetation using a vegetation mix approved by USFWS. An eight-foot-tall fence would be installed around the intake and pump station site.

2.4.2 Conveyance Facilities

Installation of the 60-inch and 96-inch pipelines would involve trenching approximately 2,100 feet in length to depths of approximately 35 feet. The pipelines would be installed adjacent to an existing maintenance road using open trench construction methods. The trench would be excavated to depths of up to approximately 20 feet and up to 34 feet wide on either side of the trench. Trench walls would be shored up when more than five feet in depth. The floor of the trench would be prepared and the pipelines would be installed and covered with compactable backfill material. Slopes would be contoured to 1.5:1. Following installation, the surface of the trench and all disturbed areas would be restored to pre-construction conditions.

2.4.3 Intake Canal and Flood and Wildlife Habitat Enhancements

Construction of the outfall structure, East Crossing, West Crossing, and Lara Tract spillway would include the placement compacted fill and aggregate base; materials and equipment for construction would be stored at the designated staging areas.

Approximately 374 linear feet of sheet piles would be constructed around the outfall structure. Approximately 280 linear feet of sheet piles would also be driven around each of the East Crossing and West Crossing structures, south of the outfall structure.

A Fish Rescue Plan (Appendix C) would be implemented, in coordination with and approved by CDFW and NMFS, prior to construction of the outfall structure, which would minimize potential construction-related effects to fish species present in the project area.

2.4.4 Access Roads

In order to maintain access to the site, roads would be constructed to the minimum elevations established for the roads, including 8 inches of Class II Aggregate base surfacing. Roads would be raised where necessary using material excavated during project construction. Prior to the placement of the fill on top of the intake canal bank, the top 12 inches of the soil would be scarified and compacted to 95 percent relative compaction. All disturbed areas would be restored to pre-construction conditions following installation.

2.4.5 Excavation and Materials Staging

The Proposed Project/Action would not require the import or export of material.

All cuts deeper than 5 feet would be sloped or shored.

Prior to construction of the proposed outfall structure, the top 10 feet of the existing materials at the bottom of the canal and side slope would be removed and replaced with structural backfill. A geotechnical engineer would observe the bottom of the excavation. If the bottom of excavation is soft, additional excavation might be required. Similarly, the spillway structure would be constructed on a minimum of 3 feet of structural backfill. The backfill materials would be extended about 3 feet behind the bottom of the proposed box culvert. Prior to construction of the proposed spillway structure, a geotechnical engineer would observe the bottom of the excavation. If the bottom of the excavation is soft, additional excavation might be required.

Compacted fill and backfill would be used mainly as trench backfill and as fill placed for outfall structure construction. Material to be used as compacted fill and backfill would be predominantly granular, less than 3 inches in any dimension, free of organic and inorganic debris, and contain less than 20 percent of mostly non-plastic fines. Excavated soils meeting the above requirements would be used as structural and non-structural fills and backfills. Staging areas would be established in existing disturbed areas at the location of existing sand sediment piles immediately southeast of the fish screen intake site and at a site adjacent to Pump Station 1A (**Figure 2-1** and Figure 3.2-4 from Section 3.2, “Aesthetic Resources”). Staging areas would accommodate and support the construction activities, including storage of excavated materials, and equipment and materials storage.

Staging areas would include gravel access driveways to minimize the tracking of dirt onto public roads, spill containment facilities, and concrete washout areas. Whenever practical, construction materials, supplies, and equipment would be stored inside the staging areas. Upon completion of the construction activities, leftover construction materials would be removed and the areas would be regraded and restored to existing conditions or would be planted with a mix of riparian woodland vegetation as described in Section 2.2.3, Intake Canal Improvements and Flood and Wildlife Habitat Enhancements.

2.4.6 Other Construction Considerations

All construction activities would comply with the requirements in the NPDES Construction General Permit and the Best Management Practice (BMP) Standards of the California Stormwater Quality Association, as approved by the Central Valley Regional Water Quality Control Board (CVRWQCB) to minimize construction-related impacts to water quality.

BMPs may include, but might not be limited to: (1) conducting major construction activities involving excavation and hauling spoils during the dry season, to the extent possible; (2) use of straw bales, sandbags, gravel traps and filters; (3) erosion control measures such as vegetation and physical stabilization; and (4) sediment control measure such as fences, dams, barriers, berms, traps, and basins. The specific BMPs to be implemented would be determined prior to issuance of the Construction General Permit, in coordination with the CVRWQCB.

A Storm Water Pollution Prevention Plan (SWPPP) would be implemented, which is a requirement of the NPDES that regulates water quality when associated with construction activities. The SWPPP would address all pollutants and their sources, including sources of sediment associated with construction, construction site erosion, and all other activities associated with construction activity and controlled through the implementation of BMPs. The construction contractor would also prepare and implement a construction erosion and sedimentation control plan to control the transport of sediment.

The construction contractor would exercise every reasonable precaution to protect waterways from pollution with fuels, oils, and other harmful materials. Gas, oil, or other petroleum products, or any other substances that could be hazardous to aquatic life and resulting from project-related activities, would be prevented from contaminating the soil and/or entering waters of the state and/or waters of the United States. Vehicles and equipment would be checked daily for leaks and would be properly maintained to prevent contamination of soil or water from external grease and oil or from leaking hydraulic fluid, fuel, oil, and grease. A written Spill Prevention and Control Plan (SPCP) would be prepared, and the SPCP and all material necessary for its implementation would be accessible on-site prior to initiation of construction activities, and throughout the construction activities. The SPCP would include a plan for the emergency cleanup of any spills of fuel or other material. Employees would be provided the necessary information from the SPCP to prevent or reduce the discharge of pollutants from construction activities to waters and to use the appropriate measures should a spill occur. Any such spills, and the cleanup efforts, would be reported in an incident report and submitted to WSID.

Throughout the construction period, water quality (turbidity, settleable material, and/or visible construction pollutants) would be monitored as required by Section 401 CVRWQCB certification requirements to ensure that it stays within acceptable limits. This would include regular grab samples to monitor turbidity and settleable material. Construction pace would be slowed and/or stopped if turbidity exceeds criteria established by the CVRWQCB.

2.5 Workforce and Equipment

2.5.1 Intake and Pump Station

The construction of the intake and pump station facilities would be anticipated to occur over a 9-month construction period of the first 12 months following the contract award. Construction of the intake and pump station would require a crew consisting of an average of 10 workers over the duration of the construction period. **Table 2-1** presents the construction equipment that would likely be required at various times during the construction of the pump station and intake facilities.

TABLE 2-1
INTAKE AND PUMP STATION CONSTRUCTION EQUIPMENT

Type of Equipment	Number of Equipment	Average Use (per day/duration)
Pickups	2	4 hours/9 months
Small Backhoe	1	4 hours/9 months
Large Excavator Backhoe	1	8 hours/2 months
Dump Truck	2	8 hours/2 months
Flat Bed Truck	1	4 hours/9 months
Vibratory Compactor	1	8 hours/2 months
Ready-mix Concrete Trucks	2	8 hours/2 month
Pile Driving	1	8 hours/2 months
Large Crane	1	8 hours/6 months
Front-end Loader	1	4 hours/9 months
Small Crane or Large Boom Truck	1	8 hours/9 months
25 kVA Portable Generator	4	8 hours/4 months
Dewatering Pump System	1	24 hours/3 months

Source: Dahl Consultants 2016

2.5.2 Earthwork

Earthwork for the project would consist of excavation and placement of approximately 30,000 cubic yards of material for development of the pump station site, access roads, and crossings of the intake canal. **Table 2-2** presents the construction equipment that would likely be required at various times for earthwork operations for the project. Some of the equipment would be used for road maintenance during the work.

TABLE 2-2
EARTHWORK CONSTRUCTION EQUIPMENT

Type of Equipment	Number of Equipment	Average Use (per day/duration)
Pickups	2	4 hours/2 months
Large Excavator Backhoe	1	8 hours/2 months
Dump Truck	2	8 hours/2 months
Flat Bed Truck	1	4 hours/2 months
Vibratory Compactor	1	8 hours/2 months
Caterpillar 633 Self-loading Scraper	2	8 hours/1 month
Water Truck	1	8 hours/6 months
Caterpillar Motor Grader	1	8 hours/6 months

Source: Dahl Consultants 2016

2.5.3 Conveyance Pipelines

The construction of the conveyance pipelines would occur over an approximately 2-month period and would require a crew consisting of an average of 10 workers over the duration of the construction period. **Table 2-3** presents the construction equipment that would likely be required at various times during the installation of the conveyance pipelines.

TABLE 2-3
CONVEYANCE PIPELINES CONSTRUCTION EQUIPMENT

Type of Equipment	Number of Equipment	Average Use (per day/duration)
Pickups	4	4 hours/2 months
Large Excavator Backhoe	1	8 hours/2 months
Dump Truck	2	8 hours/2 months
Frontend Loader	2	8 hours/2 months
Vibratory Compactor	1	8 hours/2 month
Small Bulldozer	1	4 hours/2 months
Large Crane	1	8 hours/2 months
25 kVA Portable Generator	4	8 hours/2 months
Dewatering Pump System	1	24 hours/2 months

Source: Dahl Consultants 2016

2.5.4 Outfall Structure

The construction of the outfall structure would occur over an approximately 3-month period and would require a crew consisting of an average of 5 workers over the duration of the construction period. **Table 2-4** presents the construction equipment that would likely be required at various times during the installation of the outfall structure.

TABLE 2-4
OUTFALL STRUCTURE CONSTRUCTION EQUIPMENT

Type of Equipment	Number of Equipment	Average Use (per day/duration)
Pickups	1	4 hours/3 months
Small Backhoe	1	4 hours/1 month
Large Excavator Backhoe	1	8 hours/1 month
Dump Truck	2	8 hours/1 month
Pile Driving	1	8 hours/1 month
Vibratory Compactor	1	8 hours/1 month
Ready-mix Concrete Trucks	2	4 hours/1 month
Small Crane or Large Boom Truck	1	8 hours/2 months
15 kVA Portable Generator	1	8 hours/2 months
Dewatering Pump System	1	24 hours/2 months

Source: Dahl Consultants 2016

2.5.5 East and West Crossing Structures

The East and West crossing structures would be constructed after the outfall structure is completed, and after the conveyance pipelines are installed and the new intake and pump station is fully operational.

The construction of the East and West Crossing structures would occur over an approximately 4-month period and would require a crew consisting of an average of 5 workers over the duration of the construction period. **Table 2-5** presents the construction equipment that would likely be required at various times during the installation of the East and West Crossing structures.

TABLE 2-5
EAST AND WEST CROSSING STRUCTURES CONSTRUCTION EQUIPMENT

Type of Equipment	Number of Equipment	Average Use (per day/duration)
Pickups	1	4 hours/4 months
Small Backhoe	1	4 hours/2 months
Large Excavator Backhoe	1	8 hours/2 months
Dump Truck	2	8 hours/2 months
Pile Driving	1	8 hours/2 months
Vibratory Compactor	1	8 hours/1 month
Ready-mix Concrete Trucks	2	4 hours/2 months
Small Crane or Large Boom Truck	1	8 hours/2 months
15 kVA Portable Generator	1	8 hours/3 months
Dewatering Pump System	1	24 hours/3 months

Source: Dahl Consultants 2016

2.6 Construction Schedule

It is anticipated that the fish screen intake and pump station would be constructed and operational within approximately 12 months from contract award (or Construction Year 1). It is anticipated that pile driving for the sheet pile and foundation pile would have a duration of approximately 3 months, in Construction Year 1. The estimated time for construction of the pump station is approximately 9 months, in Construction Year 1. The sheet-pile cofferdam would be driven into the riverbed or cut off flush with the riverbed during the dry season of Construction Year 1. The site excavation and roadway improvements and the outfall structure would be constructed in Construction Year 1. Under the currently anticipated sequencing plan, the construction of the East and West Crossing structures would begin after the fish screen and pump station were operational, and would be completed in approximately 22 months, by Construction Year 2.

Construction work times would comply with the County’s allowed construction hours and would typically occur Monday through Friday, 8 hours per day.

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SECTION 3
Affected Environment and Environmental Consequences

This section describes the affected environment and environmental consequences of implementing the WSID Fish Screen Intake Project. For each resource, construction and operational activities that could cause adverse environmental impacts directly or indirectly are identified along with mitigation measures to minimize identified significant adverse impacts. Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] Part 1500), allow federal agencies to focus their NEPA analysis on those resources that could be affected and to omit discussion of resource areas that clearly would not be affected by the Proposed Project/Action. Because this is a joint NEPA/CEQA document, the topical resource areas from the CEQA Guidelines Appendix G Initial Study Checklist are used as a basis for the analysis where applicable.

Determining significance or importance of likely environmental impacts in a NEPA document requires consideration of context and intensity. Context is the geographic, biophysical, and social context in which the effects will occur. 40 CFR Section 1508.27 mentions society as a whole, the region, and affected interests as examples of context. Intensity refers to the severity of the impact, in whatever context(s) it occurs. 40 CFR Section 1508.27 states that the following should be considered in measuring intensity:

- Impacts that may be both beneficial and adverse;
- Effects on public health and safety;
- Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas;
- The potential for controversy on environmental grounds;
- Uncertainty about effects or unique risks;
- The potential for establishing a precedent or representing a decision in principle that defines the parameters of a further action;
- Cumulative impacts;
- Potential adverse effects on districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, and the potential for loss or destruction of significant scientific, cultural, or historical resources;

- Potential adverse effects on an endangered or threatened species or its habitat, or on a critical habitat; and
- Potential for violation of a Federal, state, or local law or requirement imposed for the protection of the environment.

Significance thresholds for this analysis encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and the intensity of its effects, and were adapted from Appendix G of the State CEQA Guidelines (California Code of Regulations, Title 14, Chapter 3, Appendix G) and (for cultural resources) from the National Historic Preservation Act (NHPA).

The CEQA Initial Study Checklist prepared for the Proposed Project/Action is included as Appendix A.

3.1 Land Use and Agriculture

3.1.1 Affected Environment

The project site is located in a rural area of the unincorporated community of Grayson, in northwestern Stanislaus County, California. The WSID intake canal from Pump Station 1A to the proposed fish screen intake is located on an easement within the SJRNWR. The SJRNWR's Lara Tract is located to the south of the intake canal and the Hagemann Tract is located to the north of the intake canal. The proposed fish screen intake would be located on the San Joaquin River, approximately 2.25 miles south of State Route (SR) 132/Maze Boulevard. The nearest city is Modesto, approximately 9 miles northeast of the project site. Interstate 5 (I-5) is located approximately 6 miles southwest of the project site.

Existing Land Uses

The project area consists primarily of managed open space and wildlife preservation areas, wetlands, and riparian lands adjacent to the San Joaquin River, with active agricultural areas and scattered residential single-family homes in the vicinity. Riparian zones are located along the San Joaquin River near the proposed fish screen intake site.

The SJRNWR was established in 1987 to provide winter forage and roosting habitat for the threatened Aleutian cackling goose (formerly known as the Aleutian Canada goose; since delisted), protect other federally listed species, improve and manage habitat for migratory birds, and conserve native fauna and flora. In 1997, the federal government acquired the lands in the vicinity of the intake canal for inclusion in the SJRNWR. WSID's easement along the intake canal and Pump Station 1A runs with the land and remains intact after the sale of the land. The project site is located in the southern portion of the SJRNWR. The SJRNWR has focused on the restoration of riparian woodland, and the former agricultural fields on both sides of the intake canal have been planted with native trees and shrubs such as willows, cottonwoods, oaks, Pacific blackberry, and California rose. The SJRNWR offers limited recreational opportunities for the general public, with a public visitor center, a nature trail that is open daily, and a wildlife viewing area that is open to the public from mid-October to mid-March.

The San Joaquin Valley is one of the most productive agricultural regions in the world, and agriculture is the primary industry in Stanislaus County. Almonds, walnuts, and other fruit and nuts rank in the top 10 agricultural commodities in the county, along with milk, cattle, chicken, turkeys, and eggs (Stanislaus County 2015).

WSID was established in 1920 for the purpose of providing water for area farmers to grow crops in the San Joaquin Valley. WSID serves irrigation water to approximately 20,166 acres within its service area, with the average farm size being about 160 acres. The crops grown in WSID's service area are primarily row crops and orchards, including alfalfa, almonds, apricots, beans, cherries, corn, grapes, melons, tomatoes, walnuts and wheat. WSID also provides irrigation water to approximately 2,207 acres within the White Lake Mutual Water Company service area.

The project site and the immediate surroundings are designated as Agriculture (AG) by the Stanislaus County General Plan and are zoned Exclusive Agriculture 40 (A-2-40). The project site does not contain any agricultural lands, including prime farmland or lands under a Williamson Act Contract. Adjacent lands southwest and east of the project site are designated Prime Farmland, Farmland of Statewide Importance, and Williamson Act Prime Agricultural Land (California Department of Conservation 2012 and 2015). The SJRNWR in the area of the project site, the WSID easement including the intake canal, and the San Joaquin River in the vicinity of the proposed fish screen intake are not enrolled in a Williamson Act contract and are designated as "Nonagricultural and Natural Vegetation" areas.

3.1.2 Regulatory Framework

This section discusses the state and local policies and regulations relevant to the analysis of land use and agriculture in the project area. No federal regulations pertaining to land use and agriculture are applicable to the Proposed Project/Action.

State Regulations

Williamson Act

California's Land Conservation Act of 1965 is designed to preserve agricultural and open space lands by discouraging premature and unnecessary conversion to urban uses. The Act creates an arrangement whereby private landowners contract with counties and cities to voluntarily restrict their land to agricultural and compatible open-space uses. The vehicle for these agreements is a rolling term 10-year contract (i.e., unless either party files a "notice of nonrenewal," the contract is automatically renewed for an additional year). In return, restricted parcels are assessed for property tax purposes at a rate consistent with their actual use, rather than potential market value. There are no lands subject to Williamson Act contracts that would be affected as the result of implementing the Proposed Project/Action (California Department of Conservation 2012).

Local Regulations

Stanislaus County General Plan

The Proposed Project/Action is located entirely within Stanislaus County. The project site is designated as Agriculture in the Stanislaus County General Plan. The County General Plan Land Use Element and Agricultural Element include goals and policies relevant to the Proposed Project/Action, which are listed below in **Table 3.1-1**.

TABLE 3.1-1
LAND USE AND AGRICULTURAL GOALS AND POLICIES OF STANISLAUS COUNTY

Number	Goals and Policies
Agricultural Element	
Goal 2	Conserve our agricultural lands for agricultural uses.
Policy 2.5	To the greatest extent possible, development shall be directed away from the County's most productive agricultural areas.
Policy 2.15	In order to mitigate the conversion of agricultural land resulting from a discretionary project requiring a General Plan or Community Plan amendment from 'Agriculture' to a residential land use designation, the County shall require the replacement of agricultural land at a 1:1 ratio with agricultural land of equal quality located in Stanislaus County.
Land Use Element	
Goal 1	Provide for diverse land use needs by designating patterns which are responsive to the physical characteristics of the land as well as to environmental, economic and social concerns of the residents of Stanislaus County.
Policy 2	Land designated Agriculture shall be restricted to uses that are compatible with agricultural practices, including natural resources management, open space, outdoor recreation and enjoyment of scenic beauty.
Goal 2	Ensure compatibility between land uses.

Source: Stanislaus County 2016

3.1.3 Environmental Consequences

Significance Criteria

This analysis of land use and agriculture evaluates the potential effects of the Proposed Project/Action on the existing land use and agricultural resources within or adjacent to the project site.

Effects are considered significant if an alternative would result in any of the following:

- Physically divide an established community
- 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; or conflict with applicable habitat conservation plans (HCPs) or natural community conservation plans (NCCPs)
- 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

- Conflict with existing zoning for agricultural use, or a Williamson Act contract
- Conflict with existing zoning for, or cause rezoning of, forest land (as defined in California Public Resources Code [PRC] Section 12220[g]), timberland (as defined by PRC Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104[g])
- Result in the loss of forest land or conversion of forest land to non-forest use
- 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

Impact Evaluation

Resources Not Considered in Detail

Implementation of the Proposed Project/Action would not directly or indirectly physically divide an established community as there are no established communities in the project area. In addition, implementation of the Proposed Project/Action would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use, or directly or indirectly result in impacts to forest land, timberland, timberland production, or lands under Williamson Act contracts, as these resources are not present in the project site. The San Joaquin County Multi-Species Habitat Conservation and Open Space Plan and Pacific Gas & Electric's Multi-Species HCP have plan areas in Stanislaus County, but the Proposed Project/Action would be located within the WSID easement and it would not impact an HCP or NCCP. Therefore, no impact would occur and these resource areas are not discussed further within this section.

No Project/Action Alternative

Under the No Project/Action Alternative, the proposed fish screen intake, pump station, and associated features of the Proposed Project/Action would not be constructed. The proposed fish screen would not be installed and the existing unscreened intake system would continue to operate as it does currently. As a result, impacts to land use and agriculture would remain unchanged from existing conditions and no impact would occur.

Proposed Project/Action Alternative

Impact 3.1-1: The Project would be consistent and compatible with existing land use and zoning plans and policies. (Less than Significant)

The Proposed Project/Action is located within and near the San Joaquin River in an area designated as Agriculture by the Stanislaus County General Plan. Construction and operation of the fish screen intake, pump station, and associated features of the Proposed Project/Action would not conflict with the Stanislaus County General Plan policies or goals related to agricultural uses because the facilities would be located in existing disturbed areas and would not impact agricultural land. In addition, water diverted at the fish screen intake would continue to serve existing agricultural uses and no disruption of service would occur. As a result, construction of the Proposed Project/Action would not conflict with or be incompatible with existing land use and zoning plans and policies.

Mitigation: None required.

Impact 3.1-2: Project construction and operation could involve changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use. (Less than Significant)

Construction of the Proposed Project/Action would involve construction within the San Joaquin River and WSID's intake canal, and onshore, all in disturbed areas where no existing agricultural uses are present. Construction staging areas and access routes would also be located in disturbed areas where no existing agricultural uses are present. Agricultural lands are located within the project area, southwest and east of the project site. Given the small scale of the Proposed Project/Action within the WSID easement and the temporary and phased nature of construction, agricultural operations in the vicinity of the project area would not be significantly impacted (also discussed in Section 3.9, Transportation and Traffic). Therefore, project construction would not result in the conversion of farmland to non-agricultural use and this impact would be less than significant.

Operation of the Proposed Project/Action would result in the continued diversion of water to support existing agricultural irrigation with the WSID service area pursuant to existing water rights and would not result in new impacts to agricultural lands. As a result, project operations would not result in the conversion of farmland to non-agricultural use and this impact would be less than significant.

Mitigation: None required.

3.2 Aesthetic Resources

3.2.1 Affected Environment

Existing Aesthetic Character

The project area is rural in character with open space and agricultural land uses composing the visual environment. The project site is located in the northern portion of the San Joaquin Valley, on a WSID easement within the southern portion of the SJRNWR. Areas in the vicinity of the project site include disturbed and ruderal areas, grasslands, riparian woodlands, wetlands, and the San Joaquin River, with agricultural fields located outside the SJRNWR; representative photographs of the project site are shown in **Figures 3.2-1 through 3.2-5**.

A history of flooding along the San Joaquin River resulted in the construction of an extensive network of levees along the river in order to protect surrounding buildings and agricultural operations. Areas that now encompass the SJRNWR previously consisted of flood-prone farmland. After levees in the project area failed in 1983 and 1997, the USFWS purchased over 3,000 acres of land on the west bank of the San Joaquin River in 1999, including the project site, primarily to provide a demonstration of a non-structural flood management alternative. The USFWS does not maintain the area levees for historical flood protection. The project site and areas within the SJRNWR include unmaintained levees and private access and maintenance roads.

The SJRNWR has focused on the restoration of riparian woodland in the project area, and former agricultural fields on both sides of the WSID intake canal have been planted with native trees and shrubs such as willows, cottonwoods, oaks, blackberry, and rose.

There are no significant topographic features in the project area that restrict views, with only local features such as levees and roadway embankments limiting local view from specific locations.

Sensitive Viewers

Viewer response to change is a function of viewer sensitivity, duration of exposure, and degree of visual change. Sensitivity depends on the expectations and awareness of the viewer. Residential and recreational viewers are presumed to be more sensitive than other groups who may be working or commuting in the area. As exposure time increases, the perception of visual change in the landscape also increases.

The nearest residences are located approximately 3,300 feet southwest of the project site and approximately 5,500 feet northeast of the project site on the opposite side of the San Joaquin River as the proposed facilities.


East Crossing view of Hagemann Tract


East Crossing view of Lara Tract

SOURCE: ESA, 2016

Figure 3.2-1
Representative Site Photographs

SOURCE: ESA, 2016

WSID Fish Screen Intake . 120642

Figure 3.2-2
Representative Site Photographs

SOURCE: ESA, 2016

WSID Fish Screen Intake . 120642

Figure 3.2-3
Representative Site Photographs


Refuge lands near intake canal


Staging area near intake site

SOURCE: ESA, 2016

WSID Fish Screen Intake . 120642

Figure 3.2-4
Representative Site Photographs

SOURCE: ESA, 2016

Figure 3.2-5
Representative Site Photographs

Recreationists, including hikers and boaters, are considered to be sensitive viewers. The San Joaquin River is navigable by recreational traffic, and the project area in the vicinity of the river offers a variety of recreational opportunities, such as boating, fishing, hiking, and wildlife viewing. WSID's easement along the intake canal and Pump Station 1A is located in the southern portion of the SJRNWR. The main entrance to the SJRNWR and nature trail are located off Dairy Road, south of SR 132, approximately 2 miles northwest of the project site. The wildlife viewing area is located off Beckwith Road, north of SR 132, approximately 5 miles north of the project site.

Scenic Highways and Vistas

No state scenic highways or vistas are located in the project area. I-5 in Stanislaus County is an officially designated State Scenic Highway (Caltrans 2011); I-5 is located approximately 5 miles west/south of the project area. Past studies have identified several routes in Stanislaus County as potential scenic routes, including State Highway 132 west of Modesto and approximately 2.5 miles north of the project site. These potential scenic routes are generally characterized by open, undeveloped areas, in either a natural condition or devoted to agricultural production (Stanislaus County 2016). The project area is not visible from the designated highway or other potential scenic routes or scenic vistas.

3.2.2 Regulatory Framework

This section discusses the state and local policies and regulations relevant to the analysis of aesthetic resources in the project area. No federal regulations pertaining to aesthetic resources are applicable to the Proposed Project/Action.

State Regulations

California Scenic Highway Program

California's Scenic Highway Program was created in 1963 to preserve and protect scenic highway corridors from change which would diminish the aesthetic value of lands adjacent to highways. The state laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq. The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. These highways are identified in Section 263 of the Streets and Highways Code.

Local Regulations

Stanislaus County General Plan

Table 3.2-1 summarizes the planning goals and policies for managing and protecting scenic and other aesthetic resources from the Stanislaus County General Plan Conservation and Open Space Element (Stanislaus County 2016).

TABLE 3.2-1
AESTHETIC RESOURCE GOALS AND POLICIES OF STANISLAUS COUNTY

Number	Description
Conservation and Open Space Element	
Goal 1	Encourage the protection and preservation of natural and scenic areas throughout the County.
Policy 1	Maintain the natural environment in areas dedicated as parks and open space.
Policy 2	Assure compatibility between natural areas and development.
Policy 3	Areas of sensitive wildlife habitat and plant life (e.g., vernal pools, riparian habitats, flyways and other waterfowl habitats, etc.) including those habitats and plant species listed in the General Plan Support Document or by state or federal agencies shall be protected from development.

Source: Stanislaus County 2016

3.2.3 Environmental Consequences

Significance Criteria

This analysis of aesthetic resources evaluates the potential effects of the Proposed Project/Action on the existing aesthetic resources within or adjacent to the project site.

Effects are considered significant if an alternative would result in any of the following:

- Have a substantial adverse effect on a scenic vista
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway
- Substantially degrade the existing visual character or quality of the site and its surroundings
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area

Impact Evaluation

Resources Not Considered in Detail

Implementation of the Proposed Project/Action would not directly or indirectly have a substantial adverse effect on a scenic vista or substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway because the project area is not within a state scenic highway or scenic vista. Therefore, no impact would occur under any of these categories and they are not discussed further within this section.

No Project/Action Alternative

Under the No Project/Action Alternative, the proposed fish screen intake, pump station, and associated features of the Proposed Project/Action would not be constructed. WSID would continue to use its existing unscreened diversion and this would not result in a change to aesthetic resources, therefore no impact would occur.

Proposed Project/Action Alternative

Impact 3.2-1: The Project could degrade the existing visual character or quality of the site and its surroundings. (Less than Significant)

The views within the SJRNWR and along the San Joaquin River are unique visual resources to local sensitive viewers (recreationists and residents outside the SJRNWR). While there are no residences in the vicinity of the project site and there is no public access on the SJRNWR for terrestrial recreation in the area of the project site (the closest access is at the SJRNWR main entrance and nature trail approximately 2 miles northwest of the project site), recreational boaters may use the area in the vicinity of the proposed fish screen intake and pump station. Other features of the Proposed Project/Action would be located along the WSID intake canal and would not affect visual resources.

The proposed fish screen intake and pump station would be located along and within the San Joaquin River and these new structures would affect views of recreational boaters. While their primary activities involve recreational pursuits such as angling or cruising, recreational boaters are a group of recreationists likely to be sensitive to visual change. However, this group is expected to be less sensitive to visual change provided their recreational activities are not adversely affected or impaired (discussed in Section 3.11, Recreation). Further, the scale of proposed the fish screen intake and pump station on the river would be minor compared to the area covered by the river, and the facilities would be consistent with existing SJRNWR, WSID, and agricultural operations in the vicinity of the project site, as well as with other fish screen intakes and pump stations in the region. As a result, the Proposed Project/Action would not substantially degrade the existing visual character or quality of the project site and its surroundings and this impact would be less than significant.

Mitigation: None required.

Impact 3.2-2: The Project would create a new source of substantial light or glare that would adversely affect nighttime views in the area. (Less than Significant)

The proposed fish screen intake and pump station would be lighted for safety and operation. Lighting would allow for safe movement of authorized personnel. Security lighting would be used around the intake and pump station site to discourage and deter unauthorized attempts to enter. Surveillance lighting would be angled away from the river and would turn on only when triggered by motion.

As exterior lighting would be directional and limited, used occasionally based on maintenance and security needs, it would not adversely affect nighttime views in the area for the nearest residences, located approximately 3,300 feet southwest of the project site and approximately 5,500 feet northeast of the project site on the opposite side of the San Joaquin River. Therefore, the Proposed Project/Action would not create a new source of substantial light or glare that would adversely affect nighttime views in the area given the limited nighttime lighting that would occur and the rural nature of the project site. This impact would be less than significant.

Mitigation: None required.

3.3 Air Quality and Climate Change

3.3.1 Affected Environment

General Climate and Meteorology

The project site is located in unincorporated Stanislaus County in the northern portion of the San Joaquin Valley Air Basin (SJVAB). The SJVAB is defined by the Sierra Nevada in the east (8,000 to 14,000 feet in elevation), the Coast Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi mountains in the south (6,000 to 8,000 feet in elevation). The valley is basically flat with a slight downward gradient to the northwest. The valley opens to the sea at the Carquinez Straits where the San Joaquin-Sacramento Delta empties into San Francisco Bay. The San Joaquin Valley thus could be considered a “bowl” open only to the north.

The SJVAB has an inland Mediterranean climate averaging over 260 sunny days per year. The valley floor experiences warm, dry summers and cool wet winters. Summer high temperatures often exceed 100 degrees Fahrenheit, averaging in the low 90s in the northern valley and high 90s in the south. In the entire SJVAB, high daily temperature readings in summer average 95 degrees Fahrenheit. Over the last 30 years, the SJVAB averaged 106 days per year of 90 degrees Fahrenheit or hotter, and 40 days per year of 100 degrees Fahrenheit or hotter. The daily summer temperature variation can be as much as 30 degrees Fahrenheit.

In winter, as the cyclonic storm track moves southward, the storm systems moving in from the Pacific Ocean bring a maritime influence to the SJVAB. The high mountains to the east prevent the cold, continental air masses of the interior from influencing the valley. Winters are mild and humid. Temperatures below freezing are unusual. Average high temperatures in the winter are in the 50s, but highs in the 30s and 40s can occur on days with persistent fog and low cloudiness. The average daily low temperature is 45 degrees Fahrenheit.

Existing Air Quality in the Project Vicinity

Criteria Air Pollutants

Concentrations of criteria air pollutant are used as indicators of ambient air quality conditions. Source types, health effects, and future trends associated with each air pollutant are described below along with the most current attainment area designations and monitoring data for the project area and vicinity.

Ozone

Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gas (ROG) and nitrogen oxides (NO_x). ROG and NO_x are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NO_x under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone.

Carbon Monoxide

Ambient carbon monoxide (CO) concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. Wind speed and atmospheric mixing also influence CO concentrations. Under inversion conditions, CO concentrations may be distributed more uniformly over an area that may extend some distance from vehicular sources. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia, as well as for fetuses.

CO concentrations have declined dramatically in California due to existing controls and programs and most areas of the state including the proposed project region have no problem meeting the CO State and federal standards. CO measurements and modeling were important in the early 1980's when CO levels were regularly exceeded throughout California. In more recent years CO measurements and modeling results have not been a priority in most California air districts due to the retirement of older polluting vehicles, lower emissions from new vehicles, and improvements in fuels.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a reddish brown gas that is a by-product of combustion processes. NO_2 may be visible as a coloring component of a brown cloud on high pollution days, especially in conjunction with high ozone levels.

Automobiles and industrial operations are the main sources of NO_2 which is an air quality concern because it acts a respiratory irritant and is a precursor of ozone. NO_2 is a major component of the group of gaseous nitrogen compounds, commonly referred to as NO_x, which $_x$ are produced by fuel combustion in motor vehicles, industrial stationary sources (such as industrial activities), ships, aircraft, and rail transit. Typically, NO_x emitted from fuel combustion are in the form of nitric oxide (NO) and NO_2. NO is often converted to NO_2 when it reacts with ozone or undergoes photochemical reactions in the atmosphere. Therefore, emissions of NO_2 from combustion sources are typically evaluated based on the amount of NO_x emitted from the source.

Sulfur Dioxide

Sulfur Dioxide (SO_2) is a combustion product of sulfur or sulfur-containing fuels such as coal and diesel. SO_2 is also a precursor to the formation of atmospheric sulfate, particulate matter and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain. Concentration rather than duration of exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis.

Particulate Matter

PM_{10} and $PM_{2.5}$ consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. (A micron is one-millionth of a meter.) PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Some sources of particulate matter, such as wood burning in fireplaces, demolition, and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility. Large dust particles (diameter greater than 10 microns) settle out rapidly and are easily filtered by human breathing passages. This large dust is of more concern as a soiling nuisance rather than a health hazard. The remaining fraction, PM_{10} and $PM_{2.5}$, are a health concern particularly at levels above the federal and state ambient air quality standards. $PM_{2.5}$ (including diesel exhaust particles) is thought to have greater effects on health, because these particles are so small and thus, are able to penetrate to the deepest parts of the lungs. Scientific studies have suggested links between fine particulate matter and numerous health problems including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath and painful breathing. Recent studies have shown an association between morbidity and mortality and daily concentrations of particulate matter in the air. Children are more susceptible to the health risks of PM_{10} and $PM_{2.5}$ because their immune and respiratory systems are still developing.

Mortality studies since the 1990s have shown a statistically significant direct association between mortality (premature deaths) and daily concentrations of particulate matter in the air. Despite important gaps in scientific knowledge and continued reasons for some skepticism, a comprehensive evaluation of the research findings provides persuasive evidence that exposure to fine particulate air pollution has adverse effects on cardiopulmonary health (Dockery and Pope 2006). The California Air Resources Board (CARB) has estimated that achieving the ambient air quality standards for PM_{10} could reduce premature mortality rates by 6,500 cases per year (CARB 2002).

Lead

Ambient lead concentrations meet both the federal and state standards in the proposed project area. Lead has a range of adverse neurotoxin health effects, and was formerly released into the atmosphere primarily via leaded gasoline products. The phase-out of leaded gasoline in California resulted in decreasing levels of atmospheric lead. The proposed project would not introduce any new sources of lead emissions; consequently, lead emissions are not required to be quantified and are not further evaluated in this analysis.

Criteria Pollutant Monitoring Station Data

The San Joaquin Valley Air Pollution Control District (SJVAPCD) monitoring station in the vicinity of the project is located in Modesto, approximately 10 miles northeast of the project area. Data collected at these stations are considered to be generally representative of air quality of the project area for regional pollutants. **Table 3.3-1** summarizes the concentrations of ozone, NO_2, PM_{10} and $PM_{2.5}$ from 2013 through 2015 and compares the ambient air pollutant concentrations with applicable federal and state air quality standards.

TABLE 3.3-1
AIR QUALITY DATA SUMMARY (2013–2015) FOR THE PROJECT AREA

		Monitoring Data by Year		
Pollutant	**Standard**[a]	**2013**	**2014**	**2015**
Ozone: Modesto-14th Street				
Maximum concentration 1-hour (ppm)[b]		0.088	**0.103**	**0.111**
Number of days state standard exceeded 1-hour	0.09	0	1	5
Maximum concentration 8-hour (ppm)[b]		**0.82**	**0.09**	**0.093**
Number of days state standard exceeded 8-Hour	0.070	13	24	24
Number of days national standard exceeded 8-Hour	0.070	2	12	16
Nitrogen Dioxide: Turlock-S Minaret Street				
Maximum concentration 1-hour ($\mu g/m^3$)[b]		54	55	42
Number of days state standard exceeded 1-Hour	339	0	0	0
Number of days national standard exceeded 1-Hour	188	0	0	0
Particulate Matter (PM_{10}): Modesto-14th street				
Maximum concentration state measurement ($\mu g/m^3$)[b]		**98.8**	**127.7**	**90.3**
Est. days over state standard[c]	50	18	12.2	31
Maximum concentration national measurement ($\mu g/m^3$)[b]		73.0	122.5	85.6
Est. days over national standard[c]	150	0	0	0
Particulate Matter ($PM_{2.5}$): Modesto-14th street				
Maximum concentration national measurement ($\mu g/m^3$)[b]		**83.2**	**58.2**	**44**
Est. days national standard exceeded[c]	35	37	17	4
State annual average ($\mu g/m^3$)[b]	12	14.4	11.4	NA

NOTES:
a Generally, state standards and national standards are not to be exceeded more than once per year.
b $\mu g/m^3$ = micrograms per cubic meter; PM_{10} = particulate matter that is 10 microns or less in diameter; $PM_{2.5}$ = particulate matter that is 2.5 microns or less in diameter; ppm = parts per million.
c PM_{10} and $PM_{2.5}$ is not measured every day of the year. Number of estimated days over the standard is based on 365 days per year.

NA = Not Available. Values in **Bold** exceed the respective air quality standard.

Source: CARB 2016a

Toxic Air Contaminants

Non-criteria air pollutants or toxic air contaminants (TACs) are airborne substances that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, diesel engines, dry cleaners, industrial operations, and painting operations. TACs are regulated differently than criteria air pollutants at both federal and state levels. At the federal level these airborne substances are referred to as Hazardous Air Pollutants (HAPs). The state list of TACs identifies 243 substances and the federal list of HAPs identifies 189 substances.

The CARB identified diesel particulate matter (DPM) as a TAC in 1998, primarily based on evidence demonstrating cancer effects in humans. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Mobile sources such as trucks and buses are among the primary sources of diesel emissions, and concentrations of DPM are higher near heavily traveled highways and rail lines with diesel locomotive operations. The risk from DPM as determined by the CARB declined from 750 in one million in 1990 to 570 in one million in 1995; by 2000, the CARB estimated the average statewide cancer risk from DPM at 540 in one million (CARB 2009a). This calculated cancer risk values from ambient air exposure can be compared against the lifetime probability of being diagnosed with cancer in the United States, from all causes, which is more than 40 percent (based on a sampling of 17 regions nationwide), or greater than 400,000 in one million, according to the National Cancer Institute (NCI 2012).

Asbestos is also a TAC of concern due to the demolition of buildings and structures as part of the project. Asbestos is a fibrous mineral, which is both naturally occurring in ultramafic rock (a rock type commonly found in California) and used as a processed component of building materials. Because asbestos has been proven to cause serious adverse health effects, including asbestosis and lung cancer, it is strictly regulated based on its natural widespread occurrence and its use as a building material.

Odorous Emissions

Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person’s reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting and headache). The ability to detect odors varies considerably among the population and overall is quite subjective. People may have different reactions to the same odor. An odor that is offensive to one person may be perfectly acceptable to another (e.g., coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. Known as odor fatigue, a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors. Odor impacts should be considered for any proposed new odor sources located near existing receptors, as well as any new sensitive receptors located near existing odor sources. Generally, increasing the distance between the receptor and the odor source will mitigate odor impacts.

Greenhouse Gases

"Global warming" and "global climate change" are the terms used to describe the increase in the average temperature of the earth's near-surface air and oceans since the mid-20th century and its projected continuation. Warming of the climate system is now considered to be unequivocal (IPCC 2007). Natural processes and human actions have been identified as the causes of this warming. The International Panel on Climate Change (IPCC) has concluded that variations in natural phenomena such as solar radiation and volcanoes produced most of the warming from pre-industrial times to 1950 and had a small cooling effect afterward. After 1950, however, increasing greenhouse gas (GHG) concentrations resulting from human activity such as fossil fuel burning and deforestation are believed to be responsible for most of the observed temperature increase. Increases in GHG concentrations in the earth's atmosphere are thought to be the main cause of human-induced climate change. Certain gases in the atmosphere naturally trap heat by impeding the exit of solar radiation that has hit the earth and is reflected back into space. This is sometimes referred to as the "greenhouse effect" and the gases that cause it are called "greenhouse gases." Some GHGs occur naturally and are necessary for keeping the earth's surface habitable. However, increases in the concentrations of these gases in the atmosphere during the last 100 years have decreased the amount of solar radiation that is reflected back into space, intensifying the natural greenhouse effect and resulting in the increase of global average temperature.

Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) are the principal GHGs. When concentrations of these gases exceed natural concentrations in the atmosphere, the greenhouse effect may be intensified. CO_2, CH_4, and N_2O occur naturally, and are also generated through human activity. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing[1] associated with agricultural practices and landfills. Other human-generated GHGs include fluorinated gases such as SFCs, PFCs, and SF_6, which have much higher heat-absorption potential than CO_2, and are byproducts of certain industrial processes.

CO_2 is the reference gas for climate change because it is the predominant GHG emitted. The effect that each of the aforementioned gases can have on global warming is a combination of the mass of their emissions and their global warming potential (GWP). GWP indicates, on a pound-for-pound basis, how much a gas is predicted to contribute to global warming relative to how much warming would be predicted to be caused by the same mass of CO_2. For example, CH_4 and N_2O are substantially more potent GHGs than CO_2, with GWPs of 21 and 310 times that of CO_2, respectively.

In emissions inventories, GHG emissions are typically reported in terms of pounds or metric tons of CO_2 equivalents (CO_2e). CO_2e are calculated as the product of the mass emitted of a given GHG and its specific GWP. While CH_4 and N_2O have much higher GWPs than CO_2, CO_2 is emitted in such vastly higher quantities that it accounts for the majority of GHG emissions in CO_2e, both from residential developments and human activity in general.

1 Off-gassing is defined as the release of chemicals under normal conditions of temperature and pressure.

Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. Reasons for greater sensitivity include pre-existing health problems, proximity to emissions source, or duration of exposure to air pollutants. Schools, hospitals and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are also sensitive to poor air quality because people usually stay home for extended periods of time.

Land uses surrounding the project site mostly consist of managed open space and wildlife preservation areas, riparian lands, wetlands, and agricultural areas, with scattered residential single-family homes. The nearest noise-sensitive land use to the project consists of single-family homes located approximately 3,300 feet from the project site’s southwestern-most boundary. Other nearby noise sensitive land uses includes one single-family home located approximately 5,500 feet from the project site’s northeastern-most boundary.

3.3.2 Regulatory Framework

Federal Regulations

The Federal Clean Air Act (FCAA) requires the U.S. Environmental Protection Agency (EPA) to identify National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. National standards have been established for ozone, CO, NO_2, SO_2, respirable particulate matter (less than PM_{10}), and lead. **Table 3.3-2** presents current national and state ambient air quality standards and provides a brief discussion of the related health effects and principal sources for each pollutant.

Pursuant to the 1990 FCAA Amendments, the EPA classifies air basins (or portions thereof) as “in attainment” or “nonattainment” for each criteria air pollutant, based on whether or not the NAAQS had been achieved. **Table 3.3-3** shows the current attainment status of the project area.

The FCAA required each state to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The FCAA added requirements for states containing areas that violate the NAAQS to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is a living document that is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The EPA has responsibility to review all state SIPs to determine if they conform to the mandates of the FCAA and will achieve air quality goals when implemented. If the EPA determines a SIP to be inadequate, it may prepare a Federal Implementation Plan for the nonattainment area and may impose additional control measures. Failure to submit an approvable SIP or to implement the plan within mandated timeframes can result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

TABLE 3.3-2
STATE AND NATIONAL CRITERIA AIR POLLUTANT STANDARDS, EFFECTS, AND SOURCES

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 hour	0.09 ppm	---	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when reactive organic gases (ROG) and nitrogen oxides (NOx) react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial/ industrial mobile equipment.
	8 hours	0.07 ppm	0.07 ppm		
Carbon Monoxide	1 hour	20 ppm	35 ppm	Classified as a chemical asphyxiant, carbon monoxide (CO) interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9 ppm		
Nitrogen Dioxide	1 hour	0.18 ppm	0.100 ppb	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.
	Annual Avg.	0.030 ppm	0.053 ppb		
Sulfur Dioxide	1 hour	0.25 ppm	75 ppb	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	3 hours	---	0.5 ppm		
	24 hours	0.04 ppm	---		
	Annual Avg.	---	---		
Respirable Particulate Matter (PM_{10})	24 hours	50 $\mu g/m^3$	150 $\mu g/m^3$	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	Annual Avg.	20 $\mu g/m^3$	---		
Fine Particulate Matter ($PM_{2.5}$)	24 hours	---	35 $\mu g/m^3$	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.
	Annual Avg.	12 $\mu g/m^3$	15 $\mu g/m^3$		
Lead	Monthly Ave.	1.5 $\mu g/m^3$	---	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Quarterly	---	1.5 $\mu g/m^3$		
Hydrogen Sulfide	1 hour	0.03 ppm	No National Standard	Nuisance odor (rotten egg smell), headache and breathing difficulties (higher concentrations)	Geothermal Power Plants, Petroleum Production and refining
Sulfates	24 hour	25 $\mu g/m^3$	No National Standard	Breathing difficulties, aggravates asthma, reduced visibility	Produced by the reaction in the air of SO2.
Visibility Reducing Particles	8 hour	Extinction of 0.23/km; visibility of 10 miles or more	No National Standard	Reduces visibility, reduced airport safety, lower real estate value, discourages tourism.	See PM2.5.

NOTES:
$\mu g/m^3$ = micrograms per cubic meter; CO = carbon monoxide; NOx = nitrogen oxides; ppb = parts per billion; ppm = parts per million; ROG = reactive organic gases.

Source: CARB 2009b, 2016b

TABLE 3.3-3
STANISLAUS COUNTY ATTAINMENT STATUS

Criteria Pollutant[1]	Designation/Classification[1,2]	
	Federal Standards	State Standards
Ozone – one hour	No Federal Standard	Nonattainment
Ozone – eight hour	Nonattainment/Extreme	Nonattainment
PM_{10}	Attainment	Nonattainment
$PM_{2.5}$	Nonattainment/Moderate	Nonattainment
CO	Unclassified/Attainment	Attainment
Nitrogen Dioxide	Unclassified/Attainment	Attainment
Sulfur Dioxide	Unclassified	Attainment
Lead (particulate)	Unclassified/Attainment	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility-Reducing Particles	No Federal Standard	Unclassified

NOTES:
1 TACs are regulated separately from criteria pollutants on both the state and federal levels.
2 "Unclassified" is used as the designation for any area that cannot be classified, on the basis of available information, as meeting or not meeting the national or state air quality standard for the specified pollutant.

Source: CARB 2016c

Toxic Air Contaminants

Regulation of TACs, termed HAPs under federal regulations, is achieved through federal, State and local controls on individual sources. The 1977 Clean Air Act Amendments required the EPA to identify National Emission Standards for HAPs to protect public health and welfare. These substances include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. There is uncertainty in the precise degree of hazard.

Federal General Conformity Rule

For projects that receive federal funding, a general conformity determination is required. General conformity is required if a project's annual construction or operational emissions exceed *de minimis* thresholds. This evaluation is limited to emissions of pollutants (or their precursors) for which an area is classified as nonattainment or maintenance for the federal ambient air quality standards. For ozone precursors (ROG and NO_x), the *de minimis* thresholds depend on the severity of the nonattainment classification. For other pollutants, the threshold is set at 100 tons per year (tpy). The SJVAB is designated as extreme nonattainment for ozone and moderate nonattainment for $PM_{2.5}$. The *de minimis* thresholds for these pollutants are 10 tpy for ozone precursors (ROG and NO_x), and 100 tpy for $PM_{2.5}$.

State Regulations

The CARB manages air quality, regulates mobile emissions sources, and oversees the activities of county Air Pollution Control Districts and regional Air Quality Management Districts. CARB establishes state ambient air quality standards and vehicle emissions standards.

California has adopted ambient standards that are more stringent than the federal standards for the criteria air pollutants. These are shown in Table 3.3-2. Under the California Clean Air Act, patterned after the FCAA, areas have been designated as in attainment or nonattainment with respect to the state standards. Table 3.3-3 summarizes the attainment status with California standards for the Stanislaus County area.

Local Regulations

San Joaquin Valley Air Pollution Control District

The SJVAPCD adopted the *2016 Ozone Plan for 2008 8-hour Ozone Standard* (SJVAPCD 2016a) and *2016 Moderate Area Plan for the 2012 PM2.5 Standard* (SJVAPCD 2016b), which were both adopted in 2016. Both plans enforce air pollution control rules and regulations in order to attain and maintain all state and federal ambient air quality standards. The SJVAPCD regulates, permits, and inspects stationary sources of air pollution. Among these sources are industrial facilities, gasoline stations, auto body shops, and dry cleaners.

While the State is responsible for emission standards and controlling tailpipe emissions from motor vehicles, the SJVAPCD is required to regulate agricultural burning and industrial emissions, implement transportation control measures and recommend mitigation measures for new growth and development designed to reduce the number of cars on the road, and promote the use of cleaner fuels.

Table 3.3-4 shows the project-level thresholds of significance as established by the SJVAPCD for the precursors to ozone (ROG), and NO_x, CO, SO_x, PM_{10}, $PM_{2.5}$. The thresholds apply to both construction and operational impacts.

In August 2008, the SJVAPCD's Governing Board adopted the Climate Change Action Plan (CCAP). The CCAP directed the District Air Pollution Control Officer to develop guidance to assist lead agencies, project proponents, permit applicants, and interested parties in assessing and reducing the impacts of project specific GHG emissions on global climate change.

On December 17, 2009, the SJVAPCD adopted: *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA and the policy: District Policy–Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency*. The guidance and policy rely on the use of performance based standards, otherwise known as Best Performance Standards (BPS), to assess significance of project-specific GHG emissions on global climate change during the environmental review process, as required by CEQA.

TABLE 3.3-4
SUMMARY OF SJVAPCD SIGNIFICANCE THRESHOLDS

Pollutant/Precursors	Construction Emissions	Operational Emissions	
		Permitted Equipment and Activities	Non-Permitted Equipment and Activities
	Emissions (tpy)	Emissions (tpy)	Emissions (tpy)
CO	100	100	100
NOx	10	10	10
ROG	10	10	10
SOx	27	27	27
PM_{10}	15	15	15
$PM_{2.5}$	15	15	15

NOTE:
tpy = tons per year

Source: SJVAPCD 2012

Stanislaus County General Plan

The Stanislaus County General Plan Conservation and Open Space Element contains air quality and climate change goals and supportive policies (Stanislaus County 2016). The goal and policies in **Table 3.3-5** are relevant to the project.

TABLE 3.3-5
AIR QUALITY AND CLIMATE CHANGE GOALS AND POLICIES OF STANISLAUS COUNTY

Number	Goals and Policies
Conservation and Open Space Element	
Goal 6	Improve air quality
Policy 18	The County will promote effective communication, cooperation, and coordination among agencies involved in developing and operating local and regional air quality programs.
Policy 19	The County will strive to accurately determine and fairly mitigate the local and regional air quality impacts of proposed projects.
Policy 20	The County shall strive to reduce motor vehicle emissions by reducing vehicle trips and vehicle miles traveled and increasing average vehicle ridership.
Policy 21	The County will support efforts to increase public awareness of air quality problems and solutions.

Source: Stanislaus County 2016

3.3.3 Environmental Consequences

Significance Criteria

This analysis of air quality and climate change evaluates the potential effects of the Proposed Project/Action on the existing air quality and climate change within or adjacent to the project site.

Effects are considered significant if an alternative would result in any of the following:

- Conflict with or obstruct implementation of the applicable air quality plan
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)
- Expose sensitive receptors to substantial pollutant concentrations
- Create objectionable odors affecting a substantial number of people
- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs

Because the Proposed Project/Action is subject to NEPA, preparation of a General Conformity Analysis is required. As such, a quantitative evaluation of construction and operational emissions was conducted and evaluated against the federal *de minimis* thresholds to determine whether implementation of the Proposed Project/Action would result in an adverse effect.

The SJVAPCD is currently designated as extreme non-attainment for the federal 8-hour ozone standard and moderate maintenance area for the federal $PM_{2.5}$ standards. **Table 3.3-6** shows the applicable general conformity thresholds that apply to the project in the SJVAPCD.

TABLE 3.3-6
GENERAL CONFORMITY DE MINIMIS THRESHOLDS FOR PROJECTS IN THE SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT

Pollutant	SMAQMD (tpy)
NOx	10
ROG	10
PM_{10}	100

Source: U.S. EPA 2016

Impact Evaluation

No Project/Action Alternative

Under the No Project/Action Alternative, the proposed fish screen intake, pump station, and associated features of the Proposed Project/Action River would not be constructed. The project site would remain in its existing condition. Any existing activities in or around the project site would remain unchanged. Therefore, there would be no impact with respect to this criterion.

Proposed Project/Action Alternative

Impact 3.3-1: Project construction could violate air quality standards or contribute substantially to an existing or projected air quality violation. (Less than Significant with Mitigation)

Most project construction activities would occur in two distinct phases: the first would involve site preparation and earthmoving activities, while the second would involve installing equipment, concrete, and structural improvements. Site preparation would include activities such as general land clearing and vegetation removal. Earthmoving activities include cut and fill operations, trenching, soil compaction, and grading. General construction includes adding improvements such as roadway surfaces, structures, and facilities.

Criteria pollutant emissions were modeled using the California Emissions Estimator Model (CalEEMod) (version 2013.2.2) software with project-specific data (e.g., construction equipment types and number requirements, maximum daily acreage disturbed) provided in Section 2, Description of Proposed Project/Action. The modeled emissions generated during the construction of the Proposed Project/Action construction activities are presented in **Table 3.3-7** and include the following:

- Dust (including PM_{10} and $PM_{2.5}$) primarily from fugitive sources such as soil disturbance and vehicle travel over unpaved surfaces;
- Combustion emissions of criteria air pollutants (including ROG, NO_x, PM_{10}, $PM_{2.5}$, and CO) primarily from operation of heavy equipment construction machinery (primarily diesel operated), portable auxiliary equipment and construction worker automobile trips (primarily gasoline operated); and
- Evaporative emissions (ROG) from asphalt paving.

Construction-related fugitive dust emissions would vary from day to day, depending on the level and type of activity, silt content of the soil, and the weather. In the absence of mitigation, construction activities may generate significant quantities of dust, and as a result, local visibility and PM_{10} concentrations may be adversely affected (see Table 3.3-7). In addition, the fugitive dust generated by construction would include not only PM_{10}, but also larger particles, which would fall out of the atmosphere within several hundred feet of the construction area and could result in nuisance-type impacts.

Construction activities would also result in the emission of pollutants of concern (ROG, NO_x, PM_{10} and $PM_{2.5}$) from construction equipment exhaust and construction worker automobile trips. Emission levels for construction activities would vary depending on the number and type of equipment, duration of use, operating schedules, and the number of construction workers. Criteria pollutant emissions of ROG and NO_x from these emission sources would incrementally add to the regional atmospheric loading of ozone precursors during project construction.

TABLE 3.3-7
CONSTRUCTION EMISSIONS ESTIMATES (TONS PER YEAR)[1, 2]

Category	CO	NOx	ROG	SOx	PM_{10}	$PM_{2.5}$
2017 Unmitigated Annual Construction Emissions (tpy)	9	**12**	1	<1	1	1
2018 Unmitigated Annual Construction Emissions (tpy)	2	1	<1	<1	<1	<1
SJVAPCD Construction Significance Threshold (tpy)	100	10	10	27	15	15
General Conformity *de minimus* Threshold (Yes or No)?	NA	10	10	NA	NA	100
Significant (Yes or No)?	No	**Yes**	No	No	No	No
2017 Mitigated Annual Construction Emissions (tpy)	9	7	<1	<1	1	<1
2018 Mitigated Annual Construction Emissions (tpy)	1	1	<1	<1	<1	<1
SJVAPCD Construction Significance Threshold (tpy)	100	10	10	27	15	15
General Conformity *de minimus* Threshold (Yes or No)?	NA	10	10	NA	NA	100
Significant (Yes or No)?	No	No	No	No	No	No

NOTES:
1. Project construction emissions estimates were made using CalEEMod version 2013.2.2. See Appendix B for model outputs and more detailed assumptions
2. Values in bold are in excess of either the applicable SJVAPCD or General Conformity *de minimus* significance threshold.

Source: ESA 2016

Construction of the Proposed Project/Action is anticipated to occur over two construction years. The estimated time for construction of the pump station is approximately nine months, in Construction Year 1. The site excavation and roadway improvements and the outfall structure would be constructed concurrently with the pump station such that startup and testing would commence in Construction Year 1. Under the currently anticipated sequencing plan, the construction of the East and West Crossing structures would begin after the fish screen intake and pump station were operational, and would be completed in approximately 22 months, in Construction Year 2.

For this analysis, it was assumed that the construction of the intake and pump station, earthwork, installation of the conveyance pipelines and construction of the outfall structure would occur in the first year of construction. The construction of the East and West Crossing structures were assumed to be constructed in the following year. For the purposes of modeling, construction is assumed to occur in years 2017 and 2018. Estimated construction-related fugitive dust emissions, as well as exhaust emissions from construction equipment, trucks, and worker trips are shown in Table 3.3-7. As shown in Table 3.3-7, unmitigated emissions of NO_x would exceed the 10 tpy significance threshold specified by the SJVAPCD and General Conformity *de minimums* thresholds. Therefore, this impact would result in a potentially significant impact.

Mitigation Measure

Mitigation Measure 3.3-1: In order to reduce the impact of NO_x off-road equipment exhaust emissions during construction, WSID shall ensure that construction contracts stipulate that all off-road diesel-powered equipment used during construction shall be equipped with USEPA Tier 3 or cleaner engines, except for specialized construction equipment in which an USEPA Tier 3 engine is not available. In lieu of Tier 3 engines, project equipment can incorporate retrofits such that emissions reductions achieved equal that of the Tier 3 engines. WSID shall submit a detailed list of the equipment fleet that demonstrates achievement of this mitigation measure to the County prior to receiving a construction permit.

Significance after Mitigation: As shown in Table 3.3-7, implementation of Mitigation Measure 3.3-1 during project construction would reduce NO_x emissions to below the SJVAPCD and the General Conformity *de minimus* thresholds. Through implementation of Mitigation Measure 3.3-1, NO_x emissions would be reduced by requiring contractors to use USEPA Tier 3 or cleaner engines during construction. USEPA Tier 3 engines use advanced engine controls and sensors that significantly reduce off-road equipment engine emissions on all four constituents (NO_x, hydrocarbons, CO, and PM). All other criteria pollutant emissions during construction would result in a less-than-significant impact with mitigation.

Impact 3.3-2: Project operation could violate air quality standards or contribute substantially to an existing or projected air quality violation. (Less than Significant)

The Proposed Project/Action would include installation and operation of a new 347 cfs capacity screened intake with a low-lift pump station located on the bank of the San Joaquin River adjacent to the mouth of WSID's intake canal. Five vertical axial-flow pumps would be located in five separate concrete structures (circular caissons) connected by HDPE pipe conduits to the cone-type fish screens (cone screens).

The electrical systems of the proposed screened intake would include power distribution, motor control, lighting and convenience receptacles, auxiliary systems, and grounding. Electric energy would be delivered via extension of WSID's existing 12.47 kV distribution line. Since the electricity to power the Proposed Project/Action facilities would be generated off-site, there would be no on-site stationary source emissions such as diesel powered generators.

The Proposed Project/Action would result in vehicle trips during operation and maintenance activities. However, employee trips required periodically for routine inspection and maintenance would not be significantly more than to those generated under current operations, and would result in negligible increases in emissions. Therefore, this impact would result in a less-than-significant impact.

Mitigation: None required.

Impact 3.3-3: The Project could conflict with or obstruct implementation of the applicable air quality plan. (Less than Significant with Mitigation)

The applicable air quality plan is the *2016 Ozone Plan for 2008 8-hour Ozone Standard* (SJVAPCD 2016a) and *2016 Moderate Area Plan for the 2012* $PM_{2.5}$ *Standard* (SJVAPCD 2016b). The current SJVAPCD set of rules and regulations represents all feasible control measures for SJVAPCD sources. The SJVAPCD plans to achieve the California Ambient Air Quality Standards (CAAQS) and NAAQS by the earliest practicable date as a result of local reductions. Exceedance of the SJVAPCD's current adopted thresholds of significance for criteria pollutant emissions would conflict with or obstruct the implementation of the *2016 Ozone Plan for 2008 8-hour Ozone Standard* and *2016 Moderate Area Plan for the 2012* $PM_{2.5}$ *Standard.*

The Proposed Project/Action would result in an increase in criteria pollutant emissions generated by employee trips during operation, inspection, and maintenance activities. However, the increase in employee trips is not expected to be substantially greater than what currently exists at the project site. The increased mobile source emissions at the project site are expected to result in a marginal increase in criteria pollutant emissions and would not conflict with or obstruct the implementation of the *2016 Ozone Plan for 2008 8-hour Ozone Standard* and *2016 Moderate Area Plan for the 2012* $PM_{2.5}$ *Standard.*

As described above in Impact 3.3-1, project emissions of NO_x (ozone precursor) would exceed the SJVAPCD significance threshold during the duration of construction activities. Although construction of the Proposed Project/Action would be short-term and temporary, the increase in criteria pollutant emissions from off- and on-road equipment exhaust would conflict with the applicable air quality plans. Since unmitigated construction emissions would exceed both the SJVAPCD and General Conformity *de minimums* thresholds for NO_x, this impact would result in a potentially significant impact.

Mitigation Measure

Mitigation Measure 3.3-3: Implement Mitigation Measure 3.3-1.

Significance after Mitigation: Implementation of Mitigation Measure 3.3-1 would reduce NO_x emissions to below the SJVAPCD and General Conformity *de minimums* thresholds by requiring the applicant to use USEPA Tier 3 or cleaner engines. USEPA Tier 3 engines use advanced engine controls and sensors that significantly reduce off-road equipment engine emissions on all four constituents (NO_x, hydrocarbons, CO, and PM). Therefore, with mitigation, the Proposed Project/Action would not conflict with the applicable air quality plans. Therefore, this impact would result in a less-than-significant impact with mitigation.

Impact 3.3-4: Project construction and/or operation could expose sensitive receptors to substantial pollutant concentrations. (Less than Significant)

Construction of the Proposed Project/Action would result in short-term DPM exhaust emissions from on-site heavy-duty equipment. DPM is a designated TAC. Exposure of sensitive receptors—such as the adjacent and nearby residences—is the primary factor used to determine health risk. Exposure is a function of the concentration of a substance or substances in the environment and the extent of exposure that person has with the substance. A longer exposure period would result in a higher exposure level. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 30-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project (OEHHA 2015).

The fish screen intake, pump station, outfall structure, and roadway improvements would be constructed and operational within approximately 12 months from contract award and the construction of the East and West Crossings would begin after the fish screen intake and pump station were operational, and would be completed in approximately 22 months. This would result in approximately 6 percent of the total 30 year exposure period for health risk assessments. Given the short duration of exposure, DPM from construction activities is not anticipated to result in the exposure of sensitive receptors to levels that exceed applicable standards. Impacts would be less than significant.

Since the project facilities would be powered by electricity generated off-site, long-term operation of the Proposed Project/Action would not require the use of an on-site diesel powered generator known to generate TAC emissions. As a result, exposure of sensitive receptors to substantial toxic air emissions from the Proposed Project/Action would result in a less-than-significant impact.

Mitigation: None required.

Impact 3.8-5: Project construction and operation could create objectionable odors affecting a substantial number of people. (Less than Significant)

Diesel equipment used during construction can produce odorous exhaust, but equipment use in any one area of the project site would be temporary and potential odors would not affect a substantial number of people. Construction of the Proposed Project/Action would last for approximately 22 months from contract award and on-site diesel powered equipment would only operate intermittently, up to approximately 8 hours per day. The use of on-site diesel powered equipment can produce odorous exhaust, but equipment use in any one area of the project site would be temporary and potential odors would not affect a substantial number of people in the vicinity of the project site given the rural nature of the project site. Therefore, construction of the

Proposed Project/Action would not create objectionable odors that would affect a substantial number of people and odor impacts would result in a less-than-significant impact.

As a general matter, the types of land use development that pose potential odor problems include wastewater treatment plants, refineries, landfills, composting facilities and transfer stations. Since the Proposed Project/Action would consist of a fish screen intake, pump station and associated features and no uses known to pose potential odor problems would occupy the project site, operation of the Proposed Project/Action would not create objectionable odors that would affect a substantial number of people. Impact would be less than significant.

Mitigation: None required.

Impact 3.3-6: Implementation of the Project could result in a cumulative increase of criteria pollutant emissions. (Less than Significant with Mitigation during Construction; Less than Significant during Operations)

A cumulative impact occurs when two or more individual effects, considered together, are considerable or would compound or increase other environmental impacts. Cumulative impacts can result from individually minor but collectively significant impacts, meaning that the project's incremental effects are considerable when viewed in connection with the effects of past, current, and probable future projects.

No single project is sufficient in size to, by itself, result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. In addition, according to the SJVAPCD Final Draft Guidance for Assessing and Mitigating Air Quality Impacts (SJVAPCD 2015), if a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Alternatively, if a project does not exceed the identified significance thresholds, then the project would not be considered cumulatively considerable and would result in less-than-significant air quality impacts.

As described above in Impact 3.3-1, construction of the Proposed Project/Action would result in emissions of NO_x that would exceed both the SJVAPCD and General Conformity *de minimus* thresholds. However, after implementation of Mitigation Measure 3.3-1, project construction emissions of NO_x would be reduced to below the SJVAPCD and General Conformity *de minimus* thresholds. As discussed in Impact 3.3-4, the Proposed Project/Action would not generate TAC emissions that would result in significant impacts.

Since project construction emissions of NO_x would exceed both the SJVAPCD and General Conformity *de minimus* thresholds, the Proposed Project/Action would have a considerable contribution to cumulative air quality (criteria air pollutants) during short-term construction, and the impact would result in a potentially significant impact.

Mitigation Measure

Mitigation Measure 3.3-6: Implement Mitigation Measure 3.3-1.

The operation of the Proposed Project/Action would not result in any new sources of criteria pollutant emissions that currently exist at the project site. The pump station would be powered by electricity generated off-site and would not require the use of a diesel powered generator. In addition, the Proposed Project/Action would not result in substantially greater vehicle trips during operation and maintenance activities than currently exist at the site that would result in a substantial increase in criteria pollutant emissions. Therefore, the Proposed Project/Action would have a less-than-significant cumulative impact on cumulative air quality (criteria air pollutants) during long-term operation.

Significance after Mitigation: Implementation of Mitigation Measure 3.3-1 would reduce NO_x emissions during construction to below the SJVAPCD and General Conformity *de minimus* thresholds by requiring the applicant to use USEPA Tier 3 or cleaner engines. USEPA Tier 3 engines use advanced engine controls and sensors that significantly reduce off-road equipment engine emissions on all four constituents (NO_x, hydrocarbons, CO, and PM). Therefore, after mitigation is applied, the Proposed Project/Action would not have a considerable contribution to cumulative air quality (criteria air pollutants) during construction, and the impact would be less than significant.

Impact 3.3-7: Construction and operation of the Project could result in a cumulatively considerable increase in GHG emissions that could either directly or indirectly have a significant impact on the environment or conflict with any applicable plan, policy or regulation of an appropriate regulatory agency adopted for the purpose of reducing GHG emissions. (Less than Significant with Mitigation)

SVJAPCD's GHG guidance is intended to streamline CEQA review by pre-quantifying emissions reductions that would be achieved through the implementation of BPS. Projects are considered to have a less-than-significant cumulative impact on climate change if any of the following conditions are met.

1. Comply with an approved GHG reduction plan;
2. Achieve a score of at least 29 using any combination of approved operational BPS;
3. Reduce operational GHG emissions by at least 29 percent over business-as-usual (BAU) conditions (demonstrated quantitatively).

Since there is currently no adopted GHG reduction plan for Stanislaus County, Option 1 (listed above) cannot be applied. Options 2 and 3 both require projects to achieve GHG reductions consistent with the goals of Assembly Bill (AB) 32, which is to reduce statewide GHG emissions to 1990 levels by 2020 (equivalent to a 29 percent reduction over BAU conditions). However, since the publication of the SVJAPCD's GHG guidance in 2009, the California Supreme Court considered the CEQA issue of determining the significance of GHG emissions in its decision, Center for Biological Diversity v. CDFW and Newhall Land and Farming (CBD vs. CDFW). The

Court questioned a common CEQA approach to GHG analyses for development projects that compares project emissions to the reductions from BAU that will be needed statewide to reduce emissions to 1990 levels by 2020, as required by AB 32. The court upheld the BAU method as valid in theory, but concluded that the BAU method was improperly applied in the case of the Newhall project because the target for the project was incorrectly deemed consistent with the statewide emission target of 29 percent below BAU for the year 2020. In other words, the court said that the percent below BAU target developed by the AB 32 Scoping Plan is intended as a measure of the GHG reduction effort required by the State as a whole, and it cannot necessarily be applied to the impacts of a specific project in a specific location. The Court provided some guidance to evaluating the cumulative significance of a proposed land use project's GHG emissions, but noted that none of the approaches could be guaranteed to satisfy CEQA for a particular project. The Court's suggested "pathways to compliance" include:

1. Use a geographically specific GHG emission reduction plan (e.g., climate action plan) that outlines how the jurisdiction will reduce emissions consistent with State reduction targets, to provide the basis for streamlining project-level CEQA analysis, as described in CEQA Guidelines Section 15183.5.

2. Utilize the Scoping Plan's BAU reduction goal, but provide substantial evidence to bridge the gap between the statewide goal and the project's emissions reductions;

3. Assess consistency with AB 32's goal in whole or part by looking to compliance with regulatory programs designed to reduce GHG emissions from particular activities; as an example, the Court points out that projects consistent with a Senate Bill 375 Sustainable Communities Strategy may need to re-evaluate GHG emissions from cars and light trucks.

4. Rely on existing numerical thresholds of significance for GHG emissions, such as those developed by an air district.

In light of the Newhall decision and the reliance of the SVJAPCD's GHG guidance on statewide percentage reduction of GHG emissions by 2020, assessment of potential GHG emission impacts under CEQA is assessed herein using a two-fold approach:

1. Does the proposed project include reasonably feasible measures (i.e., BPS) to reduce GHG emissions; and

2. Although not strictly applicable to projects within the SJVAB, would the project emissions exceed the Bay Area Air Quality Management District GHG mass emission (or bright line) threshold of 1,100 MT CO_2e/year.

As previously discussed, operational GHG emissions for the Proposed Project/Action would be generated primarily from on-road vehicular traffic. However, employee trips required periodically for routine inspection and maintenance would not be significantly more than those generated under current operations. These trips would result in negligible GHG emissions. Since the pump station would be powered by electricity generated off-site, long-term operation of the Proposed Project/Action would not require the use of an on-site diesel powered generator, which is known to generate GHG emissions. Therefore, operation of the Proposed Project/Action would result in a less-than-significant impact.

Total GHG emissions from project construction amortized over a 30 year period were estimated using CalEEMod to be 48.4 MT of CO_2e/year. Construction of the Proposed Project/Action would not result in a cumulatively considerable increase in GHG emissions. However, to be consistent with the intent of the SJVAPCD's GHG guidance, available BPS are identified to further minimize this impact.

Mitigation Measure

Mitigation Measure 3.3-7: The project applicant and/or its contractor shall implement the following best performance standards for construction emissions (AEP 2016):

1. Use alternatively fueled vehicles and equipment, including electrification as well as alternative fuels where reasonably available and certified for use in construction equipment and vehicles (e.g., biodiesel blends, renewable diesel, etc.);
2. Reduce worker trips through organized ride sharing, where appropriate; and
3. Use local sources of construction materials when economically feasible.

Significance after Mitigation: Implementation of Mitigation Measure 3.3-7 would reduce short-term GHG emissions to the extent feasible, consistent with guidance from SJVAPCD, resulting in less-than-significant impacts.

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3.4 Noise and Vibration

3.4.1 Affected Environment

Noise

Noise can be generally defined as unwanted sound. Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level) which is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing and 120 to 140 dB corresponding to the threshold of pain.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements. Some representative noise sources and their corresponding A-weighted noise levels are shown in **Figure 3.4-1**.

Noise exposure is a measure of noise over a period of time. Noise level is a measure of noise at a given instant in time. Community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and atmospheric conditions. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual receptor. These successive additions of sound to the community noise environment vary the community noise level from instant to instant, requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts.

COMMON OUTDOOR ACTIVITIES	NOISE LEVEL (dBA)	COMMON INDOOR ACTIVITIES
	110	Rock band
Jet flyover at 1,000 feet		
	100	
Gas lawnmower at 3 feet		
	90	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80	
Noisy urban area, daytime		
Gas lawnmower at 100 feet	70	Garbage disposal at 3 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60	
		Large business office
Quiet urban daytime	50	Dishwasher in next room
Quiet urban nighttime	40	Theater, large conference room (background)
Quiet suburban nighttime		
	30	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20	
		Broadcast/recording studio
	10	
	0	

SOURCE: Caltrans, 1998

WSID Fish Screen Intake . 120642

Figure 3.4-1
Typical Noise Levels

This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

L_{eq}: the energy-equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L_{eq} is the constant sound level, which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

L_{max}: the instantaneous maximum noise level for a specified period of time.

L_{50}: the noise level that is equaled or exceeded 50 percent of the specified time period. The L_{50} represents the median sound level.

L_{90}: the noise level that is equaled or exceeded 90 percent of the specific time period. This is considered the background noise level during a given time period.

L_{dn}: also abbreviated DNL, it is a 24-hour day and night A-weighted noise exposure level which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dB to take into account the greater annoyance of nighttime noises.

CNEL: similar to DNL, the Community Noise Equivalent Level adds a 5-dB "penalty" for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10-dB penalty between the hours of 10:00 p.m. and 7:00 a.m.

As a general rule, in areas where the noise environment is dominated by traffic, the L_{eq} during the peak-hour is generally within one to two decibels of the L_{dn} at that location.

Effects of Noise on People

When a new noise is introduced to an environment, human reaction can be predicted by comparing the new noise to the existing "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur (Caltrans 2013):

- except in carefully controlled laboratory experiments, a change of 1-dB cannot be perceived;
- outside of the laboratory, a 3-dB change is considered a just-perceivable difference;
- a change in level of at least 5-dB is required before any noticeable change in human response would be expected; and
- a 10-dB change is subjectively heard as approximately a doubling in loudness, and can cause adverse response.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion; hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate between 6 dBA for hard sites and 7.5 dBA for soft sites for each doubling of distance from the reference measurement. Hard sites are those with a reflective surface between the source and the receiver such as parking lots or smooth bodies of water. No excess ground attenuation is assumed for hard sites and the changes in noise levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface such as soft dirt, grass or scattered bushes and trees. In addition to geometric spreading, an excess ground attenuation value of 1.5 dBA (per doubling distance) is normally assumed for soft sites. Line sources (such as traffic noise from vehicles) attenuate at a rate between 3 dBA for hard sites and 4.5 dBA for soft sites for each doubling of distance from the reference measurement (Caltrans 2013).

Fundamentals of Vibration

As described in the Federal Transit Administration's (FTA) Transit Noise and Vibration Impact Assessment (FTA 2006), ground-borne vibration can be a serious concern for nearby neighbors, causing buildings to shake and rumbling sounds to be heard. In contrast to airborne noise, ground-borne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of ground-borne vibration are trains, buses on rough roads, and construction activities such as blasting, sheet pile-driving and operating heavy earth-moving equipment.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used metric to describe RMS amplitude. The decibel notation acts to compress the range of numbers required to describe vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration include structures (especially older masonry structures), people (especially residents, students, the elderly and sick), and vibration sensitive equipment.

The effects of ground-borne vibration include movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Building damage is not a factor for most projects, with the occasional exception of blasting and sheet pile-driving during construction. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by only a small margin. A vibration level that causes annoyance will be well below the damage threshold for normal buildings. The FTA measure of the threshold of architectural damage for conventional sensitive structures is 0.2 in/sec PPV and the FTA threshold of human annoyance to ground-borne vibration is 80 VdB (FTA 2006).

Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, and parks and other outdoor recreation areas generally are more sensitive to noise than are commercial (other than lodging facilities) and industrial land uses.

Land uses surrounding the project site mostly consist of managed open space and wildlife preservation areas, riparian lands, wetlands, and agricultural areas, with scattered residential single-family homes. The nearest noise-sensitive land use to the project site consists of single-family homes located approximately 3,300 feet from the project site’s southwestern-most boundary. Other nearby noise sensitive land uses includes one single-family home located approximately 5,500 feet from the project site’s northeastern-most boundary.

A discussion of potentially-occurring wildlife and wildlife habitat that may be sensitive to noise in the project area is included in Section 3.7, Biological Resources.

Existing Ambient Noise Environment

The noise environment in the area surrounding the project site is characterized by rural roadways, rural agricultural noise, and scattered residences. It includes low-volume traffic noise from tractors, large trucks, and other farm equipment, both on and off-road passenger vehicles, and distant high-volume traffic noise along SR 33. The ambient noise environment in the vicinity of the project site was estimated using a relationship population density and ambient noise determined during a research program by the EPA. The EPA determined that residents in rural or other non-urban areas are estimated to be exposed to outdoor ambient noise levels ranging from 35 to 50 dBA Ldn (EPA 1974). Since the area surrounding the project site can be categorized as rural or other non-urban area, it is assumed that ambient noise levels would range between 35 and 50 dBA Ldn.

3.4.2 Regulatory Framework

Federal Regulations

The FTA has adopted vibration standards that are used to evaluate potential building damage impacts related to construction activities. The vibration damage criteria adopted by the FTA are shown in **Table 3.4-1**.

TABLE 3.4-1
CONSTRUCTION VIBRATION DAMAGE CRITERIA

Building Category	PPV (inch/second)
I. Reinforced-concrete, steel, or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

Source: FTA 2006

In addition, the FTA has also adopted standards associated with human annoyance for ground-borne vibration impacts for the following three land-use categories: Vibration Category 1 – High Sensitivity, Vibration Category 2 – Residential, and Vibration Category 3 – Institutional. The FTA defines Category 1 as buildings where vibration would interfere with operations within the building, including vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and university research operations. Vibration-sensitive equipment includes, but is not limited to, electron microscopes, high-resolution lithographic equipment, and normal optical microscopes. Category 2 refers to all residential land uses and any buildings where people sleep, such as hotels and hospitals. Category 3 refers to institutional land uses such as schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment but still have the potential for activity interference. The vibration thresholds associated with human annoyance for these three land-use categories are shown in **Table 3.4-2**. No thresholds have been adopted or recommended for commercial and office uses. Thresholds for project-induced vibration from impact pile driving activities would be based on Frequent Events, as stated in Table 3.4-2.

TABLE 3.4-2
GROUND-BORNE VIBRATION IMPACT CRITERIA FOR GENERAL ASSESSMENT

Land Use Category	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
Category 1: Buildings where vibration would interfere with interior operations	65 VdB[d]	65 VdB[d]	65 VdB[d]
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB

NOTES:
[a] "Frequent Events" is defined as more than 70 vibration events of the same source per day.
[b] "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.
[c] "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day.
[d] This criterion is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes.

Source: FTA 2006

State Regulations

The California Code of Regulations has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure, as shown in **Figure 3.4-2**. The State of California also establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the State pass-by standard is consistent with the federal limit of 80 dBA. The State pass-by standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dBA at 15 meters from the centerline. These standards are implemented through controls on vehicle manufacturers and by legal sanction of vehicle operators by state and local law enforcement officials.

The State has also established noise insulation standards for new multi-family residential units, hotels, and motels that would be subject to relatively high levels of transportation-related noise. These requirements are collectively known as the California Noise Insulation Standards (Title 24, California Code of Regulations). The noise insulation standards set forth an interior standard of Ldn 45 dBA in any habitable room. They require an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to noise levels greater than Ldn 60 dBA. Title 24 standards are typically enforced by local jurisdictions through the building permit application process.

Local Regulations

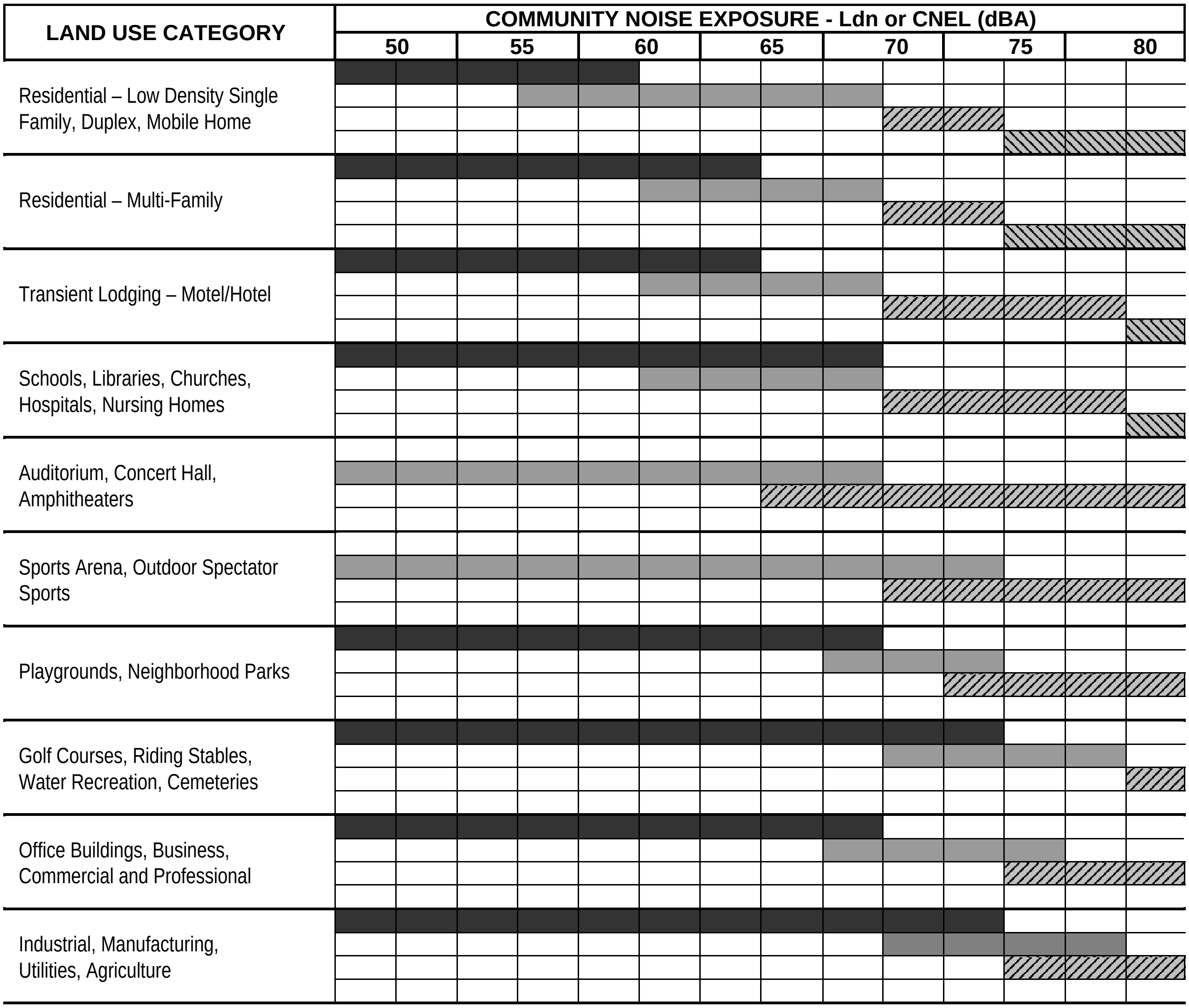
In California, local regulation of noise involves implementation of General Plan policies and Noise Ordinance standards. Local General Plans identify general principles intended to guide and influence development plans, and Noise Ordinances set forth the specific standards and procedures for addressing particular noise sources and activities.

General Plans recognize that different types of land uses have different sensitivities toward their noise environment; residential areas are considered to be the most sensitive type of land use to noise and industrial/commercial areas are considered to be the least sensitive.

Stanislaus County General Plan

The Stanislaus County General Plan Noise Element contains goals and policies pertaining to noise (Stanislaus County 2016). The goals and policies in **Table 3.4-3** are relevant to the Proposed Project/Action.

Noise-sensitive areas considered in the Noise Element include areas containing the following noise sensitive land uses: schools, hospitals, convalescent homes, churches, sensitive wildlife habitat, including the habitat of rare, threatened, or endangered species, and other uses deemed noise sensitive by the local jurisdiction. A discussion of potentially-occurring wildlife and wildlife habitat that may be sensitive to noise in the project area is included in Section 3.7, Biological Resources.



	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
	Normally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development generally should not be undertaken.

SOURCE: State of California, Governor's Office of Planning and Research 2003

Figure 3.4-2
Land Use Compatibility for Community Noise Environment

TABLE 3.4-3
NOISE GOALS AND POLICIES OF STANISLAUS COUNTY

Number	Description
Noise Element	
Goal 1	Prevent the encroachment of incompatible land uses near known noise producing industries railroads, airports, and other sources to protect the economic base of the County.
Policy 1	It is the policy of Stanislaus County to utilize the noise exposure information contained within the General Plan to identify existing and potential noise conflicts through the Land Use Planning and Project Review processes. *Implementation Measure-1:* Areas within Stanislaus County shall be designated as noise-impacted if exposed to existing or projected future noise levels exterior to buildings exceeding the standards in Figure 3.4-1 or the performance standards described in the table below.

Stanislaus County Maximum Allowable Noise Exposure - Stationary Noise Sources

Category	Daytime 7:00 a.m. to 10:00 p.m.	Nighttime 10:00 p.m. to 7:00 a.m.
Hourly Leq, dBA	55	45
Maximum Level, dBA	75	65

Source: Stanislaus County 2016

Number	Description
Goal 2	Protect the citizens of Stanislaus County from the harmful effects of exposure to excessive noise.
Policy 2	It is the policy of Stanislaus County to develop and implement effective measures to abate and avoid excessive noise exposure in the unincorporated areas of the County by requiring that effective noise mitigation measures be incorporated into the design of new noise generating and new noise sensitive land uses. *Implementation Measure-1:* New development of noise-sensitive land uses will not be permitted in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to the following levels: a) For transportation noise sources such as traffic on public roadways, railroads, and airports, 60 Ldn (or CNEL) or less in outdoor activity areas of single-family residences, 65 Ldn (or CNEL) or less in community outdoor space for multi-family residences, and 45 Ldn (or CNEL) or less within noise-sensitive interior spaces. Where it is not possible to reduce exterior noise due to these sources to the prescribed level using a practical application of the best available noise-reduction technology, an exterior noise level of up to 65 Ldn (or CNEL) will be allowed. Under no circumstances will interior noise levels be allowed to exceed 45 Ldn (or CNEL) with the windows and doors closed in residential uses. b) For other noise sources such as local industries or other stationary noise sources, noise levels shall not exceed the performance standards contained within the table under Goal 1, Policy 1. *Implementation Measure-2:* New development of industrial, commercial, or other noise generating land uses will not be permitted if resulting noise levels will exceed 60 Ldn (or CNEL) in noise-sensitive areas. Additionally, the development of new noise-generating land uses, which are not preempted from local noise regulation, will not be permitted if resulting noise levels will exceed the performance standards contained within the table under Goal 1, Policy 1 in areas containing residential or other noise sensitive land uses. Each of the noise level standards specified in the table under Goal 1, Policy 1 shall be reduced by five (5) dBA for pure tone noises, noise consisting primarily of speech or music, or for recurring impulsive noises. The standards in the table under Goal 1, Policy 1 should be applied at a residential or other noise-sensitive land use and not on the property of a noise-generating land use. Where measured ambient noise levels exceed the standards, the standards shall be increased to the ambient levels.
Policy 3	It is the objective of Stanislaus County to protect areas of the County where noise-sensitive land uses are located. *Implementation Measure-2:* Require the evaluation of mitigation measures for projects that would cause the Ldn at noise sensitive uses to increase by 3 dBA or more and exceed the normally acceptable level, cause the Ldn at noise-sensitive uses to increase 5 dBA or more and remain normally acceptable, or cause new noise levels to exceed the noise ordinance limits (after adoption).

Source: Stanislaus County 2016

Stanislaus County Municipal Code

The Stanislaus County Municipal Code contains a Noise Ordinances (Chapter 10.46) that establishes maximum exterior and interior noise level standards that apply to noise levels in the project area for affected sensitive land uses. According to Chapter 10.46.060(E), no person shall operate any construction equipment so as to cause an average sound level greater than 75 dBA between the hours of 7:00 p.m. and 7:00 a.m. at or beyond the property line of any property upon which a dwelling unit is located.

3.4.3 Environmental Consequences

Significance Criteria

This analysis of noise and vibration evaluates the potential effects of the Proposed Project/Action on the existing environment within or adjacent to the project site.

Effects are considered significant if an alternative would result in any of the following:

- 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
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project
- 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
- 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

Impact Evaluation

Resources Not Considered in Detail

Implementation of the Proposed Project/Action would not occur within an airport land use plan. The project site is located approximately 1.4 miles from the Flying Bull Airport, a private air strip, but the Proposed Project/Action would not expose people in the project area to excessive noise levels from the private air strip because of the distance from the air strip, minimal flights in the project area, and given that project construction would be short-term and temporary in duration and operations would be done remotely with infrequent staff visits for maintenance. No impact would occur under either of these categories and they are not discussed further within this section.

No Project/Action Alternative

Under the No Project/Action Alternative, the proposed fish screen intake, pump station, and associated features of the Proposed Project/Action would not be constructed. The project site would remain in its existing condition. Existing activities in or around the project site would remain unchanged, therefore no noise or vibration impacts would occur.

Proposed Project/Action Alternative

Impact 3.4-1: Construction and operation of the Project could expose persons to substantial temporary, periodic, or permanent noise levels or noise levels in excess of standards established in the local general plans or noise ordinances, or applicable standards of other agencies. (Less than Significant)

Construction activity noise levels at and near the project site would fluctuate depending on the particular type, number, and duration of uses of various pieces of construction equipment. Construction-related material haul trips would raise ambient noise levels along haul routes, depending on the number of haul trips made and types of vehicles used. In addition, certain types of construction equipment generate impulsive noises (such as pile driving), which can be particularly annoying to sensitive receptors. **Table 3.4-4** shows typical noise levels produced by various types of construction equipment.

The specific equipment and material hauling route would be determined by the contractor. However, it is assumed construction materials and worker trips would originate from the major urban areas in the region and nearby communities. Based on the existing roadway network serving the project area, it is assumed trucks and construction workers traveling to and from the construction site would primarily use a combination of highways (e.g., SR 33, SR 132), arterials, and designated truck routes in the project vicinity to reach other local points and/or regional locations.

Trucks traveling to and from the construction site would include flatbed trucks, trailers to transport pipes, concrete ready-mix trucks to transport controlled density fill and concrete, and other miscellaneous trucks to support construction activities. The construction activities under the Proposed Project/Action would not require the import or export of soil, as all back fill material would be taken from on-site. Since haul trips would be limited to the import of riprap and other construction materials, which would only occur during the daylight hours, and given the limited scale of the project, it is expected that construction-related haul trips along local roadways would not expose existing sensitive land uses to traffic noise that would result in a substantial increase in noise over the existing ambient environment. Therefore, this impact would be less than significant.

TABLE 3.4-4
TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT OPERATIONS

Construction Equipment	Noise Exposure Level, dBA at 50 Feet
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer (Truck)	85
Concrete Pump (Truck)	82
Concrete Vibrator	76
Crane-Derrick	88
Crane-Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pile-driver (Impact)	101
Pile-driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Roller	74
Scarifier	83
Scraper	89

Source: FTA 2006

For the purposes of this noise analysis, it is anticipated that pile driving for the sheet piles and foundation piles would occur intermittently for up to approximately three months and the pump station would be constructed in approximately nine months, with both occurring in Construction Year 1. The site excavation and roadway improvements and the outfall structure would be constructed concurrently with the pump station such that startup and testing would commence in Construction Year 1. Under the currently anticipated sequencing plan, the construction of the East and West Crossing structures would begin after the fish screen intake and pump station were operational, and would be completed in approximately 22 months, in Construction Year 2. Construction activities are generally expected to occur from 7:00 a.m. to 4:00 p.m., Monday through Friday.

The nearest noise-sensitive land use to the project site consists of single-family homes located approximately 3,300 feet from the project site's southwestern-most boundary. Other nearby noise sensitive land uses includes one single-family home located approximately 5,500 feet from the project site's northeastern-most boundary. The loudest source of noise during project construction would occur during impact pile driving and grading activities. As shown in Table 3.4-4, an impact pile driver and grader can generate a maximum noise level of 101 and 85 dBA from a distance of 50 feet, respectively. **Table 3.4-5** shows the maximum construction noise exposure at residences located near each construction area, assuming a 7.5 dB drop off rate per doubling of distance.

TABLE 3.4-5
ANTICIPATED CONSTRUCTION NOISE LEVELS AT EXISTING LAND USES

Construction Element	Loudest Construction Equipment	Distance to Nearest Sensitive Receptor (feet)	Maximum Noise Level (dBA)
Intake/Pump Station	Impact Pile Driver	5,500	50
Earthwork	Grader	5,500	34
Conveyance Pipelines	Grader	5,500	34
Outfall and Spillway Structures	Grader	7,600	30
East Crossing Structure	Impact Pile Driver	6,500	48
West Crossing Structure	Impact Pile Driver	3,700	54

Source: ESA 2016

According to the Stanislaus County Municipal Code (Chapter 10.46.060[E]), no person shall operate any construction equipment so as to cause an average sound level greater than 75 dBA between the hours of 7:00 p.m. and 7:00 a.m. at or beyond the property line of any property upon which a dwelling unit is located. The nearest residence to on-site construction activities would be exposed to a maximum noise level of 54 dBA during on-site impact pile driving (see Table 3.4-5). Therefore, on-site construction activities would not substantially elevate the existing ambient at the nearest residences. These residences are already exposed to existing intermittent noise sources from area roads and off-road agricultural equipment that would overshadow any noise generated by on-site construction. In addition, construction activities would occur between the allowed construction hours and would not expose the nearest sensitive land uses to construction noise levels that would exceed the maximum allowed construction noise standard set by the Stanislaus County Municipal Code. Therefore, this impact would be less than significant.

Normal operation of the fish screen intake and pump station would consist of five separate pump structures that would be completely enclosed. Electric energy to power the pump station would be delivered via extension of WSID's existing12.47 kV distribution line; no emergency diesel/gas generators would be installed in any of the pumps structures. Because the pump station would be completely enclosed, noise created by the five pumps outside of the enclosure would not be perceptible to the nearest residences located approximately 5,800 feet northeast of the proposed fish screen intake and pump station. Consequently, it is expected that there would be no permanent substantial noise increases from the Proposed Project/Action over existing conditions, nor would noise levels generated by the pump station exceed the County's exterior noise standards at the nearest sensitive receptor. Therefore, this impact would be less than significant.

Because the maximum project-generated operational traffic on any single day would be minimal, similar to existing conditions, and primarily distributed across rural roadways with few to no sensitive receptors in the vicinity, the Proposed Project/Action would not lead to a 3 dB increase in noise over the existing total ambient noise level and would not have a perceptible change over the baseline total ambient noise level. Therefore, addition of minimal operations traffic would result in a less-than-significant impact.

Mitigation: None required.

Impact 3.4-2: Project construction could expose persons to or generate excessive ground-borne vibration or ground-borne noise levels. (Less than Significant)

Ground-borne vibration from construction activities that involve impact tools, especially pile driving, could produce substantial vibration at nearby sensitive receptors. Because pile driving represents the worst case vibration scenario, it is used as the baseline for this analysis. Vibration levels for impact pile drivers are typically 104 VdB or 0.644 inches/second PPV at 25 feet, which is a typical estimate for a wide range of soil conditions (**Table 3.4-6**). Under typical propagation conditions, vibration levels at residences 3,300 feet from the pile driving activities, which represents the location of the nearest receptor, would be 39 VdB or 0.0004 inches/second PPV, which is well below the FTA threshold of 72 VdB for human annoyance and 0.20 in/sec PPV for building damage. Therefore, this impact would be less than significant. Please refer Section 3.7, Biological Resources, for discussion of vibration impacts on biological resources.

TABLE 3.4-6
VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT
(FROM MEASURED DATA)

Equipment		PPV at 25 ft (inch/second)	Approximate Lv[a] at 25 ft
Pile Driver (Impact)	Upper Range	1.518	112
	Typical	0.644	104
Pile Driver (Sonic)	Upper Range	0.734	105
	Typical	0.170	93

NOTE:
a. Lv is the velocity level in decibels (VdB) referenced to 1 μ-inch/second and based on the root mean square (RMS) velocity amplitude.

Source: FTA 2006

Operation of the Proposed Project/Action would generate similar ground-borne vibrations as existing conditions through the operation of existing pump station. Therefore, impacts from ground-borne vibration or ground-borne noise levels as a result of project operations would be similar to existing conditions. This impact would be less than significant.

Mitigation: None required.

3.5 Geology, Soils, and Seismicity

3.5.1 Affected Environment

Existing Geologic and Soil Conditions

Regional Geology

Stanislaus County lies within the Great Valley, Coast Range, and Sierra Nevada geomorphic provinces. The geologic parent material within the region was formed from erosion of mountain ranges to the east and geologic uplift along the western shore of the North American continent. The project site is located in the Great Valley geomorphic province. Two hundred and forty-five million years ago, the Great Valley province began forming as deposition of sediment-laden runoff. Eventually, the sediment deposits known as the Great Valley sequence accumulated to a depth of almost six miles.

Large amounts of sediment continued to be added to the Great Valley sequence until approximately 30 million years ago. All of these processes occurred beneath the sea, and the water captured in the pores of the deeply buried rock is saline. The Sierra Nevada is composed primarily of crystalline igneous rocks (granite, quartz monzonite, quartz diorite) with some metamorphic, volcanic and metavolcanic rocks. The Coast Range is composed of folded and faulted sedimentary rocks. The valley floor is underlain by relatively unconsolidated sediments. The main geologic formations traversed in the project site are Dos Palos alluvium and alluvial Fan Deposits. The Dos Palos Alluvium formation consists of Holocene age fine grained floodbasin deposits. The San Joaquin River is a meandering river system between the foothills and the Sacramento-San Joaquin Delta (the Delta) controlled by the tectonic uplift of the Sierra Nevada range, subsidence of the San Joaquin Valley, and surface erosion of the watershed (MWH 2010).

Seismic Hazards

Surface fault rupture (or disruption at the ground surface as a result of fault activity) and seismic ground shaking are considered primary seismic hazards by the State of California (Stanislaus County 2016a). The Great Valley, Ortigalita and Marsh Creek-Greenville fault zones are the closest active fault zones under the Alquist-Priolo Earthquake Fault Zoning Act in the region. The Great Valley fault is approximately 6 miles southwest of the project area. The Ortigalita and Marsh Creek-Greenville fault zones are situated approximately 25 miles to the southwest and west of the project area, respectively. A designation of active means the fault has shown movement in the last 11,700 years (during the Holocene) and is sufficiently well defined. The project site is neither located within, nor crosses, a delineated Alquist-Priolo Earthquake Fault Zone (CGS 2010a).

The nearest historically active fault is the Great Valley (Segment 7) Fault, located approximately 7 miles southwest of the project site. The largest earthquake that could occur, based on deterministic seismic hazard analysis, is a 6.7 moment magnitude at the Great Valley Fault (MWH 2010). The project site is within an area of low historical seismic activity. Since the

1930s, no major earthquake (magnitude greater than 6.0 on the Richter scale) has occurred within 19 miles of the project site (MWH 2010).

The major hazards associated with earthquakes are: (1) surface fault rupture (ground displacement); (2) ground motion (or ground shaking); (3) ground failure (e.g., liquefaction); and (4) differential settlement, slope instability, and land subsidence. Each of these hazards is further discussed below.

Surface Fault Rupture

As noted above, the Great Valley, Ortigalita and Marsh Creek-Greenville fault zones are the closest active fault zones to the project site. The Great Valley fault is located approximately 6 miles to the southwest and the Ortigalita and Marsh Creek-Greenville fault zones are located approximately 25 miles to the southwest and west, respectively. Because these active faults do not traverse the project site or surrounding area the likelihood of hazards associated with fault rupture is considered low (CDMG 1997).

Potential Ground Motion

Unlike surface rupture, ground shaking is not confined to the trace of a fault, but rather propagates into the surrounding areas during an earthquake. The intensity of ground shaking typically diminishes with distance from the fault, but ground shaking may be locally amplified and/or prolonged by some types of substrate materials.

The ground-shaking hazard in the county ranges from low to moderate. The ground-shaking hazard is highest in the western side of the county which is closest to active faults as previously described. The ground-shaking hazard progressively decreases across the eastern side of the county as the distance from the active faults increases. (Stanislaus County 2016a.)

The Proposed Project/Action is located in an area distant from known, active faults and experiences lower levels of shaking less frequently. In most earthquakes, only weaker, masonry buildings would be damaged. However, very infrequent earthquakes could cause strong shaking. Based on a probabilistic seismic hazard map that depicts the peak horizontal ground acceleration values exceeded at a 10 percent probability in 50 years, the probabilistic peak horizontal ground acceleration values for the project area is approximately 0.32 g (where g equals the acceleration speed of gravity) (California Geological Survey 2008a). As a point of comparison, probabilistic peak horizontal ground acceleration values for the San Francisco Bay Area range from 0.4 g to more than 0.8 g.

Liquefaction

Liquefaction is the process where the soil is transformed to a fluid form during intense and prolonged ground shaking. Areas most prone to liquefaction are those that are water saturated and consist of relatively uniform sands that are loose to medium density. Liquefaction can lead to severe settlement of foundations and slope failure. Properties such as depth to groundwater, the texture and density of the soil, and sediment within and above the groundwater are the primary factors in determining if an area is prone to liquefaction. The sediments most susceptible to liquefaction are saturated, unconsolidated sand and silt soils (particularly Quaternary age units) with low plasticity within 50 feet of the ground surface (California Geological Survey 2008b).

The western edge of the county holds the highest potential for liquefaction due to soil conditions (Quaternary fan deposits and Dos Palos Alluvium) and the potential for ground shaking resulting from the proximity of active faults. Based on the results of a liquefaction analyses conducted as part of the geotechnical investigation for the Proposed Project/Action, very loose to medium dense granular layers (up to a maximum depth of approximately 60 feet below the existing ground surface) at the locations of the proposed fish screen intake, buried conveyance pipelines, and outfall structure, are considered to have a high liquefaction potential (AGS 2017).

Earthquake-Induced Settlement

Settlement of the ground surface can occur as a result of the relatively rapid compaction and settling of subsurface materials (particularly loose, non-compacted, and variable sandy sediments) during prolonged ground shaking. Typically, areas underlain by artificial fills, unconsolidated alluvial sediments, and slope wash, and areas with improperly engineered construction fills are susceptible to settlement.

The project site is located in an area subject to seismic-induced settlement. The estimated seismically-induced settlements at the project site resulting from a strong earthquake are as follows: up to 15 inches at the location of the proposed cone screen, collector structure, connection pipes, and sheet piles; up to 5 inches at the location of the proposed caisson structure; up to 15 inches along the proposed buried conveyance pipelines; up to 11 inches at the location of the proposed Lara Tract spillway structure; up to 5 inches at the location of the proposed outfall structure; and up to 10 inches at the wings of the levee along the adjacent slopes. (AGS 2017.)

Slope Instability and Landslides

Slope failure, commonly referred to as landslide, include many phenomena that involve the downslope displacement and movement of material, either triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Exposed rock slopes undergo rockfalls, rockslides, or rock avalanches, while soil slopes experience shallow soil slides, rapid debris flows, and deep-seated rotational slides.

For most of the county and the project area, which is located on flat land in the San Joaquin Valley, there is a low risk or no risk of landsliding (California Geological Survey and U.S. Geological Survey [USGS] 2011). However, subsurface soils in the project site are soft and loose and may not be suitable to support structures. Additionally, engineered slopes have a tendency to fail if not properly designed, constructed or compacted.

Land Subsidence

Subsidence is the gradual lowering of the land surface due to loss or compaction of underlying materials. Subsidence can occur as the result of groundwater, gas and oil extraction, or the decomposition of highly organic soils. Stanislaus County as a whole is outside of the region of the San Joaquin Valley most prone to land subsidence, which lies to the south (Faunt 2009:99); however, land subsidence as a result of groundwater overdraft remains a concern for the County, as addressed in its Groundwater Ordinance (County Code Chapter 9.37).

Subsidence is expected at the project site, particularly at the location of the proposed outfall structure as a result of additional grading and loading, and at the locations proposed for road improvement after placement of fill on top of the existing road (AGS 2017).

Soils and Soil-related Hazards

In general, the project area is underlain by Dos Palos Alluvium and alluvial fan deposits. A review of the geologic maps and test boring logs indicates that the Dos Palos alluvial deposits generally consist of loose to dense silty and clayey sand and poorly graded sand to a depth of 70 to 80 feet, underlain by stiff lean clay and silt. The lean clay and silt layer is underlain by dense to very dense silty sand and gravel. The surficial soils expected to be encountered at the fish screen intake consist of fine- to medium-grained sand with only trace silt.

The major hazards associated with soils are: (1) erosion; (2) expansive soils (shrink-swell potential); and (3) corrosive soils. Each of these hazards is further discussed below.

Erosion

Erosion is the detachment and movement of soil materials through natural processes or human activities. In general, rates of erosion can vary depending on the soil resource’s capacity to drain water, slope angle and length, extent of groundcover, and human influence. Topography in the area of the project site is generally level. The erosion potential for soils in the project site is generally low; however, earthmoving and grading activities associated with construction have the potential to cause erosion. Scouring is also likely to occur at the proposed fish screen intake, outfall structure, and East and West Crossings, given the hydraulics of the San Joaquin River and WSID intake canal (AGS 2017).

Expansive Soils

Expansive soils are characterized by a shrink-swell characteristic. Structural damage may result over a long period of time, usually resulting from inadequate soil and foundation engineering or the placement of structures directly on expansive soils. Expansive soils are largely comprised of clays, which expand in volume when water is absorbed and shrink when dried. Soil resources within the project site are comprised of silty clay loams, loams, silty clays, clays and sandy loams, some of which contain expansive clays. Soils in the project site have low to moderate and moderate to high expansive soils (NRCS 2016).

Corrosive Soils

Corrosive soils can damage underground utilities including pipelines and cables, and can weaken roadway structures. Based on resistivity measurements taken within the project site, soils are classified as mildly to severely corrosive, and therefore, could be potentially reactive to uncoated steel, concrete, or concrete covered steel reinforcement (AGS 2017).

Mineral Resources

The predominant mineral resources in Stanislaus County are sand and gravel (Stanislaus County 2016b). Twelve mines are in operation in the county. Current mining activities occur primarily within fluvial deposits along river and stream drainages. None of the significant deposits occur at the project site or near the project area.

3.5.2 Regulatory Framework

This section discusses the state and local policies and regulations relevant to the analysis of geology, soils, and seismicity issues in the project area. No federal regulations pertaining to geology, soils, and seismicity are applicable to the Proposed Project/Action.

State Regulations

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act), signed into law December 1972, requires the delineation of zones along active faults in California. The purpose of the Alquist-Priolo Act is to regulate development on or near active fault traces to reduce the hazard of fault rupture and to prohibit the location of most structures for human occupancy across these traces. Cities and counties must regulate certain development projects within the zones, which includes withholding permits until geologic investigations demonstrate that development sites are not threatened by future surface displacement. Surface fault rupture is not necessarily restricted to the area within an Alquist-Priolo Zone.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site has to be conducted and appropriate mitigation measures incorporated into the project design.

California Building Code

The California Building Code (CBC) is another name for the body of regulations known as the California Code of Regulations, Title 24, Part 2, which is a portion of the California Building Standards Code.

Published by the International Conference of Building Officials, the CBC is a widely adopted model building code in the United States. The CBC incorporates by reference the Uniform Building Code (UBC) with necessary California amendments. About one-third of the text within the CBC has been tailored for California earthquake conditions. The Stanislaus County General Plan incorporates by reference the most recent version of the UBC and CBC.

Local Regulations

Stanislaus County General Plan

The Stanislaus County General Plan Safety Element and Conservation and Open Space Element include relevant policies pertaining to seismic and geologic hazards and mineral resources. These policies apply to the project area and are outlined in **Table 3.5-1**.

TABLE 3.5-1
SEISMIC, GEOLOGIC HAZARDS AND MINERAL RESOURCES GOALS AND POLICIES OF STANISLAUS COUNTY

Number	Description
Safety Element	
Goal 1	Prevent loss of life and reduce property damage as a result of natural disasters.
Policy 1	The County will adopt (and implement as necessary) plans inclusive of the Multi-Jurisdictional Hazard Mitigation Plan, to minimize the impacts of natural and man-made disasters.
Policy 3	Development should not be allowed in areas that are particularly susceptible to seismic hazard.
Goal 2	Minimize the effects of hazardous conditions that might cause loss of life and property.
Policy 14	The County will continue to enforce state-mandated structural Health and Safety Codes, including but not limited to the California Building Code, the International Property Maintenance Code, the California Fire Code, the California Plumbing Code, California Electric Code, and Title 24, Parts 1-9.
Conservation and Open Space Element	
Goal 5	Reserve, as open space, lands subject to natural disaster in order to minimize loss of life and property of residents of Stanislaus County.
Policy 16	Discourage development on lands that are subject to flooding, landslide, faulting, or any natural disaster to minimize loss of life and property.
Goal 9	Manage extractive mineral resources to endure an adequate supply without degradation of the environment.
Policy 26	Surface mining in areas classified by the State Division of Mines and Geology as having significant deposits of extractive mineral resources shall be encouraged.
Policy 27	The County shall emphasize the conservation and development of lands having significant deposits of extractive mineral resources by not permitting uses that threaten the potential to extract the minerals.

Source: Stanislaus County 2016b

3.5.3 Environmental Consequences

Significance Criteria

This analysis of geology, soils, and seismicity evaluates the potential effects of the Proposed Project/Action on the existing environment within or adjacent to the project site.

Effects are considered significant if an alternative would result in any of the following:

- 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

- Result in substantial soil erosion or the loss of topsoil
- 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
- Be located on expansive soil, as defined in Table 18-1-B of the UBC (1994), creating substantial risks to life or property
- 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
- 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?
- 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?

Impact Evaluation

Resources Not Considered in Detail

Implementation of the Proposed Project/Action would not require the use of septic tanks or alternative wastewater disposal systems. The Proposed Project/Action would be constructed on a site that has not been identified as a significant source of mineral resources. According to the Stanislaus County General Plan, mineral resources areas classified as MRZ-2 by the State Geologist are concentrated to the south of the project area. Therefore, these impacts would not occur and these issues are not discussed further in this section.

No Project/Action Alternative

Under the No Project/Action Alternative, the proposed fish screen intake, pump station, and associated features of the Proposed Project/Action would not be constructed. The proposed fish screen intake would not be installed and the existing unscreened intake system would continue to operate as it does currently and this would have no new effect on geology, soils, and seismicity.

Proposed Project/Action Alternative

Impact 3.5-1: Implementation of the Project could expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking; seismic-related ground failure, including liquefaction; and landslides. (Less than Significant with Mitigation)

As previously described, the closest active fault zones under the Alquist-Priolo Earthquake Fault Zoning Act are located approximately 10 miles to the southwest and 25 miles to the southwest and west of the project area; therefore, the Proposed Project/Action would not be subject to risk associated with fault rupture. Even though the project area is located in an area distant from known, active faults and experiences low levels of shaking less frequently, it could experience strong ground shaking attributed to very infrequent earthquakes. Based on the results of a liquefaction analyses conducted as part of the geotechnical investigation for the Proposed Project/ Action, very loose to medium dense granular layers at the locations of the proposed fish screen intake, buried conveyance pipelines, and outfall structures are considered to have a high liquefaction potential. In addition, the project site is located in an area subject to seismic-induced settlement. These are considered potentially significant impacts.

The construction of the Proposed Project/Action has the potential to alter the structural integrity of the riverbank within the immediate vicinity of project site. Earthquake-induced ground shaking could also lead to slope instability in the project area along the San Joaquin River, especially during times of high precipitation or runoff. Therefore, implementation of the Proposed Project/ Action could expose structures to increased risks associated with seismic ground-shaking and this impact is considered potentially significant.

The project design includes recommendations and design features to manage potential adverse soil and geological effects associated with seismic activity. Additionally, project facilities would be constructed to industry standards to protect against potential impacts from adverse geological effects associated with seismic activity and other site-specific soils and geology constraints, including compliance with the CBC and American Society of Civil Engineers (ASCE) standards. For example, to protect the proposed structures from seismically-induced settlements and liquefaction, the proposed fish screen intake, pump caissons, collector structure, and connecting pipes between the fish screen and the pump caissons would be supported on deep foundations of 16-inch diameter steel pipe piles. In addition to these design features and measures, the following mitigation measure would mitigate seismic related hazards to less than significant:

Mitigation Measure

Mitigation Measure 3.5-1: All earthwork, excavation, and foundation construction shall be monitored during construction by a qualified field inspector with a licensed geotechnical engineer available for consultation. Specified design and engineering requirements deemed appropriate by the licensed geotechnical engineer shall be incorporated into the project design.

Significance after Mitigation: With implementation of Mitigation Measure 3.5-1, along with the incorporation of the geotechnical recommendations into the project design and implementation of industry standards during construction, potentially significant impacts associated with seismic ground shaking and seismic related ground failure would be reduced to less than significant.

Impact 3.5-2: The Project could result in substantial soil erosion or the loss of topsoil. (Less than Significant)

The erosion potential for soils in the project site is generally low; however, earthmoving and grading activities associated with construction have the potential to cause erosion. Routine project operations and maintenance activities are not anticipated to result in substantial soil erosion or loss of topsoil.

As described in Section 2, Description of Proposed Project/Action, the contract specifications would require the contractor to prepare and implement a construction erosion and sedimentation control plan to control the transport of sediment. Therefore, impacts associated with soil erosion attributed to project construction would be less than significant. Impacts associated with fugitive dust emissions are addressed in Section 3.3, Air Quality and Climate Change and impacts associated with increased sediment loading in receiving waters are addressed in Section 3.6, Hydrology and Water Quality.

Scouring could occur at the site of the proposed fish screen intake, outfall structure, and East and West Crossings given the hydraulics of the San Joaquin River and the WSID intake canal. The Proposed Project/Action includes siting of riprap at these locations (see Figures 2-2 and 2-4) to protect the banks from scour; therefore, impacts would be less than significant.

Mitigation: None required.

Impact 3.5-3: The Project could 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, or be located on expansive or corrosive soils. (Less than Significant with Mitigation)

Portions of the project site may be located on expansive and semi-unconsolidated soils, which could subject project facilities to geologic hazards. Specifically, subsidence could occur in soils underlying the location of the proposed outfall structure as a result of additional grading and loading, and at the locations proposed for road improvement after placement of fill on top of the existing road. In addition, soils in the project site have low to moderate and moderate to high expansive soils. Therefore, implementation of the Proposed Project/Action could expose structures to increased risks associated with unstable soils and this impact is considered potentially significant.

The project design includes recommendations and design features to manage potential adverse soil and geological effects. Additionally, project facilities would be constructed to industry standards to protect against potential impacts from adverse soils and geologic effects, including compliance with the CBC, and ASCE standards. Protective measures detailed in Section 2.4, Construction Considerations, that would be implemented as part of the Proposed Project/Action include the following:

- All cuts deeper than 5 feet would be sloped or shored.
- Prior to the placement of the fill on top of the intake canal bank, the top 12 inches of the soil would be scarified and compacted to 95 percent relative compaction.
- Prior to construction of the proposed outfall structure, the top 10 feet of the existing materials at the bottom of the canal and side slope would be removed and replaced with structural backfill. A qualified field inspector would observe the bottom of the excavation. If the bottom of excavation is soft, additional excavation might be required. Similarly, the spillway structure would be constructed on a minimum of 3 feet of structural backfill. The backfill materials would be extended about 3 feet behind the bottom of the proposed box culvert.
- Prior to construction of the proposed spillway structure, a qualified field inspector would observe the bottom of the excavation. If the bottom of the excavation is soft, additional excavation might be required.
- Compacted fill and backfill would be used mainly as trench backfill and as fill placed for outfall structure construction.
- Material to be used as compacted fill and backfill would be predominantly granular, less than 3 inches in any dimension, free of organic and inorganic debris, and contain less than 20 percent of mostly non-plastic fines. Excavated soils meeting the above requirements would be used as structural and non-structural fills and backfills.

In addition to these design features and measures, the following mitigation measure would mitigate potential hazards from unstable geologic units to less than significant:

Mitigation Measure

Mitigation Measure 3.5-2: Implement Mitigation Measure 3.5-1.

Significance after Mitigation: With implementation of Mitigation Measure 3.5-1, along with the incorporation of geotechnical recommendations into the project design and implementation of industry standards during construction, potentially significant impacts associated with any unstable geologic units would be reduced to less than significant.

3.6 Hydrology and Water Quality

3.6.1 Affected Environment

WSID currently maintains a water intake along the San Joaquin and Tuolumne Rivers. The intake diverts surface water into the WSID intake canal and provides irrigation water to approximately 20,166 acres within its service area and 2,207 acres within the White Lake Mutual Water Company service area. The permitted diversion amount from the San Joaquin and Tuolumne Rivers is 347 cfs, as described in Section 1.2.1.

Surface Water Hydrology

The San Joaquin River Hydrologic Region is in California's Central Valley, which is generally the northern portion of the San Joaquin Valley, including the project site. The region is south of the Sacramento River Hydrologic Region and north of the Tulare Lake Hydrologic Region. The region includes approximately half of the Delta. The San Joaquin River Basin has an average annual runoff of approximately 4 million acre-feet (MAF) (DWR 2014).

The project site is located just upstream of the confluence of the Tuolumne and San Joaquin Rivers.

San Joaquin River

The San Joaquin River is the principal river of the region, running through Stanislaus County from south to north, and all other streams are tributary to it. The major tributaries of the San Joaquin River include the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno Rivers. The San Joaquin, Stanislaus, and Tuolumne Rivers are the largest surface water features that have their origins in the Sierra Nevada. The San Joaquin River and its tributaries eventually drain to the Delta.

Tuolumne River

The Tuolumne River originates in Yosemite National Park and flows for 149 miles before flowing into the San Joaquin River. The San Joaquin-Tuolumne River confluence occurs less than 0.5 mile upstream from the project site, at the southern end of the SJRNWR's East Unit.

Sacramento-San Joaquin Delta

The Delta receives runoff from a watershed that includes more than 40 percent of the State's land area. The Sacramento and San Joaquin Rivers converge at the western end of the Delta near Suisun Bay.

In an average water year like 2000, the largest source of water was the Sacramento River, which transported a little more than 21 MAF into the Delta. Additional flows from the San Joaquin River and eastside tributaries such as the Mokelumne and Cosumnes Rivers contributed just over 3.9 MAF, with precipitation directly on the Delta adding about another million acre-feet. Freshwater flows in the Delta are typically much smaller than those caused by tidal flows. In addition to precipitation-derived runoff, Pacific Ocean tides move into and out of the Delta twice a day. Tidal rise and fall varies with location, from less than a foot in the eastern Delta to more than 5 feet in the western Delta (DWR 2014).

Water Quality

San Joaquin River

The water quality of the San Joaquin River is affected by agricultural return flows during the dry season, and these return flows frequently transport pesticides, nutrients and sediment from agricultural areas into the south Delta. In addition, many pesticides are applied during the dormant spray season, typically November to January, and can be transported to water bodies during rainfall events. The San Joaquin River from the Merced River to the Tuolumne River is impaired on State's 2012 303(d) list for: alpha-BHC (benzenehexachloride or alpha-HCH), ammonia, arsenic, bifenthrin, boron, cadmium, chloropyrifos, copper, dichlorodiphenyldichloroethylene, dichlorodiphenyltrichloroethane, diazinon, dieldrin, electrical conductivity (EC), Escherichia coli (E. coli), group A pesticides, lead, lindane/gamma hexachlorocyclohexane, malathion, mercury, molybdenum, nickel, nitrate (NO_3), dissolved oxygen (DO), potential of hydrogen (pH), selenium, water temperature, zinc, and an unknown toxicity. (USEPA 2016.)

Tuolumne River

Like water quality of the San Joaquin River, the water quality of the Tuolumne River is affected by agricultural return flows. The Lower Tuolumne River from Don Pedro Reservoir to the San Joaquin River is impaired on the State's 2012 303(d) list for: ammonia, arsenic, boron, cadmium, chloride, chloropyrifos, chromium, copper, dacthal, diazinon, dimenthoate, E. coli, group A pesticides, lead, malathion, mercury, nickel, NO_3, pH, selenium, specific conductivity, water temperature, zinc, and an unknown toxicity (USEPA 2016).

Groundwater Hydrology and Water Quality

In the San Joaquin River Hydrologic Region, there are 11 alluvial groundwater basins and subbasins. Stanislaus County is located within the San Joaquin Valley Basin and overlies portions of the Modesto, Turlock, Eastern San Joaquin, and Delta-Mendota subbasins (DWR 2004). The project site lies at the convergence of the subbasins.

California Department of Water Resources (DWR) described the characteristics of the Modesto Subbasin in its Groundwater Bulletin 118, San Joaquin Valley Groundwater Basin, Modesto Subbasin (2004):

> The Modesto Subbasin (Basin Number 5-22.02) has a total surface area of 247,000 acres (385 square miles). It lies between the Stanislaus River to the north and Tuolumne River to the south and between the San Joaquin River on the west and crystalline basement rock of the Sierra Nevada foothills on the east. The northern, western, and southern boundaries are shared with the Eastern San Joaquin Valley, Delta-Mendota, and Turlock Groundwater subbasins, respectively. Groundwater flow is primarily to the southwest, following the

> regional dip of basement rock and sedimentary units. The lower to middle reaches of the Stanislaus and Tuolumne Rivers in the subbasin appear to be gaining streams with groundwater flow into both, especially the Tuolumne River.
>
> The groundwater in this basin is of a calcium bicarbonate type in the eastern subbasin to a calcium-magnesium bicarbonate or calciumsodium bicarbonate type in the western portion. Total dissolved solids (TDS) values range from 60 to 8,300 milligram per liter (mg/L), with a typical range of 200 to 500 mg/L. The Department of Health Services, which monitors Title 22 water quality standards, reports TDS values in 88 wells ranging from 60 to 860 mg/L, with an average value of 295 mg/L. There are areas of hard groundwater and localized areas of high chloride, boron, DBCP, nitrate, iron, and manganese. Some sodium chloride waters of high TDS values are found along the east side of the subbasin. There are also some areas of shallow groundwater in the subbasin that require dewatering wells.

DWR described the characteristics of the Turlock Subbasin in its Groundwater Bulletin 118, San Joaquin Valley Groundwater Basin, Turlock Subbasin (2006a):

> The Turlock Subbasin (Basin Number 5-22.03) has a total surface area of 347,000 acres (542 square miles). It lies between the Tuolumne and Merced rivers and is bounded on the west by the San Joaquin River and on the east by crystalline basement rock of the Sierra Nevada foothills. The northern, western, and southern boundaries are shared with the Modesto, Delta-Mendota, and Merced Groundwater subbasins, respectively. Similar to the Modesto Subbasin, groundwater flow is primarily to the southwest, following the regional dip of basement rock and sedimentary units. Based on recent groundwater measurements, a paired groundwater mound and depression appear beneath the city of Turlock and to its east, respectively.
>
> The groundwater in this subbasin is predominately of the sodium-calcium bicarbonate type, with sodium bicarbonate and sodium chloride types at the western margin and a small area in the north-central portion. TDS values range from 100 to 8,300 mg/L, with a typical range of 200 to 500 mg/L. The Department of Health Services reports TDS values in 71 wells ranging from 100 to 930 mg/L, with an average value of 335 mg/L. EC values range from 168 to 1,000 μmhos/cm, with a typical range of 244 to 707 μmhos/cm. There are localized areas of hard groundwater, nitrate, chloride, boron, and DBCP. Some sodium chloride type water of high TDS is found along the west side of the subbasin.

DWR described the characteristics of the Delta-Mendota Subbasin in its Groundwater Bulletin 118, San Joaquin Valley Groundwater Basin, Delta-Mendota Subbasin (2006b):

> The Delta-Mendota Subbasin (Basin Number 5-22.07) has a total surface area of 747,000 acres (1,170 square miles). The Delta-Mendota subbasin is bounded on the west by the Coast Ranges, on the north by the Stanislaus/San Joaquin county line, on the east by the San Joaquin River and the Chowchilla Bypass, and on the south along the Fresno Slough.

> The groundwater in this subbasin is characterized by mixed sulfate to bicarbonate types in the northern and central portion with areas of sodium chloride and sodium sulfate waters in the central and southern portion. TDS values range from 400 to 1,600 mg/L in the northern portion of the subbasin and from 730 to 6,000 mg/L in the southern portion of the subbasin. The Department of Health Services reports TDS values in 44 public supply wells to range from 210 to 1,750 mg/L, with an average value of 770 mg/L. A typical range of water quality in wells is 700-1,000 mg/L. Shallow, saline groundwater occurs within about 10 feet of the ground surface over a large portion of the subbasin.

The project area is characterized by a shallow groundwater that is heavily influenced by the San Joaquin River table. In general, groundwater levels at the project site are expected to rise and fall with respect to water levels in the San Joaquin River and intake canal. The depth to groundwater near the intake canal is anticipated to increase with increased distance and elevation respective to the intake canal. Measured groundwater depth varied from approximately 7 feet below existing ground surface along the intake canal by the San Joaquin River, to between approximately 20 and 30 feet below existing ground surface by the proposed outfall structure and East and West Crossings (AGS 2017).

Flood Control and Flood Management Facilities

Flood risks in the Sacramento-San Joaquin Valley are among the highest in the nation. In order to address this risk, the Central Valley Flood Protection Act of 2008 directed DWR to prepare the Central Valley Flood Protection Plan (CVFPP) for Central Valley Flood Protection Board (CVFPB) adoption. It lays out a strategy to prioritize the state's investment in flood management over the next three decades, as well as strategies to promote multi-benefit projects and to integrate and improve ecosystem functions associated with flood risk reduction projects. The CVFPP also incorporates information about system wide and regional flood management needs, advancements in the best available science, and new policy considerations.

The CVFPB is the State regulatory agency responsible for ensuring that appropriate standards are met for the construction, maintenance, and protection of the flood control system that protects life, property, and wildlife habitat in California's Central Valley from the effects of flooding. The San Joaquin River in the vicinity of the project site is located with the Sacramento-San Joaquin Drainage District under the jurisdiction of the CVFPB.

Dams on the Tuolumne and Stanislaus Rivers help to regulate the rivers and reduce the risk of flooding in the County. An extensive network of levees also exists along the rivers, including along the San Joaquin River, in order to protect surrounding buildings and agricultural operations. Despite these measures to control flood flows, major flooding occurs along the San Joaquin River, as well as along portions of the Tuolumne River, Stanislaus River, and tributaries (Stanislaus County 2016a). Damaging floods occurred in the project area in 1937-38, 1950-51, 1952, 1955-56, 1962-63, 1982-83, 1986, 1995, 1996-97 and 1998.

In January 1997, extensive flooding on the lower San Joaquin River system overwhelmed area levees and caused them to fail, resulting in approximately $223 million in damage to properties inundated by floodwaters. Subsequently, several landowners in the floodplain west of the San Joaquin River discussed the sale of their flood-prone land to the USFWS for inclusion within the SJRNWR, and a Congressional mandate was also issued for the Corps to explore nonstructural alternatives for flood protection. The USFWS purchased over 3,000 acres of land on the west bank of the San Joaquin River in 1999, including the project area, for inclusion in the SJRNWR, primarily to provide a demonstration of a non-structural flood management alternative. WSID's easement along the intake canal and Pump Station 1A runs with the land and remains intact after the sale of the land. (USFWS 2006, 2012.)

Levees within the SJRNWR that were damaged during the 1997 flood were not repaired and the USFWS does not maintain the levees in the project area for historical flood protection. Corps levees were also breeched in several locations within the SJRNWR to allow flood flows to inundate the Refuge lands and provide flood protection to downstream areas by offering temporary storage of peak flood flows. The temporary flooding of the Refuge lands also returns a more natural flood regime to the San Joaquin River floodplain and supports riparian habitat that benefits from periodic inundation. The USFWS actively manages upland and wetland habitats within the SJRNWR, including with managed flooding regimes, and is restoring the riparian floodplain for the benefit of endangered species and migratory birds (USFWS 2006, 2012).

According to the Stanislaus County Local Hazard Mitigation Plan (1994), the project area and most of the SJRNWR is situated within the 100-year flood zone of the San Joaquin River (AGS 2017). Under current conditions, SJRNWR lands in the vicinity of the project site flood naturally when water levels in the San Joaquin River and intake canal peak.

3.6.2 Regulatory Framework

Federal Regulations

Clean Water Act

The Clean Water Act (CWA) was enacted with the primary purpose of restoring and maintaining the chemical, physical, and biological integrity of the Nation's waters. The CWA directs states to establish water quality standards for all "waters of the United States" and to review and update such standards on a triennial basis. The EPA has delegated responsibility for implementation of portions of the CWA, including water quality control planning and control programs, such as the NPDES Program, to California.

Responsibility for the protection of water quality in California rests with the State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs). The SWRCB establishes statewide policies and regulations for the implementation of water quality control programs mandated by federal and state water quality statutes and regulations. The RWQCBs develop and implement Water Quality Control Plans that consider regional beneficial uses, water quality characteristics, and water quality problems. The project site is located within the Central Valley or Region 5 and is subject to CWA requirements.

Section 301 prohibits the discharge of any pollutant into the Nation's waters without a permit, Section 307 of the CWA describes the factors that the EPA must consider in setting effluent limits for priority pollutants, and Section 402 of the CWA contains general requirements regarding NPDES permits.

Under Section 404 of the CWA, the Corps has the authority to regulate activity that could discharge fill or dredge material or otherwise adversely modify wetlands or other waters of the U.S. Under Section 401, the CWA requires that an applicant for a Section 404 permit (to discharge dredged or fill material into waters of the U.S.) first obtain a certificate from the appropriate state agency stating that the fill is consistent with the state's water quality standards and criteria. In California, the authority to either grant certification or waive the requirement for permits is delegated by the SWRCB to the nine regional boards. Since the project site is located within the CVRWQCB's jurisdiction, the project must obtain water quality certification (401 permits) from the CVRWQCB.

Water Quality Standards

Section 303 of the federal CWA requires states to adopt water quality standards for all surface water of the U.S. Where multiple uses exist, water quality standards must protect the most sensitive use. Water quality standards are typically numeric, although narrative criteria based upon biomonitoring methods may be employed where numerical standards cannot be established or where they are needed to supplement numerical standards. Section 303(d) requires that the states make a list of waters that are not attaining standards after the technology-based limits are put into place. For waters on this list (and where the EPA administrator deems they are appropriate), the states are to develop total maximum daily loads or TMDLs established at the level necessary to implement the applicable water quality standards. Federal regulations require that an implementation plan be developed along with the TMDL and Section 303(d), 303(e), and their implementing regulations require that approved TMDLs be incorporated into water quality control plans. The EPA has established regulations (40 CFR 122) requiring that NPDES permits be revised to be consistent with any approved TMDL. Development of the Proposed Project/ Action would be subject to the water quality standards set forth in the Water Quality Control Plan for the Sacramento and San Joaquin River Basins, which is described below under the "Basin Plan" subheading.

National Pollutant Discharge Elimination System

Section 402 of the CWA regulates point-source discharges to surface waters through the NPDES program. In California, the SWRCB oversees the NPDES program, which is administered by the RWQCBs. The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits. The NPDES program covers municipalities, industrial activities, and construction activities. Construction activities, also administered by the SWRCB, are discussed below.

Rivers and Harbors Act

The Corps regulates the construction of any structure or work within navigable waters under Sections 9 and 10 of the Rivers and Harbors Act (RHA). The Corps regulates the construction of: wharves, breakwaters, and jetties; bank protection and stabilization projects; permanent mooring structures, vessels, and marinas; intake and outfall pipes; canals; boat ramps; aids to navigation; and other modifications affecting the course, location condition, and capacity of navigable waters. The Corps' jurisdiction under RHA is limited to "navigable waters," or waters subject to the ebb and flow of the tide shoreward to the mean high water mark that may be used for interstate or foreign commerce. The Corps must consider the following criteria when evaluating projects within navigable waters: (1) the public and private need for the project; (2) reasonable alternative locations and methods; and (3) the beneficial and detrimental effects on the public and private uses to which the area is suited. A Section 10 permit for construction of the Proposed Project/Action will be required.

State Regulations

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.) establishes the SWRCB and each RWQCB as the principal state agencies for coordinating and controlling water quality in California. Specifically, the Porter-Cologne Water Quality Control Act authorizes the SWRCB to adopt, review, and revise policies for all waters of the state (including both surface water and groundwater) and directs the RWQCBs to develop regional Basin Plans. Section 13170 of the California Water Code also authorizes the SWRCB to adopt water quality control plans on its own initiative.

Basin Plan

The CVRWQCB has the authority to implement water quality protection standards through the issuance of permits for discharges to waters at locations within its jurisdiction. Water quality standards for the San Joaquin River and its tributaries are specified in Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) prepared by the CVRWQCB in compliance with the CWA and the State Porter-Cologne Water Quality Control Act. Because the project site is located within the San Joaquin River Basin, all discharges are subject to the surface water and groundwater water quality standards set forth in the Basin Plan. Region 5 has set water quality objectives for all surface waters in the region for the following substances and parameters: ammonia, bacteria, biostimulatory substances, chemical constituents, color, DO, floating material, oil and grease, pH, radioactivity, salinity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, and turbidity. Specific objectives for concentrations of chemical constituents are also applied to bodies of water based on their designated beneficial uses (CVRWQCB 2016).

The water quality objectives state that the suspended sediment load, suspended sediment discharge rate of surface waters, and the turbidity shall not be altered in such a way to cause a nuisance or adversely affect beneficial uses. Where natural turbidity is between 1 and 5 nephelometric turbidity units (NTU), increases shall not exceed 1 NTU (MWH 2010).

The principal elements of the Basin Plan are a statement of beneficial water uses protected under the plan; water quality objectives necessary to protect the designated beneficial water uses; and strategies and time schedules for achieving the water quality objectives. Beneficial uses and their associated water quality objectives, together, comprise the relevant water quality standards. The water quality objectives are achieved primarily through the establishment and enforcement of Waste Discharge Requirements (WDRs). WDRs may include effluent limitations or other requirements that are designed to implement applicable water quality control plans, including designated beneficial uses and the water quality objectives established to protect those uses and prevent the creation of nuisance conditions.

In instances where water quality is better than that prescribed by the objectives, the state Anti-degradation Policy applies (State Board Resolution 68-16: Statement of Policy with Respect to Maintaining High Quality of Waters in California). This policy is aimed at protecting relatively uncontaminated aquatic systems where they exist and preventing further degradation. The state's Anti-degradation Policy is consistent with the federal Anti-degradation Policy, as interpreted by the SWRCB in State Board Order No. 86-17.

NPDES Construction Activity Storm Water Regulations

The SWRCB adopted a statewide NPDES General Permit for Storm Water Discharges Associated with Construction Activity (Construction General Permit) (Order No. 2009-0009-DWQ, NPDES No. CAR000002) in September 2009. The Permit was subsequently amended by Order Nos. 2010-0014-DWQ and 2012-0006-DWQ. Every construction project that disturbs one or more acres of land surface or that are part of a common plan of development or sale that disturbs more than one acre of land surface requires coverage under the Construction General Permit. Construction activities subject to the Construction General Permit include clearing, grading, and disturbances to the ground, such as stockpiling or excavation. The Proposed Project/ Action would result in the disturbance of 18.9 acres and is therefore subject to the requirements of the Construction General Permit. To obtain coverage under the Construction General Permit, the landowner or other applicable entity must file Permit Registration Documents prior to the commencement of construction activity, which include a Notice of Intent (NOI), SWPPP, and other documents required by the Construction General Permit.

The Construction General Permit requires specific minimum BMPs, depending upon the project sediment risk (Risk Level 1 through 3). The risk is a calculated value that is determined when the SWPPP is prepared. The SWPPP will identify the appropriate risk level and related BMPs and other requirements. The results of monitoring and corrective actions, if any, must be reported annually to the SWRCB. This permit also specifies minimum qualifications for SWPPP developers and construction site inspectors. All BMPs include a description of the action that must be taken to protect water quality, a schedule, details regarding maintenance and inspection, and the individual(s) or entity that are responsible for implementation of the measure.

NPDES General Permit for Dewatering and Other Low Threat Discharges to Surface Waters

Where groundwater levels tend to be shallow, dewatering during construction is sometimes necessary to keep trenches or excavations free of standing water when improvements or foundations/footings are installed. Clean or relatively pollutant-free water that poses little or no risk to water quality may be discharged directly to surface water under certain conditions. The CVRWQCB has adopted a general NPDES permit for short-term discharges of small volumes of wastewater from certain construction-related activities (General Dewatering Permit). Permit conditions for the discharge of these types of wastewaters to surface waters are specified in "General Order for Dewatering and Other Low-Threat Discharges to Surface Waters" (Order No. 5-00-175, NPDES No. CAG995001). Discharges may be covered by the General Dewatering Permit provided they are: (1) either four months or less in duration; or (2) the average dry weather discharge does not exceed 0.25 million gallons per day. Construction dewatering, well development water, pump/well testing, and miscellaneous dewatering/low-threat discharges are among the types of discharges that may be covered by the General Dewatering Permit. The General Dewatering Permit also specifies standards for testing, monitoring, and reporting, receiving water limitations, and discharge prohibitions. When project construction would exceed four months in duration or 0.25 million gallons per day, a project-specific permit from the CVRWQCB is required.

Central Valley Flood Protection Board

Any project encroaching into rivers, waterways, and floodways within and adjacent to federal and State authorized flood control projects or within designated floodways must receive approval from the CVFPB. Under Water Code Sections 8534, 8608, and 8710 – 8723, the CVFPB is required to enforce, within its jurisdiction, on behalf of the State of California, appropriate standards for the construction, maintenance, and protection of adopted flood control plans that will best protect the public from floods. The area of the CVFPB's jurisdiction includes the entire Central Valley, including all tributaries of the Sacramento and San Joaquin Rivers and Tulare and Buena Vista Basins. The CVFPB exercises jurisdiction over the levee section, the waterside area between project levees, a 10-foot-wide strip adjacent to the landward levee toe, within 30 feet of the top to the banks with no levees, and within designated floodways adopted by the CVFPB.

Senate Bill 1168

Senate Bill (SB) 1168 enacts the Sustainable Groundwater Management Act and states as the intent of the Legislature that, among other things, all groundwater basins and subbasins must be managed sustainably by local entities pursuant to an adopted sustainable groundwater management plan. SB 1168 requires that for all groundwater basins designated as high- or medium-priority basins by DWR agencies must develop and implement a groundwater sustainability plan to be developed and implemented to meet the sustainability goal, established as prescribed, and would require the plan to include prescribed components. This bill encourages and authorizes basins designated as low- or very low priority basins to be managed under groundwater sustainability plans. The Proposed Project/Action is located within an area with a high basin prioritization ranking.

Local Regulations

Stanislaus County General Plan

The Stanislaus County General Plan Conservation and Open Space Element contains goals and policies addressing water hydrology and water quality that apply to the Proposed Project/Action (Stanislaus County 2016b), summarized in **Table 3.6-1** below.

TABLE 3.6-1
SURFACE WATER-RELATED GOALS AND POLICIES OF STANISLAUS COUNTY

Number	Description
Goal 2	Conserve water resources and protect water quality in the County.
Policy 5	Protect groundwater aquifers and recharge areas, particularly those critical for the replenishment of reservoirs and aquifers.
Policy 6	Preserve natural vegetation to protect waterways from bank erosion and siltation.
Policy 8	The County shall support efforts to develop and implement water management strategies.
Goal 5	Reserve, as open space, lands subject to natural disaster in order to minimize loss of life and property of residents of Stanislaus County.
Policy 16	Discourage development on lands that are subject to flooding, landslide, faulting, or any natural disaster to minimize loss of life and property.

Source: Stanislaus County 2016b

3.6.3 Environmental Consequences

Significance Criteria

This analysis of hydrology and water quality evaluates the potential effects of the Proposed Project/Action on existing resources within or adjacent to the project site.

Effects are considered significant if an alternative would result in any of the following:

- Violate any water quality standards or WDRs
- 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)
- 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
- 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

- 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
- Otherwise substantially degrade water quality
- 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
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows
- 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
- Inundation by seiche, tsunami, or mudflow

Impact Evaluation

Resources Not Considered in Detail

Implementation of the Proposed Project/Action would not deplete groundwater supplies or interfere substantially with groundwater recharge given that groundwater pumping is not proposed and there would be limited new impervious surfaces with the Proposed Project/Action that could interfere with groundwater recharge (groundwater that may be encountered during construction activities is addressed below). The Proposed Project/Action is not located near existing or planned stormwater drainage systems and, therefore, the addition of a limited amount of new impervious surface would not contribute flows that could exceed the capacity of an existing system. Construction of the Proposed Project/Action does not include the construction of any housing (occupied structures); therefore, there would be no risk associated with placing occupied structures in a flood hazard area. A spillway structure would be constructed to control the flow rate of flood waters entering the Refuge’s Lara Tract. As discussed in Section 2, Description of Proposed Project/Action, under current conditions, flood flows entering the Lara Tract within the SJRNWR generally drain to the Hagemann Tract by gravity flow. Upon entering the Hagemann Tract, flood waters are preferentially directed into the perennial White Lake, which currently drains through an existing 3-foot culvert before returning to the San Joaquin River. The Proposed Project/Action would support the USFWS’ management of the SJRNWR for floodplain reconnection; however, WSID will not operate the spillway structure as part of this project and, therefore, the associated impacts are not included in this environmental review and are not part of the agency consultation. The Proposed Project/Action is situated away from areas that are typically subject to tsunami, seiche, or mudflow. Therefore, no impact would occur under these categories and they are not discussed further within this section.

No Project/Action Alternative

Under the No Project/Action Alternative, the proposed fish screen intake, pump station, and associated features would not be constructed. The existing unscreened intake system would continue to operate as it does currently. This would have no new effect on the San Joaquin River and the Delta, including water quality, temperature, downstream flows, dewatering effects, and effects to levees. Therefore, impacts associated with the above mentioned categories are less than significant and are not discussed further within this section.

Proposed Project/Action Alternative

Impact 3.6-1: Project construction and operations activities could violate water quality standards or waste discharge requirements, or otherwise substantially degrade water quality. (Less than Significant)

Construction of the Proposed Project/Action would involve the use of heavy equipment, including but not limited to: excavation, grading, earthmoving, stockpiling of spoils, installation of conveyance pipelines and facilities, pile driving, and placement of rip rap. Even though erosion potential for soils in the project site is generally low, construction activities have the potential to cause increased rates of erosion that could increase turbidity in the San Joaquin River adjacent to the project site. In addition, the use of heavy machinery during construction could result in the potential accidental release of fuels, oils, solvents, hydraulic fluid, and other construction-related fluids to the environment, thereby degrading water quality.

As described in Section 2, Description of Proposed Project/Action, prior to construction, a construction erosion and sedimentation control plan would be prepared and implemented to control erosion and minimize the potential to increase turbidity in the San Joaquin River. WSID would also obtain and comply with the requirements of the NPDES Construction General Permit to minimize the potential erosion of soils and the release of sediment and hazardous materials into the San Joaquin River by developing a SWPPP and implementing BMPs that would: (1) reduce water turbidity; (2) reduce surface erosion; (3) control stormwater flows; (4) retain sediment within the construction site; and (5) restore vegetation. Conditions of the permit would include:

- Preparation of hazardous material spill control and countermeasure programs;
- Stormwater quality sampling, monitoring, and compliance reporting;
- Development and adherence to a Rain Event Action Plan;
- Mandatory training under a specific curriculum; and
- Mandatory implementation of BMPs.

BMPs may include, but might not be limited to: (1) conducting major construction activities involving excavation and hauling spoils during the dry season, to the extent possible; (2) use of straw bales, sandbags, gravel traps and filters; (3) erosion control measures such as vegetation and physical stabilization; and (4) sediment control measure such as fences, dams, barriers, berms, traps, and basins. The specific BMPs to be implemented would be determined prior to issuance of the Construction General Permit, in coordination with the CVRWQCB. Adherence to these BMPs would be required as a condition of the permit, and would substantially reduce or prevent waterborne pollutants from entering receiving waters per CVRWQCB standards. Therefore, this impact is considered less than significant.

Construction of the fish screen intake would include installation of a cofferdam to facilitate construction of the fish screen intake within the San Joaquin River. Following installation of the cofferdam, the area inside the cofferdam would be dewatered. Excavation associated with construction of the buried conveyance pipelines, outfall structure, and culvert box structures of the East and West Crossings would also require dewatering. The contractor would be responsible for selecting the appropriate range of groundwater levels and equipment for the dewatering system used during construction, based on site conditions. The dewatering system would: lower the water table inside the excavation or intercept seepage which would emerge from the sides or the bottom of the excavation; improve the stability of the excavation and prevent disturbance of the bottom of the excavation; provide a reasonably dry working area in the bottom of the excavation; and provide for collection and removal of surface water and rainfall (AGS 2017). Discharge of water from dewatering activities associated with construction could impact the water quality of receiving waters.

Water from dewatering activities would be discharged back into the San Joaquin River or intake canal in accordance with regulatory permits. WSID would apply and receive coverage under NPDES No. CAG995001 Waste Discharge Requirements General Order for Dewatering and Other Low Threat Discharges to Surface Waters prior to construction. Management of dewatering activities in accordance with the conditions of the WDRs would minimize the risk of impacting the water quality of receiving waters. Therefore, this impact is considered less than significant.

Routine operation and maintenance activities associated with the Proposed Project/Action, such as cleaning out the sediment control system and removing pumps for maintenance, would be isolated from the river so there would be no significant increase in sediment or other potential pollutants discharged into receiving waters. As a result, impacts to water quality associated with operation and maintenance activities would be less than significant.

Mitigation: None required.

Impact 3.6-2: Project construction and operation could substantially alter the existing drainage patterns of the project site in a manner that would result in substantial erosion or siltation, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site. (Less than Significant)

The use of heavy equipment during construction activities could result in a temporary change in drainage patterns that could increase erosion, siltation, or flooding on- or off-site. Compaction of soils by heavy equipment could result in decreased infiltration rates, causing increased runoff and erosion potential. This is considered a potentially significant impact.

Implementation of a construction erosion and sedimentation control plan, as described in Section 2, Description of Proposed Project/Action, would reduce potential impacts to less than significant by minimizing erosion and sedimentation during construction. Disturbed areas would be restored to pre-construction conditions by replanting emergent vegetation and planting native vegetation using a vegetation mix approved by USFWS. Therefore, this impact is considered less than significant.

The Proposed Project/Action would include new impervious surfaces, particularly in the area of the proposed fish screen intake and pump station site. New impervious surfaces could result in an increase in the rate or amount of surface water runoff which could exceed the existing capacity of the existing drainage system, thereby contributing to localized flooding. This is considered a potentially significant impact.

Given the limited footprint of the concrete structures proposed, no significant increase in impervious surfaces over existing conditions would occur. Operation of the Proposed Project/ Action would not substantially alter the existing drainage pattern of the project site or significantly increase the rate or amount of surface runoff from the project site. Therefore, this impact is considered less than significant.

Mitigation: None required.

3.7 Biological Resources

3.7.1 Affected Environment

Introduction

The project site is located in the northern portion of the San Joaquin Valley within the SJRNWR. Historically, this region supported extensive marshes, riparian woodlands intermixed with oak woodland, vernal pools, and grasslands. Intensive agricultural and urban development has resulted in substantial changes and conversions of these habitats. Studies conducted for the Proposed Project/Action focused on the project site, including the location of the proposed intake facility on the San Joaquin River and along WSID's intake canal where access road improvements and two wildlife/water crossings of the canal are proposed.

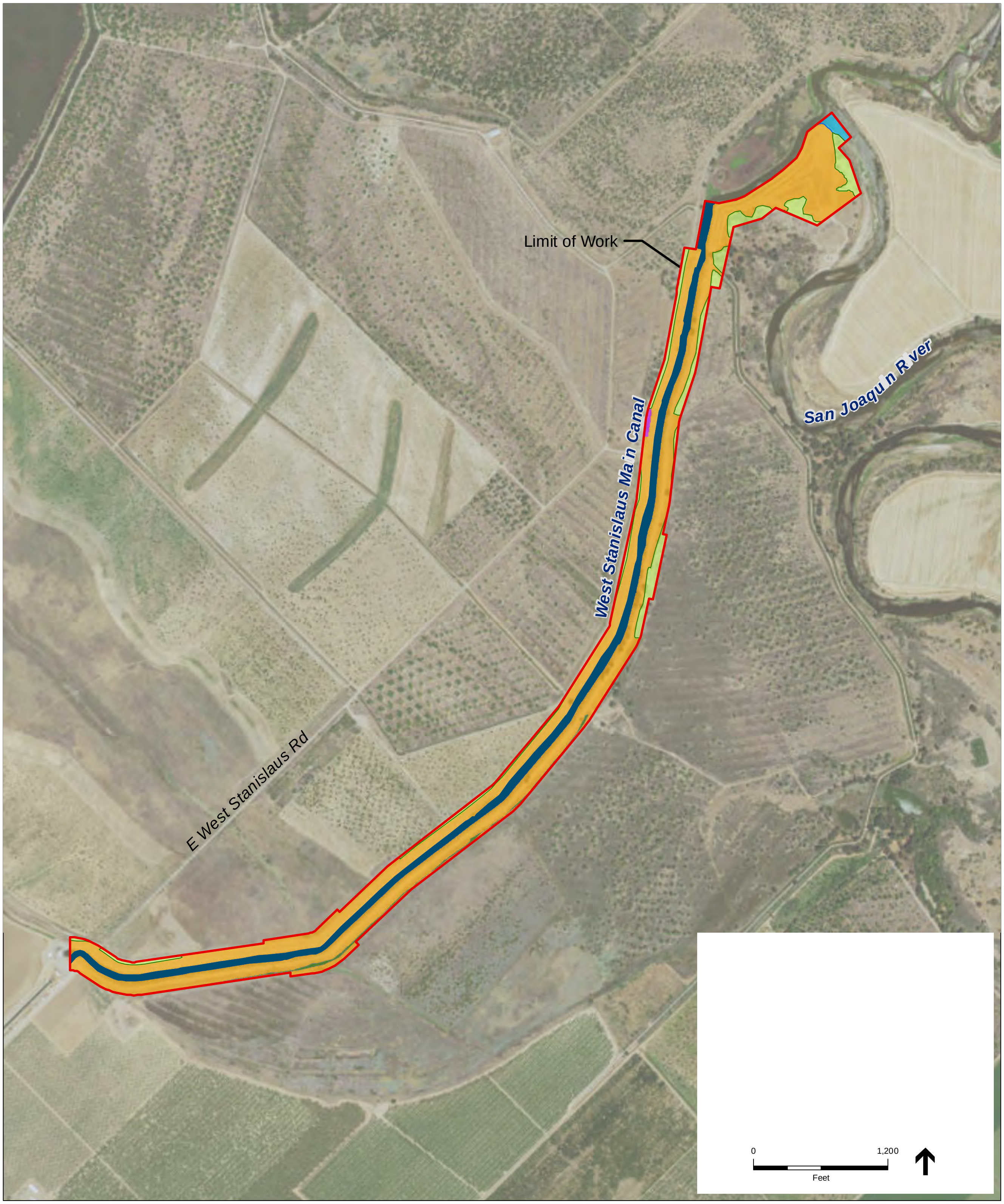
Biological Communities and Wildlife Habitats

Biological communities are assemblages of plant and animal species that commonly occur together in the same area. Wildlife habitats generally correspond to biological communities. Wildlife habitats in the project site were mapped using a combination of existing data, aerial photo interpretation, and field surveys. As shown in **Figure 3.7-1** and summarized below, upland habitat found within the project site is limited to disturbed/ruderal habitat. Aquatic habitats within the project site include riparian woodland, freshwater emergent wetland, irrigation canal, and riverine habitat. Each of these types is discussed in greater detail below.

Disturbed/Ruderal

Disturbed/ruderal habitat occurs along roadsides, parking lots, etc. This habitat is subjected to ongoing or past disturbances (e.g., vehicle traffic, mowing). Depending on the disturbance regime, these areas have remained barren or support assemblages of introduced weedy species, including yellow starthistle (*Centaurea solstitialis*) and wild oat (*Avena fatua*).

Disturbed/ruderal habitat in these disturbed areas supports a diverse weedy flora, primarily composed of non-native, invasive species. This habitat type does not correspond to any plant community. Within the project site, approximately 59.8 acres (71% of project site) of disturbed/ruderal vegetation is found along roads, on the tops of the levees north and south of the intake canal, high on the banks of the intake canal, and other disturbed areas. The levees within the project site primarily consist of dirt and gravel with sparse vegetation with the exception of the Corps levee which has been planted with a variety of riparian woodland species. These areas are characterized by level topography and are dominated by Italian thistle (*Carduus pycnocephalus*), black mustard (*Brassica nigra*), perennial pepperweed (*Lepidium latifolium*), tarweed (*Hemizonia* sp.), milk thistle (*Silybum marianum*), and other non-native annual grasses such as ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), wild oat and forbs. Very few wildlife species occur in this habitat type as it provides limited food, water, and/or shelter; however, there is the potential for burrowing owl (*Athene cunicularia*) to occur within disturbed/ruderal habitat within the project site.



SOURCE: ESRI, 2012: MWH, 2017; ESA 2017

WSID Fish Screen Intake . 120642

Figure 3.7-1
Habitat Types

Riparian Woodland

Riparian woodland (valley foothill riparian) habitat typically consists of mature riparian forest with a subcanopy tree layer and an understory shrub layer. Dominant species in the canopy are typically Fremont cottonwood (*Populus fremontii*), black willow (*Salix gooddingii*) and valley oak (*Quercus lobata*). Subcanopy trees are white alder (*Alnus rhombifolia*), box elder (*Acer negundo*), and Oregon ash (*Fraxinus latifolia*). Typical understory shrub layer species include wild grape (*Vitis californica*), California rose (*Rosa californica*), California blackberry (*Rubus ursinus*), blue elderberry (*Sambucus mexicana*), poison oak (*Toxicodendron diversilobum*), common buttonwillow (*Cephalanthus occidentalis*), and shrubby willows (*Salix* spp.). Willows often grow in shrubby thickets composed of any of several species of willow. This plant community is found in valleys bordered by sloping alluvial fans, lower foothills, and coastal plains in the Central Valley and the lower foothills of the Cascade, Sierra Nevada and Coast ranges.

Within the project site there is approximately 9.5 acres (11% of project site) of natural and restored riparian woodland habitat. Some natural riparian woodland habitat occurs within the project site along the banks of the San Joaquin River and southeast of the Corps levee. Dominant overstory species in natural riparian woodland habitat in the project site include valley oak, Oregon ash, box elder, and arroyo willow (*Salix lasiolepis*). Restored riparian habitat within the project site occurs north and south of the intake canal; the goal of the SJRNWR is to create a restored flood plain. Most of the restoration has taken place on land that was previously in agricultural production. Species planted in the restored riparian habitat include valley oak, Oregon ash, California rose, California blackberry, elderberry, buttonwillow, Goodding's black willow, arroyo willow, and narrow-leaved willow (*Salix exigua*).

Riparian habitat within the project site may provide suitable habitat for avian species such as Cooper's hawk (*Accipiter cooperii*), Swainson's hawk (*Buteo swainsoni*), sharp-shinned hawk (*Accipiter striatus*), least Bell's vireo (*vireo bellii pusillus*), and black phoebe (*Sayornis nigricans*). Mammals that may occur within valley foothill riparian habitat within the project site include: northern raccoon (*Procyon lotor*), mule deer (*Odocoileus hemionous*), riparian woodrat (*Neotoma fuscipes riparia*), riparian brush rabbit (*Sylvilagus bachmani riparius*), and brush mouse (*Peromyscus boylii*). Herpetofauna that may occur in this habitat within the project site include common kingsnake (*Lampropeltis petula*), western diamondback rattlesnake (*Crotalus atrox*), Gilbert's skink (*Plestiodon gilberti*), and western pond turtle (*Actinemys marmorata*). Invertebrates including the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*; VELB) may also occur in riparian woodland habitat within the project site due to the presence of planted elderberry shrubs.

Freshwater Emergent Wetland

Freshwater emergent wetland typically occurs in low-lying sites that are permanently flooded or saturated with fresh water and lacking significant current. Freshwater emergent wetland is most extensive where surface flow is slow or stagnant or where the water table is so close to the surface as to saturate the soil from below. This natural community characteristically forms a dense vegetative cover dominated by perennial, emergent monocots one to 15 feet high that reproduce by underground rhizomes.

Within the project site, freshwater emergent wetland occurs in an abandoned agricultural ditch to the south of the intake canal. Common plant species observed in this feature were pennyroyal (*Mentha pulegium*), cocklebur (*Xanthium strumarium*), common tule (*Schoenoplectus acutus*), and rabbitsfoot grass (*Polypogon monspeliensis*). Approximately 1.2 acres (1% of the project site) of freshwater emergent wetland occur within the project site.

Freshwater emergent wetlands provide food, cover, and water for numerous species of birds, mammals, reptiles, and amphibians, many of which depend on these wetlands throughout their life cycle. Freshwater emergent wetlands within the project site may provide suitable habitat for the following avian species: black phoebe, green heron (*Butorides virescens*), great blue heron (*Ardea herodias*), and great egret (*Ardea alba*). Mammals that may occur in freshwater emergent wetland include: northern raccoon, mule deer, and coyote (*Canis latrans*). Herpetofauna that may occur in this habitat type includes aquatic garter snake (*Thamnophis atratus*).

Riverine

Riverine habitats are distinguished by intermittent (seasonal) or perennial (continually flowing) stream channels. Approximately 0.6 acres (0.7% of the project site) of riverine habitat occurs within the project site. Riverine habitat within the project site includes the San Joaquin River in the vicinity of the proposed fish screen intake. The San Joaquin River supports valley foothill riparian and freshwater emergent wetland habitat along its banks in various places. The inner banks of the river are generally low floodplains, while the outer banks tend to be steeper and occasionally incised. The proposed fish screen intake would be located on the outer bank of a meander, with sandy substrate, low velocity flows, some aquatic vegetation including Tules (*Schoenoplectus acutus*) and various aquatic weed species including water hyacinth (*Eichhornia crassipes*).

Wildlife in riverine habitats typically includes fish, phytoplankton, diatoms, snails, and other aquatic invertebrates. Amphibians such as frogs and salamanders, and turtles may inhabit riverine habitat, although the presence of fish may preclude or limit the potential for amphibians to occur. Waterfowl, wading birds, and aerial insectivores such as flycatchers, swallows, swifts, and bats may forage in or over riverine habitat. Within the project site, riverine habitat may provide suitable habitat for species listed under Freshwater Emergent Wetland, above. Special-status species that may occur within riverine habitat in the project site include: western pond turtle, Central Valley steelhead (*Oncorhynchus mykiss*) and Chinook salmon (*Oncorhynchus tshawytscha*).

Irrigation Canal

The intake canal that serves the WSID essentially has perennial flow due to continual pumping. The intake canal encompasses approximately 13.2 acres (or 15% of the project site). The canal connects directly to the San Joaquin River, though flows are maintained through a pumping plant located at the terminal end of it. The banks of the canal are very steep with ruderal vegetation and do not provide freshwater emergent wetland habitat. Fish, amphibians, and reptiles may use the irrigation canal for various portions of their life histories, and other species such as waterfowl, bats, and river otters may use it for foraging habitat.

Sensitive Natural Communities and Waters of the U.S./State

Some of the aquatic habitats at the project site may also be considered sensitive communities or potentially regulated under the CWA or State Porter-Cologne Act. A sensitive natural community is a biological community that is regionally rare, provides important habitat opportunities for wildlife, is structurally complex, or is in other ways of special concern to local, state, or federal agencies. CEQA identifies the elimination or substantial degradation of such communities as a significant impact. The CDFW tracks sensitive natural communities in the California Natural Diversity Database (CNDDB). Furthermore, the riparian zone along streams is typically protected under Section 1600 et seq. of the California Fish and Game Code. Potentially jurisdictional features, or water features that may be regulated under Federal or State law, have also been identified in the project area. A formal aquatic resources delineation of the project site is being prepared, and will be submitted to the Corps for verification once completed.

Wildlife Corridors

Movements of wildlife generally fall into three basic categories: (a) movements along corridors or habitat linkages associated with home range activities such as foraging, territory defense, and breeding; (b) dispersal movements—typically one-way movements (e.g., juvenile animals leaving their natal areas or individuals colonizing new areas), and; (c) temporal migration movements—these movements are essentially dispersal actions which involve a return to the place of origin (e.g., deer moving from winter grounds to summer ranges and fawning areas).

Due to the abundance of both open space and agricultural lands in the project vicinity, the project site does not currently function as a wildlife corridor. This does not mean that the project site is not utilized by dispersing, migrating, or foraging wildlife, but that due to the abundance of open space and agricultural lands in the vicinity, wildlife are not restricted to a corridor within the project site.

The project site is utilized by dispersing, migrating, or foraging wildlife with the San Joaquin River main and side channels providing a corridor of aquatic and riparian habitat. This corridor is used primarily by fish as a migration corridor but is also used by terrestrial wildlife species as a movement corridor or linkage between habitats.

Although wildlife movement patterns have not been studied in the project site, it is likely that the existing WSID intake canal alters terrestrial wildlife movement patterns. As an example, smaller terrestrial species such as the riparian brush rabbit may not be able to cross the intake canal, and suitable habitat for this species may be limited by the hydrologic impact of the intake canal dividing the floodplain. The natural flood regime of the river may be altered by the intake canal as it may prevent natural flood waters from flowing into the northwest area of the refuge.

Special-Status Species

A list of special-status species with potential to occur within the project area was derived from the USFWS list of Federal Endangered and Threatened Species that may be Affected by the Project (USFWS 2016), a search of sensitive species occurrences in the CNDDB for the Westley California and eight surrounding quads (CDFW 2016), and a query of the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS 2016). A list of special-status species, their general habitat requirements, and an assessment of their potential to occur within the project site is provided below in **Table 3.7-1**. Federally and/or state-listed species, candidate species, and/or species of special concern with a moderate to high potential to occur within the project site are discussed in greater detail below and in Section 3.7.3. Designated critical habitat and essential fish habitat (EFH) in the project site is also discussed.

TABLE 3.7-1
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Scientific Name Common Name	Federal Status	State Status	CNPS Listing	Habitat Description / Blooming Period	Potential to Occur in the Project Area
Fish					
Acipenser medirostris green sturgeon (Southern Distinct Population Segment)	FT	CSC	--	Spawns in large cobble in deep and turbulent mainstem rivers. The Southern Distinct Population Segment spawns in the Sacramento River basin and in the Sacramento-San Joaquin Delta and Estuary.	Unlikely. Project site outside designated critical habitat and known range.
Hypomesus transpacificus delta smelt	FT	CE	--	Found in the Sacramento-San Joaquin Delta, Suisun Bay, Carquinez Straight, and San Pablo Bay.	Unlikely. Project outside known range of species.
Oncorhynchus mykiss **Central Valley steelhead**	**FT**	**--**	**--**	**Spawns in San Joaquin River and tributaries where gravelly substrate and suitable water conditions occur.**	**High. Migratory route in the mainstem of the San Joaquin River.**
Onorhynchus tshawytscha **Central Valley spring-run Chinook salmon**	**Nonessential Experimental Population**			**Spawns in Sacramento River and few select tributaries where gravelly substrate and suitable water conditions occur. Spring-run in the San Joaquin River are designated a "Nonessential Experimental Population" (70 FR 79622).**	**Present (assumed). Releases of experimental designated spring-run Chinook salmon have been occurring in the San Joaquin River below Friant Dam as part of the San Joaquin River Restoration Program. Depending on river conditions and restoration flows, these fish could pass through the San Joaquin River during their migration in the vicinity of the project site.**
Onorhynchus tshawytscha Central Valley winter-run Chinook salmon	FE	CE	--	Spawns primarily in upper reaches of the mainstem Sacramento River and tributaries.	Unlikely. This species does not occur in the San Joaquin River in the vicinity of the project site.
Onorhynchus tshawytscha ***Central Valley fall/late fall run Chinook salmon***	**NMFS SC**	**CSC**		**Spawns in San Joaquin River and tributaries where suitable substrate and water conditions occur.**	**High. Migratory route in the mainstem of the San Joaquin River.**

TABLE 3.7-1
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Scientific Name Common Name	Federal Status	State Status	CNPS Listing	Habitat Description / Blooming Period	Potential to Occur in the Project Area
Mylopharodon conocephalus hardhead	--	CSC	--	Low to mid-elevation streams in the Sacramento-San Joaquin drainage. Clear, deep pools with sand-gravel-boulder bottoms and slow water velocity.	Low. May migrate through project site during years of high flows.
Spirinchus thaleichthys longfin smelt	FC	CT	--	Found in the Sacramento-San Joaquin Delta, Suisun Bay, Carquinez Straight, and San Pablo Bay.	Unlikely. Project site outside known range of species.
Reptiles					
***Actinemys marmorata* western pond turtle**	**--**	**CSC**	**--**	**Inhabits ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation and requires areas of suitable basking sites and upland habitat for egg laying.**	**Present. Project site provides suitable habitat (aquatic, upland, and basking sites) for species and project site is within known range of the species. Species observed in WSID intake canal during surveys.**
Thamnophis gigas giant garter snake	FT	CT	--	Generally inhabits marshes, sloughs, ponds, slow-moving streams, ditches, and rice fields which have water from early spring through mid-fall, emergent vegetation (such as cattails and bulrushes), open areas for sunning, and high ground for hibernation and escape cover.	Unlikely. While project site provides suitable aquatic habitat and emergent vegetation with limited and poor quality upland habitat (sandy soil with few mammal burrows), it is outside of the current known range of the species.
Amphibians					
Ambystoma californiense California tiger salamander	FT	CT	--	Annual grassland and grassy understory of valley-foothill hardwood habitats in central and northern California. Needs underground refuges and vernal pools or other seasonal water sources.	Unlikely. No suitable habitat within or adjacent to the project site.
Rana draytonii California red-legged frog	FT	CSC	--	Breeds in slow moving streams with deep pools, ponds, and marshes with emergent vegetation.	Unlikely. Suitable habitat occurs within the project site however the project site is outside of the current known range and is isolated from known occurrences.
Birds					
Agelaius tricolor tricolored blackbird	--	CSC	--	Nests in dense thickets of cattails, tules, willow, blackberry, wild rose, wheat and barley crops, and other tall herbs near fresh water.	Unlikely. Project site provides limited and low quality habitat.
***Athene cunicularia* western burrowing owl**	**--**	**CSC**	**--**	**Uses ground squirrel (or other mammal) burrows within open grasslands, prairies, savanna, or agricultural fields.**	**Moderate. Project site provides suitable habitat and there are occurrences in the project vicinity.**

TABLE 3.7-1
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Scientific Name Common Name	Federal Status	State Status	CNPS Listing	Habitat Description / Blooming Period	Potential to Occur in the Project Area
Buteo swainsoni **Swainson's hawk**	**--**	**CT**	**--**	**Breeds in California's Central Valley. Winters primarily in Mexico. Typically nests in scattered trees or along riparian systems adjacent to agricultural fields or pastures.**	**Moderate. Suitable nesting habitat occurs within trees along the San Joaquin River and in restored riparian woodlands within the project site.**
Coccyzus americanus occidentalis western yellow-billed cuckoo	FT	CE	--	Nests in extensive riparian forests (at least 40 hectares).	Unlikely. Riparian area surrounding project site is highly fragmented.
Eremophilia alpestris actica California horned lark		CWL		Found in prairies, fields, airports, shores, tundra. Inhabits open ground, generally avoiding areas with trees or even bushes.	Unlikely. Project site lacks open areas free of trees and shrubs preferred by this species.
Falco columbarius **merlin**		**CWL**		**Found in open country, preferring grasslands, seashores, sand dunes, marshlands, steppes, and deserts. Does not breed in California but overwinters from September to May.**	**Moderate. Suitable foraging habitat is present within the project site. Species may be present during winter months.**
Melospiza melodia **Modesto song sparrow**		**CSC**		**Fresh-water marshes and riparian thickets.**	**Moderate. Project site provides potential habitat in restored woodlands.**
Vireo bellii pusillus **least Bell's vireo**	**FE**	**CE**		**Found in dense, shrubby riparian and forest habitat, brushy fields, chaparral, scrub oak, and mesquite brushlands.**	**Moderate. The SJRNWR is managed to provide habitat for this species and there are known occurrences in the vicinity.**
Xanthocephalus xanthocephalus yellow-headed blackbird		CSC		Marshes with tall emergent vegetation.	Unlikely. Project site provides limited and low quality habitat.
Mammals					
Neotoma fuscipes riparia **riparian (San Joaquin Valley) woodrat**	**FE**	**CSC**		**Found where shrub cover is dense and in riparian areas, highest densities of woodrats and their houses are often encountered in willow thickets with an oak overstory. They are common where there are deciduous valley oaks, but few live oaks.**	**Moderate. Project site provides potential habitat along the San Joaquin River and in restored woodlands.**
Sylvilagus bachmani riparius **riparian brush rabbit**	**FE**	**CE**		**Found in dense, brushy areas of Valley riparian forests, marked by extensive thickets of wild rose, blackberries, and willows.**	**Moderate. SJRNWR is managed for this species; suitable habitat is present within the project site.**
Taxidea taxus American badger	--	CSC	--	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Low. Project site provides limited marginal habitat.
Vulpes macrotis mutica **San Joaquin kit fox**	**FE**	**CT**		**Found in grassland, scrubland, wetlands, agricultural, and urban habitats in the San Joaquin Valley.**	**Moderate. Species may use project site for foraging and as a migration corridor.**

TABLE 3.7-1
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Scientific Name Common Name	Federal Status	State Status	CNPS Listing	Habitat Description / Blooming Period	Potential to Occur in the Project Area
Invertebrates					
Branchinecta conservation Conservancy fairy shrimp	FE	--	--	Lifecycle restricted to vernal pools.	Unlikely. No suitable habitat within or adjacent to the project site.
Branchinecta longiantenna longhorn fairy shrimp	FE	--	--	Lifecycle restricted to vernal pools.	Unlikely. No suitable habitat within or adjacent to the project site.
Branchinecta lynchi Vernal pool fairy shrimp	FT	--	--	Lifecycle restricted to vernal pools.	Unlikely. No suitable habitat within or adjacent to the project site.
Desmocerus californicus dimorphus **Valley elderberry longhorn beetle**	**FT**	**--**	**--**	**Breeds and forages exclusively on blue elderberry (Sambucus mexicana) shrubs, below 3,000 feet in elevation.**	**High. Many elderberry shrubs with stems measuring at least one inch in diameter occur within 100 feet of the project site.**
Lepidurus packardi Vernal pool tadpole shrimp	FE	--	--	Found in vernal pools, swales, ephemeral drainages, stock ponds, reservoirs, or ditches.	Unlikely. No suitable habitat within or adjacent to the project site.
Vascular Plants					
Atriplex minuscule lesser saltscale	--	--	1B.1	Found in chenopod scrub, playas, valley and foothill grasslands.	Low. Project site provides poor quality and limited habitat.
Blepharizonia plumosa big tarplant	--	--	1B.1	Found in valley and foothill grasslands.	Low. Project site provides poor quality and limited habitat.
California macrophylla round-leaved filaree	--	--	1B.1	Found in cismontane woodland and valley and foothill grassland.	Low. Project site provides limited and poor quality suitable habitat.
Caulanthus coulteri var. lemmonii Lemmon's jewelflower	--	--	1B.2	Found in pinyon and juniper woodland and valley and foothill grassland.	Low. Project site provides limited and poor quality habitat.
Cirsium crassicaule slough thistle	--	--	1B.1	Found in chenopod scrub, marshes, swamps, and riparian scrub.	Low. Project site provides limited suitable habitat.
Eryngium racemosum delta button-celery		CE	1B.1	Found in riparian scrub habitat.	Low. Potentially suitable riparian woodland habitat within the project site is dominated by invasive species in the understory.
Eschscholzia rhombipetala diamond-petaled California poppy			1B.1	Found in valley and foothill grassland.	Low. Project site provides limited and poor quality habitat.
Leptosyne hamiltonii Mt. Hamilton coreopsis			1B.2	Found in rocky cismontane woodland.	Unlikely. Project site does not provide suitable habitat.
Madia radiata showy golden madia			1B.1	Found in cismontane woodland and valley and foothill grasslands.	Low. Project site provides limited and poor quality suitable habitat.
Malacothamnus hallii Hall's bush-mallow			1B.2	Found in chaparral and coastal scrub.	Unlikely. Project site does not provide suitable habitat.
Phacelia phacelioides Mt. Diablo phacelia			1B.2	Found in chaparral and rocky cismontane woodland habitats.	Unlikely. Project site does not provide suitable habitat.

TABLE 3.7-1
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Scientific Name Common Name	Federal Status	State Status	CNPS Listing	Habitat Description / Blooming Period	Potential to Occur in the Project Area
Puccinellia simplex California alkali grass			1B.2	Mineral springs or other areas of saline soils.	Unlikely. Project site does not provide suitable habitat.

NOTES:

The "Potential for Effect" category is defined as follows:
- Unlikely: The Project Area and/or immediate area do not support suitable habitat for a particular species. Project Area is outside of the species known range.
- Low Potential: The Project Area and/or immediate area only provide limited habitat for a particular species. In addition, the known range for a particular species may be outside of the Proposed Project/Action and Project Area.
- Moderate Potential: The Project Area and/or immediate area provide suitable habitat for a particular species.
- High Potential: The Project Area and/or immediate area provide ideal habitat conditions for a particular species.

Species that have moderate or high potential to be impacted by the Proposed Project/Action and Project Area are shown in **boldface** type.

STATUS CODES:

FEDERAL:
- FC = Federal Candidate
- FE = Listed as "endangered" under the federal Endangered Species Act
- FT = Listed as "threatened" under the federal Endangered Species Act

STATE:
- CE = Listed as "endangered" under the California Endangered Species Act
- CSC = California Department of Fish and Wildlife designated "species of special concern"
- CT = Listed as "threatened" under the California Endangered Species Act

CNPS:
- List 1B = Plants rare, threatened, or endangered in California and elsewhere

Source: USFWS 2016, CDFW 2016, CNPS 2016

Baseline Conditions for Species

The following section provides basic life history information and current status for the special-status species potentially affected by the Proposed Project/Action.

Central Valley Steelhead

On March 19, 1998, NMFS listed the Central Valley steelhead as a threatened species (63 FR 13347). The Sacramento and San Joaquin Rivers offer the only migration route to the drainages of the Sierra Nevada and southern Cascade mountain ranges for steelhead. *Oncorhynchus mykiss* may exhibit anadromy or freshwater residency. Resident forms are usually referred to as rainbow trout, while anadromous life forms are termed steelhead. Central Valley steelhead were thought to be extirpated from the San Joaquin River system, until recent monitoring detected small populations of *O. mykiss* in the Stanislaus, Mokelumne, and Calaveras Rivers, and other streams previously thought to be devoid of steelhead (McEwan 2001). It is uncertain whether the *O. mykiss* in those rivers are predominantly resident or anadromous *O. mykiss*; presumably, both the anadromous and resident life history form of *O. mykiss* are present (NMFS 2014). Zimmerman *et al.* (2008) demonstrated that resident rainbow trout can produce anadromous smolts and anadromous steelhead can produce resident rainbow trout in the Central Valley. That study indicated that the proportion of resident rainbow trout to anadromous steelhead in the Central Valley is largely in favor of the resident form with 740 of 964 *O. mykiss* examined being the progeny of resident rainbow trout (Zimmerman et al. 2008). Steelhead also currently occur in the Stanislaus, Calaveras, Merced, and Tuolumne Rivers (NMFS 2014).

Central Valley steelhead enter fresh water from August through April (NMFS 2014). They hold until flows are high enough in tributaries to enter for spawning (Moyle 2002). Steelhead adults typically spawn from December through April, with peaks from January through March in small streams and tributaries where cool, well oxygenated water is available year-round (McEwan 2001). Juvenile steelhead migrate downstream during most months of the year, but the peak emigration period occurs in the spring and coincides with higher flow events. NMFS proposed critical habitat for Central Valley steelhead on December 10, 2004 (69 FR 71880) and published a final rule designating critical habitat for this species on September 2, 2005 (70 FR 52488). The specific areas designated include approximately 8,935 total miles (14,269 kilometer) of riverine habitat and 470 square miles (1,212 square kilometers) of estuarine habitat (primarily in San Francisco-San Pablo- Suisun Bays) in California. The San Joaquin River within the project site and vicinity is designated critical habitat for Central Valley steelhead.

Steelhead within the San Joaquin River system would occur seasonally in the vicinity of the project site during migrations. Steelhead spawning and juvenile rearing occur in upstream reaches of major tributaries and no steelhead spawning or oversummer rearing by juvenile steelhead would be expected in the project site. Adult and juvenile steelhead use the area of the San Joaquin River in the vicinity of the project site as a seasonal migratory corridor, with adults most likely to be present during fall and winter months and juveniles most likely to be present during higher flow events in the spring.

Central Valley Fall-/Late Fall-Run/Spring Run Chinook Salmon

Fall-run Chinook salmon historically spawned in all major rivers of the Central Valley, migrating as far as the Kings River to the south and the Upper Sacramento, McCloud, and Pit rivers to the north (Yoshiyama et al. 1998). Overall, it is estimated that over 70% of spawning habitat has been blocked by dams, although coldwater releases from dams now allow spawning where it did not formerly exist (Yoshiyama et al. 1998). Fall-run Chinook, which still have access to the part of their natural range below the dams, are now most widely distributed salmon in California, and are the only Chinook salmon run in the San Joaquin River and Delta tributaries.

Like Central Valley steelhead, fall-run Chinook generally enter fresh water as temperatures decline in the fall, in an advanced state of sexual maturation, and begin spawning when the water temperature declines. Juveniles typically emerge from the gravel in December through March and rear in fresh water for several months, usually moving downstream into large rivers within a few weeks. Salmon smolts initiate migration during storm events and flow is positively correlated with migration rate (Michel et al. 2013).

Adult and juvenile fall-run Chinook use the area of the San Joaquin River in the vicinity of the project site as a seasonal migration corridor, with adults most likely to be present during fall and winter months and juveniles most likely to be present during higher flow events in the spring. The San Joaquin River in the project site and vicinity is designated EFH for Pacific Salmon.

Naturally spawned spring-run Chinook salmon originating from the Sacramento River and its tributaries, and also spring-run Chinook salmon from the Feather River Hatchery Spring-run Chinook Program are a designated threatened species; the spring-run Chinook that could be present in the San Joaquin River are not included in this designation. Re-introductions of spring-run Chinook salmon smolts that occur in the San Joaquin River below Friant Dam as part of the San Joaquin River Restoration Program are designated a “Nonessential Experimental Population” (70 FR 79622). Previous releases of spring run Chinook have occurred during periods of high flows (February-April). These juvenile fish could pass through the vicinity of the project site during their downstream migration.

Western Pond Turtle

Western pond turtle is an aquatic turtle of permanent or nearly permanent ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation generally below 6,000 feet in elevation. They need basking sites such as partially submerged logs, vegetation mats, or open mud banks, and suitable upland habitat with well-drained soils for egg-laying, such as sandy banks or grassy, open fields. The western pond turtle is uncommon to common in suitable aquatic habitat throughout California, west of the Sierra-Cascade crest and absent from desert regions, except in the Mojave Desert along the Mojave River and its tributaries. Elevation range extends from near sea level to 1,430 meters (4,690 feet). This species is listed as a species of special concern by the state of California. Suitable aquatic and upland habitat (including basking sites) occurs in/along the intake canal and San Joaquin River within the project site and this species was observed in the intake canal near the Corps levee during surveys for the Proposed Project/Action.

Western Burrowing Owl

Burrowing owl is a small diurnal owl that nests underground in the burrows of small mammals, especially those of ground squirrels. Culverts and other human-made structures may also be suitable habitat for the burrowing owl. Often a burrowing owl will occupy several burrows in an area. In the Central Valley, the burrowing owl is a year-round resident of open spaces such as grasslands, agricultural fields, air fields, and levees. Vegetation must be very short or very sparse to be suitable habitat for burrowing owl. Breeding peaks from April to May, but can occur from March to August. The burrowing owl forages on insects and small mammals and will also consume reptiles, birds, and carrion.

Ruderal habitats within the project site could provide suitable foraging habitat for this species and there are a few ground squirrel burrows located along the banks of the intake canal that could provide potential nest locations, therefore this species may occur within the project site.

Swainson’s Hawk

Swainson’s hawk is a medium-sized raptor with white leading edges of wings, a dark bib, and lightly banded tail. This species has various color morphs that can make it difficult to identify. It breeds in stands with few trees in juniper-sage flats, riparian areas, or oak savannah adjacent to suitable foraging habitat such as grasslands, alfalfa or grainfields with rodent populations. Threats to Swainson’s hawk include development, resulting in the loss of foraging and nesting habitat.

Swainson’s hawk is listed as threatened by the state of California and is not federally listed. Ruderal habitat in the project site, restored woodlands, and cropland in the project vicinity provide suitable foraging habitat and mature trees associated with valley foothill riparian habitat may provide suitable nest sites. Swainson’s hawk are known to occur in the vicinity and it is likely that this species occurs in the project site.

Merlin

Merlin inhabit open country, such as willow or birch scrub, shrubland, but also taiga forest, parks, grassland such as steppe and prairies, or moorland. They are not very habitat-specific and can be found from sea level to the treeline. In general, they prefer a mix of low and medium-height vegetation with some trees, and avoid dense forests as well as treeless arid regions. During migration however, they will utilize almost any habitat. Merlin do not breed in California but winter in the state from September to May in open woodland, grasslands, open cultivated fields, marshes, estuaries, and seacoasts. Merlin have become adapted to living in urban areas and may overwinter in cities, taking advantage of the steady supply of house sparrows and pigeons that urban centers provide. The riparian habitat around the San Joaquin River as well as the adjacent open habitats provide potentially suitable habitat for this species and it could be present within the project site during September to May.

Modesto Song Sparrow

Modesto song sparrow is a California species of special concern that is found in fresh-water marshes and riparian thickets. Song sparrows have the greatest number of genetically distinct populations of any bird in North America. The total number of subspecies includes 11 that breed in California (with some recent debate and modifications to subspecies status), and 8 that are endemic to the state. Of all the song sparrow subspecies that have species of special concern status, Modesto song sparrow is the only one strongly associated with woody riparian habitat. While most of the project site does not provide suitable habitat for this species, some potential habitat occurs within portions of the restored riparian woodland that have thickets of willows and other shrubs.

Least Bell’s Vireo

Least Bell’s vireo is one of four subspecies of Bell's Vireo recognized by the American Ornithologist's Union. It is the western-most subspecies, breeding entirely within California and northern Baja California. Least Bell’s vireo is small, with small, rounded wings, a short, straight, blunt-tipped bill, and drab gray to green above with a white to yellow unstreaked breast. Historically, the least Bell's vireo was a common to locally abundant species in lowland riparian habitat, ranging from coastal southern California through the Sacramento and San Joaquin Valleys as far north as Red Bluff (Tehama County). Populations also occurred in the foothill streams of the Sierra Nevada and Coast Ranges, and in Owens Valley, Death Valley, and scattered locations in the Mojave Desert. This species is found in dense, shrubby, low-growing vegetation in riparian, scrub, brushy fields, woodlands, and forests. Least Bell’s vireo is listed as endangered by both the state of California and federal ESA. There are known occurrences of least Bell’s vireo in the vicinity of the project site and the SJRNWR is managed specifically for this species. Potential habitat occurs within portions of the restored riparian woodlands that have thickets of willows and other shrubs.

San Joaquin Valley Woodrat

San Joaquin Valley woodrat, also known as the riparian woodrat, is a medium sized rodent in the *Cricetidae* family. Adult riparian woodrats weigh from about 7 to 14 ounces. The riparian woodrat can be distinguished from other subspecies by having white rather than dusky hind feet. It is also larger, lighter and more grayish. Its tail is more distinctly bicolored. Riparian woodrats are most numerous where shrub cover is dense and least abundant in open areas. In riparian areas, highest densities of woodrats and their dens (houses) are often encountered in willow thickets with an oak overstory. They are common where there are deciduous valley oaks, but few live oaks. The riparian woodrat inhabits riparian communities along the lower portions of the San Joaquin and Stanislaus Rivers in the northern San Joaquin Valley. Historical records for the riparian woodrat are distributed along the San Joaquin, Stanislaus, and Tuolumne Rivers, and Corral Hollow, in San Joaquin, Stanislaus, and Merced counties. The riparian woodrat is federally listed endangered. The restored woodlands within the project site provide potential habitat for this species.

Riparian Brush Rabbit

Riparian brush rabbit is a small rabbit that is dark grayish-brown, with mottled black spots. Some populations are paler than others. It has short legs, a small tail, and short, dark ears. The riparian brush rabbit is found in riverside riparian woodland habitats with dense understories of willows, wild rose bushes, blackberry, coyote bushes and wild grape vines. The riparian brush rabbit feeds on the shoots and leaves of grasses, clover, and other herbaceous plants. This species is a state and federally listed endangered species. The restored woodlands within the project site provide suitable habitat for this species and the SJRNWR is actively managed for recovery of this species.

San Joaquin Kit Fox

San Joaquin kit fox has big, conspicuous ears, relatively long legs, and is slender-built. The San Joaquin kit fox is the smallest member of the dog family in North America. Historically, this kit fox was widely distributed throughout grassland, scrubland, and wetland communities in the San Joaquin Valley and adjacent low foothills, but agricultural, urban, and industrial development in the Valley, including oil and gas development, has led to extensive and continuing loss of native habitat, the primary threat to kit foxes. Today, much of the kit fox's remaining habitat is extremely fragmented, movement corridors are degraded or blocked, and only a few large areas of native grasslands remain on the San Joaquin Valley's perimeter. This species is state listed threatened and federally listed as endangered. Potential foraging habitat is present throughout the project site, and there may be potential den sites located along the levees or access roads.

Valley Elderberry Longhorn Beetle

Suitable habitat for VELB is typically defined as live elderberry (*Sambucus* spp.) stems measuring at least one inch in diameter at ground level. They seldom occur above 3,000 feet in elevation. They are generally found along waterways and in floodplains that support remnant stands of riparian vegetation. The VELB is completely dependent on its host plant, elderberry, which is a common component of the riparian forests and adjacent upland habitats of California's Central Valley and foothills. Elderberry shrubs/trees with VELB populations occur in a variety of habitats and plant communities, but most often are found in riparian or savanna areas.

Records for this species are restricted to small, scattered populations along the Sacramento, American, San Joaquin, Kings, Kaweah, and Tule Rivers and their tributaries. However, the species has the potential to occupy shrubs below 3,000 feet in elevation within the Central Valley and Sierra Nevada foothills. For this reason, elderberry shrubs of sufficient size (measuring at least one inch in diameter at ground level) are considered suitable habitat for this species.

The VELB is a federally threatened species. The SJNWR has planted elderberry shrubs throughout the project site, along levees and in restored woodlands. An elderberry shrub survey was conducted in the project site according to the 1999 USFWS guidelines to map shrubs, measure and count stems, and look for VELB exit holes; 165 elderberry shrubs were found to be located within 100 feet of the proposed work area limits and VELB could occur throughout the area due to the suitable habitat. The 2017 VELB framework recommends surveys to 165 feet, however because no construction activities would occur past 100 feet from the Proposed Project/ Action, no additional surveys were conducted between 100-165 feet. Due to restoration and plantings at the SJRNWR, it is known that there are many elderberry shrubs between 100-165 feet from the project site.

3.7.2 Regulatory Framework

Federal Regulations

Federal Endangered Species Act

The federal Endangered Species Act (FESA) prohibits the "take" of endangered or threatened fish and wildlife species on public or private property, and the "take" of endangered or threatened plants in areas under federal jurisdiction or in violation of state law. Under the FESA, the definition of "take" is to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." The USFWS has interpreted the definition of "harm" to include any significant habitat modification that could result in take. If a project would take a federally listed species, then an incidental take permit is required to authorize the take. Such a permit typically requires various measures to compensate for or to minimize the take.

Pursuant to Section 7 of the FESA, a federal agency reviewing a project within its jurisdiction must determine whether any federally listed threatened or endangered species, or species proposed for federal listing, may be present in the project area, and then must determine whether the project would have a potentially significant impact on such species. In addition, the federal agency must determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under FESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 United States Code [USC] 1536[3], [4]).

The USFWS administers the FESA for all terrestrial and non-marine aquatic species and the NMFS administers FESA for marine fish species, including anadromous salmonids such as salmon, sturgeon, and steelhead. Projects for which a federally listed species or its habitat is present and for which federal permits are required must receive authorization from USFWS and/or NMFS.

Migratory Bird Treaty Act and California Fish and Game Code Protections

The Migratory Bird Treaty Act (16 USC, Sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs. Birds of prey are protected in California under the State Fish and Game Code, Section 3503.5 (1992). Section 3503.5 states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "take" by the CDFW. Any loss of fertile eggs, nesting raptors, or any activities resulting in nest abandonment would constitute a significant impact. Project impacts to these species would not be considered significant unless they are known or have a high potential to nest in the project area or to rely on it for primary foraging.

Waters of the United States

The Corps has primary federal responsibility for administering regulations that concern "waters of the U.S." within the project area. The Corps acts under two statutory authorities, the RHA (Sections 9 and 10) which governs specified activities in "navigable waters of the U.S.," and the CWA (Section 404), which governs specified activities in "other waters of the U.S." including wetlands. The Corps requires that a permit be obtained if a project proposes placing structures within, over, or under navigable waters or discharging dredged or fill material into "waters of the U.S." below the ordinary high-water mark in non-tidal waters. The EPA, USFWS, NMFS, and several other agencies can provide comments on Corps permit applications.

The federal government defines wetlands in Section 404 of the CWA as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support (and do support, under normal circumstances) a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3[b] and 40 CFR 230.3). The federal definition of wetlands requires three wetland identification parameters to be present: wetland hydrology, hydric soils, and hydrophytic vegetation.

"Other waters of the U.S." refers to those hydric features that are regulated by the CWA but are not wetlands (33 CFR 328.4). To be considered jurisdictional, these features must exhibit a defined bed and bank and an ordinary high-water mark. Examples of other waters of the U.S. include rivers, creeks, intermittent and ephemeral channels, ponds, and lakes.

Essential Fish Habitat for Pacific Salmon

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996, established procedures designed to identify, conserve, and enhance EFH. The EFH designation applies to all species managed under a Federal Fishery Management Plan (FMP). In California, the FMP for Pacific salmon designates the San Joaquin River as EFH for Central Valley fall-run Chinook salmon. The San Joaquin River within the project site contains the migratory corridor components of EFH listed in **Table 3.7-2**.

TABLE 3.7-2
DESCRIPTION OF SAN JOAQUIN RIVER ESSENTIAL FISH HABITAT

Essential Fish Habitat Component	Description
Juvenile Rearing	Juvenile rearing is discussed primarily in terms of rearing in the natal stream area. As the FMP notes, juvenile rearing may be an incidental habitat function in the mainstem rivers, which serve primarily as migration corridors;
Juvenile Migration Corridors	The FMP notes that "Smolts swim and drift through the streams and rivers and must reach the estuary or ocean where there are adequate prey and water quality conditions and must find adequate cover to escape predators as they migrate"
Adult Migration Corridors and Adult Holding Habitat	The FMP does not specifically identify habitat requirements for adult migration, but notes that passage blockage, water quality, flow modifications, channel modification, reduced frequency of holding pools, lack of cover, reduced depth of holding pools, reduced cold-water refugia, and increased predation resulting from habitat modifications are habitat concerns.

Source: Pacific Fishery Management Council 2003

Amendment 14 of the Pacific Salmon FMP identifies and describes mechanisms by which various factors may influence EFH and salmonids. Specifically, habitat requirements are identified and potential habitat concerns are listed. The requirements/concerns applicable to EFH in the project site are summarized **Table 3.7-3**.

TABLE 3.7-3
FISH MANAGEMENT PLAN CONCERNS IN PROJECT AREA

Habitat Requirement	Habitat Concern
Adult migration pathways	Water diversions, changes in water currents and hydrology, changes in water quality during project construction
Smolt migration pathways	Entrainment into water diversions, changes in water currents and hydrology, changes in water quality during project construction

Source: Pacific Fishery Management Council 2003

Given these designated characteristics, the primary components of EFH present at the project site are migration pathways. The existing condition of the habitat in the area is disturbed in terms of flow modifications, channel modification (channelization and riprap), lack of vegetative cover, and the likely increased predation resulting from these habitat modifications. Flow modifications are primarily the result of upstream impoundments, water diversions, and associated water management, which have reduced flows in winter and spring, when natural precipitation and snow melt would otherwise result in higher flow, and increased flows in summer and fall, which are generally dry periods in California's Central Valley.

Critical Habitat Designations for Fish

Central Valley Steelhead

NMFS has designated critical habitat for Central Valley steelhead and includes all river reaches accessible to listed steelhead in the Sacramento and San Joaquin Rivers and their tributaries. Also included are river reaches and estuarine areas of the Delta, all waters from Chipps Island westward to the Carquinez Bridge, including Honker Bay, Grizzly Bay, Suisun Bay, and Carquinez Straits, all waters of San Pablo Bay west of the Carquinez Bridge, and all waters of San Francisco Bay (north of the San Francisco/Oakland Bay Bridge) from San Pablo Bay to the Golden Gate Bridge. Excluded are areas of the San Joaquin River upstream of the Merced River confluence and areas above specific dams or above longstanding naturally impassable barriers.

The Proposed Project/Action would be constructed within an area of the San Joaquin River designated as critical habitat for steelhead.

State Regulations

California Endangered Species Act

Pursuant to the California Endangered Species Act (CESA) and Section 2081 of the California Fish and Game Code, a permit from the CDFW is required for a project that could result in the take of a state-listed threatened or endangered species (i.e., species listed under CESA). Under CESA, the definition of “take” includes an activity that would directly or indirectly kill an individual of a species, but the state definition does not include “harm” or “harass,” as the federal definition does. As a result, the threshold for take under the CESA is typically higher than that under the FESA. Under CESA, CDFW maintains a list of threatened species and endangered species (California Fish and Game Code 2070). The CDFW also maintains two additional lists: (1) a list of candidate species that are species CDFW has formally noticed as being under review for addition to either the list of endangered species or the list of threatened species; and (2) a list of “species of special concern;” these lists serve as “watch lists.”

Consistent with the requirements of CESA, a state agency reviewing a project within its jurisdiction must determine whether any state-listed endangered or threatened species may be present in the project area and determine whether the Proposed Project/Action would have a potentially significant impact on such species. To initiate this process, a letter shall be submitted to CDFW describing the project, state-listed species potentially affected, proposed avoidance and minimization measures for the species, and request for concurrence that the project would not result in take of state listed species. Ultimately it is CDFW’s responsibility to determine whether take of the species would occur or not. If CDFW determines that take would not occur, then a consistency determination (pursuant to Fish and Game Code 2080.1) or application for a take permit (pursuant to Fish and Game Code 2081) would be required.

California Fish and Game Code

The California Fish and Game Code protects a variety of species from take. Certain species are considered fully protected, meaning that the code explicitly prohibits all take of individuals of these species except for take permitted for scientific research. Section 5050 lists fully protected amphibians and reptiles, Section 5515 lists fully protected fish, Section 3511 lists fully protected birds, and Section 4700 lists fully protected mammals. It also is possible for a species to be protected under the California Fish and Game Code, but not fully protected.

Eggs and nests of all birds are protected under Section 3503, nesting birds (including raptors and passerines) under Sections 3503.5 and 3513, and birds of prey under Section 3503.5. Migratory nongame birds are protected under Section 3800, and other specified birds under Section 3505.

California Native Plant Protection Act

The California Native Plant Protection Act of 1977 (Fish and Game Code Sections 1900–1913) is intended to preserve, protect, and enhance endangered or rare native plants in California and gives the CDFW authority to designate state endangered, threatened, and rare plants and provides specific protection measures for identified populations. The Act also directs the California Fish and Game Commission to adopt regulations governing taking, possessing, propagation, and sale of any endangered or rare native plant.

Waters of the State

The State's authority to regulate activities in "waters of the U.S." is primarily with the CDFW and the SWRCB. CDFW provides comments on Corps permit actions under the Fish and Wildlife Coordination Act. California Fish and Game Code Sections 1600-1616 require the notification of CDFW for any activity that would obstruct the flow of, or alter the bed, channel, or bank of a river or stream in which there is a fish or wildlife resource, including intermittent and ephemeral streams. In addition, Section 5650 of California's Fish and Game Code states that it is unlawful to deposit, dispose of or permit the dumping of solids, liquids or carcasses into state waters. Upon notification, the CDFW has the responsibility to prepare a Streambed Alteration Agreement, in consultation with the project proponent that includes appropriate mitigation measures. Part of that mitigation includes SWPPPs, which are a requirement of the NPDES that regulates water quality when associated with construction or industrial activities. The SWPPP addresses all pollutants and their sources, including sources of sediment associated with construction, construction site erosion, and all other activities associated with construction activity and controlled through the implementation of BMPs.

Under Section 401 of the CWA, the SWRCB, acting through the appropriate RWQCB, must certify that a Corps permit action meets state water quality objectives.

Discharges to wetlands and "other waters of the state" are also subject to state regulation under the California Porter-Cologne Water Quality Control Act (Porter-Cologne; California Water Code, Div. 7, Sections 13000-14958). Water Code section 13260 requires "any person discharging waste, or proposing to discharge waste, within any region that could affect the waters of the state to file a report of waste discharge (Water Code Section 13260[a][1]). The term "waters of the state" is defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (Water Code Section 13050[e]). Therefore, whether or not Corps has concurrent jurisdiction under Section 404 of CWA, the SWRCB and RWQCB have jurisdiction to regulate waters of the state by issuing WDRs or waivers thereof.

Oak Woodlands Conservation Act

California State SB 1334, the Oak Woodlands Conservation Act, became law on January 1, 2005 and was added to the CEQA statutes as PRC Section 21083.4. This statute requires that a county must determine whether or not a project will result in a significant impact on oak woodlands and, if it is determined that a project may result in a significant impact on oak woodlands, then the County shall require one or more of the following mitigation measures:

1. Conserve oak woodlands through the use of conservation easements;
2. Plant an appropriate number of trees, including maintenance of plantings and replacement of failed plantings;
3. Contribute funds to the Oak Woodlands Conservation Fund for the purpose of purchasing oak woodlands conservation easements;
4. Other mitigation measures developed by the county.

Local Regulations

Stanislaus County General Plan

The Stanislaus County General Plan's Conservation and Open Space Element contains goals and policies designed to protect natural resources in perpetuity for the benefit of current and future residents. These resources include woodlands, lakes, rivers, fisheries, and wildlife. The Conservation and Open Space Element's goals and policies provide management guidance for biological resources that may occur in unincorporated lands within the project area, and are summarized in **Table 3.7-4**.

TABLE 3.7-4
BIOLOGICAL RESOURCES GOALS AND POLICIES OF STANISLAUS COUNTY

Number	Description
Conservation and Open Space Element	
Goal 1	Encourage the protection and preservation of natural and scenic areas throughout the County.
Policy 1	Maintain the natural environment in areas dedicated as parks and open space.
Goal 2	Conserve water resources and protect water quality in the County.
Policy 6	Preserve vegetation to protect waterways from bank erosion and siltation.
Goal 4	Provide for the open-space recreational needs of the residents of the County.
Goal 10	Protect fish and wildlife species of the County.
Policy 30	Habitats of rare and endangered fish and wildlife species shall be protected.

Source: Stanislaus County 2016

The San Joaquin River National Wildlife Refuge Comprehensive Conservation Plan and San Joaquin River Management Plan

The SJRNWR Comprehensive Conservation Plan and the San Joaquin River Management Plan describe the primary function of the Refuge as that which protects and manages Aluetian Canada geese. This plan was expanded to include protection of wildlife that are dependent on wetlands and riparian floodplain habitat and restoration of this habitat and its ecological processes. The goal is to restore riparian habitat and hydrologic function and provide alternative methods of flood control.

The plan also includes a goal to contribute to the recovery of threatened, endangered and special-status wildlife and their habitats. Ongoing restoration efforts to reestablish the riparian brush rabbit population began in the early 2000's and include a captive breeding program and protection and planned restoration of the existing riparian habitat. Protection and restoration of riparian habitat was made a management priority when the San Joaquin Valley woodrat was observed on the refuge, as they also occupy riparian habitat.

3.7.3 Environmental Consequences

Significance Criteria

This analysis of biological resources evaluates the potential effects of the Proposed Project/Action on existing resources within or adjacent to the project site.

Effects are considered significant if an alternative would result in any of the following:

- Result in an adverse impact, either directly or through habitat modifications, on any endangered, rare, or threatened species, as listed in Title 14 of the California Code of Regulations (Sections 670.2 or 670.5) or in Title 50, CFR (Sections 17.11 or 17.12).
- 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 CDWF or USFWS.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS.
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife corridors, or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted HCP, NCCP, or other approved local, regional, or state HCP.

Impact Evaluation

Resources Not Considered in Detail

The project site is located within a WSID easement on the SJRNWR and the Proposed Project/Action would not impact an HCP or NCCP. The surrounding area is managed under the SJRNWR Comprehensive Conservation Plan and the San Joaquin River Management Plan. The Proposed Project/Action supports the goals of these plans through the screening of an unscreened diversion on the San Joaquin River. In addition, the proposed wildlife crossings of the WSID intake canal could benefit riparian woodland habitat and species supported by that habitat including riparian brush rabbit and San Joaquin Valley woodrat. The Proposed Project/Action would also support the USFWS' management of the SJRNWR for floodplain reconnection through construction of a spillway structure. However, WSID will not operate the spillway structure as part of this project and, therefore, the associated impacts are not included in this environmental review and are not part of the agency consultation. When and if an entity comes forward to operate the structure to provide flood flows to Lara Tract, in support of allowing fish to return to the river after accruing nutrients in the floodplain, that would be an independent project subject to environmental documentation and agency consultation. Development of the Proposed Project/Action would not conflict with any local policies or ordinances protecting biological resources and no impact would occur. These resource areas are not discussed further in this section.

No Project/Action Alternative

Under the No Project/Action Alternative, the proposed fish screen intake, pump station, and associated features of the Proposed Project/Action would not be constructed. The existing intake to the WSID intake canal would remain in place and would have no new effect on special-status plants and animal species when compared to existing conditions. Existing habitat would not be subject to temporary disruption and permanent loss by re-grading, filling, or abandoning existing infrastructure. The continued unscreened diversion of water from the San Joaquin River would potentially entrain resident and migratory fish species and salmonid species and would not provide for the long-term improvement of the aquatic habitat along the San Joaquin River. The intake canal may continue to be a barrier for both flood flows and wildlife through the SJRNWR.

Proposed Project/Action Alternative

Impact 3.7-1: The Project could adversely affect species identified as endangered, rare, or threatened by CDFW, USFWS, or NMFS either directly or through habitat modification. (Less than Significant with Mitigation)

As described in Table 3.7.1, there are eight federally or state-listed species that could occur within the project area and be impacted by the Proposed Project/Action including: Central Valley steelhead, fall/late-fall-run Chinook salmon, Swainson's hawk, least Bell's vireo, riparian woodrat, riparian brush rabbit, San Joaquin kit fox, and VELB. These species, including their status within the project site, potential impacts from project construction and operation, and mitigation measures to minimize or avoid impacts are described below.

Fish Species

The Proposed Project/Action would involve work within the San Joaquin River and the intake canal, which could be occupied by special-status fish species, including Central Valley steelhead, Central Valley fall/late-fall-run Chinook salmon, and Central Valley spring-run Chinook salmon.

The Proposed Project/Action would include installation and operation of a new fish screen intake with a low-lift pump station located on the bank of the San Joaquin River adjacent to the mouth of the WSID intake canal. Intake canal improvements would include a proposed outfall structure at the Corps levee (gated box culverts for conveyance of irrigation water if the system cannot operate as designed), and two crossings. Both crossings would allow wildlife passage and one would allow for vehicular passage and for flood waters to cross the intake canal without intermingling screened diversion water with floodplain water. Both crossings would include four culverts to convey canal flows. Construction of a fish screen intake in the San Joaquin River and the intake canal improvements have the potential to adversely impact various fish species and their habitats through the release and exposure of suspended sediments and/or construction contaminants, direct loss of habitat, and effects associated with pile driving, cofferdam installation, and dewatering activities. Each of these potential impacts are discussed below.

Release and Exposure of Suspended Sediments and Construction Contaminants

Construction activities could disturb sediments and soils within and adjacent to waterways. These activities, including construction of the new fish screen intake, use of staging areas, and placement of excavated material, could disturb sediments and soils within and adjacent to waterways. Any construction-related erosion or disturbance of sediments and soils would temporarily increase downstream turbidity and sedimentation in the project area if soils were transported in river flows or stormwater runoff.

The abundance, distribution, and survival of fish populations have been linked to levels of turbidity and silt deposition. Prolonged exposure to high levels of suspended sediment would create a loss of visual capability in fish in aquatic habitats within the project area, leading to reduced feeding and growth rates. Such exposure would also result in a thickening of the gills, potentially causing the loss of respiratory function; in clogging and abrasion of gills; and in increased stress levels, which in turn could reduce tolerance to disease and toxicants (Waters 1995). Turbidity also could result in increased water temperature and decreased DO levels, especially in low-velocity pools, which can cause stressed respiration.

High levels of suspended sediments could also cause redistribution and movement of fish populations in the San Joaquin River, and could diminish the character and quality of the physical habitat important to fish survival. Deposited sediments can reduce water depths in stream pools and can contribute to a reduction in carrying capacity for juvenile and adult fish (Waters 1995). Increased sediment loading downstream from construction areas could degrade food-producing habitat by interfering with photosynthesis of aquatic flora, and could displace aquatic fauna.

Many fish, including salmonids, are sight feeders and turbid waters reduce the ability of these fish to locate and feed on prey. Some fish, particularly juveniles, could become disoriented and leave the areas where their main food sources are located, ultimately reducing growth rates. Prey of fish populations, such as macroinvertebrates, could be adversely affected by declines in habitat quality (water quality and substrate conditions) caused by increased turbidity, decreased DO content, and an increased level of pollutants.

Avoidance of adverse habitat conditions by fish is the most common result of increases in turbidity and sedimentation. Fish will not occupy areas unsuitable for survival unless they have no other option. Therefore, increased turbidity attributed to construction activities could preclude fish from occupying habitat required for specific life stages.

Construction of the cofferdam would divert water around work in the actively flowing channel. This would reduce the potential for sediment or other pollutants to enter the waterways and to impact downstream resources during active construction of the fish screen intake and intake pumps. Following cofferdam construction, the area behind the cofferdam would be dewatered. The outfall structure would be constructed prior to the fish screen intake in Construction Year 1, and construction of the pumps and fish screen intake assembly is expected to take approximately 12 months (Construction Year 1); the cofferdam is expected to be in place throughout that entire time.

Installation of the cofferdam and cutting it off or driving it into the riverbed would occur during the June 15 to November 1 in-water work window. This period coincides with when Central Valley steelhead and Chinook salmon are least likely to be present in the vicinity of the project site. During the summer to early fall window, adult steelhead and salmon would not have commenced upstream migrations, and juveniles would not be migrating downstream. As described above, rearing juveniles, and resident or holding steelhead are not expected to occur in the project site; these species are only likely to be present within the project site during migrations so timing the construction outside of the primary migratory periods will limit the potential for Chinook and steelhead to be present during construction and be impacted by construction activities.

Use of heavy equipment and storage of materials is required for the construction of the fish screen intake and outfall structure. As a result, if not properly contained, contaminants (e.g., fuels, lubricants, hydraulic fluids, concrete) could be introduced into the water system, either directly or through surface runoff. Contaminants may be toxic to fish or cause altered oxygen diffusion rates and acute and chronic toxicity to aquatic organisms, thereby reducing growth and survival.

As described in Section 2, Description of the Proposed Project/Action, and in Impact 3.6-1 in Section 3.6, Hydrology and Water Quality, a construction erosion and sedimentation control plan would be prepared and implemented, and WSID would submit an NOI for coverage under the NPDES Construction General Permit and would adhere to permit conditions to minimize effects on surface water quality. The NPDES Construction General Permit requires implementation of BMPs, water quality monitoring and reporting, post construction-period requirements, and other water quality pollutant-reduction techniques to protect degradation of beneficial uses. For further discussion of the NPDES Construction General Permit requirements see Section 3.6, Hydrology and Water Quality.

Impacts to fish species related to sedimentation and turbidity during construction would also be reduced to less than significant through installation of silt fencing in all upland areas where construction occurs within 100 feet of known or potential steelhead habitat and by isolating fresh concrete from wetted channels for a period of 30 days after it is poured, both of which are described in Section 2, Description of the Proposed Project/Action. If a 30-day curing period is not feasible, a concrete sealant as approved by USFWS, NMFS, and CDFW may be applied to the surfaces of the concrete structure. If a sealant is used, the manufacturer’s guidelines for drying times would be followed before reestablishing surface flows within the work area.

WSID would also apply and receive coverage under NPDES No. CAG995001 Waste Discharge Requirements General Order for Dewatering and Other Low Threat Discharges to Surface Waters prior to construction, as discussed in Section 3.6, Hydrology and Water Quality. Management of dewatering activities in accordance with the conditions of the WDRs would minimize the risk of impacting the water quality of receiving waters.

Adherence to the conditions of the NPDES Construction General Permit, BMPs, construction windows, and permit requirements would minimize the risk of release of sediments and pollutants into receiving waters during construction activities and would minimize potential degradation of aquatic habitat and the associated harm to fish habitat and fish populations. Furthermore, all materials stored on-site would be done so consistent with regulatory requirements. Therefore, this impact is considered less than significant.

Loss of Habitat/Placement of Rip Rap

The construction of the cofferdam for installation of the proposed fish screen intake and pump station, and placement of rip rap for scour protection would remove up to 0.3 acre (approximately 275 linear feet) of aquatic habitat along banks of the San Joaquin River. Although various special-status fish species are present seasonally in the area, the habitat found in this portion of the San Joaquin River is not unique and is characterized a relatively deep, medium velocity channel, and silt and sand substrate. The area is not used as spawning habitat by salmonids; however, adult and juvenile Chinook salmon and steelhead use the area as a migratory corridor and juvenile Chinook salmon and steelhead could use the area for rearing during their downstream migration.

While the sandy substrate in the vicinity of the proposed fish screen intake provides some submerged aquatic and emergent vegetation, the area of channel where the facility would be placed would not be considered favorable rearing habitat for salmon or steelhead due to the lack of shaded aquatic habitat and habitat complexity within the project area. The net value of the channel lost due to the Proposed Project/Action therefore would be low. The placement of rip rap for scour protection would provide some increased cover over current conditions, but would not likely increase habitat quality for salmonids as warm-water predatory species would be likely to occupy this habitat post-construction.

The proposed fish screen intake would not reduce movement in this reach of the San Joaquin River migration corridor and the difference in habitat quality between the existing channel margin and a fish screen intake and rip rap would be minor. While the change in habitat is not likely to adversely affect Chinook salmon or steelhead populations, or critical habitat for Central Valley steelhead, the loss of habitat would be a potentially significant impact.

Effects of Pile Driving/Noise Analysis

As described in Section 2.4, all in-water construction activities associated with the fish screen intake would be confined within a sheet pile cofferdam, which would be put in place and removed during the low-flow period from June 15 to November 1, except by extension approved by CDFW and NMFS. The sheet pile cofferdam would remain in place following construction of the fish screen intake and pump station (anticipated to take a total of approximately 12 months) and would either be driven into the bed of the channel for additional scour protection or cut off flush with the bed during the dry season. The sheet pile cofferdam would be installed with a vibratory pile driver to minimize underwater sound pressures and associated effects to fish species present in the project area. The work area behind the cofferdam would be dewatered to allow for construction to occur in the dry.

In addition to the in-water vibratory driving activities for the sheet pile cofferdam, a total of 28, 16-inch foundation piles and approximately 630 linear feet of sheet piles would be driven with vibratory and impact drivers inside the dewatered area behind the completed cofferdam to construct the fish screen intake, the outfall structure, and the East and West Crossings. In general, cofferdams that have been dewatered down to the mud line substantially reduce underwater pile driving sound, but the sound is not eliminated because some of the energy is transmitted through the ground. It is, however, the best isolation (and sound attenuation) that can be provided (Caltrans 2009). Working inside a dewatered cofferdam is expected to substantially reduce the intensity of the impact driver-generated sound levels transmitted to the water.

Both vibratory and impact hammers produce sound waves that can be perceived, and are potentially harmful, for fish. Hydrostatic pressure waves and vibration generated by pile driving can adversely affect all life stages of fish. Effects on fish from changes in hydrostatic pressure are not related to the distance of the fish from the point of impact, but to the level and duration of the sound exposure (Hastings and Popper 2005). Hydrostatic pressure waves have the potential to rupture the swim bladders and other internal organs of all life stages of fish, and could permanently injure their inner ears and lateral line organs (Hastings and Popper 2005). These injuries could reduce the ability of fish (including special-status fish species) to orient in the water column, capture prey, and reduce the ability of fish to avoid predators (Caltrans 2009).

An interagency working group, including members from NMFS and USFWS, has established interim criteria for evaluating underwater noise impacts from pile driving on fish (Fisheries Hydroacoustic Working Group 2008). This working group identified a peak sound pressure level of 206 decibels (dB) and an accumulated sound exposure level (SEL)[2] of 187 dB as thresholds for injury to fish. For fish weighing less than 2 grams, the accumulated SEL threshold is reduced to 183 dB. Although there has been no formal agreement on a "behavioral" threshold, NMFS uses 150 dB as the threshold for adverse behavioral effects (Caltrans 2009).

Based on empirical data from actual construction sites, peak sound pressures from installing the sheet pile cofferdam with a vibratory driver are estimated to be below thresholds for injury and/or mortality:

Sheet piles installed with vibratory driver (Caltrans 2007; Table 1.2-2 from compendium data):

- Peak[3] = 175 (typical) -182 (loudest) dB
- Sound exposure level (SEL) = 160-165 dB

Because all impact pile driving would only occur in areas isolated by a cofferdam and dewatered, it is anticipated that adjacent underwater sound levels associated with this activity would not exceed injury and harm thresholds established by NMFS. Based on empirical data from actual construction sites, peak sound pressures from installing the sheet piles and foundation piles with an impact driver are estimated to be below thresholds for injury and/or mortality:

Sheet piles installed with impact driver in dewatered cofferdam area (Caltrans 2007; Table 1.2-3 from compendium data [Platte River, 15-inch steel H piles]):

- Peak = 172 dB
- Sound exposure level (SEL) = 147 dB

Estimated pressures are above thresholds for behavioral effects (150 dB threshold), however, behavioral effects are not expected to be an issue due to timing restrictions (seasonal work window and only conducting pile driving during daylight hours). Furthermore, because of the timing of in-water construction (June 15 through November 1), most special-status fish are not present in the areas affected by elevated sound levels from pile driving activities. For most species with migratory life stages that have the potential to be present, only a small portion of the population is expected to be exposed to the increased underwater sound levels because these increases generally would occur outside of peak migration periods.

Based on a review of the construction techniques (e.g., use of vibratory hammers for in-water pile driving and dewatered area for impact driving), NMFS threshold criteria for harm and injury, and

[2] Sound exposure level (SEL) is defined as the constant sound level acting for 1 second, which has the same amount of acoustic energy as the original sound. Expressed another way, the sound exposure level is a measure of the sound energy in a single pile driver strike. Accumulated SEL ($SEL_{accumulated}$) is the cumulative SEL resulting from successive pile strikes. $SEL_{accumulated}$ is based on the number of pile strikes and the SEL per strike; the assumption is made that all pile strikes are of the same SEL.

[3] Peak sound pressure refers to the highest absolute value of a measured waveform (i.e., sound pressure pulse as a function of time).

empirical data from actual construction sites, underwater sound effects on special-status fish species are likely to be low to moderate and are considered a less than significant impact.

Other Impacts from Fish Screen Intake, Outfall Structure, and Crossings Construction

Fish, including adult and juvenile salmonids, may be stranded behind the cofferdam following initial construction and at any time when high river flows would overtop the cofferdam. Fish may also be stranded in the intake canal during construction of the outfall structure and East and West Crossings. As described in the Project Description, a Fish Rescue Plan (Appendix C) would be implemented, in coordination with and approved by CDFW and NMFS, prior to dewatering, which would minimize potential construction-related effects to fish species present in the project area. The Fish Rescue Plan would also be implemented, in coordination with CDFW and NMFS, if overtopping of the cofferdam occurs during construction due to floodwaters. Therefore, any fish stranded behind the cofferdam or in the intake canal would be rescued and returned to the river consistent with the conditions in the approved plan. Although salmonids typically respond well to handling, there could be incidental injury and death to individuals of the various salmonid species as a result of handling; it is also probable that the rescue program would not capture and release every juvenile. While these residual impacts are possible, the implementation of the Fish Rescue Plan would minimize the construction impacts to the greatest extent feasible, and the potential residual impact would not have an effect on the population of salmonids in the San Joaquin River, thus this impact is considered less than significant.

Operation of the Fish Screen Intake and Pump Station

Operation of the fish screen intake and pump station has the potential to directly and indirectly impact fishery resources and aquatic habitat within the San Joaquin River by entrainment of fish eggs and larvae that are not effectively excluded from the intake by the fish screen and/or by increased predation of fish due to changes in habitat.

Operation of the fish screen, designed and operated in accordance with CDFW, NMFS, and USFWS criteria, would minimize entrainment and impingement of juvenile, sub-adult, and adult fish at the new intake. Operating staff would inspect and maintain the facility, as needed to meet criteria, and would maintain a stock of replacement screens that would be installed rapidly in case repair is needed. Long-term operation is therefore expected to be reliable; periods of non-function would be brief. Various long-term maintenance activities such as pump replacement (approximately every ten years) would result in short periods of non-operation. Pump replacement would take place within the pumping facility and would not require in-water work or result in impacts within the San Joaquin River.

Given that approach velocities to the screen would be low (the maximum screen approach velocity would be 0.33 foot/second), the net effect on fish swimming behavior in the vicinity of the diversion is predicted to be very small. Typically, the performance of a conical fish screen is expected to greatly reduce entrainment of fish and macroinvertebrates when compared to the existing unscreened diversion.

Fish exposure to screens may cause injury and may affect swimming behavior, resulting in increased vulnerability to predation. NMFS and CDFW approach velocity criteria have been incorporated into the fish screen design to minimize changes in swimming behavior and fish contact with the screen. In addition, screens have been designed to present a non-abrasive surface to fish that may come in contact with them. The low approach velocities provided by the screen would offset some of these effects. The fish screens have been designed to have a smooth exterior surface and upstream and downstream transition areas that reduce or eliminate areas where juvenile salmonids are concentrated or disoriented to reduce the risk of predation, as well as to reduce or eliminate structural locations offering cover for ambush predatory fish such as bass.

As part of fish screen operations and maintenance, an automatic screen cleaning system, consisting of a hydraulically powered rotating brush, would be installed to reduce debris accumulations and help maintain uniform approach velocities over the screen surface, thereby avoiding turbulence and “velocity hot spots”, which increase the vulnerability of fish to localized impingement on the screen surface. The screen cleaning system would continue to function throughout project operations.

The pump station would also be fitted with security and safety lighting. Surveillance lighting would be designed to deter intruders, would be angled away from the river, and would turn on only when triggered by the presence of intruders. Safety lighting would be installed to allow for safe movement of authorized personnel during maintenance activities. These lights are not expected to shine on the river or potential habitat for sensitive wildlife due to positioning and shielding, and are not expected to be on most of the time. The security lighting would only turn on if triggered, and the safety lighting would only be used by authorized personnel on an as needed basis. Because lighting would be sporadic and minimally used, it is not expected to have an impact on fish within the San Joaquin River.

Valley Elderberry Longhorn Beetle

Elderberry shrub surveys have been conducted for the project site according to USFWS guidelines (the number of stems and size class, habitat, and presence of exit holes were recorded). The survey identified 165 elderberry shrubs that are located within 100 feet of the work areas for construction of the intake canal crossings and access road improvements; many additional elderberry shrubs occur between 100 to 165 feet from the project site due to the restoration and plantings at the SJRNWR. The USFWS considers shrubs located within 165 feet of a project as potentially impacted. While most of these shrubs will not have direct impacts, five elderberry shrubs are located within the project footprint and are likely to be directly impacted by construction activities. All of these shrubs have stems greater than 1 inch, and no exit holes. The removal or damage of elderberry shrubs would be a significant impact.

Swainson’s Hawk

Suitable nesting habitat is found adjacent to the San Joaquin River and along the WSID intake canal where potentially suitable trees are scattered in native or restored riparian woodlands. These riparian woodlands have generally low canopy closure and the surrounding agricultural fields and

SJRNWR lands provide potential foraging habitat. With records of Swainson's hawk nests occurring in the vicinity of the project site along the San Joaquin River and in the SJRNWR, there is a moderate potential the project area or immediate vicinity may be used by Swainson's hawk for nesting. Riparian woodlands in the project site could be used for foraging by Swainson's hawk, and construction activities associated with installation of Proposed Project/Action facilities could result in a temporary loss of foraging opportunities for Swainson's hawk in and adjacent to the project area. However, this temporary loss of foraging habitat would not be expected to adversely impact Swainson's hawk because foraging habitat is abundant in the project vicinity. The direct loss of an active nest through removal or nest failure due to construction related disturbance would be a significant impact.

Least Bell's Vireo

The SJRNWR is managed to support this species through restoration and protection of suitable riparian habitat. Based on the proximity to suitable nesting habitat, nest sites for least Bell's vireo may be directly or indirectly affected by Proposed Project/Action construction activities. In addition to potential impacts on nests, up to a maximum of approximately 1.5 acres of riparian woodland (that could be used for foraging or nesting by least Bell's vireo) would be modified or removed by project construction and up to 1.3 acres of potentially suitable riparian woodlands would be temporarily impacted due to construction activities. The riparian woodland habitat potentially impacted by the project is located along access roads and the margins of the SJRNWR restoration areas. Because restored riparian woodlands are abundant in the vicinity of the project site, and the footprint of the Proposed Project/Action would be limited to the edges of this habitat type, impacts are expected to be minor and less than significant; however, the direct loss of an active nest would be a potentially significant impact.

San Joaquin Valley Woodrat and Riparian Brush Rabbit

The SJRNWR is managed to support these species through restoration and protection of suitable riparian habitat. Approximately 1.3 acres of potentially suitable riparian woodlands that could support these species would be temporarily impacted due to construction activities and 1.5 acres permanently impacted by project implementation primarily due to improvements for the access road and intake canal crossings. These riparian woodland habitats have been restored with the goal of supporting riparian brush rabbit and San Joaquin Valley woodrat; however, in most places the low density of riparian shrubs and cover within this habitat limits the suitability for these species. With future growth and establishment of this habitat within the SJRNWR it is anticipated that these habitats will become more suitable. Due to the abundance of restored riparian woodlands in the vicinity of the project site, limited suitability of the habitat currently present within the project site due to low densities of riparian shrubs and canopy cover, and the potential for the project to increase the suitability of these habitat types in the long term through increased connectivity over the WSID intake canal, it is unlikely that temporary or permanent impacts to potential habitat would have an adverse effect on either of these species. Because most of the habitat that would be impacted is unlikely to support these species and due to the fact that both species are highly mobile, direct impacts from construction are unlikely, however juveniles could be displaced or killed during initial ground disturbance if a nest is damaged or destroyed. Direct mortality during construction would be a significant impact.

San Joaquin Kit Fox

The project area and greater SJRNWR provides potential foraging, migratory, and potentially denning habitat for the San Joaquin kit fox. No potential San Joaquin kit fox den locations have been observed within the project site during surveys conducted to date. However, because the project area and greater SJRNWR provides potential foraging, migratory, and potentially denning habitat there is still a potential for a den to be established along the levees or access roads adjacent to the WSID intake canal. Loss of potential den sites or disruption of an active den during construction would be a significant impact.

Summary of Impact Conclusions

Operational impacts are not expected to have an adverse effect on any federally or state-listed species that could occur within the project area. Construction of the Proposed Project/Action could result in potentially significant or significant impacts to federally or state-listed species that could occur within the project area including: loss of designated habitat for Central Valley steelhead; removal or damage of elderberry shrubs used by VELB; direct loss of an active Swainson’s hawk or least Bell’s vireo nest through removal or nest failure due to construction related disturbance; direct mortality for San Joaquin Valley woodrat and riparian brush rabbit; and loss of potential den sites or disruption of an active den during construction for San Joaquin kit fox.

Mitigation Measures

The following mitigation measures would reduce construction impacts on federally or state-listed species that could occur within the project area to a less-than-significant level. Implementation of Mitigation Measure 3.7-1a would reduce the effect of habitat loss in the San Joaquin River for fish species to less than significant by requiring compensation for lost habitat. Mitigation Measure 3.7-1b would reduce or avoid potential direct or indirect impacts to VELB by implementing the USFWS’s *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (USFWS 2017). Mitigation Measures 3.7-1c and 3.7-1d would reduce potential impacts to Swainson’s hawk by requiring preconstruction surveys and nest avoidance. Mitigation Measure 3.7-1e would reduce potential impacts to least Bell’s vireo by requiring preconstruction surveys and nest avoidance. Mitigation Measure 3.7-1f would reduce potential impacts to riparian brush rabbit and San Joaquin Valley woodrat by through surveys and nest avoidance. Mitigation Measure 3.7-1g would reduce potential impacts to San Joaquin kit fox through surveys, avoidance, and protection described in the Service’s Standardized Recommendations for Protection of the San Joaquin kit fox Prior to or During Ground Disturbance (2011).

Fish Species

Mitigation Measure 3.7-1a: Implement Mitigation Measure 3.7-4.

Valley Elderberry Longhorn Beetle

Mitigation Measure 3.7-1b: In order to avoid potential direct and indirect impacts to VELB, the following conservation measures shall be implemented based upon the USFWS's *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (USFWS 2017).

- Activities that may damage or kill an elderberry shrub (e.g., trenching, paving, etc.) may need an avoidance area of at least 6 meters (20 feet) from the drip-line, depending on the type of activity.

- A qualified biologist will monitor the work area at project appropriate intervals to assure that all avoidance and minimization measures are implemented. The amount and duration of monitoring will depend on the project specifics and should be discussed with a USFWS biologist.

- As much as feasible, all activities that could occur within 50 meters (165 feet) of an elderberry shrub, will be conducted outside of the flight season of the VELB (March-July).

- Herbicides will not be used within the drip-line of elderberry shrubs. Insecticides will not be used within 30 meters (98 feet) of an elderberry shrub. All chemicals will be applied using a backpack sprayer or similar direct application method.

- Mechanical weed removal within the drip-line of elderberry shrubs will be limited to the season when adults are not active (August-February) and will avoid damaging the elderberry shrub.

- Trimming or mowing of any elderberry shrubs within the canal that may become established in the future will ensure that no plants with stems greater than 1 inch will be impacted.

Transplanting Procedure

- For the five elderberry shrubs that are within the construction footprint, WSID will attempt to remove the entire root ball and transplant the shrub close as possible to their original location. Elderberry shrubs may be relocated adjacent to the project footprint if: 1) the planting location is suitable for elderberry growth and reproduction; and 2) the project proponent is able to protect the shrub and ensure that the shrub becomes reestablished.

- A qualified biologist will be on-site for the duration of transplanting activities to assure compliance with avoidance and minimization measures and other conservation measures.

- Exit-hole surveys will be completed immediately before transplanting. The number of exit holes found, GPS location of the plant to be relocated, and the GPS location of where the plant is transplanted will be reported to the USFWS and to the California Natural Diversity Database (CNDDB).

- Elderberry shrubs will be transplanted when the shrubs are dormant (November through the first two weeks in February) and after they have lost their leaves.

Transplanting during the non-growing season will reduce shock to the shrub and increase transplantation success.

- Transplanting will follow the most current version of the ANSI A300 (Part 6) guidelines for transplanting (http://www.tcia.org/).

Worker Training

- Prior to initiation of any on-site preparation/construction activities, a USFWS-approved biologist will conduct an education and training session for all individuals who will be involved in the site preparation or construction, including the project representative(s) responsible for reporting take to the Service. Training sessions will be required for all new or additional personnel before they are allowed to access the project site. At a minimum, the training will include a description of the VELB, least Bell's vireo, riparian woodrat, riparian brush rabbit, and San Joaquin kit fox and their habitats. Additional information will include the general conservation measures, as they relate to the project, that are being implemented to conserve these species; the penalties for non-compliance with these measures; travel within the marked project site will be restricted to established roadbeds and the boundaries (work area) within which the project must be accomplished. Training shall be conducted in languages other than English, as appropriate. A fact sheet conveying this information will be prepared for distribution as a reference for workers. Proof of this instruction for all attendees will be kept on file the applicant. The applicant will provide the USFWS with a copy of the training materials and copies of the signed forms by project staff indicating that training has been completed within 30 days of the completion of the first training session. Copies of signed forms will be submitted monthly as additional training occurs for new employees. The crew foreman will be responsible for ensuring that new personnel receive the training prior to starting work and that construction personnel adhere to the guidelines and restrictions.

Compensatory Mitigation

- Compensatory mitigation will include shrub and habitat-level requirements as detailed in the VELB Framework (USFWS 2017). For the five shrubs that would be directly impacted, 6 mitigation credits will be purchased at a USFWS-approved mitigation bank (4 credits for the shrubs in non-riparian habitat at a 1:1 compensation ratio, and 2 credits for the remaining shrub located in riparian habitat at a 2:1 compensation ratio). In addition, WSID will purchase credits for the 1.5 acres of restored riparian woodland that will be permanently impacted by the Proposed Project/Action. Credits for the habitat-level compensation will also follow the Framework (USFWS 2017) and will be mitigated at a 3:1 ratio: 4.5 acres of credits, or 108.9 credits (1,800 square feet/credit) for the habitat-level impacts, and a total of 114.9 credits including the shrub and habitat level compensation. There are multiple conservation banks that service the project site, including the French Camp Conservation Bank and Nicolaus Ranch Conservation Bank.

Swainson's Hawk

Mitigation Measure 3.7-1c: Prior to construction, surveys shall be conducted by a qualified biologist to survey for nesting Swainson's hawk in and within 0.5-mile, and nests of other raptor or bird species within 500 feet of the project site. For Swainson's hawk surveys, guidelines provided in the Recommended Timing and Methodologies for Swainson's Hawk Nesting Survey in the Central Valley (Swainson's Hawk Technical

Advisory Committee 2000) shall be followed. If no Swainson's hawks or other nesting birds are found during any of the surveys, no further mitigation will be necessary. The surveys shall be conducted no less than 10 days prior to the beginning of construction.

Mitigation Measure 3.7-1d: Should active nest sites be discovered within areas that may be affected by construction activities, WSID shall ensure that the construction contractor implements the following nest avoidance measures:

- If feasible, conduct any vegetation removal and grading activities during the non-breeding season (generally September 1 to January 1). If vegetation removal and grading activities must occur during the breeding season, preconstruction surveys and nest avoidance will be implemented as described below.

- Establish appropriate no-work buffers to limit project-related construction activities near any active nest sites discovered during preconstruction surveys. The final size and dimensions of the buffer area should be determined by an experienced biologist in coordination with CDFW. Buffers should remain in place until the birds have fledged and are no longer reliant upon the nest or parental care for survival. The no-work buffer zone shall be delineated by highly visible temporary construction fencing. In consultation with CDFW, monitoring of nest activity 24-hours prior to and during construction activities by a qualified biologist may be required if the project-related construction activity has potential to adversely affect the nest or nesting behavior of the bird. No project-related construction activity would commence within the no-work buffer area until a qualified biologist and CDFW confirms that the nest is no longer active.

Least Bell's Vireo

Mitigation Measure 3.7-1e: Implement Mitigation Measures 3.7-1b through 3.7-1d. Surveys for least Bell's vireo (described in Mitigation Measure 3.7-1c) will follow the USFWS guidelines (USFWS 2001). The least Bell's vireo guideline-level surveys include eight surveys (10 days apart) between April 10 and July 31.

San Joaquin Valley Woodrat and Riparian Brush Rabbit

Mitigation Measure 3.7-1f: Implement Mitigation Measure 3.7-1b. Also, conduct vegetation removal during the non-breeding season (generally September 1 to January 1). If vegetation removal and grading activities must occur during the breeding season, preconstruction surveys and den (house) avoidance will be implemented as described below. If vegetation removal occurs between January 1 and September 1, prior to any ground disturbance, a USFWS-approved biologist shall conduct preconstruction surveys in potentially suitable habitats for San Joaquin Valley woodrat and riparian brush rabbit dens, and will focus on identifying any active or potential woodrat or rabbit den locations. If an active den is located, a protective buffer (size determined during USFWS consultation) shall be established in consultation with USFWS and CDFW until the animals have successfully reared, are able to leave the area without den abandonment or individual harassment, and it has been determined that construction can continue without affecting the animals.

San Joaquin Kit Fox

Mitigation Measure 3.7-1g: WSID shall ensure that the construction contractor implement the following measures to avoid any potential impacts to San Joaquin kit fox that may use the project site.

- A USFWS-approved biologist shall survey the project area for San Joaquin kit fox and potential dens within 30 days, and no less than 14 days, prior to construction. Surveys will follow the recommendations in the USFWS San Joaquin Kit Fox Survey Protocol for the Northern Range (2011). If an active den is discovered during the surveys, WSID will immediately contact the USFWS. WSID shall follow den monitoring and avoidance procedures as described in Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance (USFWS 2011).

- To prevent inadvertent entrapment of San Joaquin kit fox or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2-feet deep will be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen-fill or wooden planks shall be installed. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. In the case of trapped animals, the USFWS-approved biologist will immediately place escape ramps or structures will be installed to allow the animal(s) to escape, or the USFWS will be contacted for guidance.

- Construction activities shall stop in the area if a trapped or injured San Joaquin kit fox is discovered until the USFWS is contacted for guidance.

- San Joaquin kit fox are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a San Joaquin kit fox is discovered inside a pipe, that section of pipe should not be moved until the San Joaquin kit fox has left on its own. If the San Joaquin kit fox remains in the pipe for more than a day, then under the direct supervision of the USFWS-approved biologist, the pipe may be moved only once away from all construction activity until the fox has escaped.

- A representative shall be appointed by the project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a San Joaquin kit fox or who finds a dead, injured or entrapped San Joaquin kit fox. The representative shall be identified during the employee education program and their name and telephone number shall be provided to the USFWS.

- The Sacramento Fish and Wildlife Office and CDFW shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during project related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The USFWS contact is the Chief of the Division of endangered Species, at the following: Endangered Species Division, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-1846, (916) 414-6620 or (916) 414-6600. The CDFW contact is Mr. Paul Hoffman at 1701 Nimbus Road, Suite A, Rancho Cordova, California 95670, (530) 934-9309. New sightings of kit fox shall be reported to the California Natural Diversity Database (CNDDB). A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed should also be provided to the USFWS at the following: Endangered Species Division, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-1846, (916) 414-6620 or (916) 414-6600.

Significance after Mitigation: Less than significant.

Impact 3.7-2: The Project could adversely affect some species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW, USFWS, or NMFS either directly or through habitat modification. (Less than Significant with Mitigation)

As described in Table 3.7.1, there are four sensitive or watch-list species identified by federal or state agencies that could occur within the project site and be impacted by the Proposed Project/ Action including: western pond turtle, western burrowing owl, merlin, and Modesto song sparrow.

Nesting Birds

Potential nest sites for sensitive bird species may be directly or indirectly affected by project construction. These species include: western burrowing owl, merlin, and Modesto song sparrow. In addition, other nesting birds such as migratory birds protected by the Migratory Bird Treaty Act may also be adversely affected by the Proposed Project/Action. Direct loss of nests could occur during vegetation removal or ground disturbance, or indirect impacts from noise or increased activity could result in nest failure. The disruption of nesting or the loss of nests would be a potentially significant impact.

Western Pond Turtle

Moderate to low quality habitat for the western pond turtle occurs in the WSID intake canal and near the shores of the San Joaquin River. Potential impacts to this species include a loss of foraging, overwintering, and nesting habitat. Direct impacts from construction are unlikely due the species' ability and propensity for avoiding people; however individual turtles could be harmed during construction if they are trapped in the cofferdam or work areas within the intake canal. The loss of habitat, and potential direct impacts such as injury or mortality from construction is a potentially significant impact.

Summary of Impact

Operational impacts are not expected to have an adverse effect on any candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW, USFWS, or NMFS that could occur within the project area. Construction of the Proposed Project/ Action could result in potentially significant or significant impacts to candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW, USFWS, or NMFS that could occur within the project area including: the disruption of nesting or the loss of nests for western burrowing owl, merlin, and Modesto song sparrow, and the loss of habitat or potential injury or mortality to western pond turtle due to construction.

Mitigation Measures

Implementation of Mitigation Measures 3.7-2a and 3.7-2b would reduce impacts to nesting birds to less than significant through surveys and avoidance of nests. Mitigation Measures 3.7-2c and 3.7-2d would reduce impacts to western pond turtle to less than significant by compensating for impacts to aquatic habitats and through rescue and relocation during dewatering of construction sites.

Nesting Birds

Mitigation Measure 3.7-2a: Implement Mitigation Measures 3.7-1c and 3.7-1d.

Mitigation Measure 3.7-2b: Prior to construction, preconstruction surveys shall be conducted by a qualified biologist to determine presence/absence of burrowing owls and/or occupied burrows in and within 500 feet of the project site according to the California Department of Fish and Wildlife's Staff Report on Burrowing Owls (CDFW 2012). A winter survey shall be conducted between December 1 and January 31 and a nesting survey shall be conducted between April 15 and July 15. Preconstruction surveys shall also be conducted within 30 days prior to construction to ensure that no additional burrowing owls have established territories since the initial surveys. If no burrowing owls are found during any of the surveys, no further mitigation will be necessary. If burrowing owls are found, then the following measures shall be implemented prior to the commencement of construction:

- During the non-breeding season (September 1 through January 31) burrowing owls occupying area within project site should be evicted from the area by passive relocation as described in the CDFW's Staff Report on Burrowing Owls (March 2012).
- During the breeding season (February 1 through August 31) occupied burrows shall not be disturbed and shall be provided with a 250-foot protective buffer unless a qualified biologist approved by CDFW verifies through non-invasive means that either: 1) the birds have not begun egg laying, or 2) juveniles from the occupied burrows are foraging independently and are capable of independent survival. Once the fledglings are capable of independent survival, the burrow can be destroyed.
- If a burrowing owl or active nest is discovered before or during construction the biologist shall notify a CDFW representative.

Western Pond Turtle

Mitigation Measures 3.7-2c: Any western pond turtles that are found in construction areas including the cofferdam at the intake structure or at construction sites at the WSID intake canal shall be relocated by a qualified biologist if necessary to avoid harming the individual.

Mitigation Measure 3.7-2d: Implement Mitigation Measure 3.7-4.

Significance after Mitigation: Less than significant.

Impact 3.7-3: The Project could have other substantial adverse effects on riparian habitat or other sensitive natural communities identified in local or regional plans, policies, or regulations or by the CDFW or USFWS. (Less than Significant with Mitigation)

Sensitive natural communities that occur in the project site include native and restored riparian woodland. This community provides habitat for a range of terrestrial wildlife species, including several species of songbirds, small mammals, mesocarnivores, and herpetofauna. Up to 2.8 acres of riparian woodland habitat could be affected by implementation the Proposed Project/Action. The potential impact includes 1.3 acres of temporary disturbance and 1.5 acres of permanent displacement. Because riparian habitat is regionally abundant in this location and temporarily disturbed habitat would be restored post-construction, the temporary disturbance of 1.3 acres of riparian habitat would be a less than significant impact. The permanent loss of 1.5 acres of riparian woodland habitat would be a significant impact.

Mitigation Measure

The compensation described for habitat-level impacts to VELB under Mitigation Measure 3.7-1b would compensate for permanent impacts to 1.5 acres of riparian woodland and would reduce impacts to riparian woodland to a less-than-significant level.

Mitigation Measure 3.7-3: Implement Mitigation Measure 3.7-1b.

Significance after Mitigation: Less than significant.

Impact 3.7-4: The Project may have substantial adverse effects on federally protected waters as defined by Section 404 of the CWA through direct removal, filling, hydrological interruption, or other means. (Less than Significant with Mitigation)

The construction of the fish screen intake and pump station would result in a permanent fill in the San Joaquin River, a potentially jurisdictional feature. The East and West Crossings would result in temporary impacts of the potentially jurisdictional freshwater emergent wetland south of the WSID intake canal. An aquatic resources delineation report is being prepared for the Proposed Project/Action, but has not been verified by the Corps. Based on initial design, approximately 0.2 acres of the freshwater emergent marsh could be temporarily impacted, and 0.3 acres of other waters of the U.S. (the San Joaquin River) could be permanently impacted by construction of the intake facility. The permanent loss of jurisdictional wetlands or Waters of the U.S. would be a significant impact.

Mitigation Measure

Implementation of Mitigation Measure 3.7-4 would reduce potential impacts to jurisdictional waters to a less-than-significant level by obtaining the appropriate permits for the project, adhering to the conditions of those permits, and through the compensation for habitat impacts as directed by the regulatory agencies.

> **Mitigation Measure 3.7-4:** Prior to construction, WSID shall obtain a Section 404 (Clean Water Act) permit for impacts to jurisdictional wetlands from the Corps, a 1600 Streambed Alteration Agreement from the CDFW, and a Section 401 permit from CVRWQCB and shall comply with all conditions of permits received. All areas with temporary impacts shall be restored immediately post-construction. In association with either or both permits, compensatory mitigation for permanent impacts to jurisdictional wetlands may be required. WSID shall compensate for the unavoidable loss of wetlands at a ratio of 1:1 in order to ensure no net loss of wetland habitat. Corps mitigation guidelines emphasize on-site mitigation preference, but in the case that on-site mitigation is not available, WSID shall either:
>
> - Purchase wetland mitigation credits from an Corps approved mitigation bank that services the project area, or
> - Mitigate on-site for unavoidable losses, or
> - Prepare a plan to implement mitigation at an off-site location in accordance with the Corps' mitigation requirements.
>
> **Significance after Mitigation:** Less than significant.

Impact 3.7-5: The Project may 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. (Less than Significant)

Construction of the Proposed Project/Action may have a temporary impact to the movements of some terrestrial wildlife during construction activities. In addition, salmonids and other fresh water fish species may be temporarily displaced during construction. Because the fish screen intake would not extend across the entire San Joaquin River, and is not expected to create changes in flow habitats, it is unlikely to impact migrating fish other than to prevent their entrainment into the WSID intake canal. The installation of two crossings of the WSID intake canal would allow for wildlife passage, which would benefit species supported by habitat in the SJRNWR, including riparian brush rabbit and San Joaquin Valley woodrat. Therefore, implementation of the Proposed Project/Action would not substantially interfere with the movement of native resident fish or wildlife species and this impact is less than significant.

Mitigation: None required.

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3.8 Cultural Resources

This section examines the potential impacts of the Proposed Project/Action and alternatives on cultural resources, including paleontological resources. Due to the different methods involved in paleontological and cultural resources analyses, these issue areas are discussed separately. For the purposes of this analysis, the terms *cultural resource* and *paleontological resource* are defined as follows:

- *Cultural resource* – prehistoric and historic sites, structures, districts, and landscapes, or other evidence associated with human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or other reason. These resources include historic properties, as defined in the NHPA, and the following types of CEQA-defined resources: historical resources, archaeological resources, tribal cultural resources, and human remains.

- *Paleontological resource* – fossilized evidence of past life found in the geologic record. Fossils are preserved in sedimentary rocks, which are the most abundant rock type exposed at the surface of the earth. Despite the abundance of these rocks, and the vast numbers of organisms that have lived through time, preservation of plant or animal remains as fossils can be a rare occurrence. In many cases, fossils of animals and plants occur only in limited areas and in small numbers relative to the distribution of the living organisms they represent. In particular, fossils of vertebrates–animals with backbones–are sufficiently rare to be considered nonrenewable resources.

This section relies upon the information and findings presented in the following technical reports prepared for the Proposed Project/Action by ESA:

- *West Stanislaus Irrigation District Fish Screen Replacement Project, Stanislaus County, California, Cultural Resources Survey and Inventory Report* (ESA 2016)

- *West Stanislaus Irrigation District Fish Screen Replacement Project, Stanislaus County, California, Paleontological Resources Assessment Report* (ESA 2017)

Additional details on background context, Native American correspondence, and cultural resources identified are presented in the technical reports.

3.8.1 Affected Environment

Key Terms

Architectural Resource

This resource type includes historic buildings, structures (e.g., bridges, canals, roads, utility lines, railroads), objects (e.g., monuments, boundary markers), and districts. Residences, cabins, barns, lighthouses, military-related features, industrial buildings, and bridges are some examples of architectural resources.

Archaeological Resource

This resource type consists of prehistoric and historic-period archaeological resources. Prehistoric archaeological resources consist of village sites, temporary camps, lithic scatters, roasting pits/ hearths, milling features, petroglyphs, rock features, and burials. Associated artifacts include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs). Historic-era archaeological resources consist of townsites, homesteads, agricultural or ranching features, mining-related features, refuse concentrations, and features or artifacts associated with early military and industrial land uses. Associated artifacts include stone, concrete, or adobe footings and walls; artifact filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. If a resource is considered a ruin (e.g., building lacking structural elements, structure lacking historic configuration, etc.), it is classified as an archaeological resource.

Tribal Cultural Resource

This resource type consists of sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are listed, or determined to be eligible for listing, in the National Register of Historic Places (National Register), California Register of Historical Resources (California Register), or a local register of historical resources.

Paleontological Resource

This type of resource consists of the fossilized evidence of past life found in the geologic record. Fossils are preserved in sedimentary rocks, which are the most abundant rock type exposed at the surface of the earth. Despite the abundance of these rocks, and the vast numbers of organisms that have lived through time, preservation of plant or animal remains as fossils can be a rare occurrence. In many cases, fossils of animals and plants occur only in limited areas and in small numbers relative to the distribution of the living organisms they represent. In particular, fossils of vertebrates—animals with backbones—are sufficiently rare to be considered nonrenewable resources.

Project Site

For the purposes of this section, the project site is defined as the both the horizontal and vertical maximum extents of potential direct and indirect impacts to cultural and paleontological resources that could result from the Proposed Project/Action, and encompasses the project footprint and staging and access areas. The project site encompasses 84.5 acres, comprised of the 18.9-acre project footprint and an additional 65.6 acres for construction staging and access routes. The project site extends vertically to the maximum depth of project-related ground disturbance.

Background Context

Prehistoric Setting

Categorizing the prehistoric period into cultural stages allows researchers to describe a broad range of archaeological resources with similar cultural patterns and components during a given timeframe, thereby creating a regional chronology. The most commonly accepted framework for the interpretation of the Central Valley prehistoric record divides human history in the region into three basic periods: *Paleo-Indian* (13,550 to 10,550 years before present [BP]), *Archaic* (10,550 to 900 BP), and *Emergent* (900 to 300 BP). The Archaic period is subdivided into three sub-periods: *Lower Archaic* (10,550 to 7,550 BP), *Middle Archaic* (7,550 to 2,550 BP), and *Upper Archaic* (2,550 to 900 BP). Economic patterns, stylistic aspects, and regional phases further subdivide cultural patterns into shorter phases. This scheme uses economic and technological types, socio-politics, trade networks, population density, and variations of artifact types to differentiate between cultural periods.

Paleo-Indian Period (13,550 to 10,550 BP)

Humans first entered the Central Valley sometime prior to 13,000 years ago. At that time Pleistocene glaciers had receded to the mountain crests leaving conifer forests on the mid and upper elevations of the Sierra Nevada and a nearly contiguous confer forest on the Coast Ranges. The Central Valley was covered with extensive grasslands and riparian forests. The central California Delta system had not yet developed. The Central Valley was home to a diverse community of large mammals, which soon became extinct. People were likely focused on large game hunting, although evidence remains scant, as does understanding of lifeways during this period.

Lower Archaic Period (10,550 to 7,550 BP)

Climate change during the Lower Archaic led to the rapid expanse of oak woodland and grassland prairies across the Central Valley. After 10,550 BP, a significant period of soil deposition ensued in the Valley, capping older Pleistocene formation. This was followed around 7,000 BP by a second period of substantial soil deposition in the Valley.

It was during this period that the first evidence of milling stone technology appears, indicating an increased reliance on processing plants for food. Milling stones include hand stones and milling slabs and are frequently associated with a diverse tool assemblage including cobble-based pounding, chopping, and scraping tools. Milling tools were used for processing seeds and nuts. The Lower Archaic also saw the development of well-made bifaces used for projectile points and cutting tools, commonly formed from meta-volcanic greenstone and volcanic basalts.

Middle Archaic Period (7,550 to 2,550 BP)

After about 7,550 BP, California was marked by a change in climate with warmer and drier conditions throughout the region. Oak woodland expanded upslope in the Coast Ranges and conifer forest moved into the alpine zone in the Sierra Nevada. Rising sea levels led to the formation of the Delta and associated marshlands. An initial period of upland erosion and lowland deposition was followed by a long period of stabilization of landforms. Scant evidence of human occupation from this period has been found in the Central Valley or the adjacent Coast Ranges. Most evidence comes from the Sierra Foothills in Calaveras and Tuolumne counties.

Upper Archaic Period (2,550 to 900 BP)

Evidence for Upper Archaic human occupation in the Central Valley is much more extensive than for earlier periods. The development of the Holocene landscape buried older deposits, resulting in the identification of more sites from the Upper Archaic than from older periods of development. Alluvial deposition was partially interrupted by two consecutive droughts known as the Medieval Climatic Anomaly.

Two fundamental adaptations developed side-by-side during the Upper Archaic period, evidenced by a diversification in settlements patterns. Populations in the Valley tended towards large, high-density, permanent settlements. These villages were used as hubs from which the populace roamed to collect resources, utilizing a wide range of technologies. The populations in the foothills and mountains lived in less dense settlements, moving with the seasons to maximize resource returns. Tools tended to be expedient and multipurpose for use in a wide variety of activities. Village sites show extended occupation as evidenced by well-developed midden, frequently containing hundreds of burials, storage pits, structural remains, hearths, ash dumps, and extensive floral and faunal remains.

Emergent Period (900 to 300 BP)

A major shift in material culture occurred around 900 BP, marking the beginning of the Emergent Period. Particularly notable was the introduction of the bow and arrow. The adoption of the bow occurred at slightly different times in various parts of the Central Valley, but by 750 BP it was in use in the Delta region. The bow was accompanied by the Stockton Serrated point, a seemingly indigenous invention, distinctive from point types used in other parts of the State. Another key element of material culture from this period include big-head effigy ornaments thought to be associated with the Kuksu religious movement. In areas where stone was scarce, baked clay balls are found, presumably for cooking in baskets. Other diagnostic items from this period are bone tubes, stone pipes, and ear spools. Along rivers, villages are frequently associated with fish weirs, with fishing taking on an increasing level of importance in the diet of the local populace.

Ethnographic Setting

Geography/Settlement Patterns

The project site is situated in an area ethnographically occupied by the Northern Valley Yokuts, a Penutian speaking people. The traditional territory of the Northern Valley Yokuts encompassed much of the north end of the Southern San Joaquin Valley, including the area extending from the northward bend of the San Joaquin River, northward almost to the Mokelumne River, and from the crest of the Coast Range eastward to the foothills of the Sierra Nevada. Ethnographic data regarding this group is sparse. The term *Yokuts* is only an English approximation of a Native term for “people.” During the contact period the Northern Valley Yokuts population collapsed, and little historical data was recorded concerning them.

The Yokuts were relative latecomers to the area, probably moving northward about 500 BP. This was largely due to pressure from Numic speakers coming over the Sierra Nevada mountain ranges. Prior to the collapse of their population, the Northern Valley Yokuts probably numbered between 25,000 and 31,000 people. Most of the population was clustered in villages along the San Joaquin River, with a density of approximately 10 persons per square mile along the river. The Northern Valley Yokuts were organized into tribelets of about 300 people, although the size and breakdown of these groups is tenuous. A group known as the *Nopchinchi* probably occupied the project site and vicinity in the period prior to and immediately following Euro-American contact.

Ethnographic accounts documented several Native American villages in the area, and one, *Mayemes*, very close to the project site. As recorded by Padre Viader, Spaniard Gabriel Moraga's first 1810 expedition through the San Joaquin Valley included visiting a Yokuts village on the west side of the San Joaquin River just north of the its confluence with the Tuolumne River—this location is immediately north/northeast of the project site. The name of the village leader was recorded as *Maijem*, a variant of which, *Mayemes*, was later used to designate the village. During the Moraga's second 1810 expedition of the area, Viader revisited the village, calling it the *Ranchería de Mayem*. Based baptism records from 1813 to 1823, an estimated 300 to 400 people may have lived at the village.

Euroamerican Contact

As noted previously, the population of the Northern Valley Yokuts collapsed during the contact period. First contact probably occurred during the first decades of the 19th century, with sporadic forays by the Spanish into the Central Valley. By 1805, missionaries with the support of Spanish soldiers began making forays into the Central Valley to gather Native Americans to bring back to the coastal missions. This continued for nearly two decades, and neophytes were taken to Missions San Jose, Santa Clara, Soledad, San Juan Batista, and San Antonio. More active missionary "recruitment" occurred after 1810.

Further intrusions into Native American lands came in the form of *ranchos*, expanses of land granted to individuals by the Spanish and Mexican governments. What developed was a complex interchange between the Native Americans and their new Spanish neighbors. Missionaries and soldiers made more, and further reaching, excursions to gather up Native Americans. Many Native Americans tired of life at the missions, and escaped, returning to their homeland. Simultaneously, many Native Americans attained a taste for the Spanish horse and cattle, and began raiding the stocks of the missions and ranchos. The result were raids by the Spanish to punish the Native Americans, and bring captors back to the missions and ranchos. In 1822, control passed from Spain to Mexico, and the missions were eventually secularized, leaving many Native Americans free to return to their homes.

By this time, their populations were greatly reduced, they had been mixed and intermarried at the mission, ties had been broken with their former tribes, and many did not return. Disease was another major disruptive factor; influenza, smallpox, venereal disease, and malaria were all major contributors to the decline of Native American populations in California. Even prior to contact, old world diseases were devastating Native populations. In 1833, a major epidemic swept the Central Valley of California. What has since been surmised to be malaria was responsible for the deaths of up to 75 percent of the remaining Native American population in the Central Valley. The result was that by the 1840s the Northern Valley Yokuts had nearly vanished as a coherent group. The few that remained were pushed aside by the onslaught of immigrants who flooded in during the American period. By 1910, it was estimated that less than 1 percent of the Northern Valley Yokuts survived. Despite this catastrophic population loss, today Yokuts descendants continue to have a strong presence in the Central Valley, including involvement in activities promoting their heritage.

Historic-Period Setting

The earliest Euroamerican arrival into Stanislaus County was by Spanish Lieutenant Gabriel Moraga during the expedition he led into the California interior in search of mission sites in 1806. In 1827, Euroamerican trappers, including Jedediah Strong Smith, began to enter to the region in order to hunt the fur-bearing animals that inhabited the Central Valley. Settlement of the Valley was aided by the issuing of land grants, with Spanish, and later Mexican, governors giving settlers large sections of land to use for farming and raising cattle. Prior to the Gold Rush, the San Joaquin Valley was devoted to grazing and hunting, as immense herds of cattle and some horses roamed the valley.

The project site was part of the El Pescador land grant. In November 1843, Mexican Governor Micheltorena granted land to Valentin Higuera and Rafael Feliz, which became known as El Pescadero, with 34,446 acres, located west of the San Joaquin River, bordering San Joaquin County. The project site is located northwest of the community known as Grayson. In 1850, Captain Andrew Grayson and a small group of men settled on what was a portion of the El Pescadero land grant. Grayson and the others began operation of a ferry in April of that year, serving miners heading for the southern mines of Mariposa, Agua Fria, and other camps along the lower Tuolumne River.

With the resulting influx of population with the Gold Rush, the production of food was needed to support the miners, and the San Joaquin Valley developed to become an agricultural supplier. Some of the miners, disappointed in the search for gold, turned to farming in the fertile swamp lands in the San Joaquin Valley. Stanislaus County was organized in 1854 from a part of Tuolumne County. The county seat was first located at Adamsville, but was transferred to several other locations until it was finally located in Modesto in 1871.

Irrigation in the San Joaquin Valley and the West Stanislaus Irrigation District

During the late 1850s and 1860s, settlers in the San Joaquin Valley used short, roughly made earthen ditches to divert water from the lower courses of streams running west out of the Sierra. The great floods of 1862 and 1868 destroyed most early ditch systems, but San Joaquin Valley farmers continued to experiment with irrigation. By 1870, farmers had also begun to irrigate bottom lands along the streams in the southern San Joaquin Valley.

Most San Joaquin Valley settlers in the 1850s through the 1870s were not particularly interested in investing time and money in irrigation, preferring cattle raising and dry-farm cultivation. The area was sparsely settled, and cattlemen such as Henry Miller and Charles Lux amassed large land holdings by acquiring swamp and overflowed lands and other public lands in the valley on which they raised livestock. The San Joaquin Valley became the center of California's wheat belt in the 1870s, and relied almost entirely on dry farming, and reached its peak in the early 1890s. Although few wheat farmers were irrigating, some valley land barons, like Miller and Lux, invested in large-scale irrigation of pasturage for their primary business of stock raising.

Agricultural use of the project site and vicinity intensified after the turn of the twentieth century. In the first decades of the twentieth century, many private enterprise irrigation systems in the San Joaquin Valley, as in Southern California, were acquired by irrigation districts formed by local residents. The most common absorption occurred when local citizens formed an irrigation district covering the area served, and then purchased the commercial canals serving it. After irrigation districts took over in the 1910s and 1920s in the San Joaquin Valley, they typically replaced the wooden headgates, control structures, and diversion works with concrete structures. Many canals remain earth lined, although areas with high seepage losses or problems with high groundwater tables installed linings in their originally earth-lined conduits (Caltrans 2000).

The irrigation district remains the single most important institution for water conveyance in the San Joaquin Valley. It was in the San Joaquin Valley that the Wright Act was born, promoted by local irrigators, and the valley was home of the three original Wright Act districts. Some of the later districts formed after the turn of the century, particularly those in northwestern portion of the valley, like WSID.

The WSID was established in 1921 in order to provide water from the San Joaquin River for use by local farmers. Irrigation and canal systems were developed throughout the 1920s. The WSID intake canal was originally constructed in 1928, along with several concrete pump houses and several diversion pumps located along the intake canal (Kerr 1922). WSID, along with other San Joaquin Valley irrigation districts, used canals and lift pump systems. These systems were later built on a far grander scale by the CVP and State Water Project on their aqueduct systems.

The history of flooding along the San Joaquin River resulted in the construction of extensive levees along the river in order to protect surrounding buildings and agricultural operations. Roads and levees within the project vicinity appear on maps dating as early as flood control along the lower San Joaquin River was authorized by the Flood Control Act of 1944. The Federal government implemented improvements to the channel and levee system along the San Joaquin River from the Delta upstream to the mouth of Merced River and on several tributaries and distributaries. Construction of the extant levees began in 1956 and was generally completed by 1968, although the levee on the west bank of the San Joaquin River, from the Tuolumne River to the Merced River, was completed in 1972. Improvements, maintenance, and modifications to the levees have occurred since their original construction (Corps 1985).

In 1999, the USFWS purchased 3,166 acres of flood-prone farmland consisting of three properties located on the west bank of the San Joaquin River, including the project site, near the confluence of the Tuolumne River with the San Joaquin River. Levees protecting these parcels had failed in 1983 and 1997, and one of the principal reasons for the purchase of the land to provide a demonstration of a non-structural flood management alternative.

Paleontological Setting

Geological mapping by Wagner et al. (1991) indicates that the surface of the project site is covered with the Dos Palos Alluvium (mapped as Qdp). The Dos Palos Alluvium consists of unconsolidated arkosic sands, gravels, and clay covering the flood basin of the San Joaquin River (Lettis 1982). These sediments date to the Holocene and as such are not old enough to contain fossil remains. However, the Modesto Formation (mapped as Qm) is found at the surface approximately one mile northeast of the project site. The Modesto Formation is a Pleistocene-aged formation with a record of preserving fossils (Wagner et al. 1991). Fossils previously recovered from the Modesto Formation include bison, horse, ground sloth, camel, and mammoth (Ibarra et al. 2009). It is likely that the Modesto Formation is present below the surficial Dos Palos Alluvium in the project site. The depth of the Dos Palos Alluvium has not been well established; however, it likely ranges from approximately 6 to 15 feet in depth (Lettis 1982).

Methods and Results

Cultural Resources Background Research

On May 4, 2016, at ESA's request, the staff of the Central California Information Center (CCIC), California State University, Stanislaus, conducted a records search for the Proposed Project/Action. The CCIC is the California Historical Resources Information System (CHRIS) repository housing records for the project site and vicinity. The study area for the records search consisted of the project site and areas within 0.5 miles of the project site. The records search included a review of CCIC base maps (primarily the Westley, California 7.5-minute USGS) quadrangle), previously recorded site records, and previous cultural resources study reports for the study area. Additional sources reviewed during the records search included historic maps, the Directory of Properties in the Historic Property Data File for Stanislaus County, the National Register, the California Register, the *California Inventory of Historic Resources* (1976), the *California Historical Landmarks* (1996), and the *California Points of Historical Interest* (1992). The objectives of the records search were to: (1) determine whether known cultural resources had been recorded within or adjacent to the project site; (2) assess the likelihood of unrecorded cultural resources based on historical references and the distribution of environmental settings of nearby sites; and (3) develop a context for identification and preliminary evaluation of cultural resources.

ESA also conducted a review of historic maps for the project site. Two historic maps, the 1940-1941 Modesto West, California 15-minute USGS Topographic Quadrangle and the 1952 Westley, California 7.5-minute USGS Topographic Quadrangle, were reviewed.

The CCIC records indicate that no previously recorded cultural resources are in the project site. One formally recorded cultural resource, archaeological site P-50-000433, is within 0.5 mile (but outside) of the project site. Additionally, the CCIC records show that the ethnographic Yokuts village *Mayemes* was reported within 0.5 mile of the project site. These resources are summarized in **Table 3.8-1**, and further discussed below. The CCIC has reports on file from nine previous cultural resources studies conducted with 0.5 mile of the project site, one of which (Study 4129) included a portion of the project site. Seven of these studies included a field survey, while two (including Study 4129) did not.

TABLE 3.8-1
PREVIOUSLY DOCUMENTED CULTURAL RESOURCES WITHIN 0.5 MILE OF PROJECT SITE

Primary (P-)	Trinomial (CA-)	Name/Description	Location
50-000433	STA-395	Archaeological site: human remains, housepits, projectile points, flaked stone tools, debitage, groundstone, shell beads, shell ornaments, bone tools, fire-affected rock, baked clay, faunal remains	Immediately west of project site
n/a	n/a	Mayemes – ethnographic Yokuts village	800 feet northeast of project site

Source: CCIC 2016

P-50-000433 (CA-STA-395)

Prehistoric archaeological site P-50-000433 was recorded after a breach in a levee resulting from the January 1997 floods. Only surface examination and construction monitoring were conducted at the site. The site is west (and outside) of the north end of the project site. Cultural material recorded at the site includes dozens of burials and a large number of scattered human remains, housepits, projectile points, flaked stone tools, debitage, groundstone, shell beads, shell ornaments, bone tools, fire-affected rock, baked clay, and faunal remains. Paleontological specimens were also recorded at the site and include mammoth, bison, and camelid. The materials present support the argument that the site was a large Native American village dating to the Emergent Period (900 to 300 BP), and its proximity to the ethnographic village *Mayemes* suggests that they could be one and the same.

Mayemes

Although not formally recorded, the CCIC basemaps show the ethnographic Yokuts village *Mayemes* approximately 800 feet northeast of the project site. The village was documented by Padre Viader on two separate expeditions during 1810, and an estimated 300 to 400 people may have lived at the village at the time. *Mayemes* and P-50-000433 may represent the same village or two associated sites.

Native American Correspondence

ESA contacted the Native American Heritage Commission (NAHC) on May 9, 2016, to request of a search of the NAHC’s Sacred Lands File (SLF) and a list of Native American representatives who may have interest in the Proposed Project/Action. The NAHC replied to ESA on May 16, 2016, indicating that the SLF has no record of any cultural resources within the project site, and also included a list of Native American representatives who may be interested in the Proposed Project/Action.

On June 24, 2016, WSID sent letters regarding the Proposed Project/Action to the Native American contacts provided by the NAHC, consistent with AB 52 consultation requirements. These letters included information on the Proposed Project/Action, a map of the project location, and an invitation to share information or concerns regarding cultural resources in or near the project site and to indicate if they would like to consult pursuant to PRC Sections 21074(a) and 21080.3.1 On July 18, 2016, ESA archaeologist Robin Hoffman left voicemails for representatives of each of the tribes represented in the NAHC contact list. To date, WSID and ESA have not received any responses from any of the Native American representatives.

Archaeological Sensitivity Analysis

In this document, archaeological “sensitivity” is a synthesis of the likelihood of the presence of archaeological deposits and its potential for significance, whereby an area with high sensitivity would be an area with both a high likelihood of encountering archeological deposits and a high likelihood of any such deposits being significant.

Landforms that predate the earliest estimated periods for human occupation of the region are considered to have very low potential for buried archaeological sites, while those that postdate human occupation are considered to have a higher potential for buried archaeological sites. The degree of buried potential is inversely related to the estimated date range of a landform.

During the prehistoric period, the project site would have been an amenable setting for procurement of the abundant flora and fauna found in the area’s marshes, river channels, and adjacent forests and grasslands. The project site may also have been an ideal setting for prehistoric habitation, probably temporary or seasonal due to flood risks from the nearby San Joaquin and Tuolumne Rivers. As the project site is underlain by thick Holocene alluvium (stream channel deposits) and (California Division of Mines and Geology 1972; Rosenthal and Meyer 2004:54, Map 1) soils in the project site consist of various series of sandy loam (Columbia, Veritas), silty clay loams (Merritt, El Solyo), clay loam (Dospalos-Bolfar), and silty clay (Clear Lake) (USDA 2016). The majority of these soils are middle to late Holocene in age, with the Columbia series sandy loams that characterize much of the project site and vicinity dating to the late Holocene to historic period (Rosenthal and Meyer 2004:Appendix D).

Rosenthal and Meyer’s (2004:Appendix D) geoarchaeological analysis suggest that the soil types in the project site have high potential for buried archaeological deposits dating to the late Holocene to early historic period. Also, the proximity of the project site to previously recorded prehistoric archaeological site P-50-000433, which contained buried deposits, and the ethnographic village *Mayemes* suggest an increased potential for archaeological deposits. Thus, the potential for buried archaeological deposits is high for the project site.

Much of the project site has experienced a large degree of ground disturbance from historic-period and modern agricultural activities, including levee and canal construction. The depth of such disturbance varies throughout the project site. Likely most, if not all, of surface sediments in the project site have been disturbed from historic-period and modern activities (associated with canal construction and use).

While it is challenging to assess the archaeological sensitivity for buried deposits in the project site, the high potential for presence of buried archaeological deposits in the project area is offset in areas/depths of the project site with previously disturbed sediment, where the potential significance for any archaeological deposits is low due to a lack of integrity from the ground disturbance. Thus, these areas would have a low archaeological sensitivity. These areas of low archaeological sensitivity include all portions of the project site outside the project footprint, since they would only be used for access routes, with minimal anticipated project ground disturbance in the areas. Portions of the project site that do not contain previously disturbed sediment or soil would have high archaeological sensitivity.

Historic maps indicate that the portion of the project site from the historic Corps levee northward has changed substantially since the intake canal’s construction. Prior to the canal’s construction, the San Joaquin River channel meandered through this portion of the project site, and was situated on the east side of the river. During canal construction, a significant amount of ground disturbance occurred in this portion of the project site, though the exact extent is not known. Much of the sediment in this portion of the project site is probably disturbed, though it is difficult to ascertain the exact extent (horizontal and vertical) of the disturbance. Sediment in the rest of the project site appears to be disturbed, as these areas almost solely consist of canal construction spoils. Study of previous ground disturbance also considers alluvial sediment deposition associated with flooding of the nearby San Joaquin and Tuolumne Rivers, in addition to channel migration of these rivers. The results of the geotechnical investigations completed for the Proposed Project/Action (AGS 2016) are inconclusive regarding the extent of previous ground disturbance.

In summary, the archaeological sensitivity of the project site is low for surface-visible deposits, and the archaeological sensitivity of the project site for buried deposits is low in all areas of the project site outside the project footprint and also in the portion of the project footprint south/southwest of the area where the Proposed Project/Action proposes to install the conveyance pipelines. In the remainder of the project footprint, the archaeological sensitivity for buried deposits is high for undisturbed sediment, and low for disturbed sediment. This ambiguity stems from the unknown extent of historic-period and modern ground disturbance in this area.

Cultural Resources Field Survey

In May 2016, ESA conducted a pedestrian field survey of the project site. The survey covered all portions of the project site outside of the intake canal itself. Intensive pedestrian survey methods, consisting of walking parallel 15-meter transects and inspecting the ground surface, were used for the boring locations, staging areas, culvert/crossing footprints, and northeast portion of the channel identified as potentially archaeologically sensitive from the records search and sensitivity analysis. As the majority of project work would occur in the intake canal, the remainder of the project site was surveyed through a combination of windshield survey and intensive pedestrian survey in areas of exposed natural soils. The entire project site appears to have been disturbed from canal and levee construction, along with historic-period agricultural and/or modern development activities.

No surface-visible archaeological resources were identified during the field survey. Background research and the records search indicate nearby prehistoric and possibly ethnographic resources; these do not appear to extend to the area encompassed by the project site. In addition to archaeological resources, no newly recorded or previously unrecorded traditional cultural properties, as defined by *National Register Bulletin 38*, were identified in the project site, including through outreach efforts to Native American representatives.

Two historic-period architectural resources were identified in the project site during the pedestrian survey: the 1928 WSID intake canal and associated ancillary features (bridge remnants, irrigation pumps, maintenance roads, etc.); and, a segment of the Corps levee. Both resources were evaluated for National Register-eligibility and eligibility to qualify as historical resources, for CEQA purposes. Both resources were recommended as not eligible for the National Register and not eligible to qualify as historical resources, for CEQA purposes.

University of California Museum of Paleontology Record Search

On December 19, 2016, ESA requested a database search from the University of California Museum of Paleontology (UCMP) for records of fossil localities in the project site. The purpose of the museum records search was to: (1) determine whether any previously recorded fossil localities occur in the project site; (2) assess the potential for disturbance of these localities during construction; and (3) evaluate the paleontological sensitivity in the project site. The records search returned no known localities within the project site; however, a number of vertebrate fossils are known from approximately 6 miles southwest of the project site (Finger 2016).

Paleontological Sensitivity Analysis

Geological mapping of the project site, as described earlier, indicates that the surface of the project site is covered with the Dos Palos Alluvium (Wagner et al. 1991), which consists of unconsolidated arkosic sands, gravels, and clay covering the flood basin of the San Joaquin River (Lettis 1982). These sediments date to the Holocene and as such are not old enough to contain fossil remains. However, the Modesto Formation (mapped as Qm) is found at the surface to the northeast and east of the project site and is a Pleistocene-aged formation with a record of preserving fossils (Wagner et al. 1991).

The UCMP records search returned no known localities of paleontological resources within the project site, though a number of vertebrate fossils are known from approximately 6 miles southwest of the project site. The surficial sediments of the project site, the Dos Palos Alluvium, have been identified as too young to preserve fossils and therefore of low paleontological sensitivity. The Modesto Formation is found at the surface to the east and northeast of the project site and is likely present in the subsurface of the project site (at least 6 to 15 feet below the surface). The Modesto Formation has a proven record of preserving fossil resources and therefore has high paleontological sensitivity.

3.8.2 Regulatory Framework

Federal Regulations

Cultural Resources

National Historic Preservation Act

Federal regulations for cultural resources are primarily governed by Section 106 of the NHPA of 1966, which applies to actions taken by federal agencies. The goal of the Section 106 review process is to offer a measure of protection to sites that are listed or determined eligible for listing in the National Register. The criteria for determining National Register-eligibility are found in 36 CFR Part 60. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on Historic Properties and affords the federal Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The Council's implementing regulations, "Protection of Historic Properties," are found in 36 CFR Part 800. The National Register criteria (36 CFR Section 60.4) are used to evaluate resources when complying with Section 106 of the NHPA. Those criteria state that eligible resources comprise districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and any of the following:

a) Are associated with events that have made a significant contribution to the broad patterns of our history;

b) Are associated with the lives of persons significant in our past;

c) Embody the distinctive characteristics of a type, period, or method of construction, or that possess high artistic values, or that represent a significant distinguishable entity whose components may lack individual distinction; or

d) Have yielded or may be likely to yield, information important to history or prehistory.

Eligible properties must meet at least one of the criteria and exhibit integrity. Historical integrity is measured by the degree to which the resource retains its historical attributes and conveys its historical character, the degree to which the original fabric has been retained, and the reversibility of changes to the property.

Certain types of properties are usually excluded from consideration for listing in the National Register, but can be considered if they meet special requirements in addition to meeting Criteria A to D. The following seven Criteria Considerations deal with properties usually excluded from listing in the National Register: religious properties, moved properties, birthplaces and graves, cemeteries, reconstructed properties, commemorative properties, and properties that have achieved significance within the past 50 years.

Archaeological site evaluation assesses the potential of each site to meet one or more of the criteria for National Register-eligibility based upon visual surface and subsurface evidence (if available) at each site location, information gathered during the literature and records searches, and the researcher's knowledge of and familiarity with the historic or prehistoric context associated with each site.

Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act (NAGPRA) (23 USC Section 3001-3013) and its implementing regulations (43 CFR Section 10) specify, among other topics, the procedures federal agencies must follow in the treatment, repatriation, and disposition of Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony. NAGPRA requires that Native Americans be consulted when Native American human remains and associated material are unexpectedly discovered on lands under federal jurisdiction (43 CFR Section 10). NAGPRA requires that when such a discovery is made, the federal agency with jurisdiction over the land turn over control of the remains and/or cultural items according to the chain of custody described in 43 CFR Section 10.5. NAGPRA applies to the Proposed Project/Action since the Proposed Project/Action would occur on land owned by the USFWS. If human remains are discovered during project implementation and are determined to be Native American in origin, USFWS would be required to comply with NAGPRA.

Paleontological Resources

There are several federal statutes that provide legislative protection for paleontological resources. The first of these is the Antiquities Act of 1906 (Public Law [PL] 59-209; 16 USC 431 et seq.; 34 Stat. 225), which calls for protection of historic landmarks, historic and prehistoric structures, as well as other objects of historic or scientific interest on federally administered lands, the latter of which would include fossils. The Antiquities Act both establishes a permit system for the disturbance of any object of antiquity on federal land and also sets criminal sanctions for violation of these requirements. More recent federal statutes that address the preservation of paleontological resources include NEPA, which requires the consideration of important natural aspects of national heritage when assessing the environmental impacts of a project (PL 91-190; 31 Stat. 852; 42 USC 4321-4327). The Federal Land Policy Management Act of 1976 (PL 94-579; 90 Stat. 2743; USC 1701-1782) requires that public lands be managed in a manner that will protect the quality of their scientific values, while 40 CFR Section 1508.2 identifies paleontological resources as a subset of scientific resources. The Paleontological Resources Preservation Act (Title VI, Subtitle D of the Omnibus Land Management Act of 2009) furthers the protection of paleontological resources on federal lands by criminalizing the unauthorized removal of fossils.

State Regulations

California Environmental Quality Act

The State implements provisions in CEQA through its statewide comprehensive cultural resources surveys and preservation programs. The California Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation, oversees adherence to CEQA regulations. The OHP also maintains the California Historic Resources Inventory. The State Historic Preservation Officer (SHPO) is an appointed official who implements historic preservation programs within the State's jurisdiction. Typically, a resource must be more than 50 years old to be considered as a potential historic resource. The OHP advises recordation of any resource 45 years or older, since there is commonly a 5-year lag between resource identification and the date that planning decisions are made.

CEQA (codified at PRC Section 21000 et seq.) is the principal statute governing environmental review of projects occurring in the State. CEQA requires lead agencies to determine if a project would have a significant effect on historical resource and unique archaeological resources.

Historical Resources

CEQA Guidelines recognize that a historical resource includes: (1) a resource in the California Register of Historical Resources [California Register]; (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); and (3) any object, building, structure, site, area, place, record, or manuscript, which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California by the lead agency, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

If a lead agency determines that an archaeological site is a historical resource, the provisions of PRC Section 21084.1 and CEQA Guidelines Section 15064.5 apply. If an archaeological site does not meet the criteria for a historical resource contained in the CEQA Guidelines, then the site may be treated in accordance with the provisions of PRC Section 21083, pertaining to unique archaeological resources.

Unique Archaeological Resources

As defined in PRC Section 21083.2 a "unique archaeological resource" is an archaeological artifact, object, or site, about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information;
- Has a special and particular quality such as being the oldest of its type or the best available example of its type; or,
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

The CEQA Guidelines note that if an archaeological resource is not a unique archaeological resource or historical resource, the effects of the project on those cultural resources shall not be considered a significant effect on the environment (CEQA Guidelines Section 15064.5[c][4]).

Tribal Cultural Resources

Impacts to tribal cultural resources also are considered under CEQA (PRC Sections 21080.3.1, 21084.2, and 21084.3). PRC Section 21074(a) defines a tribal cultural resource as any of the following:

- Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
  - included or determined to be eligible for inclusion in the California Register; or
  - included in a local register of historical resources, as defined in PRC Section 5020.1(k).
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1. In applying these criteria, the lead agency would consider the significance of the resource to a California Native American tribe.

Per PRC Section 21074(a)(c), an historical resource, unique archaeological resource, or nonunique archaeological resource may also be a tribal cultural resource if it is included or determined eligible for the California Register or included in a local register of historical resources.

Unique Paleontological Resources

The CEQA threshold of significance for a significant impact to paleontological resources is reached when a project is determined to “directly or indirectly destroy a unique paleontological resource” (CEQA Guidelines Section 15023 Appendix G [XIV]). A unique paleontological resource is a paleontological resource that is the best example of its kind locally or regionally, provides a key piece of information about its context, is exclusive locally or regionally, or is an example of a resource not known to occur elsewhere in the region. This includes any vertebrate fossil may be considered a unique paleontological resource.

In general, for project sites that are underlain by paleontologically sensitive geologic units, the greater the amount of ground disturbance, the higher the potential for significant impacts to paleontological resources. For project sites that are directly underlain by geologic units with no paleontological sensitivity, there is no potential for impacts on paleontological resources unless sensitive geologic units which underlie the non-sensitive unit are also affected.

The loss of any identifiable fossil that could yield information important to prehistory, or that embodies the distinctive characteristics of a type of organism, environment, period of time, or geographic region, would be a significant environmental impact. Direct impacts to paleontological resources primarily concern the potential destruction of nonrenewable paleontological resources and the loss of information associated with these resources. This includes the unauthorized collection of fossil remains. If potentially fossiliferous bedrock or surficial sediments are disturbed, the disturbance could result in the destruction of paleontological resources and subsequent loss of information (significant impact). At the project-specific level, direct impacts can be mitigated to a less-than-significant level through the implementation of paleontological mitigation.

Assembly Bill 52

In September of 2014, the California Legislature passed AB 52, which added provisions to the PRC regarding the evaluation of impacts on tribal cultural resources under CEQA, and consultation requirements with California Native American Tribes. In particular, AB 52 requires lead agencies to analyze project impacts on "tribal cultural resources," separately from archaeological resources (PRC Section 21074; 21083.09). AB 52 also requires lead agencies to engage in additional consultation procedures with respect to California Native American Tribes (PRC Section 21080.3.1, 21080.3.2, 21082.3). Finally, AB 52 requires the Office of Planning and Research to update Appendix G of the CEQA Guidelines by July 1, 2016 to provide sample questions regarding impacts to tribal cultural resources (PRC Section 21083.09).

California Register of Historical Resources

The California Register is "an authoritative listing and guide to be used by State and local agencies, private groups, and citizens in identifying the existing historical resources of the State and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1[a]). The criteria for eligibility for the California Register are based upon National Register criteria (PRC Section 5024.1[b]), as defined above. Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for, or listed in, the National Register.

To be eligible for the California Register, a cultural resource must be significant at the local, State, and/or federal level under one or more of the following four criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

A resource eligible for the California Register must be of sufficient age, and retain enough of its historic character or appearance (integrity) to convey the reason for its significance. Additionally, the California Register consists of resources that are listed automatically and those that must be nominated through an application and public hearing process. The California Register automatically includes the following:

- California properties listed in the National Register and those formally Determined Eligible for the National Register;
- California Registered Historical Landmarks from No. 770 onward; and
- Those California Points of Historical Interest that have been evaluated by the OHP and have been recommended to the State Historical Commission for inclusion on the California Register.

Other resources that may be nominated to the California Register include:

- Historical resources with a significance rating of Category 3 through 5 (those properties identified as eligible for listing in the National Register, the California Register, and/or a local jurisdiction register);
- Individual historic resources;
- Historic resources contributing to historic districts; and
- Historic resources designated or listed as local landmarks, or designated under any local ordinance, such as an historic preservation overlay zone.

California Public Resources Code Section 5097

California PRC Section 5097.99, as amended, states that no person shall obtain or possess any Native American artifacts or human remains that are taken from a Native American grave or cairn. Any person who knowingly or willfully obtains or possesses any Native American artifacts or human remains is guilty of a felony, which is punishable by imprisonment. Any person who removes, without authority of law, any such items with an intent to sell or dissect or with malice or wantonness is also guilty of a felony which is punishable by imprisonment. PRC Section 5097.5 specifies that any unauthorized removal of paleontological remains is a misdemeanor.

California Public Resources Code Section 5097.5 and Section 30244

Other state requirements for paleontological resource management are included in PRC Section 5097.5 and Section 30244. These statutes prohibit the removal of any paleontological site or feature from public lands without permission of the jurisdictional agency, define the removal of paleontological sites or features as a misdemeanor, and require reasonable mitigation of adverse impacts to paleontological resources from developments on public (state, county, city, district) lands.

California Native American Historic Resource Protection Act

The California Native American Historic Resources Protection Act of 2002 imposes civil penalties, including imprisonment and fines up to $50,000 per violation, for persons who unlawfully and maliciously excavates upon, removes, destroys, injures, or defaces a Native American historic, cultural, or sacred site that is listed or may be listed in the California Register.

California Health and Safety Code Section 7050.5

Section 7050.5 of the California Health and Safety Code (CHSC) protects human remains by prohibiting the disinterring, disturbing, or removing of human remains from any location other than a dedicated cemetery. PRC Section 5097.98 (and reiterated in CEQA Guidelines Section 15064.59[e]) also identifies steps to follow in the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery.

California Penal Code Section 622.5

The California Penal Code Section 622.5 sets the penalties for the damage or removal of paleontological resources.

Society for Vertebrate Paleontology

The SVP has established standard guidelines (SVP 1995, 2010) that outline professional protocols and practices for conducting paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation. Most practicing professional vertebrate paleontologists adhere closely to the SVP's assessment, mitigation, and monitoring requirements as specifically provided in its standard guidelines. Most state regulatory agencies with paleontological resource specific Laws, Ordinances, Regulations, and Standards accept and use the professional standards set forth by the SVP.

As defined by the SVP (1995:26), significant nonrenewable paleontological resources are:

> Fossils and fossiliferous deposits here restricted to vertebrate fossils and their taphonomic and associated environmental indicators. This definition excludes invertebrate or paleobotanical fossils except when present within a given vertebrate assemblage. Certain invertebrate and plant fossils may be defined as significant by a project paleontologist, local paleontologist, specialists, or special interest groups, or by lead agencies or local governments.

As defined by the SVP (1995:26), significant fossiliferous deposits are:

> A rock unit or formation which contains significant nonrenewable paleontologic resources, here defined as comprising one or more identifiable vertebrate fossils, large or small, and any associated invertebrate and plant fossils, traces, and other data that provide taphonomic, taxonomic, phylogenetic, ecologic, and stratigraphic information (ichnites and trace fossils generated by vertebrate animals, e.g., trackways, or nests and middens which provide datable material and climatic information). Paleontologic resources are considered to be older than recorded history and/or older than 5,000 BP.

Based on the significance definitions of the SVP (1995), all identifiable vertebrate fossils are considered to have significant scientific value. This position is adhered to because vertebrate fossils are relatively uncommon, and only rarely will a fossil locality yield a statistically significant number of specimens of the same genus. Therefore, every vertebrate fossil found has the potential to provide significant new information on the taxon it represents, its paleoenvironment, and/or its distribution. Furthermore, all geologic units in which vertebrate fossils have previously been found are considered to have high sensitivity. Identifiable plant and invertebrate fossils are considered significant if found in association with vertebrate fossils or if defined as significant by project paleontologists, specialists, or local government agencies.

A geologic unit known to contain significant fossils is considered to be "sensitive" to adverse impacts if there is a high probability that earth-moving or ground-disturbing activities in that rock unit will either directly or indirectly disturb or destroy fossil remains. Paleontological sites indicate that the containing sedimentary rock unit or formation is fossiliferous. The limits of the entire rock formation, both areal and stratigraphic, therefore define the scope of the paleontological potential in each case (SVP 1995).

Fossils are contained within surficial sediments or bedrock, and are therefore not observable or detectable unless exposed by erosion or human activity. In summary, paleontologists cannot know either the quality or quantity of fossils prior to natural erosion or human-caused exposure. As a result, even in the absence of surface fossils, it is necessary to assess the sensitivity of rock units based on their known potential to produce significant fossils elsewhere within the same geologic unit (both within and outside of the study area), a similar geologic unit, or based on whether the unit in question was deposited in a type of environment that is known to be favorable for fossil preservation. Monitoring by experienced paleontologists greatly increases the probability that fossils will be discovered during ground-disturbing activities and that, if these remains are significant, successful mitigation and salvage efforts may be undertaken in order to prevent adverse impacts to these resources.

Local Regulations

Stanislaus County General Plan

The Stanislaus County General Plan's Conservation and Open Space Element includes goals and policies for preservation of cultural resources, which are summarized in **Table 3.8-2**.

TABLE 3.8-2
CULTURAL RESOURCES GOALS AND POLICIES OF STANISLAUS COUNTY

Number	Description
Goal 8	Preserve areas of national, state, regional and local historical importance.
Policy 24	The County will support the preservation of Stanislaus County's cultural legacy of historical and archeological resources for future generations.

Source: Stanislaus County 2016

Implementing measures of Policy 24, as prescribed in the General Plan, include utilizing CEQA to protect cultural resources and coordination with SHPO and local historical societies and other interested parties for protection of cultural resources.

3.8.3 Environmental Consequences

Approach to Analysis

Historical Resources

Potential impacts on historical architectural resources are assessed by identifying any project activities such as new construction, demolition, or substantial alteration within identified historic districts that could affect resources that have been identified as historical resources for the purposes of CEQA. Properties identified as historical resources under CEQA include those that are significant because of their association with important events, people, or architectural styles or master architects, or for their informational value (National Register and California Register Criteria A/1, B/2, C/3, and D/4) and that retain sufficient historic integrity to convey their significance. However, Criterion D/4 is typically applied to the evaluation of archaeological resources and not to architectural resources, as described below. Once a resource has been identified as significant, it must be determined whether the impacts of the project would "cause a substantial adverse change in the significance" of the resource (CEQA Guidelines Section 15064.5[b]). A substantial adverse change in the significance of a historical resource means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be materially impaired" (CEQA Guidelines Section 15064[b][1]). A historical resource is materially impaired through the demolition or alteration of the resource's physical characteristics that convey its historical significance and that justify its inclusion in the California Register (CEQA Guidelines Section 15064.5[b][2][A]).

Archaeological Resources

A project could have an impact on archaeological resources if it caused a substantial adverse change in the significance of an archaeological resource including those that qualify as historical resources according to CEQA Guidelines Section 15064.5, unique archaeological resources as defined in PRC Section 21083.2(g), and historic properties that meet the National Register listing criteria at 36 CFR Section 60.4. Under CEQA, the significance of most prehistoric and historic-period archaeological sites is usually assessed under California Register Criterion 4. This criterion stresses the importance of the information potential contained within the site, rather than its significance as a surviving example of a type or its association with an important person or event. Archaeological resources may also be assessed under CEQA as unique archaeological resources, defined as archaeological artifacts, objects, or sites that contain information needed to answer important scientific research questions.

Historic Properties

Any prehistoric or historic building, structure, object, site, landscape, or district that is included in, or is eligible for inclusion in, the National Register is termed a *historic property* and is managed for protection under the NHPA. Types of historic properties include architectural resources, archaeological sites, archaeological and historic districts, cultural landscapes, and traditional cultural properties. These resources may also be considered under the Archaeological

Resources Protection Act, the NAGPRA, the American Indian Religious Freedom Act, and Executive Order 13007 (Indian Sacred Sites).

Section 106 of the NHPA requires the federal agency to consider the effects of its undertakings on historic properties and to provide the Advisory Council on Historic Preservation a reasonable opportunity to comment. The agency must also identify the appropriate SHPO/Tribal Historic Preservation Officers to consult with during the process. It should also plan to involve the public, and identify other potential consulting parties. Section 106 also applies to properties not formally determined eligible, but which meet eligibility requirements for the National Register and are therefore treated as eligible until a formal determination can be made.

Under the NHPA and NEPA, archaeological resources are typically considered eligible for inclusion in the National Register because of their cultural value to traditionally associated peoples (Criteria A and/or B), and the information they have or may be likely to yield (Criterion D). In certain instances archaeological resources can also be assessed as eligible for the National Register under Criterion C (exemplifying a type, construction method, or style). Intensity of impacts on archaeological resources relates, additionally, to the importance of the information they contain and the extent of disturbance or degradation. Even the disturbance of a small portion of a rare or unstudied site type (impacts to less than 10 percent of the total site area) can be considered an adverse effect, while impacts to 25 percent or more of the site area of a well-known and common site type may be considered not adverse.

Characteristics that qualify a property for inclusion in the National Register include the seven integrity factors: location, design, setting, materials, workmanship, feeling, and association. Undertakings are designed to avoid adverse effects to the maximum extent possible. If complete avoidance of adverse effects is not possible, steps are taken to minimize those effects, including the implementation of mitigation measures. Data recovery does not constitute mitigation of adverse effects under the current NHPA regulations (36 CFR Part 800). Finally, if complete mitigation is not possible, memoranda of agreement are developed with the SHPO to resolve adverse effects. Resolving and/or mitigating adverse effects in this manner does not necessarily mean that there would be no remaining adverse effects; in many cases, mitigation can result in reduced impacts.

Human Remains

Human remains, including those buried outside of formal cemeteries, are protected under several state laws, including PRC Section 5097.98 and CHSC Section 7050.5. This analysis considers impacts including intentional disturbance, mutilation, or removal of interred human remains.

Tribal Cultural Resources

Effective for projects for which a notice of preparation or notice of negative declaration/mitigated negative declaration was filed on or after July 1, 2015, CEQA requires that a project’s impacts on tribal cultural resources be considered as part of the overall analysis of project impacts (PRC Sections 21080.3.1, 21084.2, and21084.3). The significance of a tribal cultural resource is assessed by evaluating: 1) its eligibility for listing on the California Register; 2) eligibility as a unique archaeological resource pursuant to PRC Section 21083.2) its listing status on the NAHC's SLF. Additionally, a lead agency can independently determine a resource to be a tribal cultural resource. Because California Native American tribes are considered experts with respect to tribal cultural resources, the analysis of whether project impacts may result in a substantial adverse change to the significance of a tribal cultural resource is heavily dependent on consultation efforts conducted between the lead agency and relevant California Native American tribes during the CEQA process.

Paleontological Resources

The paleontological analysis identifies the potential to encounter paleontological resources (i.e., plant, animal or invertebrate fossils or microfossils) during excavations associated with the Project. A potentially significant impact on paleontological resources would occur if: (1) project-related ground disturbance were to move or excavate previously undisturbed geologic bedrock (native rock); and, (2) the bedrock to be disturbed has a high paleontological potential.

Fossils are considered to be unique paleontological resources; therefore, effects are considered significant if one or more of the following criteria apply:

1. The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct;
2. The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;
3. The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas;
4. The fossils demonstrate unusual or spectacular circumstances in the history of life; or
5. The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.

Significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically important. Significant fossils can include remains of large to very small aquatic and terrestrial vertebrates or remains of plants and animals previously not represented in certain portions of the stratigraphy. Assemblages of fossils that might aid stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, and paleoclimatology are also critically important.

Significance Criteria

This analysis of cultural resources evaluates the potential effects of the Proposed Project/Action on cultural resources within or adjacent to the project site.

Effects are considered significant if an alternative would result in any of the following:

- Cause a substantial adverse change in the significance of a historical resource
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature
- Disturb any human remains, including those interred outside of formal cemeteries
- Cause a substantial adverse change in the significance of a tribal cultural resource as defined in PRC Section 21074
- Adversely affect an historic property, as defined in the NHPA

Impact Evaluation

No Project Alternative

Under this alternative, no impacts or changes would occur to existing cultural resources that were identified and evaluated in the project site as a result of construction activities because the Proposed Project/Action would not be implemented. No grading or any activities associated with the Proposed Project/Action would occur; therefore, no known or unidentified cultural resources would be impacted. As a result, this alternative would result in no impact on cultural resources.

Proposed Project Alternative

Impact 3.8-1: The Project could cause a substantial adverse change in the significance of a historical resource, as defined in CEQA Guidelines Section 15064.5, or adversely affect an historic property, as defined by the National Historic Preservation Act. (Less than Significant with Mitigation)

Through a records search, background research, and a field survey, two cultural resources were identified in the project site. The resources, the WSID intake canal and a segment of the Corps levee, are architectural resources and were evaluated as not eligible for listing in the National Register and as not qualifying as historical resources, as defined in CEQA Guidelines Section 15064.5. As such, there are no cultural resources in the project site that qualify as historical resources, for CEQA purposes, or that are considered historic properties for NHPA purposes; therefore, the Proposed Project/Action is not anticipated to impact any historical resources, as defined in CEQA Guidelines Section 15064.5, or adversely affect an historic property, as defined by the NHPA.

The archaeological sensitivity of the project site is low for surface-visible deposits, and the archaeological sensitivity of the project site for buried deposits is low in all areas of the project site outside the project footprint and also in the portion of the project footprint south/southwest of the area where the Proposed Project/Action proposes to install the conveyance pipelines. In the remainder of the project site, the archaeological sensitivity for buried deposits is high for undisturbed sediment, and low for disturbed sediment.

If any previously unrecorded archaeological resource that qualifies as an historical resource, for CEQA purposes, or as an historic property, for NHPA purposes, were encountered during project construction, any impacts to the resource resulting from the Proposed Project/Action could be potentially significant. Any such potential significant impacts would be reduced to a less-than-significant level by implementing Mitigation Measures 3.8-1a and 3.8-1b.

Mitigation Measures

Mitigation Measure 3.8-1a: Archaeological monitoring shall be conducted for project-related ground-disturbing construction activities areas determined to have a high sensitivity for archaeological resources. This consists of the portion of the project site north/northeast of where the proposed conveyance pipelines would connect to the canal. Prior to authorization to proceed, or issuance of permits, WSID shall submit an archaeological monitoring plan (AMP), prepared by an archaeologist meeting the Secretary of the Interior's Professional Qualification Standards for Archeology, to the U.S. Bureau of Reclamation (Reclamation) for review and approval. The AMP should also be developed in consultation with the USFWS to address protocol for compliance with NAGPRA in the event that human remains are discovered during monitoring.

Monitoring shall be required for all surface alteration and subsurface excavation work including trenching, boring, grading, use of staging areas and access roads, and driving vehicles and equipment within all areas determined to have a high or very high sensitivity for archaeological resources. The plan shall address (but not be limited to) the following issues:

- Training program for all construction and field workers involved in site disturbance;
- Person(s) responsible for conducting monitoring activities, including Native American monitors;
- How the monitoring shall be conducted and the required format and content of monitoring reports, including any necessary archaeological re-survey of the final pipeline alignment (including the need to conduct shovel-test units or auger samples to identify deposits in advance of construction), assessment, and designation and mapping of the sensitive cultural resource areas on final project maps;
- Person(s) responsible for overseeing and directing the monitors;
- Schedule for submittal of monitoring reports and person(s) responsible for review and approval of monitoring reports;
- Physical monitoring boundaries;
- Protocol for notifications in the event that cultural resources are encountered, as well as methods of dealing with the encountered resources (e.g., collection, identification, curation);
- Protocol for notification and treatment of, in accordance with NAGPRA, any human remains and associated cultural items that are encountered;
- Methods to ensure security of cultural resources sites;

- Protocol for notifying local authorities (i.e., Sheriff, Police) should site looting and other illegal activities occur during construction.

Mitigation Measure 3.8-1b: Unanticipated discovery protocol for archaeological resources and human remains.

If prehistoric or historic-period archaeological resources are encountered during archaeological monitoring for the Proposed Project/Action or project implementation, all construction activities within 100 feet shall halt and the archaeological monitor(s) (including Native American monitor) if present, or an archaeologist meeting the U.S. Secretary of the Interior's Professional Qualification Standards for Archeology (hereafter "qualified archaeologist") shall inspect the find within 24 hours of discovery and notify WSID and Reclamation of their initial assessment. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-period materials might include building or structure footings and walls, and deposits of metal, glass, and/or ceramic refuse.

If WSID and Reclamation determine that the resource may qualify as a historical resource or unique archaeological resource (as defined in CEQA Guidelines Section 15064.5), or as an historic property (as defined in the NHPA), and that the Proposed Project/Action has potential to damage or destroy the resource, WSID and Reclamation will consult with SHPO, appropriate Native American tribes (if the resource is Native American-related), and other appropriate interested parties to determine treatment measures to avoid, minimize, or mitigate any potential impacts to the resource pursuant to 36 CFR Section 800.13(b)(3), PRC Section 21083.2, and CEQA Guidelines Section 15126.4. The preferred treatment measure shall be preservation in place; however, if this is not possible, a qualified archaeologist shall prepare and implement a detailed treatment plan to recover the scientifically consequential information from the resource prior to any excavation at the resource site. The treatment plan shall be prepared in consultation with WSID, Reclamation, and, if the resource is prehistoric, interested Native American representatives. Treatment for most resources would consist of (but would not necessarily be limited to) sample excavation, artifact collection, site documentation, and historical research, with the aim to target the recovery of important scientific data contained in the portion(s) of the significant resource to be impacted by the project. The treatment plan shall include provisions for analysis of data in a regional context, reporting of results within a timely manner, curation of artifacts and data at an approved facility, and dissemination of reports to local and state repositories, libraries, and interested professionals. If potential human remains are encountered, the protocol outlined in the AMP regarding treatment of human remains in accordance with NAGPRA should be followed.

Significance after Mitigation: Implementation of Mitigation Measures 3.8-1a and 3.8-1b would protect any previously unrecorded historical resource or historic property that may be encountered during project construction and would reduce potential impacts to less than significant.

Impact 3.8-2: The Project could cause a substantial adverse change in the significance of an archaeological resource as defined in CEQA Guidelines Section 15064.5. (Less than Significant with Mitigation)

Through a records search, background research, and a field survey, no archaeological resources, as defined in CEQA Guidelines Section 15064.5, were identified in the project site. Therefore, the Proposed Project/Action is not anticipated to impact any previously identified archaeological resources.

However, as discussed above, the archaeological sensitivity of the project site for buried deposits is high for undisturbed sediment in the portion of the project site north/northeast of where the proposed conveyance pipelines would connect to the intake canal. If any previously unrecorded archaeological resource that qualifies as an archaeological resource, as defined in CEQA Guidelines Section 15064.5, were encountered during project construction, any impacts to the resource resulting from the Proposed Project/Action could be potentially significant. Any such potential significant impacts would be reduced to a less-than-significant level by implementing Mitigation Measures 3.8-1a and 3.8-1b.

Mitigation Measure

> **Mitigation Measure 3.8-2:** Implement Mitigation Measures 3.8-1a and 3.8-1b.
>
> **Significance after Mitigation:** Implementation of Mitigation Measures 3.8-1a and 3.8-1b would protect any previously unrecorded archaeological resource that may be encountered during project construction and would reduce potential impacts to less than significant.

Impact 3.8-3: The Project may disturb human remains, including those interred outside of formal cemeteries. (Less than Significant with Mitigation)

Through a records search, background research, and a field survey, no human remains are known to exist in the project site. Therefore, the Proposed Project/Action is not anticipated to impact any human remains, including those interred outside of formal cemeteries.

However, if any human remains were encountered during project construction, any impacts to them resulting from the Proposed Project/Action could be potentially significant. Any such potential significant impacts would be reduced to a less-than-significant level by implementing Mitigation Measures 3.8-1a and 3.8-1b.

Mitigation Measure

> **Mitigation Measure 3.8-3:** Implement Mitigation Measures 3.8-1a and 3.8-1b.
>
> **Significance after Mitigation:** Implementation of Mitigation Measures 3.8-1a and 3.8-1b would protect any human remains that may be encountered during project construction and would reduce potential impacts to less than significant.

Impact 3.8-4: The Project may cause a substantial adverse change in the significance of a tribal cultural resource as defined in PRC Section 21074. (Less than Significant with Mitigation)

Through a records search, background research, and a field survey, no tribal cultural resources, as defined in PRC Section 21074, were identified in the project site. Therefore, the Proposed Project/Action is not anticipated to impact tribal cultural resources, as defined in PRC Section 21074.

However, the archaeological sensitivity of the project site for buried deposits is high for undisturbed sediment in the portion of the project site north/northeast of where the proposed conveyance pipelines would connect to the canal. If any previously unrecorded archaeological resource that qualifies as a tribal cultural resource, as defined in PRC Section 21074, were encountered during project implementation, any impacts to the resource resulting from the Proposed Project/Action could be potentially significant. Any such potential significant impacts would be reduced to a less-than-significant level by implementing Mitigation Measures 3.8-1a and 3.8-1b.

Mitigation Measure

Mitigation Measure 3.8-4: Implement Mitigation Measures 3.8-1a and 3.8-1b.

Significance after Mitigation: Implementation of Mitigation Measures 3.8-1a and 3.8-1b would protect any previously unrecorded tribal cultural resource that may be encountered during project construction and would reduce potential impacts to less than significant.

Impact 3.8-5: The Project may directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. (Less than Significant with Mitigation)

Based on the records search, background literature search, and geological map research, no recorded fossil localities are in the project site and surficial sediments of the project site, the Dos Palos Alluvium, have a low sensitivity for paleontological resources. However, the geologic formation underlying the project site, the Modesto Formation, has a high paleontological sensitivity. If any previously unrecorded paleontological resources were encountered during project construction and any were found to be a unique paleontological resource, any impacts to the resource resulting from the Proposed Project/Action could be potentially significant. Any such potential significant impacts would be reduced to a less-than-significant level by implementing Mitigation Measures 3.8-5a and 3.8-5b.

Mitigation Measures

Mitigation Measure 3.8-5a: A qualified paleontologist, defined as one meeting the SVP Standards (SVP 2010), shall conduct construction worker paleontological resources sensitivity training prior to the start of ground-disturbing activities (including vegetation removal, pavement removal, etc.). The training session shall focus on the recognition of the types of paleontological resources that could be encountered within the project site and the procedures to be followed if they are found. WSID shall retain documentation demonstrating that construction personnel attended the training.

Full-time paleontological resources monitoring shall be conducted for all project ground-disturbing activities at depths that could disturb the Modesto Formation; therefore, the monitoring should occur for ground-disturbing activities at depths of 5 feet or greater. The qualified paleontologist, based on observations of subsurface soil stratigraphy or other factors, may reduce or discontinue monitoring, as warranted, if the qualified paleontologist determines that the possibility of encountering fossiliferous deposits is low. Paleontological resources monitoring shall be performed by a qualified paleontological monitor (or cross-trained archaeological/paleontological monitor) under the direction of the qualified paleontologist. Monitors shall have the authority to temporarily halt or divert work away from exposed fossils in order to recover the fossil specimens. Any significant fossils collected during project-related ground disturbance shall be prepared to the point of identification and curated into an accredited repository with retrievable storage. Monitors shall prepare daily logs detailing the types of activities and soils observed, and any discoveries. The qualified paleontologist shall prepare a final monitoring and mitigation report to be submitted to WSID.

Mitigation Measure 3.8-5b: If construction or other Project personnel discover any potential fossils during construction, regardless of the depth of work or location, work at the discovery location shall cease in a 50-foot radius of the discovery until the qualified paleontologist has assessed the discovery and made recommendations as to the appropriate treatment. If the find is deemed significant, it should be salvaged following the standards of the SVP (SVP 2010) and curated with a certified repository.

Significance after Mitigation: Implementation of Mitigation Measures 3.8-5a and 3.8-5b would protect any unique paleontological resource or site or unique geologic feature that may be encountered during project construction and would reduce potential impacts to less than significant.

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3.9 Transportation and Traffic

3.9.1 Affected Environment

Stanislaus County is primarily an agricultural region with nearly 80 percent of the County's land devoted to agricultural production. With agricultural processing occurring throughout the County, transportation and circulation in many of the towns and cities are linked to the health of the County's economy. Additionally, approximately one-fifth of the workers living in Stanislaus County commute to jobs outside the county each day, placing demand on freeways, county roads, and bridges that provide access to adjacent counties. The County's existing transportation system has generally had sufficient capacity to absorbed growth in the County over the past few decades without extensive expansion of County roads and State Highways. However, some urbanized areas are starting to exceed the available transportation system capacity. (Stanislaus County 2016.)

There are no local transit systems or delineated pedestrian and bicycle facilities in the vicinity of the project site.

Roadway Network

Regional access to the project area is provided by I-5 and SR 33. I-5 is located approximately 5 miles west/south of the project site and serves as a major route connecting southern California to the Pacific Northwest. SR 33 is a two-lane highway that runs north-south between Ventura and a point east of Tracy. SR 33 provides primary access between the communities of Vernalis and Westley in the project area, and is located approximately 1.5 miles west/south of the project site.

SR 132 is located approximately 2.5 miles north of the project site and runs east-west from I-5 to Coulterville. SR 99 is located east of the project site, running north-south through Modesto.

East Stanislaus Road provides immediate access to WSID's existing Pump Station 1A and the project site. The project site and areas within the SJRNWR include private access and maintenance roads.

Union Pacific Railroad

The Union Pacific Railroad operates on the California Northern Railroad line located on the west side of Stanislaus County, which passes through Westley, Patterson, Crows Landing and Newman. The line runs parallel to SR 33 in the project area.

3.9.2 Regulatory Framework

This section discusses the state and local policies and regulations relevant to the analysis of transportation and traffic in the project area. No federal regulations pertaining to transportation and traffic are applicable to the Proposed Project/Action.

State Regulations

California Department of Transportation - District 10

California Department of Transportation (Caltrans) manages interregional transportation, including management and construction of the California highway system. In addition, Caltrans is responsible for permitting and regulation of the use of state roadways. The project area includes three roadways that are within Caltrans' jurisdiction (I-5, SR 33, and SR 132).

Caltrans' construction practices require temporary traffic control planning "during any time the normal function of a roadway is suspended." In addition, Caltrans requires that permits be obtained for transportation of oversized loads and transportation of certain materials, and for construction-related traffic disturbance. Caltrans regulations may apply to the transportation of construction crews and construction equipment in the project area.

Local Regulations

Stanislaus County General Plan

The Stanislaus County General Plan Circulation Element includes transportation goals and policies applicable to the project area, which are summarized in **Table 3.9-1**.

TABLE 3.9-1
TRANSPORTATION GOALS AND POLICIES OF STANISLAUS COUNTY

Number	Description
Circulation Element	
Goal 1	Provide a system of roads throughout the County that meets land use needs.
Policy 1	Development will be permitted only when facilities for circulation exist, or will exist as part of the development, to adequately handle increased traffic.
Goal 2	Provide a safe, comprehensive, and coordinated transportation system that includes a broad range of transportation modes.
Policy 6	The County shall strive to reduce motor vehicle emissions and vehicle trips by encouraging the use of alternatives to the single occupant vehicle.

Source: Stanislaus County 2016

3.9.3 Environmental Consequences

Significance Criteria

This analysis of transportation and traffic evaluates the potential effects of the Proposed Project/ Action on existing transportation resources and traffic patterns within or adjacent to the project site.

Effects are considered significant if an alternative would result in any of the following:

- 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

- 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
- 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
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)
- Result in inadequate emergency access
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities

Impact Evaluation

Resources Not Considered in Detail

No component of the Proposed Project/Action would affect air traffic and the Proposed Project/Action would not serve transit, bicycle, or pedestrian uses or conflict with adopted policies, plans, or programs related to those uses. Therefore, no impact would occur under these categories and they will not be discussed further within this section.

No Project/Action Alternative

Under the No Project/Action Alternative, the proposed fish screen intake, pump station, and associated features of the Proposed Project/Action would not be constructed and WSID would continue to use its existing unscreened diversion. This would have no new impact on existing transportation and traffic patterns.

Proposed Project/Action Alternative

Impact 3.9-1: Project construction could substantially increase traffic in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections). (Less than Significant)

Construction of the Proposed Project/Action would intermittently and temporarily generate increases in vehicle trips by construction workers and construction vehicles on area roadways over the duration of project construction activities. However, increases would be minimal, with construction of the Proposed Project/Action requiring a crew consisting of an average of 5 to 10 workers. The construction activities under the Proposed Project/Action would not require the import or export of soil, as all back fill material would be taken from on-site. The only dump trucks trips anticipated to occur would be the result of the import of riprap and other construction materials. Tables 2-1 through 2-5 in Section 2, Description of Proposed Project/Action, detail the types of construction equipment that would be transported to the project site. Construction equipment would be staged within the project site and would not impact local roadways or site access. Further, features of the Proposed Project/Action would be constructed in phases as described in Section 2.6, Construction Schedule, and construction would be completed in approximately 22 months. Given the small scale of the Proposed Project/Action and the temporary and phased nature of construction-generated traffic, no significant short-term or long-term degradation in operating conditions or level of service on any local roadways would occur. Construction activities associated with the Proposed Project/Action would not have a potentially significant impact on existing traffic or capacity on local roadways.

Operation and maintenance activities for the intake canal are currently performed by WSID, and WSID would continue to be responsible for them after implementation of the Proposed Project/ Action. Routine operation and maintenance would not require a significant number of workers or vehicles. Some monitoring and control would be operated remotely through WSID's SCADA system and no new vehicle trips would be generated. Annual maintenance, such as sediment control at the intake screens, would require the use of large equipment; however, activities would be temporary and would not require a significant number of workers or vehicles. Therefore, operation and maintenance activities for the Proposed Project/Action would not generate a significant increase in traffic volumes on roadways above existing levels.

Mitigation: None required.

Impact 3.9-2: Construction could adversely affect access to adjacent land uses and temporarily block access routes used by police or sheriff departments, fire departments, and emergency services, or substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). (Less than Significant)

Construction of the Proposed Project/Action would have temporary and less than significant effects on traffic flow associated with construction worker and equipment traffic at local ingress or egress points. Construction of the Proposed Project/Action would occur entirely within WSID's easement and not near public roads, so no public roads would be blocked during construction. Construction activities would also not block emergency access routes because construction would not occur near public roads, and there are multiple access roads with the SJRNWR for Refuge staff to utilize for Refuge maintenance activities during construction. The Proposed Project/Action would not adversely affect access to adjacent land uses as construction would occur entirely within WSID's easement, which is accessed from WSID property. The intake canal levee roads would be improved to provide year-round access and the proposed East Crossing would provide additional vehicular access between the Lara Tract and Hagemann Tract. Construction activities associated with the Proposed Project/Action would not have a potentially significant impact on access to adjacent land uses or emergency access.

In-water construction activities would include the use of silt screens and/or silt fences, riprap installation, and a temporary sheet-pile cofferdam along the west side of the San Joaquin River. Boating use of the San Joaquin River in the vicinity of the project site would be restricted during construction activities; however, use would not be restricted across the entire width of the river and navigation in the river would not be impaired. In addition, the existing volume of San Joaquin River boat use is light in the vicinity of the project area (based on WSID staff observations), so construction activities would not significantly impact boaters. In-water access would not be significantly impacted.

Existing and improved private access roads would be used to conduct project operations and maintenance activities within WSID's property and easement. Project operations would not affect access to adjacent land uses or block emergency access routes.

The cone screens of the fish screen intake would be installed on a pile-supported steel frame located in the San Joaquin River and would extend approximately 97 feet into the river from the west bank. Similar to conditions during construction, boating use in the vicinity of the project site would be restricted with implementation of the Proposed Project/Action; however, use would not be restricted across the entire width of the river, navigation in the river would not be impaired, and the volume of San Joaquin River boat use is light in the vicinity of the project area. Therefore, project operations would not significantly impact boaters and in-water access would not be significantly impacted.

Mitigation: None required.

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3.10 Hazards and Hazardous Materials

3.10.1 Affected Environment

Existing Setting

The land use in the project area includes rural and agricultural land, the SJRNWR, and local county roadways. Hazardous materials typically used for agricultural production include agricultural fertilizers, pesticides, herbicides, and fuels. Regulatory restrictions have limited the use and control of many substances, and there is less agricultural production in the immediate vicinity of the project site compared to past conditions with the establishment of the SJRNWR in 1987. The WSID intake canal was originally constructed in 1928, along with several concrete pump houses and diversion pumps along the intake canal. Because the land use in the project site has not significantly changed in the last 50 years, historic hazardous materials use within the project site was likely similar to present day hazardous materials use.

Information about hazardous materials sites in the project area was collected by conducting a review of the California Environmental Protection Agency (Cal/EPA) Cortese List Data Resources (Cortese List). The Cortese list includes the following data resources that provide information regarding the facilities or sites identified as meeting the Cortese list requirements: the list of Hazardous Waste and Substances sites from Department of Toxic Substances Control (DTSC) EnviroStor database; the list of Leaking Underground Storage Tank (LUST) sites from GeoTracker database; the list of solid waste disposal sites identified by Water Board; the list of active Cease and Desist Orders and Cleanup and Abatement Orders from Water Board; and the list of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code identified by DTSC. The Cortese List also includes federal superfund sites, state response sites, non-operating hazardous waste sites, voluntary cleanup sites, and school cleanup sites. The Cortese List is updated at least annually, in compliance with California regulations (California Code Section 65964.6[a][4]). Based on a review of the Cortese List, no listed sites are located within one mile of the project site (DTSC 2016).

One large wildfire (greater than 500 acres) occurs on SJRNWR lands approximately once every five years, on average. Several small fires start on SJRNWR lands annually, usually caused by trespassers. The USFWS fire-trained Refuge staff provide wildfire suppression capability, with support from the West Stanislaus County Fire Protection District and other federal, State, and county agencies, as needed. Prescribed fire is also used on SJRNWR lands in an effort to control weeds and prepare lands for restoration work. (USFWS 2006.)

3.10.2 Regulatory Framework

Federal Regulations

Federal regulatory agencies include the EPA, Occupational Safety and Health Administration, Nuclear Regulatory Commission, U.S. Department of Transportation, and National Institutes of Health. The following represent federal laws and guidelines governing hazardous substances.

- Pollution Prevention Act (42 U.S. Code Section 13101 et seq./ 40 CFR)
- Clean Water Act (33 U.S. Code Section 1251 et seq./ 40 CFR)
- Oil Pollution Act (33 U.S. Code Section Sections 2701-2761/ 30, 33, 40, 46, 49 CFR)
- Clean Air Act (42 U.S. Code Section 7401 et seq./40 CFR)
- Occupational Safety and Health Act (29 U.S. Code Sections 651 et seq./29 CFR)
- Federal Insecticide, Fungicide, and Rodenticide Act 7 U.S. Code Section 136 et seq./40 CFR)
- Comprehensive Environmental Response Compensation and Liability Act (42 U.S. Code Section 9601 et seq./29, 40 CFR)
- Superfund Amendments and Reauthorization Act Title III (42 U.S. Code Section 9601 et seq./29, 40 CFR)
- Resource Conservation and Recovery Act (42 U.S. Code Section 6901 et seq./40 CFR)
- Safe Drinking Water Act (42 U.S. Code Section 300f et seq./40 CFR)
- Toxic Substances Control Act (15 U.S. Code Section 2601 et seq./40 CFR)

At the federal level, the principal agency regulating the generation, transport and disposal of hazardous substances is the EPA, under the authority of the Resource Conservation and Recovery Act. The EPA regulates hazardous substance sites under the Comprehensive Environmental Response Compensation and Liability Act. Applicable federal regulations are contained primarily in Titles 29, 40, and 49 of the CFR.

State Regulations

Legislation at the state level allows state agencies to accept delegation of federal responsibility for hazardous materials and hazardous waste management. The Cal/EPA and the Office of Emergency Services (OES) of the State of California establish rules governing the use of hazardous substances. The SWRCB has primary responsibility to protect water quality and supply. The Secretary for Environmental Protection oversees the following agencies: CARB, Integrated Waste Management Board, Department of Pesticide Regulation, SWRCB, DTSC), and OEHHA.

Applicable State laws include the following:

- Porter Cologne Water Quality Control Act (California Water Code Section 13000–14076/ 23 California Code of Regulations)
- California Accidental Release Prevention Law (CHSC Section 25531 et seq./19 California Code of Regulations)
- California Building Code (CHSC Section 18901 et seq./24 California Code of Regulations)
- California Fire Code (CHSC Section 13000 et seq./19 California Code of Regulations)

- California Occupational Safety and Health Act (California Labor Code Section 6300–6718/ 8 California Code of Regulations)
- Hazardous Materials Handling and Emergency Response "Waters Bill" (CHSC Section 25500 et seq./19 California Code of Regulations)
- Hazardous Waste Control Law (CHSC Section 25100 et seq./22 California Code of Regulations)
- Carpenter-Presley-Tanner Hazardous Substance Account Act "State Superfund" (CHSC Section 25300 et seq./California Revenue and Tax Code Section 43001 et seq.)
- Hazardous Substances Act (CHSC Section 108100 et seq.)
- Safe Drinking Water and Toxic Enforcement Act "Proposition 65" (CHSC Sections 25180.7, 25189.5, 25192, 25249.5-25249.13/8, 22 California Code of Regulations)
- California Air Quality Laws (CHSC Section 39000 et seq./17 California Code of Regulations)
- Aboveground Petroleum Storage Act (CHSC Section 25270 et seq.)
- Pesticide Contamination Prevention Act (California Food and Agriculture Code Section 13141 et seq./3 California Code of Regulations)
- Underground Storage Tank Law "Sher Bill" (CHSC Section 25280 et seq./23 California Code of Regulations)

Local Regulations

Stanislaus County General Plan

The Safety Element of the Stanislaus County General Plan outlines goals and objectives related to hazardous materials and safety, summarized in **Table 3.10-1** (Stanislaus County 2016).

TABLE 3.10-1
HAZARDOUS MATERIALS AND SAFETY GOALS AND POLICIES OF STANISLAUS COUNTY

Number	Description
Safety Element	
Goal 1	Prevent loss of life and reduce property damage as a result of natural disasters.
Policy 1	The County will adopt (and implement as necessary) plans inclusive of the Multi-Jurisdictional Hazard Mitigation Plan, to minimize the impacts of a natural and man-made disasters.
Goal 2	Minimize the effects of hazardous conditions that might cause loss of life and property.
Policy 6	All new development shall be designed to reduce safety and health hazards.
Policy 13	The Department of Environmental Resources shall continue to coordinate efforts to identify locations of hazardous materials and prepare and implement plans for management of spilled hazardous materials as required.

Source: Stanislaus County 2016

3.10.3 Environmental Consequences

Significance Criteria

This analysis of hazards and hazardous materials evaluates the potential effects of the Proposed Project/Action on the existing environment within or adjacent to the project site.

Effects are considered significant if an alternative would result in any of the following:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials
- 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
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school
- 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
- 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
- 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
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan
- 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

Impact Evaluation

Resources Not Considered in Detail

The development of the Proposed Project/Action would not emit hazardous emissions or require the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school because there are no schools within one-quarter mile of the project site; the nearest school, Shiloh Charter School, is located approximately 3.5 miles east of the project site. The Proposed Project/Action would not be located on a hazardous materials site that is known to be on a list compiled pursuant to Government Code Section 65962.5; therefore, no impacts are anticipated. The Proposed Project/Action is not located within an airport land use plan. The project site is located approximately 1.4 miles from the Flying Bull Airport, a private airstrip. Because project construction would be temporary in duration and operations would be handled remotely with infrequent staff visits for maintenance, the Proposed Project/Action would not result in a safety hazard for people residing or working in the area due to proximity to the airport. Therefore, no impact would occur and these resource areas are not discussed further within this section.

No Project/Action Alternative

Under the No Project/No Action Alternative, the proposed fish screen intake, pump station, and associated features of the Proposed Project/Action would not be constructed. The existing unscreened intake system would continue to operate as it does currently and this would have no new effect on hazards and hazardous materials.

Proposed Action Alternative

Impact 3.10-1: The Project could create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, or through reasonable foreseeable upset and accident conditions involving the release of hazardous materials into the environment. (Less than Significant)

Construction and operation of the Proposed Project/Action could involve the use, storage and disposal of small quantities of hazardous materials, such as fuel, oil, pesticides, and herbicides. The types and amounts of hazardous materials used, stored, and disposed of would be similar to operation and maintenance activities performed for the intake and pumps under existing conditions. The use, storage, and transport of hazardous materials would be required to comply with applicable local, state, and federal regulations. Transportation of hazardous materials on area roadways is regulated by California Highway Patrol and Caltrans, and use of these materials is regulated by DTSC, as outlined in Title 22 of the California Code of Regulations. Any project facilities that would use or store hazardous materials would be required to obtain permits and comply with appropriate regulatory agency standards designed to avoid hazardous waste releases. Because the Proposed Project/Action is required by law to implement and comply with existing hazardous material regulations, impacts related to the creation of significant hazards to the public through routine, transport, use, disposal, and risk of upset are less than significant.

Mitigation: None required.

Impact 3.10-2: The Project could impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. (Less than Significant)

Construction of the Proposed Project/Action would include the mobilization and demobilization of construction equipment (e.g., excavator, front end loader, vibratory compactor, dump truck, and crane) to and from the project site. Once the equipment is on site, it would travel from the staging area to the work area using private access roads within WSID’s property and easement. Construction traffic would be limited to daily trips for personnel and routine service and supply vehicles to the site. Construction activities would be managed to ensure that emergency response and evacuation plans are not impeded. Similarly, existing and improved private access roads would be used to conduct project operations and maintenance activities within WSID’s property and easement. Vehicles currently access the project site as WSID staff perform operations and maintenance activities under current conditions, and any increase in vehicles traveling to and from the site for operations and maintenance activities under the Proposed Project/Action would be negligible. Therefore, project operations would not interfere with emergency response or evacuation plans. Impacts would be less than significant.

Mitigation: None required.

Impact 3.10-3: The Project could 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. (Less than Significant with Mitigation)

Construction activities are a potential source of wildfire ignition. The Proposed Project/Action is located in an area partially designated as a Moderate Hazard Severity Zone (CalFire 2007). Potential fuels within the boundaries of the site are generally contiguous; however, the intake canal, San Joaquin River, Tuolumne River and Stanislaus River within and adjacent to the SJRNWR serve as natural firebreaks. The short-term potential for wildland fire during construction could result in a potentially significant impact. However, implementation of Mitigation Measure 3.10-1 would reduce the potential for wildfire to a less-than-significant level.

In the long-term, operation and maintenance activities would be similar to those performed under existing conditions for the intake and pumps, potential fire conditions would be similar to those that currently exist, and operations impacts would be less than significant.

Mitigation Measure

> **Mitigation Measure 3.10-1**: During construction, staging areas, or areas slated for development using spark-producing equipment shall be cleared of dried vegetation or other materials that could serve as fire fuel. To the extent feasible, the contractor shall keep these areas clear of combustible materials in order to maintain a firebreak. Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order. This includes, but is not limited to, vehicles and heavy equipment.
>
> **Significance after Mitigation**: Implementation of Mitigation Measure 3.10-1 would reduce potentially significant impacts associated with wildfire during construction activities to less than significant.

3.11 Recreation

3.11.1 Affected Environment

The San Joaquin River runs from the Sierra Nevada mountain range through the San Joaquin Valley to the Delta. Friant Dam near Fresno has modified the historic flows and temperature of the San Joaquin River; water is stored and diverted in Millerton Lake behind Friant Dam. The San Joaquin River is navigable by recreational traffic, and the project area in the vicinity of the river offers a variety of recreational opportunities, such as boating, fishing, hiking, and wildlife viewing.

The SJRNWR was established in 1987 and is part of the USFWS's National Wildlife Refuge System. The SJRNWR is 7,000 acres in size and is located at the confluence of the Tuolumne, Stanislaus and San Joaquin Rivers in the San Joaquin Valley within Stanislaus County. The SJRNWR is managed with a focus on migratory birds and endangered species. The refuge offers limited recreational opportunities for the general public, with a public visitor center, a nature trial that is open daily, and a wildlife viewing area that is open to the public from mid-October to mid-March. The main entrance to the SJRNWR and nature trail are located off Dairy Road, south of SR 132, approximately 2 miles northwest of the project site. The wildlife viewing area is located off Beckwith Road, north of SR 132, approximately 5 miles north of the project site. Included in the SJRNWR's Comprehensive Conservation Plan is a strategy to develop one or more walk-in car-top boat launching facilities to facilitate the public's ability to view wildlife from small watercraft and to promote recreational angling (USFWS 2006).

Stanislaus County maintains several regional and neighborhood parks and seasonal off-road vehicle areas. The nearest public boat launch along the San Joaquin River is in Patterson at the County's Las Palmas park, approximately 9 miles southeast and downstream of the project site. The 3-acre park has 1 mile of river frontage.

Commercial sportsmen's clubs with boat ramps along the San Joaquin River in the vicinity of the project site include Old Fisherman's Club and Eagal Lakes Sports Resort, located approximately 2 miles and 12 miles, respectively, northwest of the project site.

3.11.2 Regulatory Framework

Federal Regulations

The U.S. Coast Guard is authorized to establish aids to navigation, the rules, regulations and procedures of which are located in the CFR, Title 33, Chapter 1, Part 66. To obtain approval to establish a private aid to navigation, applicants must submit a Private Aids to Navigation Application, CG-2554.

State Regulations

California Code of Regulations Title 14, Article 6, Waterway marking system, Section 7000 states "Pursuant to the authority vested in it by Section 659, Harbors and Navigation Code, the

Department of Boating and Waterways adopts rules and regulations for a uniform system for marking the State's waters; such rules and regulations to establish, (a) a system of regulatory markers for use on all waters of the State to meet needs not provided for by the U.S. Coast Guard system of navigational aids, and (b) a system of navigational aids for use on the waters of the State not marked by the U.S. Coast Guard and/or not determined to be United States navigable waters; provided that such rules and regulations shall not be in conflict with the markings prescribed by the U.S. Coast Guard."

Local Regulations

Stanislaus County General Plan

The Conservation and Open Space Element of the Stanislaus County General Plan calls for the preservation of open space lands for outdoor recreation. The Conservation and Open Space Element also provides for the County to provide a system of local and regional parks which will serve the residents of the County. **Table 3.11-1** includes County recreation-related policies relevant to the project.

TABLE 3.11-1
RECREATION-RELATED GOALS AND POLICIES OF STANISLAUS COUNTY

Number	Description
Conservation and Open Space Element	
Goal 1	Encourage the protection and preservation of natural and scenic areas throughout the County.
Policy 1	Maintain the natural environment in areas dedicated as parks and open space.
Goal 4	Provide for the open-space recreational needs of the residents of the County.
Policy 12	Provide a system of local and regional parks which will serve the residents of the County.
Policy 14	Provide for diverse recreational opportunities such as horseback riding trails, hiking trails, and bikeways.

Source: Stanislaus County 2016

3.11.3 Environmental Consequences

Significance Criteria

This analysis of recreation evaluates the potential effects of the Proposed Project/Action on existing recreational resources within or adjacent to the project site.

Effects are considered significant if an alternative would result in any of the following:

- 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
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment

Impact Evaluation

Resources Not Considered in Detail

Implementation of the Proposed Project/Action would not increase the use of existing neighborhood and regional parks or other recreational facilities because the Proposed Project/ Action would not result in an increase in population compared to existing conditions given the small scale of the project. Therefore, no change in park use as a result of the Proposed Project/ Action would occur. In addition, the Proposed Project/Action does not include recreational facilities or require the construction or expansion of recreational facilities. Therefore, no impact would occur and these resource areas are not discussed further within this section.

No Project/Action Alternative

Under the No Project/Action alternative, the proposed fish screen intake, pump station, and associated features of the Proposed Project/Action would not be constructed, WSID would continue to use its existing unscreened diversion, and this would have no new effect on recreational resources. As a result, impacts to recreational resources would remain unchanged from existing conditions and no impact would occur.

Proposed Project/Action Alternative

Impact 3.11-1: Construction and operation of the Project could reduce access to, or interfere with the use of existing recreational opportunities or facilities, including recreational use of the San Joaquin River. (Less than Significant)

Construction of the Proposed Project/Action would not disrupt public access along the San Joaquin River. The SJRNWR in the vicinity of the project site does not support public terrestrial recreational activities; the closest access is at the SJRNWR main entrance and nature trail approximately 2 miles northwest of the project site. Therefore, construction activities would not interfere with the use of existing terrestrial recreational opportunities or facilities.

In-water construction activities would include the use of silt screens and/or silt fences, riprap installation, and a sheet-pile cofferdam along the west side of the San Joaquin River. Recreational use in the river in the vicinity of the project area would be restricted during construction activities; however, use would not be restricted across the entire width of the river and navigation in the river would not be impaired. In addition, the existing volume of San Joaquin River recreational use is light in the vicinity of the project area (based on WSID staff observations), so construction activities would not be observed by many recreational boaters. This impact would be less than significant.

Although recreational use in the river would be partially restricted by the fish screen intake, operation and maintenance of the fish screen intake, pump station and associated features of the Proposed Project/Action would not prevent recreational boating or access and navigation in the river would not be impaired. This impact would be less than significant.

Mitigation: None required.

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3.12 Environmental Justice, Socioeconomics, Population and Housing, and Indian Trust Assets

3.12.1 Affected Environment

Environmental Justice and Socioeconomics

Demographic information for the State of California and Stanislaus County is presented in **Table 3.12-1,** based on the 2015 census. In Stanislaus County, the 2015 ethnic composition was 83.9 percent Caucasian, 44.8 percent Hispanic or Latino, 6.0 percent Asian, 3.3 percent African American, 1.9 percent American Indian and Alaskan, and 3.9 percent two or more races.

TABLE 3.12-1
DEMOGRAPHIC DATA

	California	Stanislaus County
White	72.9%	83.9%
Hispanic or Latino	38.8%	44.8%
Black or African American	6.5%	3.3%
American Indian and Alaska Native	1.7%	1.9%
Asian	14.7%	6.0%
Native Hawaiian and Other Pacific Islander	0.5%	0.9%
Two or more races	3.8%	3.9%

Source: U.S. Census Bureau 2015

The 2010-2014 U.S. Census Bureau data indicates that 15.3 percent of the population was below the poverty level in the State California and 18.1 percent was below the poverty level in Stanislaus County.

The median family income in Stanislaus County was $49,573 (in 2014 dollars) from 2010-2014. This number was lower than California’s median family income of $61,489 during the same time period (U.S. Census Bureau 2015).

Population and Housing

The project site is in a rural area within the southern portion of the SJRNWR. The nearest residences are located approximately 3,300 feet southwest of the project site and approximately 5,500 feet northeast of the project site. The nearest city, Modesto, has a population of approximately 210,000 and is located approximately 9 miles northeast of the project area.

Indian Trust Assets

There are no Indian Trust Assets (ITAs) within the vicinity of the project area.

3.12.2 Regulatory Framework

This section discusses the federal policies and regulations relevant to the analysis of environmental justice, socioeconomics, population and housing, and ITA issues in the project area. No state or local regulations pertaining to these issue areas are applicable to the Proposed Project/Action.

Federal Regulations

Environmental Justice

On February 11, 1994, President Clinton issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-income Populations. The purpose of the order is to avoid disproportionately adverse environmental, human health, or economic impacts from federal policies and actions on minority and low-income populations. The executive order requires that any significant adverse impacts of a federal project or alternatives on minority and low-income populations be reported and, where appropriate, that mitigation measures be prescribed.

Indian Trust Assets

ITAs are legal interests in property rights held by the United States for Indian Tribes or individuals. Trust status originates from rights imparted by treaties, statutes, or executive orders. ITAs are lands, including reservations and public domain allotments, minerals, water rights, hunting and fishing rights, or other natural resources, money or claims. Assets include real property, physical assets, or intangible property rights. ITAs cannot be sold, leased, or otherwise alienated without Federal approval. ITAs do not include things in which a tribe or individuals have no legal interest, such as off-reservation sacred lands or archaeological sites in which a tribe has no legal property interest.

3.12.3 Environmental Consequences

Significance Criteria

This analysis of environmental justice, socioeconomics, population and housing, and ITAs evaluates the potential effects of the Proposed Project/Action on existing resources within or adjacent to the project site.

Effects are considered significant if an alternative would result in any of the following:

- Adversely affect minority or low-income populations and ITAs
- Directly or indirectly induce substantial population growth in an area, or displace substantial numbers of people or existing housing

Environmental Evaluation

No Project/Action Alternative

Under the No Project/Action Alternative, the proposed fish screen intake, pump station, and associated features of the Proposed Project/Action would not be constructed. WSID would continue to use its existing unscreened diversion and this would have no effect on socioeconomics, environmental justice or ITAs. The No Project/Action Alternative would not increase population or affect housing.

Proposed Project/Action Alternative

Impact 3.12-1: The Project could have negative effects on minority or low-income populations, population and housing, and Indian Trust Assets. (Less than Significant)

The Proposed Project/Action would not be located in a populated area and no minority or low-income communities of concern are located within the affected environment for the Proposed Project/Action that warrant environmental justice analysis. The Proposed Project/Action would not induce population growth given the small scale of the project, with construction of the proposed facilities requiring a crew consisting of an average of 5 to 10 workers, and given that the quantity of water diverted from the San Joaquin River would not increase and the water would be used for existing agricultural uses. The project site is in a previously disturbed area within WSID's easement adjacent to the SJRNWR and no change in water use would occur; therefore, the Proposed Project/Action would not displace people or housing. There are no ITAs within the vicinity of the project area. Consequently, no environmental justice, socioeconomic or Indian trust impacts are associated with the Proposed Project/Action. Impacts would be less than significant.

Mitigation: None required.

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3.13 Public Services and Utilities

Public services and utilities analyzed in this section include law enforcement, fire protection, emergency medical response services, solid waste disposal, electricity, and energy conservation.

Growth-related effects of the Proposed Project/Action on local public service providers (i.e., law enforcement, schools, libraries, etc.) are discussed in Section 3.15, Growth Inducing Effects. Impacts on recreation-related resources are addressed in Section 3.11, Recreation.

3.13.1 Affected Environment

Existing Conditions

Law Enforcement

The Stanislaus County Sheriff's Department is charged with law enforcement duties in Stanislaus County. Its Operations Division has principal jurisdiction in all unincorporated areas, covering an area of approximately 1,521 square miles with a population of more than 200,000 (Stanislaus County 2016). Given the rural nature of the project area, calls to the project site for law enforcement are relatively low.

Fire Protection

The fire services system in Stanislaus County is a mix of municipal agencies, fire protection districts, and various forms of state fire protection. Under the direction of the Fire Warden, the Fire Prevention Bureau provides a wide range of fire prevention services to the unincorporated areas of Stanislaus County, including the unincorporated communities of Crows Landing, Denair, Grayson, Hughson, Newman, Salida, and Westley. There are six municipal fire departments in the county (Stanislaus County 2016).

The USFWS fire-trained Refuge staff provide wildfire suppression capability within the SJRNWR, with support from the West Stanislaus County Fire Protection District and other federal, State, and county agencies, as needed (USFWS 2006).

Schools

There are no schools within the vicinity of the project area. The nearest school, Shiloh Charter School, is located approximately 3.5 miles east of the project site.

Storm Drainage

There are no dedicated storm water collection systems located within the vicinity of the project site. The storm drainage system is generally connected to flood control canals and channels that drain into the natural drainage and stream networks or infiltrate into groundwater. More information about regulation of stormwater runoff and quality can be found in Section 3.6, Hydrology and Water Quality.

Flood Control

Flood risks in the Sacramento-San Joaquin Valley are among the highest in the nation. To reduce this risk, the Central Valley Flood Protection Act of 2008 directed DWR to prepare the CVFPP for CVFPB adoption. Section 3.6, Hydrology and Water Quality, provides additional information about flood control in the project area.

Solid Waste Disposal

The Fink Road Sanitary Landfill is a Class III landfill for nonhazardous municipal solid waste in the project vicinity; the facility is owned by Stanislaus County and operated by the Stanislaus County Department of Environmental Resources. The landfill provides municipal solid waste services to Ceres, Hughson, Modesto, Newman, Oakdale, Patterson, Riverbank, Turlock, Waterford, and the unincorporated areas of Stanislaus County. As of January 5, 2012, the Fink Road Sanitary Landfill, the sole permitted landfill in the county, had a permitted capacity of 14,640,000 cubic yards, a remaining capacity of 8,240,435 and is permitted through 2023 (CalRecycle 2016).

Water Services

In the project vicinity, the City of Modesto serves the unincorporated town of Grayson through the former Del Este Water Company system. There are no sources of drinking water that serve the project area. There are four domestic wells located within the SJRNWR that provide water for restoration purposes, but use is limited given water quality concerns associated with the wells (USFWS 2006). In addition to WSID’s existing Pump Station 1A, there are four pumps with capacities of 10 cfs each along the intake canal that are operated by USFWS to maintain wetlands and to irrigate habitats on the SJRNWR. Rural domestic uses in the vicinity of the project area are typically served by on-site wells.

Wastewater

There are no public wastewater collection systems that serve the project area. Rural uses in the vicinity of the project area are typically served by on-site septic systems such as leech fields.

Utilities

Electric energy to power the pump station would be delivered via extension of WSID’s existing12.47 kV distribution line.

3.13.2 Regulatory Framework

This section discusses the state and local policies and regulations relevant to the analysis of utilities and public services issues in the project area. No federal regulations pertaining to utilities and public services are applicable to the Proposed Project/Action.

State Regulations

California Integrated Waste Management Act of 1989

The California Integrated Waste Management Act of 1989 requires state, county and local governments to divert at least 50 percent of their solid waste from their landfills by the year 2000. State law enacted in 1989 requires that a minimum of 25 percent of the total waste generated are diverted from landfills by 1995 and a minimum of 50 percent are diverted by the year 2000. The Act is overseen by the California Integrated Waste Management Board (CIWMB). CIWMB oversees a reporting program for local jurisdictions to account for levels of diversion achieved. Implementation is often carried out by a local entity called a Local Enforcement Agency (LEA). The LEA for the project area is Stanislaus County.

Local Regulations

Stanislaus County General Plan

The Stanislaus County General Plan Land Use Element and Safety Element include public services and utilities goals and policies relevant to the Proposed Project/Action, which are summarized in **Table 3.13-1** (Stanislaus County 2016).

TABLE 3.13-1
PUBLIC SERVICES AND UTILITIES GOALS AND POLICIES OF STANISLAUS COUNTY

Number	Description
Land Use Element	
Goal 4	Ensure that an effective level of public service is provided in unincorporated areas.
Policy 24	Future growth shall not exceed the capabilities/capacity of the provider of services such as sewer, water, public safety, solid waste management, road systems, schools, health care facilities, etc.
Goal 6	Promote and protect healthy living environments.
Policy 25	Support the development of a built environment that is responsive to decreasing air and water pollution, reducing the consumption of natural resources and energy, increasing the reliability of local water supplies, and reduces vehicle miles traveled by facilitating alternative modes of transportation, and promoting active living (integration of physical activities, such as biking and walking, into everyday routines) opportunities.
Safety Element	
Goal 2	Minimize the effects of hazardous conditions that might cause loss of life and property.
Policy 7	Adequate fire and sheriff protection shall be provided.

Source: Stanislaus County 2016

Stanislaus County Emergency Operations Plan

Responsibility for the day-to-day administration of Stanislaus County's disaster preparedness, mitigation, response, and recovery programs has been assigned to OES. The OES develops and maintains the Stanislaus County Emergency Operations Plan and its associated annexes. It also coordinates training, planning, and exercises for first responders throughout the Stanislaus Operational Area (Stanislaus County 2016).

3.13.3 Environmental Consequences

Significance Criteria

This analysis of public services and utilities evaluates the potential effects of the Proposed Project/Action on the existing public services and utilities within or adjacent to the project site.

Effects are considered significant if an alternative would result in any of the following:

- 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
  - Other public facilities

An alternative is considered to have a significant impact on utilities and service systems if it would:

- Exceed wastewater treatment requirements of the RWQCB;
- 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;
- 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;
- Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed;
- 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;
- Be served by a landfill with sufficient permitted capacity to accommodate the project’s solid waste disposal needs; or
- Comply with federal, State, and local statutes and regulations related to solid waste.
- Result in the wasteful and inefficient use of nonrenewable resources during construction or operation.

Impact Evaluation

Resources Not Considered in Detail

Implementation of the Proposed Project/Action would not require the construction or expansion of new wastewater or storm water facilities. While the Proposed Project/Action would involve the construction and operation of a new fish screen intake, pump station, and associated features, the Proposed Project/Action would continue to divert 347 cfs of water consistent with existing permits. No new water entitlements are required. Therefore, impacts associated with the resources areas would be less than significant and they are not discussed further within this section.

No Project/Action Alternative

Under the No Project/Action Alternative, the proposed fish screen intake, pump station, and associated features would not be constructed. The existing unscreened intake system would continue to operate as it does currently and this would have no new effect on public services and utilities.

Proposed Project/Action Alternative

Impact 3.13-1: The Project could generate the need for new or physically altered governmental facilities in order to maintain acceptable service ratios, response times of other performance objectives for any of the public services (i.e., fire protection, police protection, other public facilities, the construction of which could cause significant environmental impacts). (Less than Significant)

A minor increased need for emergency services may occur during construction of the Proposed Project/Action; the potential for accidents requiring emergency services could increase during construction of project components because of increased use of heavy equipment, truck traffic and equipment movement compared to conditions without construction. However, the potential increase would only result in a short-term, temporary increase in the need for police and fire services, in the event of an accident. This type of demand increase could be accommodated by existing facilities and resources in the project vicinity and impact would be less than significant.

Operation of the Proposed Project/Action would not result in the need for new governmental facilities. In addition, the Proposed Project/Action would not generate demands for additional public services that would require new or altered facilities, including police, fire protection, storm drainage, solid waste, and wastewater facilities. As described previously, electricity to power the pump station would be delivered via extension of WSID's existing12.47 kV distribution line and there would be no need to construct new or expanded facilities. No additional production of wastewater or solid waste would result with the implementation of the Proposed Project/Action. Impact would be less than significant.

Mitigation: None required.

Impact 3.13-2: The Project could be served by a landfill without sufficient permitted capacity to accommodate the project's solid waste disposal needs. (Less than Significant)

Construction of the Proposed Project/Action facilities would involve excavation and grading. The Proposed Project/Action would not require the import or export of soil, and riprap would be imported. Construction activities may generate waste materials, including vegetation and other nonhazardous materials that could be recycled and/or disposed of in a landfill. Other waste materials related to construction of the Proposed Project/Action would not be generated in substantial amounts. WSID would coordinate waste disposal with the Fink Road Sanitary Landfill, which has a future operation life of approximately 7 years with an expected closure date of December 1, 2023 (CalRecycle 2016). As of January 2012, the landfill had over half of its capacity still available. Therefore, construction of the Proposed Project/Action would not substantially reduce the capacity or life of the Fink Road Sanitary Landfill and impact would be less than significant.

Proposed Project/Action operations would generate trash that would be disposed of at the Fink Road Sanitary Landfill. As previously described, as of January 2012, the landfill had over half of its capacity still available and is permitted through 2023. Capacity within the Fink Road Sanitary Landfill is therefore sufficient to meet project waste disposal needs, and no significant impact to landfill capacity is anticipated.

Mitigation: None required.

Impact 3.13-3: The Project could violate federal, State, and local statutes and regulations related to solid waste. (Less than Significant)

Construction and operation of the Proposed Project/Action would require compliance with applicable federal, State and county policies for minimizing solid waste, including the Stanislaus County General Plan policy that requires not exceeding capacity of service providers. As described under Impact 3.13-2, waste generated by construction and operation of the Proposed Project/Action would be disposed of at the Fink Road Sanitary Landfill which is at half capacity and permitted through 2023. Therefore, this impact is less than significant.

Mitigation: None required.

Impact 3.13-3: The Project could result in the wasteful and inefficient use of nonrenewable resources during construction and operation. (Less than Significant)

Construction energy refers to the energy required to construct buildings and the transportation network as well as manufacture and maintain on-road vehicles and transit vehicles. Other energy consumption also includes changes in energy demand due to a project, such as building materials, supplies, changes related to trip origins and destinations or travel modes. Indirect energy consumption from the production of fuel as well as transportation/transmission services for end users is not included in this analysis because any such analysis would be speculative.

Natural-gas fired construction equipment or vehicles are not expected to be used during construction of the Proposed Project/Action and electrical power does not currently extend to the project site. Thus, there would not be a need for new or substantially altered electrical power or natural gas utility systems during construction. The construction of the Proposed Project/Action would be a necessary component of the project and a one -time expenditure of energy.

Although equipment and vehicles that would be used for construction and operation and maintenance of the Proposed Project/Action would use diesel fuel and gasoline, use of these resources in this manner is not considered a wasteful use of energy resources. Similarly, electric energy that would power the pump station via an extension of WSID's existing12.47 kV distribution line is not considered a wasteful use of energy resources and would allow for the beneficial use of the fish screen intake facilities. Thus, construction and operation of the Proposed Project/Action would create less-than-significant impacts on local and regional energy supplies. Additionally, the relatively small increases in electricity consumption during operation of the Proposed Project/Action would not create any significant negative impacts on local or regional energy supplies and would not create a significant effect on either peak or baseload energy demand. Impacts would be less than significant.

Mitigation: None required.

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3.14 Cumulative Effects

3.14.1 Regulatory Framework

The cumulative effects analysis broadens the scope of analysis to include effects beyond those directly attributable to the implementation of the Proposed Project/Action. Cumulative effects are defined as the effects "…on the environment which result from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions regardless what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time (40 CFR Section 1508.7)". The purpose of a cumulative effects analysis, as stated by the CEQ "is to ensure that federal decisions consider the full range of consequences" (CEQ 2007).

Section 15130(b) of the CEQA Guidelines states that the following three elements are necessary to an adequate discussion of significant cumulative impacts:

- Either: (A) a list of past, present, and probable future projects producing related or cumulative impacts, including those projects outside the control of the Lead Agency (i.e., the list approach); or (B) a summary of projections contained in an adopted general plan or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact (i.e., the plan approach). Any such planning document shall be referenced and made available to the public at a location specified by the Lead Agency.

- A summary of expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available.

- A reasonable analysis of the cumulative impacts of the relevant projects. [A project] shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

This analysis uses the "list" method for identifying and evaluating potential cumulative impacts. The past, present, and probable future projects listed in Table 3.14-1 are either: (a) located within the vicinity of the project site and may affect the same environmental resources; or (b) of a similar nature to the Proposed Project/Action in the local region. The identified projects are in various stages of development and include projects that are under construction, have been recently approved, or are pending approval.

TABLE 3.14-1
PROJECTS WHICH MAY CONTRIBUTE TO CUMULATIVE EFFECTS

Project Name	Acreage	Location	Description	Status	Potential Environmental Impacts*
Three Amigos Non-structural Alternative Flood Management Project at the SJRNWR	Approximately 3,100 acres	SJRNWR, Stanislaus County	Restore flooding and temporary floodwater storage to more than 3,100 acres of historic floodplain, restore riparian habitats, and promote river scour and deposition along 3 miles of the San Joaquin River. The Ecosystem Restoration and Floodwater Attenuation Project of the West Unit of the SJRNWR is a component of the Three Amigos Non-structural Alternative Flood Management Project, and would include installation of three new 48-inch diameter gated pipes with manually-operated slide gates, and authorization of one existing 36-inch diameter gated pipe under the west levee of the San Joaquin River.	Planning in progress	Agriculture, biological resources, water quality (temporary), climate change (beneficial), cultural resources, geology and soils (temporary), groundwater (beneficial)
Dos Rios Ranch Floodplain Expansion and Ecosystem Restoration Project and Hidden Valley Ranch Mitigation Project	Approximately 2,100 acres	Adjacent to the SJRNWR, Stanislaus County	Restore flooding and temporary floodwater storage to approximately 1,000 acres of historic floodplain, restore riparian habitats, and promote river scour and deposition along 6 river miles. Remove levee maintenance obligations from State Plan of Flood Control (SPFC) and modify Corps operations and maintenance manual to allow breaching and other modification to the existing levees. Provide 191 acres of habitat mitigation for future regional SPFC environmental impacts.	Planning and implementation in progress	Agriculture, biological resources, water quality (temporary), climate change (beneficial), cultural resources, geology and soils (temporary), groundwater (beneficial)
Expansion of the SJRNWR	22,156	SJRNWR, Stanislaus County	Expand the SJNWR by acquiring up to 22,156 acres along the lower San Joaquin, Tuolumne, and Stanislaus Rivers to protect and restore riparian habitat.	Planning in progress	Agriculture, biological resources (beneficial), water quality (temporary), climate change (beneficial), cultural resources, geology and soils (temporary), groundwater (beneficial), recreation (beneficial)
Grayson Multi-benefit Flood Risk Reduction Project	TBD	Town of Grayson, Stanislaus County	Reduce flood hazards in the town of Grayson associated with flood waters flowing into the San Joaquin River channel at the entrance to Laird Slough. Provide habitat enhancement and public recreation benefits, and help to provide transportation and infrastructure benefits by reducing flooding of Grayson Road, a major east-west corridor across the San Joaquin River.	Pre-planning in progress	TBD
Stokman Multi-benefit Floodplain Project	285	Near the Town of Grayson, Stanislaus County	Provide wildlife habitat enhancement and restoration, improve flood management for the adjacent town of Grayson, improve groundwater recharge potential, and improve water quality in the San Joaquin River.	Pre-planning in progress	TBD

Source: Mid San Joaquin River Regional Flood Management Plan 2016; USFWS 2012

3.14.2 Description of Cumulative Projects

Three Amigos Non-structural Alternative Flood Management Project at the San Joaquin River National Wildlife Refuge

The SJRNWR is working with the Corps to plan a non-structural flood management alternative project. This alternative includes breaching existing mainstem San Joaquin River levees on refuge land to protect and restore riverine and riparian habitat. The proposed Non-structural Alternative will provide floodplain inundation behind project levees on up to 3,100 acres of the Refuge in some years. The Non-structural Alternative study has focused on identifying potential levee breech sites and evaluating potential flooding risk to adjacent landowners. The study is in the process of identifying potential impacts of the Non-structural Alternative and refining the alternative to allow for benefits to native aquatic, terrestrial, and avian species. The study will also assess potential hazards to wildlife caused by floodplain inundation. (Mid San Joaquin River Regional Flood Management Plan 2016.)

The Ecosystem Restoration and Floodwater Attenuation Project of the West Unit of the San Joaquin River National Wildlife Refuge

The Ecosystem Restoration and Floodwater Attenuation Project is a component of the Three Amigos Non-structural Alternative Flood Management Project. This project will include the installation of three new 48-inch diameter gated pipes fitted with manually-operated slide gates. It also includes the authorization of one existing 36-inch diameter gated pipe under the project levee of the San Joaquin River on SJRNWR land. The project will provide improved river-floodplain connectivity for over 2,500 acres of restored floodplain habitat along the west side of the San Joaquin River between its confluence with the Tuolumne River and Highway 132. The existing levee will be modified (gated pipes will be installed) to promote inflow and drainage that preserves and supports wildlife habitat values at the SJRNWR. (CVFPB 2015.)

Dos Rios Ranch Floodplain Expansion and Ecosystem Restoration Project and Hidden Valley Ranch Mitigation Project

Approximately 2,100 acres of flood-prone farmland at the confluence of the San Joaquin and Tuolumne Rivers will be restored to multi-benefit wildlife habitat and temporary floodwater storage areas through the reestablishment of native vegetation, grading, levee breaching, and other local improvements. Projects include fish screening surface diversions (similar to the Proposed Project/Action), permanently retiring riparian water rights, weed management, recreational development, and removing bank retaining walls. Currently, 600 acres are being restored, and planning is underway for the remaining acreage. (Mid San Joaquin River Regional Flood Management Plan 2016.)

Expansion of the San Joaquin River National Wildlife Refuge

The USFWS proposes to expand the approved boundary of the SJRNWR and acquire up to 22,156 additional acres from willing sellers within the proposed expansion area. The SJRNWR expansion will connect Refuge lands southward to CDFW's China Island Unit of the North

Grasslands Wildlife Area, approximately 21 miles south along the river corridor. The expansion will connect the SJRNWR to the area of the San Joaquin River Restoration Program, which is a comprehensive long-term effort to restore flows to the San Joaquin River from Friant Dam to the confluence of Merced River and restore a self-sustaining Chinook salmon fishery in the river while reducing or avoiding adverse water supply impacts from restoration flows. The SJRNWR boundary will also expand approximately 10 miles along the San Joaquin River corridor to the north, an area considered to be part of the Delta, which includes a portion of delta smelt critical habitat. (USFWS 2012.)

Grayson Multi-benefit Flood Risk Reduction Project

This project will enhance flood conveyance in the San Joaquin River channel under the Grayson Road Bridge, thereby reducing flood stage and associated flood risk in the town of Grayson. Stage reduction is anticipated to reduce the frequency and depth to which Grayson Road is inundated during flood events, providing improved access and reducing infrastructure maintenance needs. Enhanced conveyance will be achieved by grading and vegetation management that avoids impacts to wetlands and sensitive species and potentially enhances habitats and ecological functions. Community access and recreational opportunities will also be enhanced. (Mid San Joaquin River Regional Flood Management Plan 2016.)

Stokman Multi-benefit Floodplain Project

This project involves habitat restoration on 285 acres of agricultural land adjacent to the San Joaquin River, in close proximity to the town of Grayson. The property has been identified by Stanislaus County as a natural groundwater recharge area. Floodplain inundation proposed by this project will allow for greater groundwater recharge to the San Joaquin River groundwater basin, as well as enhance the wildlife habitat value of the site and alleviate flood pressure for the adjacent town of Grayson. The project site is immediately adjacent to 10,000 acres of managed wildlife habitat and would serve a regional benefit to several federally-listed, riparian-dependent wildlife species in the San Joaquin Valley. The 100-year flood risk to the town of Grayson will be reduced through topographic modification at this property in the future. (Mid San Joaquin River Regional Flood Management Plan 2016.)

3.14.3 Cumulative Impact Summary and Analysis

Land Use and Agriculture

The cumulative context for land use and agricultural would be the agricultural land in Stanislaus County. Implementation of the cumulative projects has the potential to significantly impact land use and agriculture by converting agricultural land to non-agricultural use. However, as discussed in Section 3.1, “Land Use and Agriculture,” the Proposed Project/Action would be consistent with existing land uses, zoning plans, and policies, and would not convert any farmland or otherwise affect agricultural resources. Therefore, the proposed Project/Action’s contribution to cumulative impacts would be less than considerable and cumulative impacts to land use and agricultural resources would be less than significant.

Aesthetic Resources

The cumulative context for aesthetic resources would be other projects in the same viewshed as the proposed Project/Action. Implementation of the Proposed Project/Action in combination with the cumulative projects would not be anticipated to result in a cumulative degradation of the visual character of the region or new substantial sources of light or glare given the nature of the projects. As described in Section 3.2, Aesthetic Resources, no designated scenic highways or vistas occur within the project area. The fish screen intake and pump station and associated features of the Proposed Project/Action would be consistent with existing SJRNWR, WSID and agricultural operations in the vicinity of the project site. In addition, exterior lighting would be occasional based on maintenance and security needs, and would be directed away from the river, and the Proposed Project/Action would not create a new source of substantial light or glare. Therefore, the Proposed Project/Action would result in a less than considerable contribution to changes in visual character in the viewshed and additional sources of light and glare and this cumulative impact is less than significant.

Air Quality and Climate Change

The cumulative context for changes in the air quality environment due to development of the Proposed Project/Action would be both regional and local. Ozone would be the primary pollutant of regional concern, and the cumulative context would be comprised of the SJVAB. Implementation of the cumulative projects has the potential to significantly impact air quality depending on the level of construction activities that would occur. Construction activities associated with the Proposed Project/Action would result in the temporary, intermittent, and localized emission of pollutants of concern (ROG, NO_x, PM_{10} and $PM_{2.5}$) from construction equipment exhaust and construction worker automobile trips. Unmitigated emissions of NO_x would exceed the 10 tpy significance threshold specified by the SJVAPCD and General Conformity *de minimums* thresholds, which would conflict with or obstruct the implementation of the 2016 Ozone Plan for 2008 8-hour Ozone Standard and 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard. However, as discussed in Section 3.3, “Air Quality and Climate Change,” project-related construction emissions of NO_x would be reduce to below the SJVAPCD and General Conformity *de minimums* thresholds with implementation of Mitigation Measure 3.3-1, which requires the applicant to use Tier 3 or cleaner engines in all off-road equipment. Since the Proposed Project/Action would not result in significantly greater vehicle trips during operation and maintenance activities than currently exist at the site, project operations would result in negligible emissions to the local air quality environment and would be consistent with the applicable air quality plan. As discussed in Section 3.3, “Air Quality and Climate Change,” the Proposed Project/Action would not expose sensitive receptors to substantial pollutant concentrations or create objectionable odors. Because construction would be short term and potentially significant impacts would be mitigated to less-than-significant levels with the implementation of Mitigation Measure 3.3-1, the Proposed Project/Action’s contribution would be less than considerable and cumulative impacts would be less than significant. Implementation of the cumulative projects has the potential to significantly impact GHG emissions depending on the level of construction activities that would occur. As discussed in Section 3.3, “Air Quality and

Climate Change," the Proposed Project/Action would not generate GHG emissions during construction or operation that would exceed the applied BAAQMD "bright-line" threshold. Therefore, the Proposed Project/Action's contribution would be less than considerable and the cumulative impact would be less than significant. However, to be consistent with the intent of the SVJAPCD's GHG guidance, Mitigation Measure 3.3-7 would be implemented, which requires the applicant to implement best performance standards to reduce construction-related GHG emissions which would further reduce the project's contribution to this potentially significant cumulative impact related to GHG emissions.

Noise and Vibration

The cumulative context for noise and vibration would be the area adjacent to the proposed project site. Implementation of the Proposed Project/Action in combination with the cumulative projects would not be anticipated to result in a cumulative increase in noise levels or vibration because construction noise and vibration effects associated with the projects would be localized in relatively rural areas away from a significant number of noise receptors, and would be intermittent and temporary. Impacts from ground-borne vibration or ground-borne noise levels as a result of project operations would be similar to existing conditions. Therefore, cumulative impacts would be less than significant.

Geology, Soils and Seismicity

Other projects proposed in the project area would be subject to the same types of geology, soils, and seismicity impacts as the project. However, these types of impacts represent hazards to people and property on a site-specific basis. For example, corrosive soils at two separate project sites do not result in a greater combined impact than the individual impacts do separately. There is little, if any, cumulative relationship for geology and soils between the development of the Proposed Project/Action and the projects listed in the cumulative setting. Therefore, there would be no cumulative impacts related to geology, soils, and seismicity.

Hydrology and Water Quality

The cumulative context for hydrology and water quality would be the San Joaquin River Hydrologic Region and the San Joaquin River in the vicinity of the Proposed Project/Action. Implementation of the cumulative projects has the potential to significantly impact hydrology and water quality, depending on the location of individual projects and types of project features proposed. As described in Section 3.5, Hydrology and Water Quality, the Proposed Project/Action would not substantially alter the existing drainage pattern of the project site or significantly increase the rate or amount of surface runoff from the project site. Therefore, it would not be anticipated to significantly contribute to any increase in localized flooding. Furthermore, BMPs would be implemented to substantially reduce or prevent waterborne pollutants from entering receiving waters, and dewatering activities would be managed in accordance with the conditions of the NPDES WDRs to minimize the risk of impacting the water quality of receiving waters. Therefore, the Proposed Project/Action's contribution would be less than considerable and cumulative impacts associated with water quality would be less than significant.

Biological Resources

The cumulative context for biological resources would be Stanislaus County. Construction of the Proposed Project/Action in combination with the cumulative projects could result in potentially significant cumulative impacts to biological resources. Similar potential for adverse effects on special-status species and their habitats would be associated with the development of the cumulative projects identified in Table 3.14-1. Without mitigation these effects could contribute to the further decline of certain species and habitat losses that have led to the need for protection under the ESA.

As discussed in Section 3.7, Biological Resources, Mitigation Measures 3.7-1a through 3.7-1g would reduce the Proposed Project/Action's contribution to potential adverse impacts on federally or state-listed species that could occur within the project area, including special-status fish species, VELB, Swainson's hawk, least Bell's vireo, San Joaquin Valley woodrat and riparian brush rabbit, and San Joaquin kit fox, to less than considerable level. Construction of the Proposed Project/Action also has the potential to contribute to the loss or degradation of sensitive habitats, such as riparian woodland, and to adversely affect sensitive wildlife species. Mitigation Measures 3.7-2a through 3.7-2d would reduce the Proposed Project/Action's contribution to cumulative impacts to sensitive habitats and species to less than considerable. Furthermore, implementation of Mitigation Measures 3.7-3 and 3.7-4 would reduce the Proposed Project/ Actions contribution to potentially substantial adverse effects on riparian habitat and federally protected waters during construction of the Proposed Project/Action to less than considerable.

Implementation of the mitigation measures in Section 3.7 would ensure that the contribution of the Proposed Project/Action to potentially significant impacts to biological resources are reduced to less than considerable or avoided, and that the Proposed Project/Action would be implemented in accordance with the requirements of the ESA and other regulatory programs that protect habitats, such as Section 1602 of the California Fish and Game Code. Furthermore, the Proposed Project/Action includes habitat enhancement components, such as the fish screen intake and wildlife crossings. Therefore, the Proposed Project/Action would not make a considerable contribution to a significant cumulative effect on biological resources and cumulative impacts would be less than significant.

Cultural Resources

The cumulative context for cultural resources would be Stanislaus County. Implementation of the Proposed Project/Action in combination with the cumulative projects could result in potentially significant cumulative impacts to historical resources, archaeological resources, human remains, tribal cultural resources, and historic properties.

Cultural resources are non-renewable; any loss or physical damage to these resources is permanent. They may be subject to direct impacts primarily during project construction; however, impacts could occur during any ground-disturbing activities during operation and maintenance. For purposes of the cumulative analysis, the temporal impact scope is the life of the project.

Direct impacts from past, present, and reasonably foreseeable projects in the geographic area of analysis could, when taken together in combination, create a cumulatively significant impact on historical resources, archaeological resources, human remains, tribal cultural resources, and historic properties. Potential construction impacts from the Proposed Project/Action to known and unknown historical resources, archaeological resources, human remains, tribal cultural resources, historic properties, and paleontological resources could contribute to this direct cumulative impact. These impacts are only potential, in that they arise only if unknown resources are discovered. However, implementation of Mitigation Measures 3.8-1 through 3.8-5 included in Section 3.8, Cultural Resources would reduce the Proposed Project/Action's contribution to a less than considerable level and cumulative impacts would be less than significant. Indirect impacts are particularly pertinent to architectural resources, and some tribal cultural resources and archaeological resources—for which setting, feeling and association are aspects of integrity that are critical to conveying the significance of the resource. Project implementation would not result in a substantial change in the setting of the area due to the relatively small scale of proposed work and new above-ground facilities. Therefore, the Proposed Project/Action is not anticipated to result in any indirect impacts, and cumulative impacts would be less than significant.

Transportation and Traffic

The cumulative context for transportation and traffic would be the local roads in the project area. Implementation of the Proposed Project/Action in combination with the cumulative projects would not be anticipated to result in a cumulative increase in traffic or result in inadequate emergency access because the projects likely would generate minor increases in vehicle trips during construction and trips during operation would like be similar to existing conditions, and the projects would be located in rural areas that would not block emergency access. Therefore, the Proposed Project/Action's contribution would be less than considerable and cumulative impacts would be less than significant.

Hazards and Hazardous Materials

The cumulative context for hazardous materials and public safety would be Stanislaus County. Exposure to existing soil and groundwater contamination and accidental release of hazardous materials is generally site-specific and depends on past, present, and future uses, and existing soil and groundwater conditions. It also depends on the timing of development. Any existing or previously unidentified contaminated soil or groundwater uncovered during construction activities would be managed consistent with applicable federal, state and local laws to limit exposure and to clean up the contamination at each site. Similarly, the potential routine transport, storage, use and disposal of hazardous materials that could lead to accidental release of hazardous materials is time and site specific, would not combine with other individual projects in a cumulative impact, and would also be managed consistent with applicable regulations. In addition, existing and improved private access roads would be used to construct the Proposed

Project/Action and conduct project operations and maintenance activities within WSID's property and easement; therefore, construction and operational activities would not impede emergency response or evacuation plans. Therefore, construction of the Proposed Project/Action would not combine with other projects to result in the cumulative exposure to hazards associated with contaminated soil, groundwater or accidental releases of hazardous materials during construction or operation, and would not result in a cumulative contribution to emergency response access, and no cumulative impact would occur.

As discussed in Section 3.10, Hazards and Hazardous Materials, construction activities are a potential source of wildfire ignition that could result in a cumulative impact if construction activities occurred at the same time in the project area. Implementation of Mitigation Measure 3.10-1 would reduce the Proposed Project/Action's contribution to the potential for wildfire to less than considerable and this cumulative impact would be less than significant.

Recreation

The cumulative context for recreation would be Stanislaus County. Implementation of the Proposed Project/Action in combination with the cumulative projects would not be anticipated to result in a cumulative decrease in access to existing recreational opportunities or facilities; the projects would not prevent recreational opportunities, and some projects may provide additional recreational benefits. Therefore, cumulative impacts would be less than significant. As discussed in Section 3.11, Recreation, effects of the Proposed Project/Action on recreational uses would be limited to disturbance of access to a portion of the San Joaquin River during construction and operation of the fish screen intake. However, use would not be restricted across the entire width of the river and navigation in the river would not be impaired. Therefore, the construction and operation activities associated with the Proposed Project/Action would result in a less than considerable contribution to less than significant cumulative impacts to recreation.

Environmental Justice, Socioeconomics, Population and Housing, and Indian Trust Assets

The cumulative context for environmental justice, socioeconomics, population and housing, and ITAs would be Stanislaus County. Implementation of the Proposed Project/Action in combination with the cumulative projects would not be anticipated to result in a cumulative impact to environmental justice, socioeconomics, and population and housing because the projects would not generally be located in highly populated areas or within communities, including minority or low-income. The projects also would not induce population growth or displace housing or people given the types of use proposed. Therefore, cumulative impacts would be less than significant. Construction and operation activities associated with the Proposed Project/Action would result in a less than considerable contribution to less than significant cumulative impacts to environmental justice, socioeconomics, and population and housing.

Implementation of the cumulative projects has the potential to significantly impact ITAs, depending on the location of the proposed projects; however, there are no ITAs within the affected environment for the Proposed Project/Action and the Proposed Project/Action would not impact ITAs. Therefore, no cumulative impact would occur. Construction and operation activities associated with the Proposed Project/Action would result in a less than considerable contribution to less than significant cumulative impacts to ITAs.

Public Services and Utilities

The cumulative context for public services and utilities would be the service areas of the service providers. Implementation of the Proposed Project/Action in combination with the cumulative projects would not be anticipated to result in a cumulative decrease in service levels because the types of uses would not increase population or uses that would result increased public services and utilities such as police, fire, water supply, wastewater, and solid waste. Therefore, cumulative impacts would be less than significant. Construction of the Proposed Project/Action could result in a short-term, temporary increase in the need for police and fire services in the event of an accident, as described in Section 3.13, Public Services and Utilities, but this type of demand increase could be accommodated by existing facilities and resources in the project vicinity. There would be no demands for additional public services that would require new or altered facilities and waste materials related to construction and operation of the Proposed Project/Action would not be generated in substantial amounts. Construction and operation activities associated with the Proposed Project/Action would result in a less than considerable contribution to less than significant cumulative impacts to public services and utilities.

3.15 Growth Inducing Effects

A growth-inducing effect is an effect which fosters economic or population growth. If the Proposed Project/Action is determined to be growth-inducing the effects of this growth need to be analyzed. Growth inducing effects may include effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air, water, and other natural resources.

The significance of the growth-inducing potential of a project is determined whether or not it stimulates population growth or a population concentration above what is assumed in local and regional land use plans, or in projections made by regional planning authorities that incorporate population projections for all cities and communities within the region. Projects that induce growth consistent with local and regional land use plans are still considered growth inducing. However, it is assumed that the environmental effects of this growth have been analyzed and mitigated during the development of these growth plans. When growth extends beyond the assumptions outlined within existing growth plans, the environmental effects of this growth have not been considered and must be analyzed. The key issue related to growth inducement for the Proposed Project/Action is whether or to what extent water supplies provided by the project would have indirect growth-inducing impacts.

3.15.1 Direct Growth Inducement

The Proposed Project/Action would result in the replacement of the existing unscreened intake system with a new fish screen intake, pump station, and associated features. Temporary employment would be generated during the construction phase. Given the small scale of the project, with construction of the proposed facilities requiring a crew consisting of an average of 5 to 10 workers, it is anticipated that workers would be available from the local labor pool without drawing new workers to the area. Additionally, because the Proposed Project/Action would not result in an additional water supply over that which currently exists, it would not support any additional growth beyond what is already approved including the creation of additional housing units or additional permanent employment, nor would it require that additional housing resources be developed elsewhere. Therefore, no direct growth inducement would occur with implementation of the Proposed Project/Action. Because the Proposed Project/Action would not increase population, no impacts on public service providers would occur.

3.15.2 Removal of Infrastructure or Institutional Barriers to Growth

Implementation of the Proposed Project/Action would result in the construction of a new fish screen intake and pump station similar to the existing WSID facilities to provide irrigation water to the existing WSID service area. Water would also continue to be provided to White Lake Mutual Water Company and the SJRNWR in accordance with existing contractual obligations (described in Section 1.2, Background). The Proposed Project/Action would maintain the 347 cfs WSID currently diverts into the intake canal and would not result in additional water supply above and beyond the existing amount. The Proposed Project/Action would not provide new unplanned municipal or agricultural capacity and water from the screened diversion would only serve existing agricultural uses and existing contractual obligations. The fish screen intake would ensure that WSID can continue to divert water from the San Joaquin River in order to implement its long-term objectives and deliver long-term water supplies to its service area in a manner that complies with present and future regulatory requirements. Therefore, the Proposed Project/Action would not result in growth inducing effects or foster economic growth above existing conditions. The Proposed Project/Action would not induce growth by extending infrastructure to a currently unserved area because the ability to provide water to serve use areas already exists. Rather, the Proposed Project/Action would allow WSID to maintain adequate water quality for its San Joaquin and Tuolumne River diversions, and maintain supplies while providing a fish screen diversion that meets NMFS and CDFW fish screen design requirements. Therefore, the Proposed Project/Action would not result in growth inducing effects or remove a barrier to growth. Because the Proposed Project/Action would not increase population, no impacts on public service providers would occur.

SECTION 4
Report Preparation

4.1 Lead Agencies and Staff

Bobby Pierce	West Stanislaus Irrigation District
Tim Rust	Bureau of Reclamation
Levi Johnson	Bureau of Reclamation
Shelly Hatleberg	Bureau of Reclamation

4.2 Project Engineers

Janet Atkinson	MWH Americas, Inc. Principal-in-Charge
Wayne Dahl	Dahl Consultants

4.3 Environmental Assessment/Initial Study

Cathy McEfee	Environmental Science Associates Project Director/Manager
Jennifer Aranda	Environmental Science Associates Project Manager
Stan Armstrong	Environmental Science Associates Air Quality/Noise
Alyssa Bell	Environmental Science Associates Paleontology
Sara Dietler	Environmental Science Associates Cultural Resources
Erich Fischer	Environmental Science Associates Biological Resources
Todd Gordon	Environmental Science Associates Technical Associate
Andrew Hatch	Environmental Science Associates Biological Resources
Robin Hoffman	Environmental Science Associates Cultural Resources
Gerrit Platenkamp	Environmental Science Associates Biological Resources

Tim Rimpo	Environmental Science Associates Air Quality/Climate Change
Samhita Saquib	Environmental Science Associates Technical Associate
Kristine Olsen	Environmental Science Associates Word Processor

SECTION 5
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Section 3.15 – Growth Inducing Effects

No sources are cited in this Section.

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Appendix A
CEQA Initial Study Checklist

ENVIRONMENTAL CHECKLIST
Initial Study

1. Project Title:	West Stanislaus Irrigation District Fish Screen Intake Project
2. Lead Agency Name and Address:	West Stanislaus Irrigation District (CEQA) and U.S. Bureau of Reclamation (NEPA) 2800 Cottage Way, Sacramento, CA 95825
3. Contact Person and Phone Number:	Shelly Hatleberg (916-978-5050)
4. Project Location:	The project area is located in northwestern Stanislaus County, California. The West Stanislaus Irrigation District (WSID) intake canal from Pump Station 1A to the proposed fish screen intake is located on an easement within the San Joaquin River National Wildlife Refuge (SJRNWR, or Refuge). The proposed fish screen intake would be located on the San Joaquin River, approximately 2.25 miles south of State Route 132/Maze Boulevard. The nearest city is Modesto, approximately 9 miles northeast of the project site. Interstate 5 is located approximately 6 miles southwest of the project site.
5. Project Sponsor's Name and Address:	West Stanislaus Irrigation District
6. General Plan Designation(s):	Agriculture (AG)
7. Zoning Designation(s):	Extensive Agriculture 40 (A-2-40)

8. **Description of Project:** The Proposed Project/Action consists of: (1) cone screens located at the mouth of the existing intake canal at the San Joaquin River; (2) a low-lift pump station at the same location; (3) approximately 2,100 feet of underground pipeline from the proposed pump station to the intake canal; (4) sediment removal and management along the length of the intake canal; (5) upgrading of existing roads along the intake canal; (6) two wildlife crossing of the intake canal, one of which that would also allow flood conveyance; (7) facilities for providing late fall-water deliveries to the Refuge; and (8) a flood connectivity structure to allow flow into the Refuge (Lara Tract) during times when the San Joaquin River is at high flood stage (river stages above elevation 36).

9. **Surrounding Land Uses and Setting.** Managed open space and wildlife preservation areas, wetlands, and riparian lands adjacent to the San Joaquin River, with active agricultural areas and scattered residential single-family homes in the vicinity.

10. **Other public agencies whose approval is required.** U.S. Bureau of Reclamation, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Coast Guard, California Department of Fish and Wildlife, Central Valley Flood Protection Board, Central Valley Regional Water Quality Control Board, State Historic Preservation Office, State Lands Commission, San Joaquin Valley Air Pollution Control District, Stanislaus County.

Environmental Factors Potentially Affected

The proposed project could potentially affect the environmental factor(s) checked below. The following pages present a more detailed checklist and discussion of each environmental factor.

☐ Aesthetics	☐ Agriculture and Forestry Resources	☒ Air Quality
☒ Biological Resources	☒ Cultural Resources	☒ Geology, Soils and Seismicity
☐ Greenhouse Gas Emissions	☒ Hazards and Hazardous Materials	☐ Hydrology and Water Quality
☐ Land Use and Land Use Planning	☐ Mineral Resources	☐ Noise
☐ Population and Housing	☐ Public Services	☐ Recreation
☐ Transportation and Traffic	☐ Utilities and Service Systems	☒ Mandatory Findings of Significance

DETERMINATION: (To be completed by Lead Agency)

On the basis of this initial study:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, no further environmental documentation is required.

______________________	______________________
Signature	Date
______________________	______________________
Printed Name	For

Environmental Checklist

Aesthetics

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
1. 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 daytime or nighttime views in the area?	☐	☐	☒	☐

Discussion

Subsection 3.2 of the IS/EA presents a description of the existing conditions and environmental effects for aesthetic resources.

Agricultural and Forest Resources

	Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
2.	**AGRICULTURAL 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 Department 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 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?	☐	☐	☐	☒

Discussion

Subsection 3.1 of the IS/EA presents a description of the existing conditions and environmental effects for agricultural and forest resources.

Air Quality

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
3. 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?	☐	☐	☒	☐

Discussion

Subsection 3.3 of the IS/EA presents a description of the existing conditions, environmental effects and mitigation measures, as appropriate, for air quality.

Biological Resources

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
4. 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 U.S. 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?	☐	☐	☐	☒

Discussion

Subsection 3.7 of the IS/EA presents a description of the existing conditions, environmental effects and mitigation measures, as appropriate, for biological resources.

Cultural Resources

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
5. 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?	☐	☒	☐	☐

Discussion

Subsection 3.8 of the IS/EA presents a description of the existing conditions, environmental effects and mitigation measures, as appropriate, for cultural resources.

Geology, Soils, and Seismicity

		Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
6.		**GEOLOGY, SOILS, AND SEISMICITY — 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 wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

Discussion

Subsection 3.5 of the IS/EA presents a description of the existing conditions, environmental effects and mitigation measures, as appropriate, for geology, soils, and seismicity.

Greenhouse Gas Emissions

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
7. GREENHOUSE GAS EMISSIONS — Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☒	☐	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☒	☐	☐

Discussion

Subsection 3.3 of the IS/EA presents a description of the existing conditions and environmental effects greenhouse gas emissions.

Hazards and Hazardous Materials

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
8. 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?	☐	☒	☐	☐

Discussion

Subsection 3.10 of the IS/EA presents a description of the existing conditions, environmental effects and mitigation measures, as appropriate, for hazards and hazardous materials.

Hydrology and Water Quality

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
9.	**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)?	☐	☐	☐	☒
c)	Substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river, or by other means, in a manner that would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
d)	Substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river, or by other means, substantially increase the rate or amount of surface runoff in a manner that 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 that 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)	Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

Discussion

Subsection 3.6 of the IS/EA presents a description of the existing conditions, environmental effects and mitigation measures, as appropriate, for hydrology and water quality.

Land Use and Land Use Planning

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
10. 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?	☐	☐	☐	☒

Discussion

Subsection 3.1 of the IS/EA presents a description of the existing conditions and environmental effects for land use and planning.

Mineral Resources

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
11. 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?	☐	☐	☐	☒

Discussion

Subsection 3.5 of the IS/EA presents a description of the existing conditions and environmental effects for minerals.

Noise

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
12.	**NOISE — Would the project:**				
a)	Result in 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)	Result in exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c)	Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d)	Result in 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 area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels?	☐	☐	☐	☒
f)	For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Discussion

Subsection 3.4 of the IS/EA presents a description of the existing conditions and environmental effects for noise.

Population and Housing

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
13. 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 units, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐

Discussion

Subsections 3.12 and 3.15 of the IS/EA present a description of the existing conditions and environmental effects for population and housing.

Public Services

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
14. PUBLIC SERVICES — Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of, or the 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 following public services:				
i) Fire protection?	☐	☐	☒	☐
ii) Police protection?	☐	☐	☒	☐
iii) Schools?	☐	☐	☒	☐
iv) Parks?	☐	☐	☒	☐
v) Other public facilities?	☐	☐	☒	☐

Discussion

Subsection 3.13 of the IS/EA presents a description of the existing conditions and environmental effects for public services.

Recreation

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
15. RECREATION — Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated?	☐	☐	☐	☒
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☒

Discussion

Subsection 3.11 of the IS/EA presents a description of the existing conditions and environmental effects for recreation.

Transportation and Traffic

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
16. TRANSPORTATION AND 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?	☐	☐	☐	☒

Discussion

Subsection 3.9 of the IS/EA presents a description of the existing conditions and environmental effects for transportation and traffic.

Utilities and Service Systems

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
17.	**UTILITIES AND SERVICE SYSTEMS — Would the project:**				
a)	Conflict with 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?	☐	☐	☐	☒
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 that would 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?	☐	☐	☒	☐

Discussion

Subsection 3.13 of the IS/EA presents a description of the existing conditions and environmental effects for utilities and service systems.

Mandatory Findings of Significance

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
18. MANDATORY FINDINGS OF SIGNIFICANCE — Would the project:				
a) 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, 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) 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) Have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

Discussion

a) Implementation of the proposed project could result in potentially significant impacts on air quality, biological resources, cultural resources, geology, soils and seismicity, and hazards and hazardous materials, as identified in the environmental checklist above and discussed in the IS/EA. These resource areas could have the potential to degrade the quality of the environment, and impact biological and cultural resources. Implementation of mitigation measures identified in the IS/EA would reduce the impacts to less than significant.

b) As discussed in Section 3 of the IS/EA, the proposed project would not cause long term adverse affects on the resources described. However, some of the resources have the potential to incur temporary, short-term effects during construction. An assessment of potential cumulative effects indicated that with implementation of the mitigation measures identified in Section 3, cumulative impacts would be less than significant. Construction and operation activities associated with the proposed project would result in a less than considerable contribution to potentially significant cumulative impacts.

c) See Environmental Checklist Items 18a and b.

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Appendix B
Air Quality Modeling Results

WSID Project - Construction Only

Stanislaus County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	18.89	Acre	18.89	822,848.40	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2014
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Assumed construction phasing

Off-road Equipment - Table 2-4 of PD

Off-road Equipment - Table 2-3 of PD

Off-road Equipment - Table 2-5 of PD

Off-road Equipment - Table 2-2 of PD

Off-road Equipment - Table 2-1 of PD

Trips and VMT - Assumed 10 workers

On-road Fugitive Dust - Assumed 98 percent paved

Construction Off-road Equipment Mitigation - Tier 3 engines for mitigation

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	300.00	196.00
tblConstructionPhase	NumDays	300.00	64.00
tblConstructionPhase	NumDays	300.00	87.00
tblConstructionPhase	NumDays	30.00	130.00
tblConstructionPhase	PhaseEndDate	1/1/2018	11/1/2017
tblConstructionPhase	PhaseEndDate	1/30/2018	5/1/2017
tblConstructionPhase	PhaseEndDate	8/30/2017	6/1/2018
tblConstructionPhase	PhaseEndDate	9/29/2017	4/1/2017
tblConstructionPhase	PhaseStartDate	4/2/2017	2/1/2017
tblConstructionPhase	PhaseStartDate	11/2/2017	2/1/2017
tblConstructionPhase	PhaseStartDate	5/2/2017	2/1/2018
tblConstructionPhase	PhaseStartDate	8/2/2017	2/1/2017
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Discharge Pipelines
tblOffRoadEquipment	PhaseName		Discharge Pipelines
tblOffRoadEquipment	PhaseName		Discharge Pipelines
tblOffRoadEquipment	PhaseName		Intake and Pump Station
tblOffRoadEquipment	PhaseName		Corps Levee Structure
tblOffRoadEquipment	PhaseName		E and W Crossing Structures
tblOffRoadEquipment	PhaseName		Discharge Pipelines
tblOffRoadEquipment	PhaseName		Earthwork
tblOffRoadEquipment	PhaseName		Discharge Pipelines
tblOffRoadEquipment	PhaseName		Intake and Pump Station
tblOffRoadEquipment	PhaseName		Corps Levee Structure
tblOffRoadEquipment	PhaseName		E and W Crossing Structures
tblOffRoadEquipment	PhaseName		Discharge Pipelines
tblOffRoadEquipment	PhaseName		Intake and Pump Station
tblOffRoadEquipment	PhaseName		Corps Levee Structure
tblOffRoadEquipment	PhaseName		E and W Crossing Structures
tblOffRoadEquipment	PhaseName		Discharge Pipelines
tblOffRoadEquipment	PhaseName		Intake and Pump Station
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00

tblOffRoadEquipment	UsageHours	7.00	1.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOnRoadDust	WorkerPercentPave	100.00	98.00
tblOnRoadDust	WorkerPercentPave	100.00	98.00
tblOnRoadDust	WorkerPercentPave	100.00	98.00
tblOnRoadDust	WorkerPercentPave	100.00	98.00
tblOnRoadDust	WorkerPercentPave	100.00	98.00
tblTripsAndVMT	VendorTripNumber	135.00	0.00
tblTripsAndVMT	VendorTripNumber	135.00	0.00
tblTripsAndVMT	VendorTripNumber	135.00	0.00
tblTripsAndVMT	WorkerTripNumber	13.00	10.00
tblTripsAndVMT	WorkerTripNumber	28.00	10.00
tblTripsAndVMT	WorkerTripNumber	346.00	10.00
tblTripsAndVMT	WorkerTripNumber	346.00	10.00
tblTripsAndVMT	WorkerTripNumber	346.00	10.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	1.3276	13.3630	9.0403	0.0147	0.7909	0.6921	1.4829	0.0832	0.6606	0.7437	0.0000	1,313.3673	1,313.3673	0.2757	0.0000	1,319.1563
2018	0.1161	0.9677	0.8943	1.5400e-003	0.1243	0.0602	0.1845	0.0130	0.0592	0.0722	0.0000	132.6212	132.6212	0.0170	0.0000	132.9776
Total	**1.4438**	**14.3308**	**9.9346**	**0.0162**	**0.9151**	**0.7523**	**1.6674**	**0.0961**	**0.7198**	**0.8159**	**0.0000**	**1,445.9884**	**1,445.9884**	**0.2926**	**0.0000**	**1,452.1339**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.3320	6.7490	8.6804	0.0147	0.7909	0.3604	1.1513	0.0832	0.3604	0.4436	0.0000	1,313.3657	1,313.3657	0.2757	0.0000	1,319.1548
2018	0.0323	0.6861	0.9631	1.5400e-003	0.1243	0.0451	0.1694	0.0130	0.0451	0.0581	0.0000	132.6210	132.6210	0.0170	0.0000	132.9775
Total	**0.3643**	**7.4351**	**9.6434**	**0.0162**	**0.9151**	**0.4056**	**1.3207**	**0.0961**	**0.4056**	**0.5017**	**0.0000**	**1,445.9867**	**1,445.9867**	**0.2926**	**0.0000**	**1,452.1322**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**74.77**	**48.12**	**2.93**	**0.00**	**0.00**	**46.09**	**20.79**	**0.00**	**43.66**	**38.52**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.7857	0.0000	1.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.4000e-004	3.4000e-004	0.0000	0.0000	3.6000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0298	0.0839	0.2850	4.0000e-004	0.0242	1.2700e-003	0.0255	6.4900e-003	1.1600e-003	7.6500e-003	0.0000	33.9557	33.9557	1.5500e-003	0.0000	33.9883
Waste						0.0000	0.0000		0.0000	0.0000	0.3289	0.0000	0.3289	0.0194	0.0000	0.7370
Water						0.0000	0.0000		0.0000	0.0000	0.0000	22.9165	22.9165	1.0400e-003	2.1000e-004	23.0047
Total	**3.8155**	**0.0839**	**0.2851**	**4.0000e-004**	**0.0242**	**1.2700e-003**	**0.0255**	**6.4900e-003**	**1.1600e-003**	**7.6500e-003**	**0.3289**	**56.8725**	**57.2014**	**0.0220**	**2.1000e-004**	**57.7303**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.7857	0.0000	1.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.4000e-004	3.4000e-004	0.0000	0.0000	3.6000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0298	0.0839	0.2850	4.0000e-004	0.0242	1.2700e-003	0.0255	6.4900e-003	1.1600e-003	7.6500e-003	0.0000	33.9557	33.9557	1.5500e-003	0.0000	33.9883
Waste						0.0000	0.0000		0.0000	0.0000	0.3289	0.0000	0.3289	0.0194	0.0000	0.7370
Water						0.0000	0.0000		0.0000	0.0000	0.0000	22.9165	22.9165	1.0400e-003	2.1000e-004	23.0047
Total	**3.8155**	**0.0839**	**0.2851**	**4.0000e-004**	**0.0242**	**1.2700e-003**	**0.0255**	**6.4900e-003**	**1.1600e-003**	**7.6500e-003**	**0.3289**	**56.8725**	**57.2014**	**0.0220**	**2.1000e-004**	**57.7303**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Earthwork	Grading	2/1/2017	8/1/2017	5	130	
2	Discharge Pipelines	Trenching	2/1/2017	4/1/2017	5	43	
3	Intake and Pump Station	Building Construction	2/1/2017	11/1/2017	5	196	
4	Corps Levee Structure	Building Construction	2/1/2017	5/1/2017	5	64	
5	E and W Crossing Structures	Building Construction	2/1/2018	6/1/2018	5	87	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Earthwork	Excavators	1	8.00	162	0.38
Earthwork	Graders	1	8.00	174	0.41
Earthwork	Plate Compactors	1	8.00	8	0.43
Earthwork	Scrapers	2	8.00	361	0.48
Discharge Pipelines	Cranes	1	8.00	226	0.29
Discharge Pipelines	Excavators	1	8.00	162	0.38
Discharge Pipelines	Generator Sets	4	8.00	84	0.74
Discharge Pipelines	Plate Compactors	1	8.00	8	0.43
Discharge Pipelines	Pumps	1	24.00	84	0.74
Discharge Pipelines	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Intake and Pump Station	Cranes	2	8.00	226	0.29
Intake and Pump Station	Excavators	1	8.00	162	0.38
Intake and Pump Station	Generator Sets	4	8.00	84	0.74

Intake and Pump Station	Plate Compactors	1	8.00	8	0.43
Intake and Pump Station	Pumps	1	24.00	84	0.74
Discharge Pipelines	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Corps Levee Structure	Cranes	1	8.00	226	0.29
Corps Levee Structure	Excavators	1	8.00	162	0.38
Corps Levee Structure	Generator Sets	1	8.00	84	0.74
Corps Levee Structure	Plate Compactors	1	8.00	8	0.43
Corps Levee Structure	Pumps	1	24.00	84	0.74
Corps Levee Structure	Tractors/Loaders/Backhoes	1	4.00	97	0.37
E and W Crossing Structures	Cranes	1	1.00	226	0.29
E and W Crossing Structures	Excavators	1	8.00	162	0.38
E and W Crossing Structures	Generator Sets	1	8.00	84	0.74
E and W Crossing Structures	Plate Compactors	1	8.00	8	0.43
E and W Crossing Structures	Pumps	1	24.00	84	0.74
E and W Crossing Structures	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Intake and Pump Station	Scrapers	2	8.00	361	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Earthwork	5	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Discharge Pipelines	11	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Intake and Pump Station	11	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Corps Levee Structure	6	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
E and W Crossing Structures	6	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Clean Paved Roads

3.2 Earthwork - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1723	0.0000	0.1723	0.0186	0.0000	0.0186	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2570	3.0255	1.8763	2.7200e-003		0.1338	0.1338		0.1232	0.1232	0.0000	251.2023	251.2023	0.0766	0.0000	252.8100
Total	**0.2570**	**3.0255**	**1.8763**	**2.7200e-003**	**0.1723**	**0.1338**	**0.3061**	**0.0186**	**0.1232**	**0.1418**	**0.0000**	**251.2023**	**251.2023**	**0.0766**	**0.0000**	**252.8100**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1800e-003	2.5000e-003	0.0254	6.0000e-005	0.1857	4.0000e-005	0.1857	0.0194	4.0000e-005	0.0194	0.0000	4.4719	4.4719	2.2000e-004	0.0000	4.4766
Total	**2.1800e-003**	**2.5000e-003**	**0.0254**	**6.0000e-005**	**0.1857**	**4.0000e-005**	**0.1857**	**0.0194**	**4.0000e-005**	**0.0194**	**0.0000**	**4.4719**	**4.4719**	**2.2000e-004**	**0.0000**	**4.4766**

3.2 Earthwork - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1723	0.0000	0.1723	0.0186	0.0000	0.0186	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0660	1.2752	1.5967	2.7200e-003		0.0520	0.0520		0.0520	0.0520	0.0000	251.2020	251.2020	0.0766	0.0000	252.8097
Total	**0.0660**	**1.2752**	**1.5967**	**2.7200e-003**	**0.1723**	**0.0520**	**0.2244**	**0.0186**	**0.0520**	**0.0706**	**0.0000**	**251.2020**	**251.2020**	**0.0766**	**0.0000**	**252.8097**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1800e-003	2.5000e-003	0.0254	6.0000e-005	0.1857	4.0000e-005	0.1857	0.0194	4.0000e-005	0.0194	0.0000	4.4719	4.4719	2.2000e-004	0.0000	4.4766
Total	**2.1800e-003**	**2.5000e-003**	**0.0254**	**6.0000e-005**	**0.1857**	**4.0000e-005**	**0.1857**	**0.0194**	**4.0000e-005**	**0.0194**	**0.0000**	**4.4719**	**4.4719**	**2.2000e-004**	**0.0000**	**4.4766**

3.3 Discharge Pipelines - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1272	1.0969	0.8376	1.4000e-003		0.0703	0.0703		0.0683	0.0683	0.0000	123.0584	123.0584	0.0186	0.0000	123.4486
Total	**0.1272**	**1.0969**	**0.8376**	**1.4000e-003**		**0.0703**	**0.0703**		**0.0683**	**0.0683**	**0.0000**	**123.0584**	**123.0584**	**0.0186**	**0.0000**	**123.4486**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.2000e-004	8.3000e-004	8.3800e-003	2.0000e-005	0.0614	1.0000e-005	0.0614	6.4100e-003	1.0000e-005	6.4200e-003	0.0000	1.4792	1.4792	7.0000e-005	0.0000	1.4807
Total	**7.2000e-004**	**8.3000e-004**	**8.3800e-003**	**2.0000e-005**	**0.0614**	**1.0000e-005**	**0.0614**	**6.4100e-003**	**1.0000e-005**	**6.4200e-003**	**0.0000**	**1.4792**	**1.4792**	**7.0000e-005**	**0.0000**	**1.4807**

3.3 Discharge Pipelines - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0297	0.6571	0.8873	1.4000e-003		0.0430	0.0430		0.0430	0.0430	0.0000	123.0582	123.0582	0.0186	0.0000	123.4485
Total	**0.0297**	**0.6571**	**0.8873**	**1.4000e-003**		**0.0430**	**0.0430**		**0.0430**	**0.0430**	**0.0000**	**123.0582**	**123.0582**	**0.0186**	**0.0000**	**123.4485**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.2000e-004	8.3000e-004	8.3800e-003	2.0000e-005	0.0614	1.0000e-005	0.0614	6.4100e-003	1.0000e-005	6.4200e-003	0.0000	1.4792	1.4792	7.0000e-005	0.0000	1.4807
Total	**7.2000e-004**	**8.3000e-004**	**8.3800e-003**	**2.0000e-005**	**0.0614**	**1.0000e-005**	**0.0614**	**6.4100e-003**	**1.0000e-005**	**6.4200e-003**	**0.0000**	**1.4792**	**1.4792**	**7.0000e-005**	**0.0000**	**1.4807**

3.4 Intake and Pump Station - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.8218	8.2229	5.5107	9.1200e-003		0.4268	0.4268		0.4096	0.4096	0.0000	813.7747	813.7747	0.1622	0.0000	817.1804
Total	**0.8218**	**8.2229**	**5.5107**	**9.1200e-003**		**0.4268**	**0.4268**		**0.4096**	**0.4096**	**0.0000**	**813.7747**	**813.7747**	**0.1622**	**0.0000**	**817.1804**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2900e-003	3.7800e-003	0.0382	1.0000e-004	0.2800	6.0000e-005	0.2800	0.0292	6.0000e-005	0.0293	0.0000	6.7423	6.7423	3.3000e-004	0.0000	6.7493
Total	**3.2900e-003**	**3.7800e-003**	**0.0382**	**1.0000e-004**	**0.2800**	**6.0000e-005**	**0.2800**	**0.0292**	**6.0000e-005**	**0.0293**	**0.0000**	**6.7423**	**6.7423**	**3.3000e-004**	**0.0000**	**6.7493**

3.4 Intake and Pump Station - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2024	4.2298	5.3306	9.1200e-003		0.2292	0.2292		0.2292	0.2292	0.0000	813.7737	813.7737	0.1622	0.0000	817.1795
Total	**0.2024**	**4.2298**	**5.3306**	**9.1200e-003**		**0.2292**	**0.2292**		**0.2292**	**0.2292**	**0.0000**	**813.7737**	**813.7737**	**0.1622**	**0.0000**	**817.1795**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2900e-003	3.7800e-003	0.0382	1.0000e-004	0.2800	6.0000e-005	0.2800	0.0292	6.0000e-005	0.0293	0.0000	6.7423	6.7423	3.3000e-004	0.0000	6.7493
Total	**3.2900e-003**	**3.7800e-003**	**0.0382**	**1.0000e-004**	**0.2800**	**6.0000e-005**	**0.2800**	**0.0292**	**6.0000e-005**	**0.0293**	**0.0000**	**6.7423**	**6.7423**	**3.3000e-004**	**0.0000**	**6.7493**

3.5 Corps Levee Structure - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1144	1.0094	0.7313	1.2600e-003		0.0611	0.0611		0.0594	0.0594	0.0000	110.4370	110.4370	0.0176	0.0000	110.8069
Total	**0.1144**	**1.0094**	**0.7313**	**1.2600e-003**		**0.0611**	**0.0611**		**0.0594**	**0.0594**	**0.0000**	**110.4370**	**110.4370**	**0.0176**	**0.0000**	**110.8069**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	1.2300e-003	0.0125	3.0000e-005	0.0914	2.0000e-005	0.0914	9.5400e-003	2.0000e-005	9.5600e-003	0.0000	2.2016	2.2016	1.1000e-004	0.0000	2.2039
Total	**1.0700e-003**	**1.2300e-003**	**0.0125**	**3.0000e-005**	**0.0914**	**2.0000e-005**	**0.0914**	**9.5400e-003**	**2.0000e-005**	**9.5600e-003**	**0.0000**	**2.2016**	**2.2016**	**1.1000e-004**	**0.0000**	**2.2039**

3.5 Corps Levee Structure - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0267	0.5787	0.7814	1.2600e-003		0.0360	0.0360		0.0360	0.0360	0.0000	110.4369	110.4369	0.0176	0.0000	110.8067
Total	**0.0267**	**0.5787**	**0.7814**	**1.2600e-003**		**0.0360**	**0.0360**		**0.0360**	**0.0360**	**0.0000**	**110.4369**	**110.4369**	**0.0176**	**0.0000**	**110.8067**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	1.2300e-003	0.0125	3.0000e-005	0.0914	2.0000e-005	0.0914	9.5400e-003	2.0000e-005	9.5600e-003	0.0000	2.2016	2.2016	1.1000e-004	0.0000	2.2039
Total	**1.0700e-003**	**1.2300e-003**	**0.0125**	**3.0000e-005**	**0.0914**	**2.0000e-005**	**0.0914**	**9.5400e-003**	**2.0000e-005**	**9.5600e-003**	**0.0000**	**2.2016**	**2.2016**	**1.1000e-004**	**0.0000**	**2.2039**

3.6 E and W Crossing Structures - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1148	0.9662	0.8791	1.4900e-003		0.0602	0.0602		0.0592	0.0592	0.0000	129.7034	129.7034	0.0168	0.0000	130.0570
Total	**0.1148**	**0.9662**	**0.8791**	**1.4900e-003**		**0.0602**	**0.0602**		**0.0592**	**0.0592**	**0.0000**	**129.7034**	**129.7034**	**0.0168**	**0.0000**	**130.0570**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3100e-003	1.5100e-003	0.0152	4.0000e-005	0.1243	3.0000e-005	0.1243	0.0130	2.0000e-005	0.0130	0.0000	2.9177	2.9177	1.4000e-004	0.0000	2.9207
Total	**1.3100e-003**	**1.5100e-003**	**0.0152**	**4.0000e-005**	**0.1243**	**3.0000e-005**	**0.1243**	**0.0130**	**2.0000e-005**	**0.0130**	**0.0000**	**2.9177**	**2.9177**	**1.4000e-004**	**0.0000**	**2.9207**

3.6 E and W Crossing Structures - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0310	0.6846	0.9478	1.4900e-003		0.0451	0.0451		0.0451	0.0451	0.0000	129.7033	129.7033	0.0168	0.0000	130.0568
Total	**0.0310**	**0.6846**	**0.9478**	**1.4900e-003**		**0.0451**	**0.0451**		**0.0451**	**0.0451**	**0.0000**	**129.7033**	**129.7033**	**0.0168**	**0.0000**	**130.0568**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3100e-003	1.5100e-003	0.0152	4.0000e-005	0.1243	3.0000e-005	0.1243	0.0130	2.0000e-005	0.0130	0.0000	2.9177	2.9177	1.4000e-004	0.0000	2.9207
Total	**1.3100e-003**	**1.5100e-003**	**0.0152**	**4.0000e-005**	**0.1243**	**3.0000e-005**	**0.1243**	**0.0130**	**2.0000e-005**	**0.0130**	**0.0000**	**2.9177**	**2.9177**	**1.4000e-004**	**0.0000**	**2.9207**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0298	0.0839	0.2850	4.0000e-004	0.0242	1.2700e-003	0.0255	6.4900e-003	1.1600e-003	7.6500e-003	0.0000	33.9557	33.9557	1.5500e-003	0.0000	33.9883
Unmitigated	0.0298	0.0839	0.2850	4.0000e-004	0.0242	1.2700e-003	0.0255	6.4900e-003	1.1600e-003	7.6500e-003	0.0000	33.9557	33.9557	1.5500e-003	0.0000	33.9883

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	30.04	30.04	30.04	64,121	64,121
Total	30.04	30.04	30.04	64,121	64,121

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.437140	0.064959	0.157507	0.185241	0.055990	0.008039	0.017829	0.060299	0.001829	0.001231	0.006388	0.000700	0.002849

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.7857	0.0000	1.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.4000e-004	3.4000e-004	0.0000	0.0000	3.6000e-004
Unmitigated	3.7857	0.0000	1.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.4000e-004	3.4000e-004	0.0000	0.0000	3.6000e-004

6.2 Area by SubCategory

Unmitigated

SubCategory	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Architectural Coating	0.5721					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2136					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	1.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.4000e-004	3.4000e-004	0.0000	0.0000	3.6000e-004
Total	**3.7857**	**0.0000**	**1.8000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**3.4000e-004**	**3.4000e-004**	**0.0000**	**0.0000**	**3.6000e-004**

Mitigated

SubCategory	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Consumer Products	3.2136					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	1.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.4000e-004	3.4000e-004	0.0000	0.0000	3.6000e-004
Architectural Coating	0.5721					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.7857**	**0.0000**	**1.8000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**3.4000e-004**	**3.4000e-004**	**0.0000**	**0.0000**	**3.6000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	22.9165	1.0400e-003	2.1000e-004	23.0047
Unmitigated	22.9165	1.0400e-003	2.1000e-004	23.0047

7.2 Water by Land Use

<u>Unmitigated</u>

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 22.5071	22.9165	1.0400e-003	2.1000e-004	23.0047
Total		**22.9165**	**1.0400e-003**	**2.1000e-004**	**23.0047**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 22.5071	22.9165	1.0400e-003	2.1000e-004	23.0047
Total		**22.9165**	**1.0400e-003**	**2.1000e-004**	**23.0047**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.3289	0.0194	0.0000	0.7370
Unmitigated	0.3289	0.0194	0.0000	0.7370

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	1.62	0.3289	0.0194	0.0000	0.7370
Total		**0.3289**	**0.0194**	**0.0000**	**0.7370**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	1.62	0.3289	0.0194	0.0000	0.7370
Total		**0.3289**	**0.0194**	**0.0000**	**0.7370**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Appendix C
Pile Driving, Dewatering, and Fish Rescue Plan

ESA

2600 Capitol Avenue
Suite 200
Sacramento, CA 95816
916.564.4500 phone
916.564.4501 fax

www.esassoc.com

memorandum

date July 25, 2017

to West Stanislaus Irrigation District

from Chris Fitzer

subject Pile Driving, Dewatering, and Fish Rescue Plan

1 INTRODUCTION

This document responds to proposed conservation measures that were incorporated into the West Stanislaus Irrigation District Fish Screen Intake Project (Proposed Action) to avoid and/or minimize potential adverse effects of the Proposed Action on fish species.

This Plan will be implemented prior to and during construction to ensure that potential effects to fish are avoided and minimized in the Project area during construction activities.

2 PROPOSED CONSERVATION MEASURES

The following conservation measures have been incorporated into the Proposed Action to avoid and/or minimize potential adverse effects of the Proposed Action on fish species.

- There will be an in-water construction work window of June 15 – November 1. This time period corresponds with periods when salmonids are least likely to be present due to unsuitable water temperatures.
- Contractor education and environmental training about salmonid biology (life history and habitat requirements) and using best management practices (BMPs) as described below to minimize potential impacts on water quality and/or fish habitat.
- Biological monitoring during construction activities.
- Use of environmentally sensitive areas and environmentally restricted areas to protect Essential Fish Habitat.
- Restoration of temporarily disturbed areas upon project completion.
- Temporary construction sites, including staging areas, lay down and storage areas for equipment, materials, and construction vehicles, parking areas, and incidental stockpiling areas, will be assigned, as feasible, in areas that do not include sensitive habitat for listed species or that affect riparian vegetation. These temporary construction sites may include areas that are within agriculture, pasture, barren or otherwise disturbed vegetation.

- Work within the area of the designated floodway will be limited to the period from April 15 to November 15 for flood protection issues, unless otherwise authorized by the Central Valley Flood Protection Board.

- Develop and implement a Storm Water Pollution Prevention Plan (SWPPP). Temporary construction BMPs will be developed and implemented. BMPs may include, but would not be limited to, silt fences, fiber rolls, straw bales, sandbag barriers, check dams, and sediment basins.

- Pile Driving Underwater Sound Pressure Measures. The following measures will be implemented to avoid and minimize potential adverse effects that could otherwise result from in-water pile-driving activities:

  The contractor will develop a plan for sheet pile-driving activities in water to minimize impacts on fish and will allow sufficient time in the schedule for coordination with regulatory agencies.

  Sheet piling will be driven by vibratory or nonimpact methods (i.e. hydraulic) that result in sound pressures below threshold levels to the extent feasible. Pile driving will be conducted only during daylight hours and initially will be used at low energy levels and reduced impact frequency. Applied energy and frequency will be gradually increased until necessary full force and frequency are achieved.

- Implement Fish Rescue Plan Inside Cofferdam. Installation of the cofferdam and dewatering on the site during construction could result in fish stranding. The contractor will develop and implement a fish rescue plan acceptable to the NMFS, USFWS, and CDFW.

  The contractor will ensure that a qualified fisheries biologist with a current CDFW collection permit conducts the fish rescue and relocation efforts behind the cofferdam. The fish rescue effort will be implemented during the dewatering of the areas behind the cofferdam(s) and involve capture and return of those fish to suitable habitat within the adjacent waterways. The area will first be seined, followed by electrofishing to remove fish that are behind the cofferdam. A fisheries biologist will be on-site during initial pumping (dewatering) to ensure compliance with the plan.

  The contractor will monitor the progress of dewatering and allow for the fish rescue to occur prior to completely closing the cofferdam and again when water depths reach approximately 2 feet. USFWS, NMFS, and CDFW will be notified at least 48 hours prior to the start of fish rescue efforts. Information on the species, number, and sizes of fish collected would be recorded during the fish rescue and provided in a letter report to be submitted within 30 days after the fish rescue to USFWS, NMFS, and CDFW.

  If, during construction, river levels rise and flood the work area, the Contractor shall implement dewatering and fish rescue prior to resuming normal work activities.

  The Fish Rescue Plan will contain methods for minimizing the risk of stress and mortality due to capture and handling of fish removed from the construction site and returned to adjacent waterways.

  Implementation of the Fish Rescue Plan would minimize potential adverse effects to listed fish species (if present) associated with fish stranding during dewatering activities related to the construction activities.

3 FISH RESCUE PLAN

This plan is intended to cover fish rescues from the San Joaquin River that would be required to meet agency permits for the sheet pile cofferdam installation and dewatering during construction of the fish screen intake and associated project components.

Installation of the cofferdam could encroach on part of the active San Joaquin River channel that may contain fish and therefore, a fish rescue plan is required. For this project, the fish rescue plan will be implemented within the area that is isolated by the cofferdam.

3.1 Overview of the Sheet Pile Installation, Dewatering and Fish Rescue and Relocation Effort

The sheet pile installation and dewatering operation will need to be closely coordinated between the construction contractor and the biological team responsible for the fish rescue and relocation. The construction contractor is responsible for installing the sheet piles and dewatering the enclosure. The sheet pile walls will remain in place throughout the construction. The exact process of installing the sheet pile wall is not yet defined but close coordination between the construction contractor and the biological team is necessary to integrate the fish rescue and relocation effort with the dewatering effort within the cofferdam.

3.2 Site Isolation and Preliminary Clearance

Prior to the installation of the cofferdam, block nets shall be placed within the designated construction area to isolate fish movement and prevent fish from entering the site. Exclusionary fish netting will be installed approximately 50 feet upstream and 50 feet downstream of the activity. Action agency, in coordination and consultation with NMFS *and CDFW*, will ensure that qualified fish biologists are onsite to implement fish relocation operations through the use of herding, seining and/or electrofishing, if necessary. Best professional determination will be used to decide which method(s) of collection and relocation is most appropriate. Biologists will first try to haze and herd fish out of the fish exclusion area. If fish biologists determine that the use of electrofishing is necessary for the efficient and successful removal of fish, the NMFS electrofishing guidelines (NMFS 2000) will be strictly followed. The fish relocation team will be comprised of fishery biologists with professional experience using seines and electrofishing equipment.

Once the waterway has been isolated, seine passes and/or electrofishing shall be made throughout the entire length of the reach (isolated by block nets) to capture, remove, count, and release fish.

Electrofishing and/or seine passes shall continue as necessary until it has been reasonably determined by the on-site fisheries biologist that all fish have been removed from the site and relocated (see below). Once all fish have been captured, transported, and released, the on-site fisheries biologist shall clear the site for sheet pile cofferdam installation.

Following the installation of the cofferdam, the removal effort will resume, systematically electrofishing and/or seining the interior confined portion of sheet pile dam until zero catch is obtained. This would occur in concert with dewatering by the construction contractor. Fisheries biologists onsite will help the contractor determine where pumps will be placed for dewatering to limit the potential for fish entrainment, and monitoring of the dewatering process will be ongoing to prevent any entrainment. If necessary the pumps will be isolated via block nets to prevent entrainment. The fish rescue crew would be onsite by the time the maximum water depth inside the sheet pile dam is about two feet. At that point the crew would enter the sheet pile enclosure and seine or electrofish the area until essentially no more fish are collected. This step will require close coordination with the construction contractor so that the fish rescue crew is on site during the key dewatering stages. The fish rescue crew will conduct repeat rescues in the confines of the cofferdam until no fish are captured. The construction contractor would, upon direction by the fish rescue lead, continue to remove water from within the sheet pile dam. The fish crew would remain on site until the enclosure is completely dewatered.

Release sites will be predetermined prior to beginning the rescues. Release sites will be easily accessible and located upstream and/or downstream of the project site.

The Fish Rescue Plan shall include, but not be limited to, the name(s) of the qualified fisheries biologist(s) who will handle the fish, a list of the permits possessed by the qualified biologist(s) to handle the fish, the method(s) of fish capture to be used, identification of the relocation site(s) for captured fish, the method(s) used for transporting the rescued fish to the relocation site(s), and the method(s) used for minimizing the risk of stress and mortality due to capture and handling of the fish.

3.3 Dewatering

The contractor will be responsible for dewatering the enclosed sheet pile area. The contractor must conduct all dewatering consistent with all permit conditions. The contractor will determine the most effective method to adhere to permit conditions in relation to discharge during dewatering and may use a settling or infiltration basin, settling tanks, or other appropriate methods to avoid discharge of turbid water into the San Joaquin River.

3.4 Fish Relocation

Staging –Relocation sites with suitable access will be identified and approved by agencies prior to starting the fish relocation. Relocation sites will have drive-to access to expedite captured fish release into the San Joaquin River. Relocation sites will be selected based on proximity and access to the sheet pile structure and the creek and consider safe access and operation of equipment.

Staffing – This fish relocation effort will include one electrofishing/seining crew to work closely with the contractor to remove fish as soon as possible. The crew will include 1 electrofishing operator, 2 netters, 1 holding container handler and 1 bucket handler /recorder. The live car handler and bucket/recorder will also serve as the fish transport and release team. The electrofishing operator and 2 netters will also serve as the seining team.

Initial Site Isolation – Block nets will be placed to segment and isolate the work area (area where sheet pile coffer dam will be installed) in order to isolate this area from the creek. Multiple passes will be made in each segment to clear the area of fishes, to the extent feasible, before the coffer dam is installed.

Collection and Transport Methods – The methods included in this fish relocation plan have been selected to maximize efficiency of collection effort while minimizing handling and transport time/stress. Local transport of fish may be implemented by various methods depending on site conditions and the amount of catch needing relocation including:

1. Bucket transfer will be used by the removal team to move fish from the sheet pile enclosure to the holding container(s) located outside of the sheet pile walls. If necessary, live cars can be set up in the creek and rescued fish can be held temporarily held in live car nets immersed in the San Joaquin River prior to relocation.

2. Live car nets will be used for short term holding in-stream while collection is active.

3. Buckets will be used for transfer of fish from live car nets in the creek to live car wells in the transport truck and from live wells to creek release sites.

Relocation Sites – Specimens rescued will be transported upstream and downstream, and if possible, estimates during processing will be made to distribute fish equally among drop-off sites. Large fish will be isolate from smaller fish to minimize predation during holding and transport. The release locations are all accessible to the general fish population of the sheet pile structure. Fish will not be moved more than 400 feet up or downstream or into waters than are isolate by surface flow from the San Joaquin River.

Records and Data – Documentation of fish relocation efforts will be undertaken at the time of operations using standardized forms.

1. Fish will be inventoried and other pertinent specimen data recorded if circumstances allow. If conditions preclude detailed inventory, a list of the species present and an estimation of their abundance should be documented along with their disposition (i.e. released, mortality (+reason), sacrificed, salvaged).
2. Information on ambient site conditions, including photo-documentation at collection and release sites will be gathered.
3. Information on collection and handling methods and transport conditions will be recorded.
4. Transport and release conditions will be recorded including transport time, temperature and dissolved oxygen in the live well and at the release site, estimates of numbers of fishes released at a site and observations on the behavior of the fish immediately post-release.

3.5 Post-Operation Reporting

A report on the fish rescue results will be prepared. The report will include content on:

- Site conditions, including photos at collection and release sites
- Collection and handling methods
- Transport methods and conditions
- List of species present
- Quantity or estimate of abundance of species, and disposition
- Inventory data if conditions allowed
- Quantity or estimate of fish released at each release site

3.6 Equipment

At a minimum, the following equipment will be required for capturing, holding, transporting and release of fish:

- Several assorted 3/8” to 5/8” mesh and 4’ X 20’ to 6’ X 35’ length block nets and beach seines,
- Seine poles and ropes (if necessary),
- Long handled dip nets,
- Large hand-held aquarium dip nets,
- Chest or hip waders, and wading shoes,
- Smith-Root LR-24 backpack electrofisher with a sufficient supply of batteries,
- Several 5-gallon buckets with handles,

- Portable live cars and live-car net pens,
- Several insulated ice-chests with lids, and affixed portable aerators with air stones, numerous battery powered portable aerators and air stones,
- Hand held thermometers,
- Fish measuring board and weighing scale (as necessary),
- Ice (as necessary),
- Pick-up truck or hauling cart for ice chests to transport and relocate fish, and
- Notebooks with “Rite-in-the-Rain” paper.