Delta-Mendota Canal/ California Aqueduct Intertie

Central Valley Project, California

Final
Environmental Impact Statement

Volume I: Main Report

U.S. Department of the Interior
Bureau of Reclamation

Western Area Power Administration (DOE/EIS-0398)

November 2009

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Final Environmental Impact Statement
Delta-Mendota Canal/California Aqueduct Intertie Project

United States Department of the Interior
Bureau of Reclamation, Mid-Pacific Region
2800 Cottage Way, MP-700
Sacramento, CA 95825

This Final Environmental Impact Statement (FEIS) has been prepared by the, U.S. Department of the Interior, Bureau of Reclamation, Mid-Pacific Region (Reclamation) in accordance with the requirements of the National Environmental Policy Act (NEPA) for the Delta-Mendota Canal (DMC)/California Aqueduct Intertie (Intertie). The Western Area Power Administration (Western) and the San Luis & Delta-Mendota Water Authority (SLDMWA) are cooperating agencies under NEPA. The Intertie would be located in Alameda or San Joaquin County and involves constructing and operating a pumping plant and pipeline connection between the DMC and the California Aqueduct at Mile 7.2 of the DMC and Mile 9 of the California Aqueduct, which would be used primarily in winter months to fill the San Luis Reservoir earlier each year. The project also includes an interconnection and the construction and operation of a new transmission line, and a new point of delivery on Western's system for delivery of power for the Intertie. The project purpose is to improve the DMC conveyance conditions that restrict the Central Valley Project (CVP) Jones Pumping Plant to less than its authorized pumping capacity of 4,600 cubic feet per second (cfs) and to improve operational flexibility for operations and maintenance and emergency activities.

The FEIS considers three action alternatives and the No Action Alternative:

- Alternative 1—No Action Alternative
- Alternative 2—constructing and operating a pumping plant and pipeline connection between the DMC and the California Aqueduct at Mile 7.2 of the DMC and Mile 9 of the California Aqueduct
- Alternative 3—constructing and operating a pumping plant and pipeline connection between the DMC and the California Aqueduct at Mile 11.5 of the DMC and Mile 13.8 of the California Aqueduct
- Alternative 4—use State Water Project (SWP) Harvey O. Banks Pumping Plant capacity not used by SWP for Table A deliveries (existing long-term SWP water supply contract amount) to pump the increment of CVP water that cannot be conveyed in the DMC without the Intertie and install a temporary intertie during emergencies and maintenance activities

This FEIS describes and evaluates the potential environmental, social and economic effects of the Intertie project. It analyzes the direct, indirect, and cumulative environmental effects of the following resources: water supply and Delta water management, Delta tidal hydraulics, Delta water quality, geology and soils, transportation, air quality, noise, climate change, fish, vegetation and wetlands, wildlife, power production and energy, aesthetic and visual resources, cultural resources, hazards and hazardous materials, socioeconomics, Indian trust assets, utilities and public services, and environmental justice. The alternatives would not result in significant adverse environmental impacts after mitigation. The proposed project would result in beneficial effects on Delta fishery and aquatic resources under Alternatives 2, 3, and 4 due to a shift in the timing of Jones Pumping.

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Executive Summary

ES.1 Introduction

This document is a final environmental impact statement (EIS) that is intended to satisfy the requirements of the National Environmental Policy Act (NEPA). This final EIS has been prepared by the U.S. Department of the Interior, Bureau of Reclamation, which is serving as the lead agency, to identify and analyze the anticipated environmental effects of constructing and operating a proposed intertie between the federal Delta-Mendota Canal (DMC) and the state California Aqueduct (Proposed Action). The Proposed Action will provide operational flexibility for the CVP and State Water Project (SWP) and improve conveyance capacity of the CVP.

This final EIS is a public information document prepared to disclose environmental effects and to inform decision makers about these effects in compliance with NEPA. The document describes the existing conditions and the potential environmental effects of the Proposed Action and alternatives and discloses the direct, indirect, and cumulative impacts. This document also identifies measures that have been incorporated into the design of the project to ensure that there are no adverse effects. Volume III of this final EIS includes all of the public an agency comments received during the draft EIS review period and Reclamation's responses to those comments.

ES.2 Purpose and Need for Proposed Action

The Delta-Mendota Canal/California Aqueduct Intertie (Intertie) is being considered by Reclamation and the San Luis Delta Mendota Water Authority (Authority) to improve the water supply reliability of the Central Valley Project (CVP). The purpose of the Proposed Action is to improve the DMC conveyance conditions that restrict the CVP C.W. "Bill" Jones Pumping Plant (Jones Pumping Plant) to less than its original design pumping capacity of 4,600 cubic feet per second (cfs) and to improve operational flexibility for operations and maintenance and emergency activities.

The need for this action results from the following conditions:

- A lack of operational flexibility compromises the ability of the CVP and SWP to respond to emergencies, conduct necessary system maintenance, and provide capacity to respond to environmental opportunities in the Sacramento–San Joaquin River Delta (Delta).

- The amount, timing, and location of water deliveries from the DMC, apparent canal subsidence, siltation, the facility design, and other factors have resulted in a mismatch between designed Jones Pumping Plant export capacity and DMC conveyance capacity.
- There are unmet CVP water supply demands south of the Delta, and conditions along the DMC constrain CVP operations, reducing the water supplies reliably delivered to CVP water service contractors south of the Delta.

ES.3 Related Environmental Documentation

In December 2004, Reclamation and the Authority issued an Environmental Assessment/Initial Study (EA/IS) for the Intertie project. The Authority signed a Mitigated Negative Declaration on April 20, 2005, and Reclamation signed a Finding of No Significant Impact (FONSI) in May, 2005. On August 31, 2005, the Planning and Conservation League brought suit against Reclamation under NEPA. The Court found and granted a temporary restraining order based upon its determination that there was reasonable likelihood that the plaintiffs would prevail on their contention that an EIS is required because: the Project would have a potential significant impact to delta smelt habitat; the sensitivity of the Delta and conflicting expert evidence; the limitations of the CALSIM model had not been disclosed; and the failure of the cumulative effects analysis to consider certain projects which were reasonably likely to be implemented even though the environmental reviews had not been completed. Reclamation withdrew the FONSI and committed to preparing this EIS, and the suit has been dropped.

The Intertie project also was included in the 2008 Operating Criteria and Plan (OCAP) Biological Assessment (BA), hereafter referred to as the CVP/SWP Longterm Operations Plan, which addresses system-wide operations for CVP and SWP facilities. To ensure consistency between NEPA and ESA analysis for the Intertie, modeling assumptions for the Intertie analysis in the EIS were based on modeling assumptions used in the CVP/SWP Longterm Operations Plan. The subsequent OCAP biological opinions (BO), hereafter referred to as the Operations BOs, issued by U.S. Fish and Wildlife Service (USFWS) in December 2008 and the National Marine Fisheries Service (NMFS) in June 2009 include operational constraints that affect how and when the Intertie is operated. This EIS describes the maximum effects of operating the Intertie (i.e., no restrictions related to the Operations BOs). The actual effects of the Intertie will be avoided or substantially minimized because of the Operations BOs operational constraints that will be in place.

ES.4 Overview of Proposed Action, Alternatives, and Alternatives Development

The Jones Pumping Plant and the DMC were originally designed to pump and convey 4,600 cfs, and these facilities have routinely been operated at 4,600 cfs for many years. The operations of the Jones Pumping Plant are dictated not only by the design capacity, but also by tidal fluctuations at the Jones Pumping Plant and the capacity of the DMC south of Tracy. Because the DMC capacity upstream of Santa Nella and the pumping capacity at O’Neill Pumping Plant is about 4,200 cfs, additional Jones Pumping Plant pumping can presently be accommodated only if deliveries are made to contractors upstream of the O'Neill Pumping Plant. These factors reduce the opportunities for Reclamation to maximize its full design monthly average pumping rate of 4,600 cfs at Jones Pumping Plant during the fall and winter months.

As such, alternatives to allow Reclamation to maximize pumping were evaluated. Ultimately, the construction and operation of an intertie between the California Aqueduct and the DMC was proposed. Locations were evaluated based on their ease of access, distance between the California Aqueduct and the DMC, geological conditions, distance from Jones Pumping Plant, and other physical factors.

This EIS evaluates a no action alternative; the Proposed Action (the Intertie as described in the EA/IS); an Intertie that is operationally identical to the proposed project but is in a different location (Transmission Agency of Northern California [TANC] Site); and an alternative that would use SWP Harvey O. Banks Pumping Plant (Banks Pumping Plant) to achieve the objective related to improving conveyance capacity and a temporary intertie structure to address emergencies (Virtual Intertie).

ES.4.1 Alternative 1 (No Action)

The No Action Alternative is required under NEPA and assumes that the current operation of Jones and Banks Pumping Plants would continue.

ES.4.2 Alternative 2 (Proposed Action)

The Proposed Action is the Intertie (as originally proposed in the 2005 EA/IS). The site of the Proposed Action is in an unincorporated area of the San Joaquin Valley in Alameda County, west of the city of Tracy (Figure ES-1). The site is in a rural area zoned for general agriculture and is under federal and state ownership. Alternative 2 consists of constructing and operating a pumping plant and pipeline connection between the DMC and the California Aqueduct at Mile 7.2 of the DMC and Mile 9 of the California Aqueduct, where the DMC and California Aqueduct are approximately 500 feet apart (Figure ES-2).

The Intertie would allow the DMC and California Aqueduct to share conveyance capacity and could be used to convey water in either direction. To convey water from the DMC to the California Aqueduct, the Intertie would use a pumping plant at the DMC that would allow up to 467 cfs to be pumped from the DMC to the California Aqueduct via an underground pipeline. This additional 467 cfs would allow the Jones Pumping Plant to pump at its designed maximum monthly average of about 4,600 cfs throughout the year. As modeled and analyzed for this EIS, the Intertie would be operated for this purpose primarily in September through March. Additionally, water could be conveyed from the California Aqueduct to the DMC. Because the California Aqueduct is approximately 50 feet higher in elevation than the DMC, up to 900 cfs flow could be conveyed from the California Aqueduct to the DMC through the Intertie using gravity flow. The operations of the Intertie would be subject to all applicable export pumping restrictions for water quality and fisheries protection.

The Intertie would be owned by the federal government and operated by the Authority. Prior to any operations, Reclamation will seek approval from DWR for the introduction of water into the California Aqueduct. An agreement among Reclamation, California Department of Water Resources (DWR), and the Authority would identify the responsibilities and procedures for operating the Intertie. A permanent easement would be obtained by Reclamation where the Intertie alignment crosses state property.

ES.4.3 Alternative 3 (TANC Site)

Alternative 3 is similar in design and the same in operation to the Proposed Action. The only difference is the location of the Intertie and appurtenant structures. The TANC Intertie Site alternative was developed in response to scoping comments submitted by TANC, which requested that the Intertie site be relocated to avoid high-voltage transmission lines. TANC identified two options for alternative sites. Option 1 is evaluated in this EIS because it is most similar in length and distance from the Jones Pumping Plant. Alternative 3 would be located at Milepost 11.5 of the DMC and Milepost 13.8 of the California Aqueduct, where these facilities are approximately ¼ mile apart (Figure ES-2).

ES.4.4 Alternative 4 (Virtual Intertie)

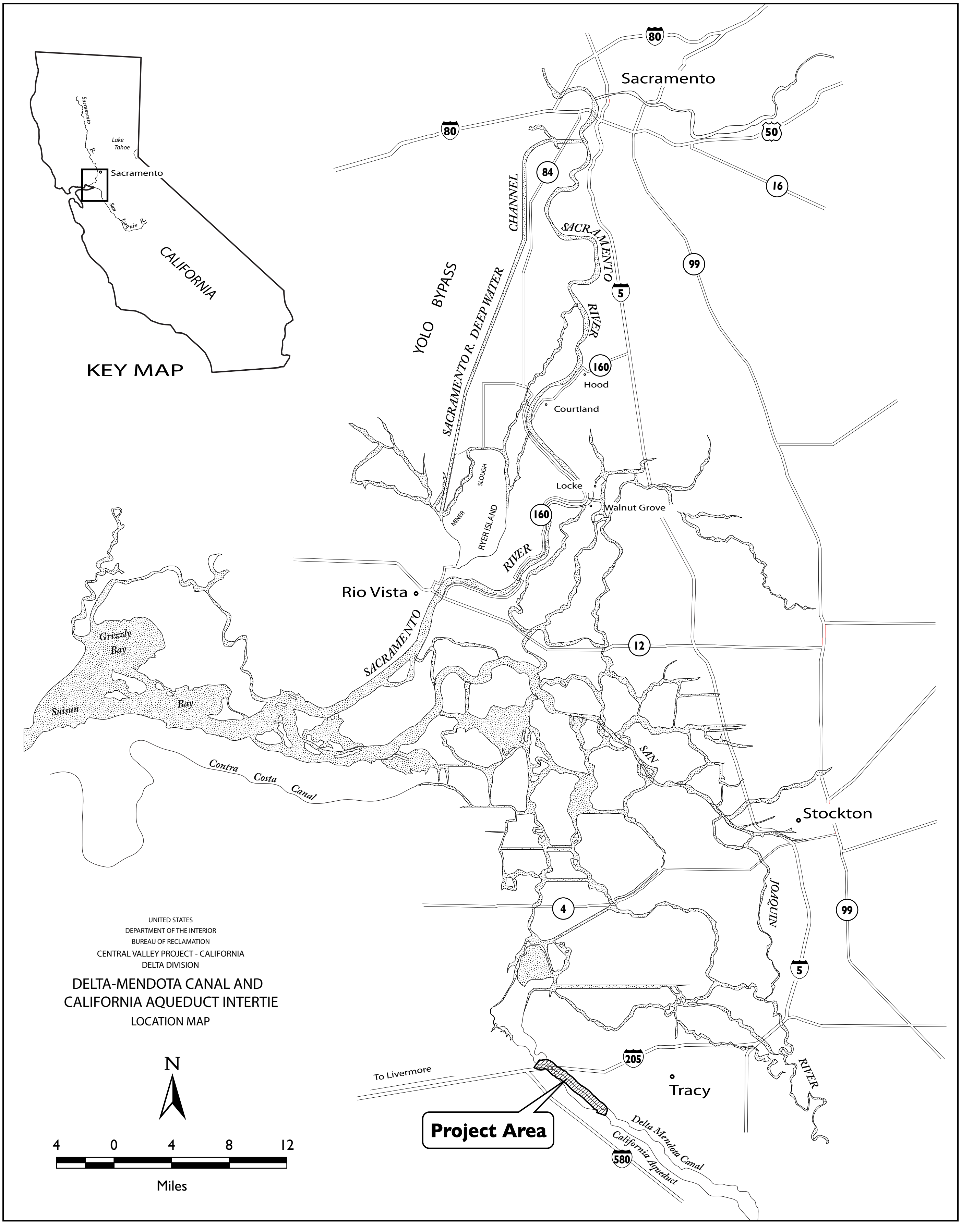
Alternative 4 (Virtual Intertie) would use Banks Pumping Plant capacity not used by SWP for Table A deliveries (existing long-term SWP water supply contract amount) to pump the increment of CVP water that cannot be conveyed in the DMC without the Intertie. This would use some of the available pumping and conveyance capacity of the SWP. CVP operations at Jones Pumping Plant therefore would not change. Under the Virtual Intertie alternative, the CVP would use the Banks Pumping Plant to convey CVP water to O'Neill Forebay and San Luis Reservoir (CVP share).

The permitted pumping capacity at Banks Pumping Plant would not change from the No Action Alternative. Under the No Action Alternative, available CVP water for export that cannot be pumped at Jones because of the DMC conveyance limitations is treated as unused federal share under the Coordinated Operations Agreement (COA) and can be exported by the SWP at Banks Pumping Plant. This water, released from upstream CVP reservoirs for instream or temperature-control flows, is often more than is required for Delta outflow and the maximum pumping capacity at Jones Pumping Plant.

During emergencies, a temporary intertie-like structure would be installed to connect the DMC with the California Aqueduct. This structure would be similar to the structure installed in 2001.

ES.5 Cooperating Agencies

The Western Area Power Administration (Western) has participated in the preparation of this EIS in regards to the interconnection and the construction and operation of the new transmission line associated with Alternatives 2 and 3. They will use this EIS as their NEPA compliance



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ICF Jones & Stokes
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Figure ES-1
Regional Location Map

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Figure ES-2
Project Study Area

document for construction and operation of the new transmission line and a new point of delivery on Western's system for delivery of power for the Intertie.

The Authority is the local project proponent for the Intertie, and will be responsible for its operation and maintenance. They have participated in the preparation of this EIS.

ES.6 Overview of Potential Environmental Effects

The EIS evaluates the potential direct, indirect, and cumulative environmental changes and/or effects on the following resources:

- water supply and Delta water management,
- Delta tidal hydraulics,
- Delta water quality,
- geology and soils,
- transportation,
- air quality,
- noise,
- climate change,
- fish,
- vegetation and wetlands,
- wildlife,
- land use,
- power production and energy,
- aesthetic and visual resources,
- cultural resources,
- hazards and hazardous materials,
- socioeconomics,
- Indian trust assets,
- utilities and public services, and
- environmental justice.

The EIS also evaluates effects of climate change on Intertie project performance. Resources not expected to be affected by either the construction or operation of the Proposed Action and alternatives are:

- navigation,
- population and housing, and

- recreation

Table ES-1, below, provides an overview of the impacts identified and any applicable mitigation.

ES.7 Areas of Controversy

The scoping process and prior litigation revealed several areas of controversy surrounding the Proposed Action. The Proposed Action is controversial as it relates to diversions from the Delta and construction of facilities near the TANC California-Oregon Transmission Project (COTP). In the past several years, virtually any project proposal to change diversions in the Delta has been met with great resistance from a variety of agencies, organizations, and landowners depending on the specific proposal. It is assumed that the Intertie generates a similar level of controversy.

As described above, the Intertie was included in the consultation for OCAP. As such, restrictions on diversions outlined in the Operations BOs are part of the Intertie operations and would minimize or avoid adverse effects on fish related to the Intertie.

As described above, TANC submitted a comment letter during public scoping stating opposition to the proposed siting of the Intertie. In response, Reclamation has developed a Construction Safety Plan outlining the measures that will be implemented to avoid disruption of the transmission line and injury or death related to construction and maintenance of the Intertie facilities. These measures, as they apply to environmental effects disclosed in this EIS, have been incorporated into the project either as Environmental Commitments or as mitigation measures.

Additionally, the previous lawsuit brought by the Planning and Conservation League (PCL) on the EA for the Intertie indicates controversy related to the suit points:

1. Use of CALSIM model as the only tool for evaluation of effects without disclosing the limitations of the model.
2. Cumulative effects analysis that did not include all reasonably foreseeable projects.
3. Determination of significance based on a percentage change.

Reclamation has addressed each of the identified areas of controversy through changes in the project, impact assessment, and inclusion of measures required for ESA compliance.

ES.8 Public Involvement and Next Steps

Pursuant to the requirements of NEPA, Reclamation published a Notice of Intent (NOI) to prepare an EIS and Notice of Public Scoping Meetings in the Federal Register on Wednesday, July 12, 2006 (Vol. 71, No. 133) and held public scoping meetings on Tuesday, August 1, 2006, and Thursday, August 3, 2006. The August 1, 2006, scoping meeting was held in Sacramento from 10:00 a.m. to 12:00 noon at the Federal Building located at 2800 Cottage Way. Approximately 15 representatives of various organizations attended the Sacramento scoping meeting. The August 3, 2006, scoping meeting was held in Stockton from 6:00 p.m. to 8:00 pm at the Cesar Chavez Central Library located at 605 North El Dorado Street. Approximately 12 representatives of various organizations attended the Stockton scoping meeting. The purpose of the scoping meetings was to solicit input on the scope of the Intertie EIS, including potentially significant impacts, ways to mitigate these impacts, and feasible alternatives. Written comments were received by Reclamation between July 12, 2006, and September 6, 2006.

Reclamation filed a Notice of Availability (NOA) for the draft EIS in the Federal Register on July 17, 2009. The draft EIS was circulated for public review for 45 days, during which time Reclamation held two public hearings (August 4 and 5, 2009). No oral comments were received during these hearings, but ten written comments were received during the public review period. These comments and accompanying responses are included as Volume III of this final EIS, which represents the next step in public involvement. This final EIS will be circulated for at least 30 days before Reclamation issues a record of decision (ROD).

ES.9 Impact and Mitigation Measures Summary Table

Table ES-1. Summary of Impacts and Mitigation Measures for the Delta-Mendota Canal/California Aqueduct Intertie Project

Effect	Alternative	Adverse Effect?	Mitigation Measure
3.1 Water Supply and Delta Water Management			
Construction Effects			
No changes			
Operation Effects			
WS-1: Changes in Central Valley Project Delta Pumping	2, 3, 4	No, beneficial	–
WS-2: Changes in Central Valley Project South-of-Delta Deliveries	2, 3	No, beneficial	–
WS-3: Changes in State Water Project Delta Pumping	2, 3, 4	No	–
WS-4: Changes in State Water Project South-of-Delta Deliveries	2, 3	No	–
3.2 Delta Tidal Hydraulics			
Construction Effects			
No effects			
Operation Effects			
HYD-1: Effects of Intertie Pumping on Tidal Elevations and Flow in Old River at Clifton Court Ferry	2, 3, 4	No	–
3.3 Delta Water Quality			
Construction Effects			
No impacts			

Effect	Alternative	Adverse Effect?	Mitigation Measure
Operation Effects			
WQ-1: Delta Salinity Changes at Jersey Point	2, 3, 4	No	–
WQ-2: Delta Salinity Changes at Rock Slough	2, 3, 4	No	–
WQ-3: Delta Salinity Changes at Los Vaqueros Intake	2, 3, 4	No	–
WQ-4: Delta Salinity Changes at Banks Pumping Plant	2, 3, 4	No	–
WQ-5: Delta Salinity Changes at Jones Pumping Plant	2, 3, 4	No	–
WQ-6: Increases in Dissolved Organic Carbon at CCWD, SWP, or CVP Intakes	2, 3, 4	No	–
3.4 GEOLOGY AND SOILS			
Construction Effects			
GEO-1: Potential Short-Term Increase in Erosion Resulting from Project Construction	2, 3, 4	No	–
GEO-2: Potential Slope Failure along Canals Resulting from Project Construction	2, 3	No	–
GEO-3: Potential Structural Damage from Fault Displacement and Ground Shaking during a Seismic Event	2, 3, 4	No	–
GEO-4: Potential Structural Damage from Development on Materials Subject to Liquefaction	2, 3	No	–
GEO-5: Potential Structural Damage from Development on Expansive Soils	2, 3	No	–
GEO-6: Potential Rupture of Pipelines Caused by Expansive Soils and Pipeline Corrosion	2, 3	No	–
Operation Effects			
No effects			
3.5 TRANSPORTATION			
Construction Effects			
TN-1: Changes in Roadway Capacity as a Result of Truck and Commute Trips	2, 3, 4	No	–
TN-2: Damage to Roadways during Construction	2, 3, 4	No	–
TN-3: Disruption to Bikeways during Construction	2, 3, 4	No	–
TN-5: Disruption of Railroad Line or Service during Construction	3	No	–
TN-6: Disruption to I-205 during Construction	3	Yes	TN-MM-1: Non-Peak Hour Installation of I-205 Transmission Line Segment
Operation Effects			
TN-4: Changes in Transportation Patterns Caused by the Creation of New Roadways and Operation of the Intertie Facility	2, 3, 4	No	–

Effect	Alternative	Adverse Effect?	Mitigation Measure
3.6 AIR QUALITY			
Construction Effects			
AQ-1: Exposure of Sensitive Receptors to Elevated Health Risks from Exposure to Diesel Particulate Matter from Construction Activities	2, 3, 4	No	–
AQ-2: Comply with General Conformity	2, 3, 4	No	–
Operation Effects			
No effects			
3.7 NOISE			
Construction Effects			
NZ-1: Exposure of Noise-Sensitive Land Uses to Construction Noise	2, 3, 4	Yes	NZ-MM-1: Employ Noise-Reducing Construction Practices
Operation Effects			
NZ-2: Exposure of Noise-Sensitive Land Uses to Operational Noise during Intertie Operation	2, 3	No	
NZ-2: Exposure of Noise-Sensitive Land Uses to Operational Noise during Temporary Intertie Operation	4	Yes	NZ-MM-2: Employ Noise-Reducing Measures for the Temporary Pumps
3.8 CLIMATE CHANGE EFFECTS ON INTERTIE PROJECT IMPACTS			
Construction Effects			
CC-1: Construction-Related Changes in Greenhouse Gas Emissions	2, 3, 4	No	–
Operation Effects			
CC-2: Permanent Changes in Greenhouse Gas Emissions as a Result of Intertie Operations	2, 3	No	–
CC-2: Permanent Changes in Greenhouse Gas Emissions as a Result of Intertie Operations	4	No	–
CC-3: Project Performance under Changed Conditions	2, 3, 4	No	–
4.1 FISH			
Construction Effects			
No direct effects			
Operation Effects			
FISH-1: Operations-Related Decline in Migration Habitat Conditions for Chinook Salmon	2, 3, 4	No	–
FISH-2: Operations-Related Increases in Entrainment of Chinook Salmon	2, 3, 4	No	–
FISH-3: Operations-Related Decline in Migration Habitat Conditions for Steelhead	2, 3, 4	No	–

Effect	Alternative	Adverse Effect?	Mitigation Measure
FISH-4: Operations-Related Increases in Entrainment of Steelhead	2, 3, 4	No, beneficial	–
FISH-5: Operations-Related Loss of Spawning Habitat Area for Delta Smelt	2, 3, 4	No	–
FISH-6: Operations-Related Loss of Rearing Habitat Area for Delta Smelt	2, 3, 4	No	–
FISH-7: Operations-Related Decline in Migration Habitat Conditions for Delta Smelt	2, 3, 4	No	–
FISH-8: Operations-Related Increases in Central Valley Project and State Water Project Pumping Resulting in Entrainment of Delta Smelt	2, 3, 4	No	–
FISH-9: Operations-Related Loss of Spawning Habitat Area for Longfin Smelt	2, 3, 4	No	–
FISH-10: Operations-Related Loss of Rearing Habitat Area for Longfin Smelt	2, 3, 4	No	–
FISH-11: Operations-Related Increases in Central Valley Project and State Water Project Pumping Resulting in Entrainment of Longfin Smelt	2, 3, 4	No	–
FISH-12: Operations-Related Loss of Spawning Habitat Area for Splittail	2, 3, 4	No	–
FISH-13: Operations-Related Loss of Rearing Habitat Area for Splittail	2, 3, 4	No	–
FISH-14: Operations-Related Decline in Migration Habitat Conditions for Splittail	2, 3, 4	No	–
FISH-15: Operations-Related Increases in Entrainment Losses of Splittail	2, 3, 4	No	–
FISH-16: Operations-Related Decline in Migration Habitat Conditions for Striped Bass	2, 3, 4	No	–
FISH-17: Operations-Related Loss of Rearing Habitat Area for Striped Bass	2, 3, 4	No	–
FISH-18: Operations-Related Increases in Central Valley Project and State Water Project Pumping Resulting in Entrainment of Striped Bass	2, 3, 4	No	–
FISH-19: Operations-Related Decline in Migration Habitat Conditions for Green Sturgeon	2, 3, 4	No	–
FISH-20: Operations-Related Increases in CVP and State Water Project Pumping Resulting in Entrainment of Green Sturgeon	2, 3, 4	No	–
4.2 VEGETATION AND WETLANDS			
Construction Effects			
VEG-1: Direct and Indirect Effects on Sensitive Biological Resources within and Adjacent to the Construction Zone	2, 3, 4	No	–

Effect	Alternative	Adverse Effect?	Mitigation Measure
VEG-2: Introduction or Spread of Invasive Plant Species	2, 3, 4	No	–
VEG-3: Potential Impacts on Special-Status Plants	3, 4	No	–
Operation Effects			
No effects			
4.3 WILDLIFE			
Construction Effects			
WILD-1: Potential Degradation or Changes in Hydrology of Habitat for Longhorn Fairy Shrimp, Vernal Pool Fairy Shrimp, and Vernal Pool Tadpole Shrimp	2, 3	No	–
WILD-2: Potential Injury or Mortality of California Tiger Salamander, California Red-Legged Frog, and Western Spadefoot Toad	2, 3	Yes	WILD-MM-1: Conduct Preconstruction Surveys for California Tiger Salamander, California Red-Legged Frog, and Western Spadefoot WILD-MM-2: Implement Measures during Construction to Avoid and Minimize Potential Injury or Mortality of California Tiger Salamander, California Red-Legged Frog, and Western Spadefoot
WILD-3: Temporary and Permanent Loss of Upland Habitat for California Tiger Salamander, California Red-Legged Frog, and Western Spadefoot Toad	2, 3, 4	No	–
WILD-4: Potential Disturbance of Nesting Northern Harrier, Swainson's Hawk, White-Tailed Kite, Loggerhead Shrike, and Non-Special-Status Migratory Birds	2, 3	Yes	WILD-MM-3: Avoid Construction during the Nesting Season of Migratory Birds or Conduct Preconstruction Survey for Nesting Birds
WILD-5: Loss of Suitable Foraging Habitat for Swainson's Hawk	2, 3, 4	No	–
WILD-6: Potential Mortality or Disturbance of Western Burrowing Owl	2, 3	Yes	WILD-MM-4a: Conduct Preconstruction Surveys for Western Burrowing Owl WILD-MM-4b: Avoid and Minimize Effects on Western Burrowing Owl

Effect	Alternative	Adverse Effect?	Mitigation Measure
WILD-7: Potential Disturbance, Injury, or Mortality of San Joaquin Kit Fox and American Badger	2, 3	Yes	WILD-MM-5: Conduct Preconstruction Den Surveys for San Joaquin Kit Fox and American Badger and Avoid or Protect Dens WILD-MM-6: Provide Escape Ramps or Cover Open Trenches at the End of Each Day to Avoid Entrapment of San Joaquin Kit Fox and American Badger
WILD-8: Temporary Disturbance and Permanent Loss of Suitable Habitat for San Joaquin Kit Fox and American Badger	2, 3, 4	No	–
Operation Effects			
WILD-9: Potential Injury or Mortality of Migratory Birds from Electrocution or Collisions with the New Transmission Line	2, 3	No	WILD-MM-7: Prepare and Implement an Avian Protection Plan WILD-MM-8: Consult with USFWS under the Bald and Golden Eagle Protection Act
5.1 Power Production and Energy			
Construction Effects			
POW-1: Increased Energy Consumption as a Result of Constructing the Intertie	2, 3, 4	No	–
Operation Effects			
POW-2: Increased Electricity Consumption as a Result of Operating the Intertie	2, 3, 4	No	–
5.2 Visual Resources			
Construction Effects			
VIS-1: Temporary Visual Impacts Caused by Construction Activities	2	No	–
VIS-1: Temporary Visual Impacts Caused by Construction Activities	3	No	VIS-MM-4: Limit Construction to Daylight Hours near Residences
Operation Effects			
VIS-2: Adversely Affect a Scenic Vista	2, 3, 4	No	–
VIS-3: Damage Scenic Resources along a Scenic Highway	2, 3, 4	No	–
VIS-4: Degrade the Existing Visual Character or Quality of the Site and Its Surroundings	2, 3	No	–

Effect	Alternative	Adverse Effect?	Mitigation Measure
VIS-5: Create a New Source of Light or Glare	2, 3	No	VIS-MM-1: Apply Minimum Lighting Standards VIS-MM-2: Construct Facilities and Infrastructure with Low-Sheen and Non-Reflective Surface Materials VIS-MM-3: Reduce Visibility of New Structures
5.3 CULTURAL RESOURCES			
Construction Effects			
CUL-1: Modification of Known Cultural Resources Resulting from Construction	2, 3	No	–
CUL-2: Visual Intrusions to the Historic Setting of Significant Cultural Resources from Transmission Line Construction	2, 3	No	–
CUL-3: Inadvertent Damage to or Destruction of Buried Archaeological Sites and Human Remains	2, 3, 4	No	–
Operation Effects			
No adverse effects			
5.4 HAZARDS AND HAZARDOUS MATERIALS			
Construction Effects			
HAZ-1: Exposure to or Release of Hazardous Materials during Construction	2, 3, 4	No	–
HAZ-2: Increased Risk to the Public Attributable to Potential Disturbance of Overhead Powerlines	2	No	–
HAZ-4: Risk to the Public during Installation of Transmission Line over I-205	3	No	–
Operation Effects			
HAZ-3: Exposure to or Release of Hazardous Materials during Operation	2, 3, 4	No	–
5.5 SOCIOECONOMICS			
Construction Effects			
SOC-1: Change in Population during Project Construction	2, 3, 4	No	–
SOC-2: Change in Employment and Income during Project Construction	2, 3, 4	No, beneficial	–
Operation Effects			
SOC-3: Change in Population, Employment, and Income during Project Operation	2, 3, 4	No	–

Effect	Alternative	Adverse Effect?	Mitigation Measure
5.6 Indian Trust Assets			
Construction Effects			
No effect			
Operation Effects			
No effect			
5.7 Utilities and Public Services			
Construction Effects			
PUB-1: Disruption of Electricity Service	2, 3, 4	No	–
PUB-2: Disruption to Underground Utility Lines during Excavation Activities	2, 3, 4	No	–
PUB-3: Disruption to Emergency Services during Construction	2, 3, 4	No	–
PUB-4: Increased Contributions to Local Landfills	2, 3, 4	No	–
Operation Effects			
No impacts			
5.8 Environmental Justice			
Construction Effects			
No effects			
Operation Effects			
No effects			

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Acronyms and Abbreviations

µS/cm	microSiemens per centimeter
1978 Delta WQCP	1978 Water Quality Control Plan (WQCP) for the Sacramento–San Joaquin Delta and Suisun Marsh
1995 WQCP	1995 Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary
AB	Assembly Bill
ABAG	Association of Bay Area Governments
AC	Alternating Current
ADAM	Aerometric Data Analysis and Management System
AIP	Alternative Intake Project
ANPR	Advanced Notice of Proposed Rulemaking
APE	area of potential effects
APLIC	Avian Power Line Interaction Committee
APP	Avian Protection Plan
ARB	California Air Resources Board
ATCM	Air Toxics Control Measure
Authority	San Luis & Delta Mendota Water Authority
B.P.	years before present
BA	biological assessment
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
Banks Pumping Plant	SWP Harvey O. Banks Pumping Plant
BDCP	Bay Delta Conservation Plan
bhp	brake horsepower
BMPs	best management practices
BOCA	Building Officials and Code Administrators International, Inc.
BOs	biological opinions
BSC	California Building Standards Commission
CAA	federal Clean Air Act
CAAA	Clean Air Act Amendments of 1990
CAAQS	California ambient air quality standards
CAFE	Corporate Average Fuel Economy
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CAP	Bay Area Clean Air Plan
CAR	Coordination Act Report

CARB	California Air Resources Board
CBSC	California Building Standards Code
CCAA	California Clean Air Act
CCF	Clifton Court Forebay
CCIC	Central California Information Center
CCR	California Code of Regulations
CCWD	Contra Costa Water District
CDFA	California Department of Food and Agriculture
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGS	California Geological Survey
CH_4	methane
CHRIS	California Historical Resources Information System
CIWMB	California Integrated Waste Management Board
cm	centimeters
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalents
COA	Coordinated Operation Agreement
COI	California-Oregon Intertie
Corps	U.S. Army Corps of Engineers
COTP	California-Oregon Transmission Project
CRHR	California Register of Historical Resources
CVO	Central Valley Operations
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CWA	federal Clean Water Act
D-1641	State Water Resources Control Board water right Decision 1641
dB	decibel
dBA	A-weighted decibel
DBPs	disinfection byproducts
DCC	Delta Cross Channel
Delta	Sacramento–San Joaquin River Delta

DIDI	Delta Island Drainage Investigations
DMC	federal Delta-Mendota Canal
DO	dissolved oxygen
DOC	dissolved organic carbon
DOE	Department of Energy
DOI	U.S. Department of the Interior
DOT	Departments of Transportation
DPSs	distinct population segments
Draft CARB Thresholds	October 24, 2008, CARB released a draft staff proposal entitled Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under CEQA
DSM2	Delta Simulation Model
DWB	2009 Drought Water Bank
DWR	California Department of Water Resources
DWSC	Deep Water Ship Channel
E/I	export/inflow
EA/IS	Environmental Assessment/Initial Study
EBMUD	East Bay Municipal Utility District
EC	electrical conductivity
EIS	environmental impact statement
EISA	Energy Independence and Security Act of 2007
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ERP	Ecosystem Restoration Program
ESA	federal Endangered Species Act
FHWA	Federal Highway Administration
FMWT	Fall Mid-Water Trawl
FONSI	Finding of No Significant Impact
FR	Federal Register
FRWP	Freeport Regional Water Project
ft/sec	feet per second
FTA	Federal Transit Administration
FWCA	Fish and Wildlife Coordination Act
FWUA	Friant Water Users Authority
g	acceleration of gravity
g/bhp-hr	grams per brake horsepower hour
GCM	global circulation model
General Construction Permit	General Permit for Discharges of Storm Water Associated with Construction Activity
GHG	greenhouse gas

GPS	global positioning system
GWP	global warming potential
HECP	hazardous energy control program
HFCs	hydrofluorocarbons
HGWPG	high global warming potential gases
hp	Horsepower
I-205	Interstate 205
I-580	Interstate 580
I-5	Interstate 5
ICBO	International Conference of Building Officials
ICC	International Code Council
IDHAMP	Interagency Delta Health Aspects Monitoring Program
IEP	Interagency Ecological Program
IESP	Interagency Ecological Study Program
Intertie	Delta-Mendota Canal/California Aqueduct Intertie
IPCC	Intergovernmental Panel on Climate Change
ISAC	Invasive Species Advisory Committee
ITAs	Indian Trust Assets
Jones Pumping Plant	CVP C.W. “Bill” Jones Pumping Plant
JPOD	Joint Point of Diversion
kV	kilovolt
KWh	kilowatt-hour
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
LFC	low-flow channel
L_{max}	maximum sound level
L_{min}	minimum sound level
LOS	level of service
lower DMC	section of the DMC south of O’Neill Pumping Plant
L_{xx}	percentile-exceeded sound level
maf	million acre-feet
maf/yr	million acre-feet per year
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MBTA	Migratory Bird Treaty Act
Metropolitan	The Metropolitan Water District of Southern California
msl	above mean sea level
MTC	Metropolitan Transportation Commission
MVEBs	motor vehicle emissions budgets

MWh	megawatt hours
MWQI	Municipal Water Quality Investigations
N_2O	nitrous oxide
NAAQS	national ambient air quality standards
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NGVD	1929 national geodetic vertical datum
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NICS	National Invasive Species Council
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOI	Notice of Intent
NOP/NOI	Notice of Preparation/Notice of Intent
NO_X	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRDC	Natural Resources Defense Council
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
O&M	operations and maintenance
OAP	Ozone Attainment Plan
OCAP	Operations Criteria and Plan
ODS	ozone-depleting substances
OES	Office of Emergency Services
OHWM	ordinary high water mark
OMR	Old and Middle River
OPR	Office of Planning and Research
PFCs	perfluorocarbons
PG&E	The Pacific Gas and Electric Company
PM10	particulate matter 10 microns in diameter or less
PM2.5	particulate matter 2.5 microns or less in diameter
ppb	parts per billion
ppm	parts per million
ppt	parts per thousand
PRC	Public Resources Code
Proposed Action	constructing and operating a proposed intertie between the federal Delta-Mendota Canal (DMC) and the state California Aqueduct
RACM	reasonably available control measures

RBDD	Red Bluff Diversion Dam
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
RFS	Renewable Fuel Standard
RM	River Mile
ROD	Record of Decision
ROG	reactive organic gases
ROW	right-of-way
RPA	Reasonable and Prudent Alternative
RWQCB	Regional Water Quality Control Board
SA	Settlement Agreement
SB	Senate Bill
SBA	South Bay Aqueduct
SBCCI	Southern Building Code Congress International, Inc.
SCADA	supervisory control and data acquisition
SCVWD	Santa Clara Valley Water District
SCWA	Sacramento County Water Agency
SDIP	South Delta Improvements Program
SFBAAB	San Francisco Bay Area Air Basin
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SJMSCP	San Joaquin County Multi Species Habitat Conservation and Open Space Plan
SO_2	sulfur dioxide
SR	State Route
SRRE	Source Reduction and Recycling Element
SS	suspended sediments
State Water Board	State Water Resources Control Board
Superfund	Comprehensive Environmental Response, Compensation, and Liability Act
SVWMA	Sacramento Valley Water Management Agreement
SWP	State Water Project
SWPPP	stormwater pollution prevention plan
TACs	toxic air contaminants
taf	thousand acre-feet
taf/yr	thousand acre-feet per year
TANC	Transmission Agency of Northern California
TBACT	Best Available Control Technology for Toxics
TCCA	Tehama-Colusa Canal Authority
TDF	Through-Delta Facility
TFCF	Tracy Fish Collection Facility
THMs	trihalomethanes
TMDL	total maximum daily load

UBC	Uniform Building Code
upper DMC	section of the DMC north of O'Neill Pumping Plant
USC	U.S. Government Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VAMP	Vernalis Adaptive Management Program
VOCs	volatile organic carbons
Western	Western Area Power Administration
WQCP	Water Quality Control Plan
WTP	Water Treatment Plant
WY	water year
X2	position of the 2 ppt salinity gradient
YOY	young of the year

Chapter 1 Introduction

1.1 Purpose of This Document

This document is a final environmental impact statement (EIS) that has been prepared to comply with the requirements of the National Environmental Policy Act (NEPA). This final EIS was prepared by the U.S. Department of the Interior, Bureau of Reclamation, which is serving as the lead agency, to identify and analyze the anticipated environmental impacts from constructing and operating a proposed intertie (pumping plant and pipeline connection) between the federal Delta-Mendota Canal (DMC) and the state California Aqueduct (Proposed Action). The Proposed Action would provide operational flexibility for the Central Valley Project (CVP) and State Water Project (SWP) and improve conveyance capacity of the CVP. Because Reclamation owns and operates the CVP, it must comply with NEPA for its proposed action of operating the Delta-Mendota Canal/California Aqueduct Intertie (Intertie) and approving the construction of the Intertie by the San Luis & Delta Mendota Water Authority (Authority).

This final EIS is a public information document prepared to disclose environmental effects and to inform decision makers about these potential effects in compliance with NEPA. The document describes the existing conditions and the environmental impacts of the Proposed Action and alternatives, and discloses the potential direct, indirect, and cumulative impacts. This document also identifies measures that have been incorporated into the design of the project to minimize project impacts.

1.2 Relationship to the Intertie Environmental Assessment/Initial Study

In December 2004, Reclamation and the Authority issued an Environmental Assessment/Initial Study (EA/IS) for the Intertie project, prepared jointly to comply with NEPA and the California Environmental Quality Act (CEQA). The Authority adopted a Mitigated Negative Declaration on April 20, 2005, and Reclamation signed a Finding of No Significant Impact (FONSI) in May 2005. On August 31, 2005, the Planning and Conservation League brought suit against Reclamation claiming that the FONSI did not fully comply with NEPA. Reclamation withdrew the FONSI and committed to preparing this EIS.

1.3 Relationship to the Operations Criteria and Plan Biological Assessment and the National Marine Fisheries Service and U.S. Fish and Wildlife Service Biological Opinions

In August 2008, Reclamation submitted a biological assessment (BA) for the CVP and SWP facilities and operations, including as described in the Operations Criteria and Plan (OCAP) with a request for formal consultation with U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) under Section 7 of the federal Endangered Species Act (ESA). The OCAP BA, hereafter referred to as the CVP/SWP Longterm Operations Plan, included existing facilities and operations and some near-future changes in operations and new facilities. The subsequent biological opinion (BO), hereafter referred to as the Operations BO, issued by USFWS in December 2008 and the NMFS Operations BO issued in June 2009 include operational constraints that indirectly affect how and when the Intertie is operated (U.S. Fish and Wildlife Service 2008; National Marine Fisheries Service 2009). The Intertie was identified as a near-future project and the Operations BOs include take authorizations for the CVP and SWP operations with the Intertie in operation. To ensure consistency between NEPA and the ESA analysis for the Intertie, modeling assumptions for the Intertie analysis in this EIS were based on modeling assumptions used in the 2008 CVP/SWP Longterm Operations Plan.

1.4 Relationship to the Bay Delta Conservation Plan and other Long-Term Planning and Drought-Relief Efforts

Reclamation has executed Financial Assistance Agreements with DWR to assist in the completion of planning efforts, environmental documentation, and technical studies for the Bay Delta Conservation Plan (BDCP)—a process to develop a habitat conservation plan for the Delta and to provide for reliable water supplies to areas receiving supplies from or via the Delta.

Reclamation is also participating in or leading several efforts to minimize the impacts of the current drought on CVP contractors through helping to facilitate transfers, use of groundwater, use of carryover storage, implementation of recycling and reuse programs, and many other efforts. The Intertie, although not specifically a component of any of these programs, is consistent with the overall goal of providing increased operational flexibility to maintain reliable water supplies for CVP and SWP water contractors.

1.5 Purpose and Need

The Intertie is intended to improve the operations and maintenance (O&M) abilities of the CVP by addressing constraints in the DMC just south of the CVP C.W. “Bill” Jones Pumping Plant (Jones Pumping Plant). The purpose of the Proposed Action is to improve the DMC conveyance conditions that restrict the Jones Pumping Plant to less than its original-design pumping capacity of 4,600 cubic feet per second (cfs) and to improve operational flexibility for operations and maintenance and emergency activities.

The need for this action results from the following conditions:

- A lack of operational flexibility compromises the ability of the CVP and SWP to respond to emergencies, conduct necessary system maintenance, and provide capacity to respond to environmental opportunities in the Sacramento–San Joaquin River Delta (Delta).
- The amount, timing, and location of water deliveries from the DMC, apparent canal subsidence, siltation, the facility design, and other factors have resulted in a mismatch between designed Jones Pumping Plant export capacity and DMC conveyance capacity.
- There are unmet CVP water supply demands south of the Delta, and conditions along the DMC constrain CVP operations, reducing the water supplies reliably delivered to CVP water service contractors south of the Delta.

1.5.1 Background of the Purpose and Need

Overview of the Central Valley Project and the State Water Project

The CVP and SWP maintain facilities in California’s Central Valley to deliver water supplies to water right-holders and CVP/SWP contractors. Both projects are operated under restrictions imposed through a variety of agency jurisdictions and authorities, including State Water Resources Control Board (State Water Board) water right Decision 1641 (D-1641), ESA, California Endangered Species Act (CESA), water rights, and Delta inflow/outflow ratio.

The CVP was originally authorized by Congress in 1937, and operation began in 1951. The CVP is operated and maintained by Reclamation. The CVP can deliver about 7 million acre-feet (maf) annually—for agriculture (6.2 maf), urban (0.5 maf), and wildlife refuge (0.3 maf) use (California Department of Water Resources 1998a, 1998b). Service areas for CVP contracting agencies are shown on Figure 1-1. CVP water is pumped from the Jones Pumping Plant located northwest of the city of Tracy. The Jones Pumping Plant consists of six pumps that discharge water into the DMC, a gravity-flow canal located in the western San Joaquin Valley. The DMC travels south for 117 miles from the Jones

Pumping Plant to the Mendota Pool, a small reservoir at the confluence of the San Joaquin River and Fresno Slough. A portion of CVP water is diverted into the O'Neill Forebay and pumped into the San Luis Reservoir, a joint-use facility built and used by the state and federal governments to store water diverted from the Delta. The DMC capacity starts at 4,600 cfs in the northernmost section, decreases to 4,200 cfs upstream of the O'Neill Forebay, and is 3,200 cfs at the Mendota Pool.

The SWP is operated and maintained by the California Department of Water Resources (DWR) and conveys an annual average of 2.5 maf of water from northern California to agricultural and urban water users south of the Delta. Service areas for SWP contracting agencies are shown on Figure 1-1. SWP water is pumped into the California Aqueduct at the SWP Harvey O. Banks Pumping Plant (Banks Pumping Plant) near Tracy. The capacity of the aqueduct is 10,300 cfs, decreasing to 10,000 cfs as contractors divert water to the South Bay Aqueduct from Bethany Forebay. Currently, diversions into the Clifton Court Forebay (CCF) and the California Aqueduct are constrained to an average daily flow of 6,680 cfs, resulting in unused conveyance capacity.

Some conveyance and storage facilities are joint CVP/SWP facilities. Both the CVP and the SWP use the San Luis Reservoir, O'Neill Forebay, and more than 100 miles of the California Aqueduct and its related pumping and generating facilities. Reservoir releases and Delta exports must be coordinated to ensure that each project receives its share of benefit from shared water supplies and bears its share of joint obligations to protect beneficial uses. Operation of the Projects is governed by the Coordinated Operation Agreement (COA). The COA was authorized in 1986 and is both an operations agreement and a water rights settlement.

Delta-Mendota Canal Capacity Constraints

The Jones Pumping Plant and the DMC were originally designed to pump and convey about 4,600 cfs, and these facilities have routinely been operated at 4,600 cfs for many years. The operations of the Jones Pumping Plant are dictated not only by the design capacity, but also by tidal fluctuations at the Jones pumping plant and the capacity of the DMC south of Tracy. Because the DMC capacity upstream of Santa Nella and the pumping capacity at O'Neill Pumping Plant is about 4,200 cfs, additional Jones Pumping Plant pumping can presently be accommodated only if deliveries are made to contractors upstream of the O'Neill Pumping Plant. These factors reduce the opportunities for Reclamation to maximize its full design monthly average pumping rate of 4,600 cfs at Jones Pumping Plant during the fall and winter months.

The Intertie project would allow Reclamation to increase the maximum pumping at Jones Pumping Plant during the fall and winter months from about 4,200 cfs to about 4,600 cfs. This 400-cfs increase in maximum pumping therefore would

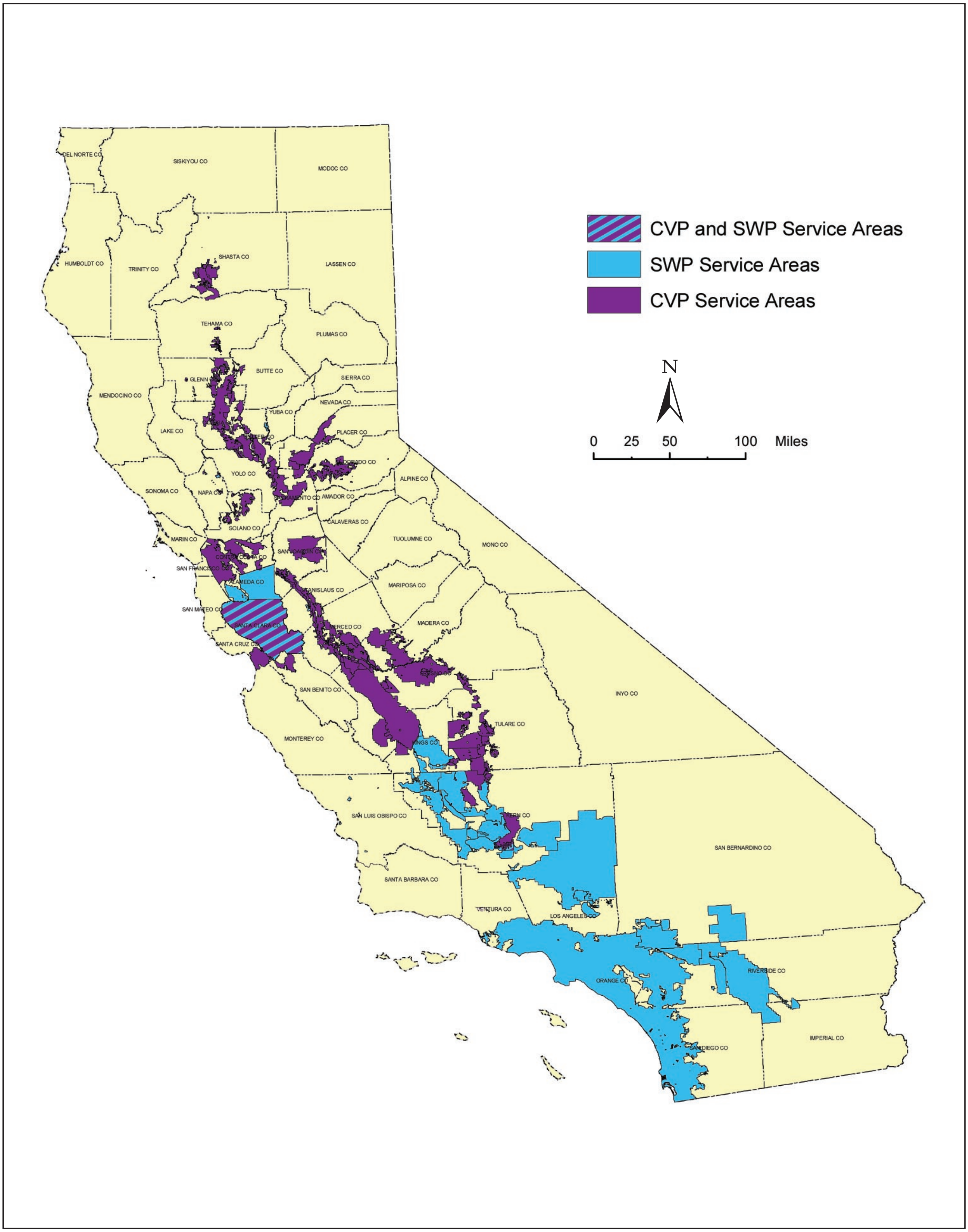

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Figure 1-1
State Water Project (SWP) and
Central Valley Project (CVP) Service Areas

increase the flow and velocities in the DMC intake channel by about 10%. This increased pumping flow would have some effects on the tidal elevations at the DMC intake and would have smaller effects on the tidal elevations, flows, and velocities in the south Delta channels. These tidal effects would be much smaller in other portions of the Delta.

The tidal hydraulic conditions in the Delta channels are governed by the same balance of gravitational and friction forces as the flows, velocities, and water elevations in the DMC. The hydraulic conditions in the DMC recently have been evaluated by Reclamation using the HEC-RAS model, developed by the U.S. Army Corps of Engineers (Corps) (Jonas and Associates and West Consultants 2004a).

The (upstream section) from the Jones Pumping Plant discharge at DMC mile 3.5 to Check 13 (DMC mile 70) was modeled. The DMC design flow (completed in 1952) was 4,600 cfs for the first 10 miles downstream from the Jones Pumping Plant discharge and decreased to 4,200 cfs at DMC mile 54, about 50 miles downstream of the Jones Pumping Plant. This area, from the Jones Pumping Plant to DMC mile 54 is considered the ‘upper DMC.’ The upper DMC was constructed with an average slope of about 4 inches/mile. The canal bottom elevation at the Jones Pumping Plant discharge is about 180 feet msl, and the canal bottom at Check 13 (O’Neill Pumping Plant) is about 158 feet msl. The bottom width is about 48 feet, and the design water depth is about 16.5 feet. With side slopes of 1.5:1 (i.e., 34°), the top width is 98 feet, the wetted perimeter is 106 feet, the conveyance area is about 1,150 square feet, the hydraulic radius is about 11 feet, and the design velocity is 3.7 feet per second (ft/sec). Twelve sets of radial gates (three gates with widths of 20 feet and open depths of 17 feet) are located along the canal to regulate water surface elevations. The canal is operated at a high water surface elevation to prevent maintenance problems caused by changing water pressures behind the canal lining. When the gates are raised, there are relatively small (0.25 foot) water elevation changes through the gates.

Flow in the DMC (and in Delta channels) is governed by the slope and hydraulic radius according to Manning’s hydraulic flow equation as:

$$\text{Velocity (ft/sec)} = 1.5/n * R^{2/3} * S^{1/2}$$

Where n is the friction factor (i.e., a value of about 0.015 for concrete), R is the hydraulic radius (i.e., area/perimeter) of about 11, and S is the water surface slope of about 0.00006.

The flow is the velocity times the conveyance area. A friction factor of 0.014 is needed to give a velocity of 4 ft/sec and a flow of 4,600 cfs with a depth of 16 feet. The DMC modeling suggested a friction factor of 0.016 provided the best match with measured surface elevation along most of the DMC. The DMC water velocity would be lower and the water depths would be greater with this higher friction factor.

The DMC modeling (Jonas and Associates and West Consultants 2004b) indicated that increasing the flow from 4,200 cfs to 4,600 cfs would raise the water surface elevation at the upstream end of the DMC about 2 feet. The DMC water elevation is almost overtopping the canal lining, and the water surface touches many of the bridges across the canal at full water surface elevation. The modeling suggests that 25 bridges or culvert crossings are within 6 inches of the maximum water surface elevations. The water surface elevation drops about 1 foot through the Mountain House Road Siphon (at DMC mile 4.5) which is a 24-foot-diameter tunnel 1,200 feet long.

The DMC lining was raised by 1.5 feet, from about 18 feet above the canal bottom to about 19.5 feet above the bottom, in 1965 to compensate for canal settling and various other factors. The canal lining was raised with tubular concrete bladders in 2002 along portions of the DMC to reduce overtopping spills. About 10 locations with a total length of 2 miles were raised about 6 inches along local “sags.” Locating the Intertie as close as possible to the upstream end of the DMC would allow the full design capacity of 4,600 cfs to be achieved more easily. The DMC is brim full at the design flow of 4,600 cfs. The DMC cannot convey more than 4,600 cfs.

Delta-Mendota Canal/California Aqueduct Intertie Background

A potential intertie to connect the DMC and the California Aqueduct was studied in 1988 by Westlands Water District and Reclamation. The original concept of an intertie involved a pumped connection between DMC and the California Aqueduct that would allow up to 600 cfs of CVP supplies to be diverted from the DMC to the California Aqueduct and conveyed either to San Luis Reservoir or directly to Westlands Water District. This concept was withdrawn before final environmental studies were completed. Additionally, the Intertie was proposed project to implement the California Bay-Delta Program described in the CALFED Programmatic Record of Decision (ROD) issued August 28, 2000. The Intertie is consistent with the implementation approach in the ROD.

The first use of a temporary intertie between the DMC and the California Aqueduct was during construction of the SWP. The South Bay Aqueduct and pumping plant in Bethany Forebay were built in stages between 1960 and 1969. Bethany Forebay reservoir was constructed in 1959–1961. The South Bay pumping plant was built between 1960 and 1969. For several years prior to completion of the Banks Pumping Plant in 1969, an intertie canal and pumping facility were constructed to connect the DMC Tracy Pumping Plant (since renamed as Jones Pumping Plant) headworks to the Bethany Forebay. This intertie canal and pumping facility has not been used in approximately 30 years. Portions of the canal have been removed, several structures have been permanently plugged or removed and the pumping plant is inoperable.

An emergency arose in spring 2001 that called for the installation of a temporary intertie in June 2001 because of damage to the canal lining of the California Aqueduct that affected water deliveries to SWP contractors. At that time, DWR met environmental compliance requirements and installed a temporary intertie. The temporary intertie used rented portable pumping equipment and pipelines to deliver about 100 cfs of SWP water supplies from the DMC to the California Aqueduct for about a 30-day period. This water was used to supply the South Bay Aqueduct pumping from Bethany Forebay (just as during the mid-1960s). Since the one-time operation of the temporary intertie in 2001, discussions have focused on a variety of options to restore capacity in the DMC and address outages and water delivery reductions that could occur as a result of pumping plant or conveyance outages on either the California Aqueduct or the DMC.

The Record of Decision for the CALFED-Bay Delta Program included the Intertie as a related action to the Preferred Program Alternative. Congress confirmed that the Intertie is an operation and maintenance activity in the 2004 “CalFed Bay Delta Authorization Act.” Pub.L 108-361, Title I, § 103(d)(2)(c)(i), 118 Stat. 1681 (Oct. 25, 2004).

1.6 Consultation and Coordination

1.6.1 Public and Agency Coordination

Public Involvement

Reclamation issued a news release on July 20, 2006, seeking public input on preparation of an EIS for the Intertie project. A Notice of Intent (NOI) announcing the preparation of an EIS was published in the Federal Register (FR) on July 12, 2006. Two scoping meetings were held to solicit written comments about the scope of the environmental review. A Sacramento meeting was held August 1, 2006, and a Stockton meeting was held August 3, 2006. Comments were received and incorporated as appropriate into this document. Additionally, a scoping report was prepared and is included as Appendix A.

Reclamation filed a Notice of Availability (NOA) for the draft EIS in the Federal Register on July 17, 2009. The draft EIS was circulated for public review for 45 days, during which time Reclamation held two public hearings (August 4 and 5, 2009). No oral comments were received during these hearings, but ten written comments were received during the public review period. These comments and accompanying responses are included as Volume III of this final EIS, which represents the next step in public involvement. This final EIS will be circulated for at least 30 days before Reclamation issues a record of decision (ROD).

Areas of Controversy

The scoping process and prior litigation revealed several areas of controversy surrounding the Proposed Action. The Proposed Action is controversial as it relates to diversions from the Delta and construction of facilities near the TANC California-Oregon Transmission Project (COTP). In the past several years, virtually any project proposal to change diversions in the Delta has been met with great resistance from a variety of agencies, organizations, and landowners depending on the specific proposal. It is assumed that the Intertie generates a similar level of controversy.

As described above, the Intertie was included in the consultation for OCAP. As such, restrictions on diversions outlined in the Operations BOs apply to the Intertie operations and would minimize or avoid adverse effects on fish related to the Intertie. These restrictions are adopted in this EIS as mitigation where an effect attributable to the Intertie is identified.

As described above, TANC submitted a comment letter during public scoping stating opposition to the proposed siting of the Intertie. In response, Reclamation has developed a Construction Safety Plan outlining the measures that will be implemented to avoid disruption of the transmission line and injury or death related to construction and maintenance of the Intertie facilities. These measures, as they apply to environmental effects disclosed in this EIS, have been incorporated into the project either as Environmental Commitments or as mitigation measures.

Additionally, the previous lawsuit brought by the Planning and Conservation League (PCL) on the EA for the Intertie indicates controversy related to the suit points:

- Use of CALSIM model as the only tool for evaluation of effects without disclosing the limitations of the model.
- Cumulative effects analysis that did not include all reasonably foreseeable projects.
- Determination of significance based on a percentage change.

Reclamation has addressed each of the identified areas of controversy through changes in the project, impact assessment, and inclusion of measures required for ESA compliance.

1.6.2 Agency Coordination and Consultation

As part of the development of the Intertie, Reclamation has coordinated with several agencies, including USFWS, DWR, and cooperating agencies. Reclamation has coordinated with USFWS for development of the Coordination Act Report (CAR) and consultation under Section 7 of the ESA (OCAP) and with

DWR to obtain right-of-way access on the California Aqueduct. Coordination with the cooperating agencies is described below.

Cooperating Agencies

The Western Area Power Administration (Western) has participated in the preparation of this EIS in regards to the interconnection and the construction and operation of the new transmission line associated with Alternatives 2 and 3. They will use this EIS as their NEPA compliance document for construction and operation of the new transmission line and a new point of delivery on Western's system for delivery of power for the Intertie.

The Authority is the local project proponent for the Intertie, and will be responsible for its construction. They have participated in the preparation of this EIS.

Consultation

Table 1-1 summarizes the status of consultation and other requirements that must be met by Reclamation before the Proposed Action can be completed.

Table 1-1. Summary of Environmental Compliance for the Proposed Action

Requirements	Status of Compliance/Expected Completion
National Environmental Policy Act	Ongoing as part of this document.
Federal Endangered Species Act	Reclamation has received BOs from NMFS and FWS for long-term operations of the CVP, which includes the Intertie.
Magnuson-Stevens Fishery Conservation and Management Act	Reclamation has complied with Magnuson-Stevens Act regulations through the OCAP consultation process. The NMFS Operations BO (National Marine Fisheries Service 2009) includes consultation on Essential Fish Habitat.
Fish and Wildlife Coordination Act	USFWS provided a Coordination Act Report (CAR) for the project in November 2004 and the recommendations in the report were incorporated into the final EA/IS for the Proposed Action. Additionally, USFWS prepared a CAR in April 2009 for the updated project (as described in this EIS). Several of the recommendations were incorporated into the mitigation measures in this EIS.
Migratory Bird Treaty Act	Reclamation will comply with provisions of the Migratory Bird Treaty Act.
Clean Air Act	The Intertie incorporates measures consistent with the applicable Air Quality Management Districts.

Requirements	Status of Compliance/Expected Completion
National Historic Preservation Act	Reclamation consulted with the SHPO regarding the Proposed Action on January 25, 2005. The SHPO concurred with Reclamation that efforts to identify historic properties in the APE were adequate and that no historic properties would be adversely affected by the Proposed Action.
Uniform Building Code	Reclamation will comply with the Uniform Building Code.
Executive Order 13112—Prevention and Control of Invasive Species	The environmental commitments in Chapter 2 of this document include measures to avoid and minimize the introduction and spread of invasive plants into and from the project area for the Proposed Action.
Executive Order 12898—Environmental Justice	No minority or low-income areas or communities would be disproportionately affected by the Proposed Action.

1.7 Relationship between Short-Term Uses and Long-Term Productivity

NEPA requires that the local short-term benefits of implementing any of the project alternatives be compared to the maintenance and enhancement of long-term productivity (42 U.S. Government Code [USC] 4332; 40 Code of Federal Regulations [CFR] 1502.16). The Intertie has been proposed to improve the DMC conveyance conditions that restrict the Jones Pumping Plant to less than its monthly average pumping capacity of 4,600 cfs, thus contributing to long-term productivity related to the use of the CVP water that can be pumped as a result of the Intertie.

The short-term effects as a result of implementation of project alternatives include construction-related emissions and effects on aquatic and terrestrial species in the project area, and the conversion of agricultural and/or open space lands. A small amount of agricultural land would be permanently converted within the Alternative 3 footprint; however, this represents a small amount of the total area of agricultural lands within the project area. The short-term effect on air quality would occur only during project construction. The small loss in agricultural land would not result in the loss of the long-term productivity of remaining agriculture lands.

1.8 Irreversible and Irretrievable Commitments

This section fulfills the requirement to address irreversible and irretrievable commitments of resources. Irreversible impacts are those that cause, through direct or indirect effects, use or consumption of resources in such a way that they cannot be restored or returned to their original condition despite mitigation. Potentially irreversible impacts are documented in this report. An irretrievable impact or commitment of resources occurs when a resource is removed or consumed. These types of impacts are evaluated to ensure that consumption is justified.

Irreversible commitments of resources would result from implementing project Alternatives 2, 3, or 4. These resources include:

- construction materials;
- labor;
- energy needed for construction, operation, and maintenance; and
- minor land conversion of open space, agricultural, and natural environments.

Land uses that would be irreversibly committed include agricultural land and open space. The loss of agricultural land occurs only under Alternative 3 and is minimal, and affects lands currently fallowed. However, this conversion of some agricultural lands to nonagricultural uses is considered an irreversible and irretrievable commitment of resources.

1.9 Organization of This Document

The content and format of this final EIS are based on NEPA requirements and standard practices and evaluate the project’s effects on the following resources:

- Section 3.1, Water Supply and Delta Water Management;
- Section 3.2, Delta Tidal Hydraulics;
- Section 3.3, Delta Water Quality;
- Section 3.4, Geology and Soils;
- Section 3.5, Transportation;
- Section 3.6, Air Quality;
- Section 3.7, Noise;
- Section 3.8, Climate Change Effects;
- Section 4.1, Fish;
- Section 4.2, Vegetation and Wetlands;
- Section 4.3, Wildlife;
- Section 5.1, Land Use
- Section 5.2, Power Production and Energy;
- Section 5.3, Aesthetics and Visual Resources;

- Section 5.4, Cultural Resources;
- Section 5.5, Hazards and Hazardous Materials;
- Section 5.6, Socioeconomics;
- Section 5.7, Indian Trust Assets;
- Section 5.8, Utilities and Public Services;
- Section 5.9, Environmental Justice;
- Chapter 6, Cumulative Impacts; and
- Chapter 7, Growth-Inducing Impacts.

Appropriate setting information and a discussion of adverse effects are provided for each resource. Additionally, the changes in water supply, Delta water management (Section 3.1), and Delta tidal hydraulics (Section 3.2) are described to provide information for the assessment of effects on the resources listed above. Volume III contains the comments received during public review of the draft EIS and Reclamation’s responses to these comments.

1.10 Resources Eliminated from Detailed Discussion

Some resources are not expected to be affected by either the construction or operation of the Proposed Action and alternatives. The reasons these resources are not discussed in detailed are explained below.

1.10.1 Navigation

Navigation would not be affected by the Proposed Action because none of the project components would be constructed in, or alter, a navigable waterway. Additionally, the small changes that could occur as a result of operating any of the action alternatives would not result in changes in navigation in the affected channels. Therefore, navigation is not included for detailed discussion.

1.10.2 Population and Housing

No changes in population or housing would occur as a result of implementing any of the alternatives. The construction of the Intertie would not require new housing and would not result in changes in population. Similarly, the installation of the temporary Intertie during emergencies would not require new housing or result in an increase or change in population. Operating neither the Intertie nor the temporary Intertie would require housing, and neither would change populations in the Intertie area or in the services areas. Therefore, population and housing are not discussed further. However, Chapter 7 specifically addresses the potential for indirect growth-inducing effects.

1.10.3 Recreation

The alternatives would not result in changes in recreation or require the construction of new recreational facilities. The alternatives would be installed or constructed in an area that is currently used only to access the DMC, and would not result in changes in upstream or downstream water levels that could affect recreational opportunities. Therefore, recreation is not discussed in further detail.

Chapter 2 Project Description and Alternatives

2.1 Introduction

Reclamation is considering the implementation of the Intertie to provide operational flexibility and address operations and maintenance constraints of the CVP just south of the Jones Pumping Plant. The Intertie action alternatives are intended to satisfy the project purpose and needs of meeting current water supply demands, allowing for the maintenance and repair of the CVP Delta export and conveyance facilities without water supply interruptions to the upper DMC contractors, and providing operational flexibility to respond to emergencies related to both the CVP and the SWP.

2.2 Alternatives Development

The Jones Pumping Plant and the DMC were designed to pump and convey about 4,600 cfs. The operations of the Jones Pumping Plant are dictated not only by the design and permitted limits, but also by the tidal fluctuations at the Jones Pumping plant and the capacity of the DMC south of Jones Pumping Plant. Because the DMC capacity upstream of Santa Nella and the pumping capacity at O'Neill Pumping Plant is about 4,200 cfs, additional Jones Pumping Plant pumping can be presently accommodated only if deliveries are made to contractors upstream of the O'Neill Pumping Plant. These factors reduce the opportunities for Reclamation to utilize its maximum monthly average pumping rate of 4,600 cfs at Jones Pumping Plant during the fall and winter months.

As such, alternatives to allow Reclamation to maximize pumping were evaluated. Ultimately, the construction and operation of an intertie between the California Aqueduct and the DMC was proposed. Locations were evaluated based on their ease of access, length between the California Aqueduct and the DMC, geological conditions, distance from Jones Pumping Plant, and other physical factors.

The EA (Bureau of Reclamation 2004) evaluated the Proposed Action, an Intertie connection between Mile 7.2 of the DMC and Mile 9 of the California Aqueduct. This EIS also evaluates an alternate location for the same structure (Alternative 3) farther south. This alternative was suggested by TANC as a result of their concerns with the Proposed Action's location relative to the COTP. Additionally, a less permanent alternative is evaluated (Alternative 4) that utilizes Banks Pumping Plant capacity to pump the 400 cfs that cannot be conveyed after Jones Pumping Plant.

Alternative 2 is the Proposed Action and the Preferred Alternative due to its proximity to the Jones Pumping Plant, the short distance between the California Aqueduct and DMC in this location, and the water supply reliability it provides.

2.3 Alternative 1 (No Action)

NEPA requires the lead agency to analyze a no action alternative. This alternative represents the future conditions without the Proposed Action or alternatives. Under the No Action Alternative, the Intertie between the DMC and California Aqueduct would not be constructed or operated, and CVP operations would continue without the use of an intertie connection to the California Aqueduct. It is anticipated that maintenance and repairs to the DMC would increase, water supply deliveries would be interrupted during O&M activities, and conveyance capabilities would continue to be constrained.

The No Action Alternative assumes that project operations would continue under the existing regulatory and legal constraints. Because the No Action Alternative represents future conditions, it is possible that other actions may take place and projects may be constructed and implemented in the foreseeable future that could affect environmental resources absent the Proposed Action. NEPA requires the disclosure of effects that these foreseeable actions may have on environmental resources. These effects are discussed in Chapter 6, “Cumulative Impacts,” of this EIS.

2.4 Alternative 2 (Proposed Action)

Alternative 2 (Intertie) is the Proposed Action. The site of the Proposed Action is in an unincorporated area of the San Joaquin Valley in Alameda County, west of the city of Tracy (Figure 2-1). The site is in a rural area zoned for general agriculture and is under federal and state ownership. Alternative 2 consists of constructing and operating a pumping plant and pipeline connection between the DMC and the California Aqueduct at Mile 7.2 of the DMC and Mile 9 of the California Aqueduct, where the DMC and California Aqueduct are approximately 500 feet apart (Figure 2-2).

The Intertie would allow the DMC and California Aqueduct to share conveyance capacity and could be used to convey water in either direction. To convey water from the DMC to the California Aqueduct, the Intertie would include a pumping plant at the DMC that would allow up to 467 cfs to be pumped from the DMC to the California Aqueduct via an underground pipeline. This additional 467 cfs would allow the Jones Pumping Plant to pump at its designed maximum monthly average rate of about 4,600 cfs. Additionally, water could be conveyed from the California Aqueduct to the DMC. Because the California Aqueduct is approximately 50 feet higher in elevation than the DMC, up to 900 cfs flow could be conveyed from the California Aqueduct to the DMC through the Intertie using

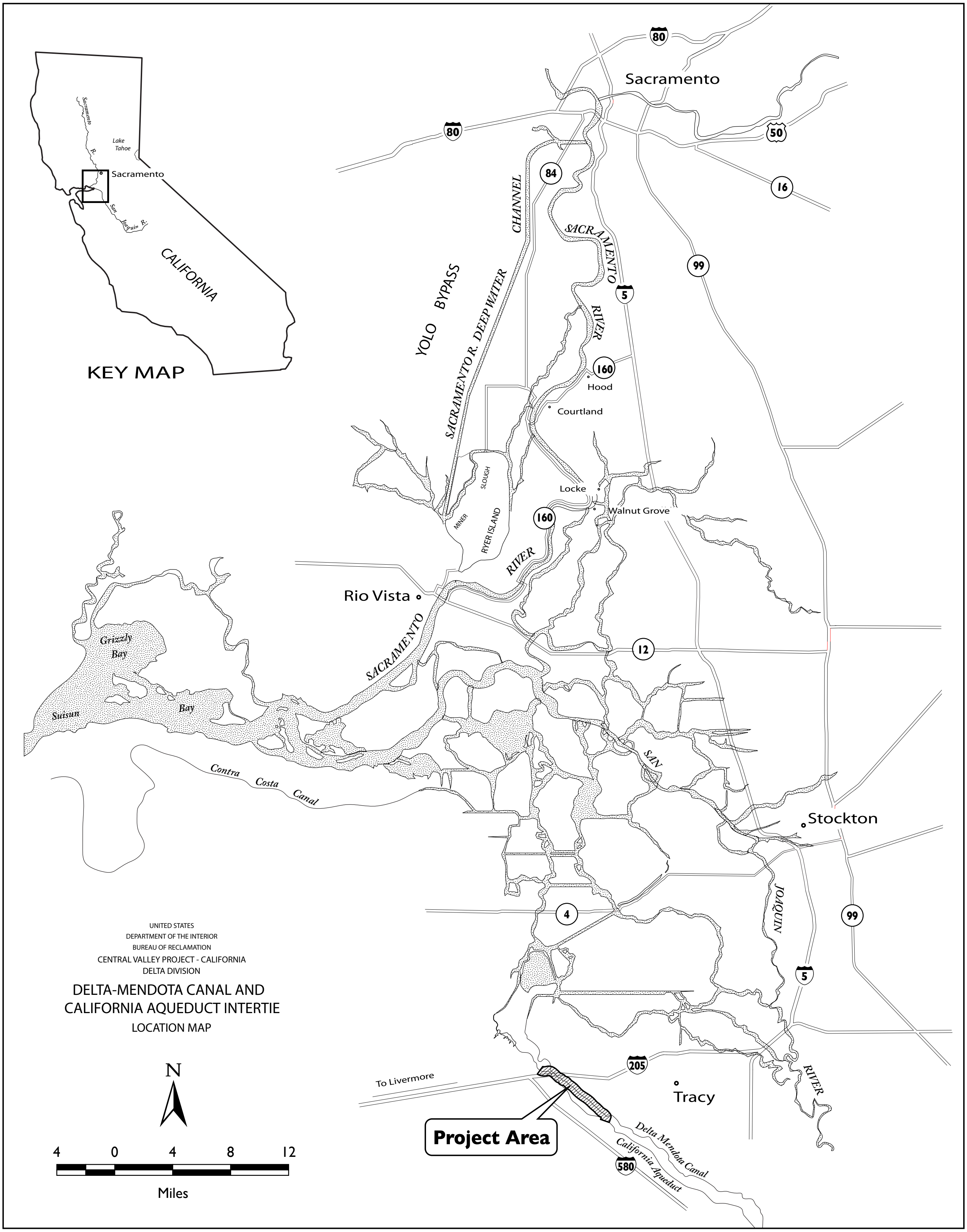

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Figure 2-1
Regional Location Map

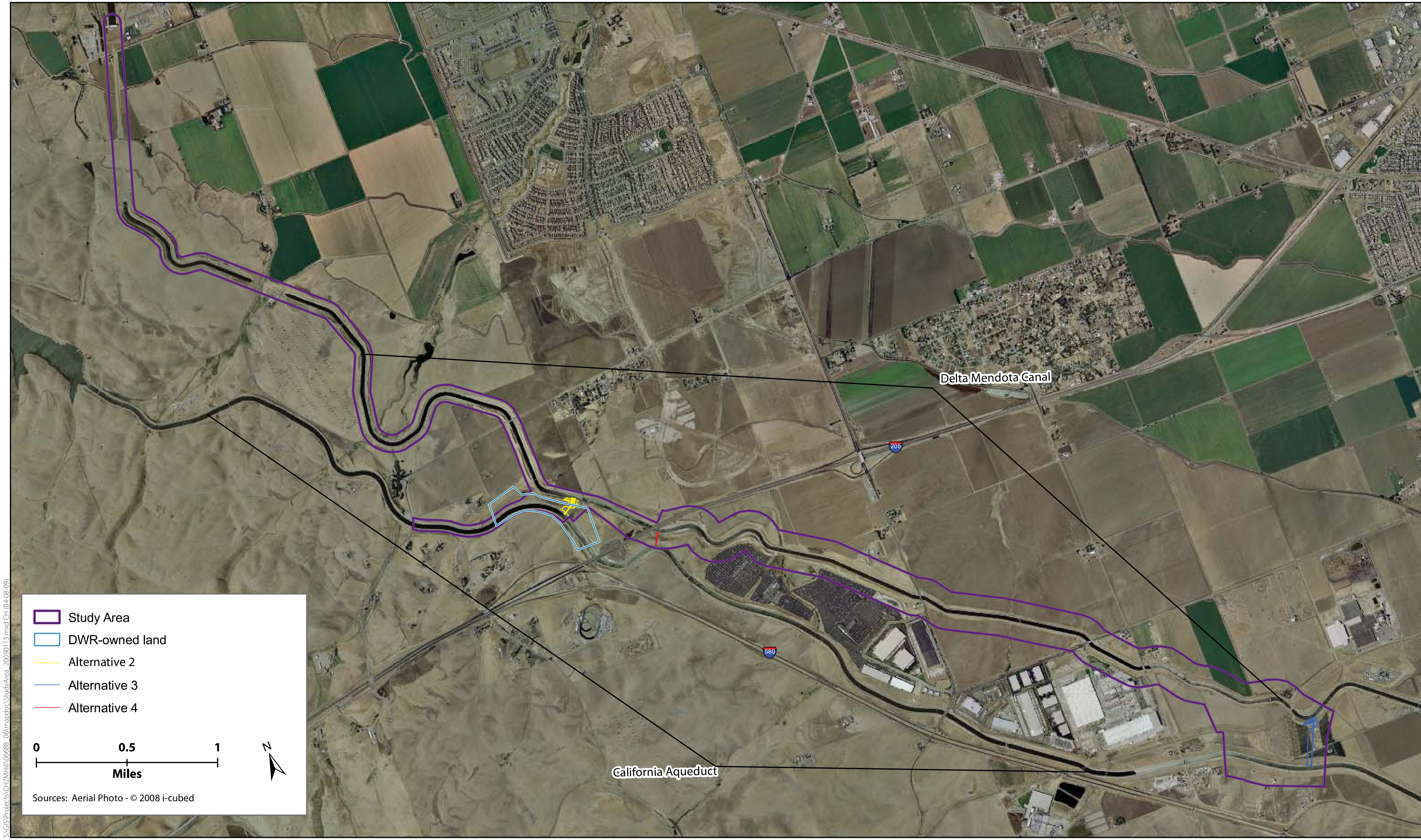

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Figure 2.2
Project Study Area

gravity flow. The operations of the Intertie would be subject to all applicable export pumping restrictions for water quality and fisheries protection.

The Intertie would be owned by the federal government and operated by the Authority. An agreement among Reclamation, DWR, and the Authority would identify the responsibilities and procedures for operating the Intertie. Reclamation would obtain a permanent easement for the portion of the Intertie alignment that is constructed on the state property (Figures 2-2 and 2-3).

2.4.1 Design

The primary project component of the Intertie would be a pumping plant with a total pumping capacity of 467 cfs, although the maximum average monthly pumping is expected to be around 400 cfs. Figure 2-3 shows a preliminary site plan. The Proposed Action would involve the installation of four electrically powered pumping units, each rated at 116.7-cfs capacity, within the pumping plant structure. Water would be withdrawn from the DMC through a conventional-style intake structure consisting of four bays (one bay for each of four pump units) with trashracks mounted flush with and parallel to the existing canal sideslope. Each intake bay would contain stoplog slots to allow isolation of the intake structure from the pumping plant sump. Water would be pumped uphill a vertical distance of about 50 feet through belowground pipelines and discharged into the California Aqueduct.

A switchyard would be located northwest of the pumping plant. A new power transmission line would be extended to the new switchyard site from the Tracy switchyard located 4.5 miles to the north. The O&M roads along the DMC and California Aqueduct would be realigned to accommodate project structures. A new access road would connect the DMC and California Aqueduct, and a service yard would be constructed adjacent to the pumping plant. The road would be 16–20 feet wide and surfaced with gravel. Guardrails, drainage culverts, and suitable erosion control measures would be installed as necessary for safety and controlling surface runoff. A pre-engineered steel building would be constructed at the southeast end of the project site and would house the pumping plant units and motor control equipment. A 9-foot-high chain link security fence with razor wire on top would be installed around the pumping plant and associated facilities. The exterior of the facilities would be lighted.

2.4.2 Construction Activities

Construction of the Intertie would be completed within approximately 12–15 months after award of the construction contract. Construction activity would occur 8–10 hours per day, 6 days per week.

DMC Pumping Plant, Intake Structure, and Pipeline

Construction activity would begin with site excavation for the pumping plant. A sheet pile cofferdam would be installed on the DMC and dewatered to allow construction of the pumping plant intake. It is anticipated that the contractor would use a vibratory hammer for sheet pile installation for a period of 8 to 10 hours per day; cofferdam construction for the DMC intake would take approximately 6 days. The cofferdam would be dewatered prior to the removal of the canal lining. Once this is accomplished, excavation for the pumping plant intake would proceed. Relatively deep excavation would be required at the intake site. The excavation sideslopes would be shored using sheet piling. A dewatering system would be installed outside as necessary to maintain reduced groundwater levels in the construction area. These measures would ensure the stability of the excavation and allow construction to proceed in dry conditions. It is estimated that construction of the intake structure floors and walls would take 47 days. Installation of the pumping plant floor slabs also would occur during this period.

Following construction of the intake structure and pumping plant floor, construction of the pumping plant would continue, as would the installation of the pumping plant discharge lines. Each pair of pumping units would be connected via a manifold to a 9-foot-diameter discharge pipe. A flow measurement structure would be located midway between the pumping plant and the intake structure to allow monitoring of flow rates in each pipe.

Cumulatively, construction of the pumping plant, intake structure, and associated components (e.g., trashracks, bulkhead gates, pumps and valves) would take approximately 200 days and would extend from April through September. Roads and a parking lot at the site would be constructed in mid-September. The construction of the pumping plant, intake structure, and pipeline would require a maximum construction crew of 24 people.

Construction of the intake structure on the DMC and the turnout on the California Aqueduct likely would require lowering the water surfaces of both canals. To minimize impacts on water deliveries, these drawdowns would be timed to occur during periods of lower demand and would be limited in duration.

Two discharge pipes would cross under the California Aqueduct O&M road and connect to the California Aqueduct turnout. Motor-operated slide gates would be mounted over each discharge pipe at this structure. Installation of the pipeline and associated structures would take approximately 46 days and would extend from July through August, using a maximum construction crew of 10 people.

Excavated material not reused in permanent construction would be disposed of in spoilbanks in the federal and state right-of-way land between the two canals. The exact location of the new spoilbanks has not been determined, but they would be placed adjacent to the existing spoilbanks and canal embankments within 2,600 feet of their point of origin. They would not be placed where they would

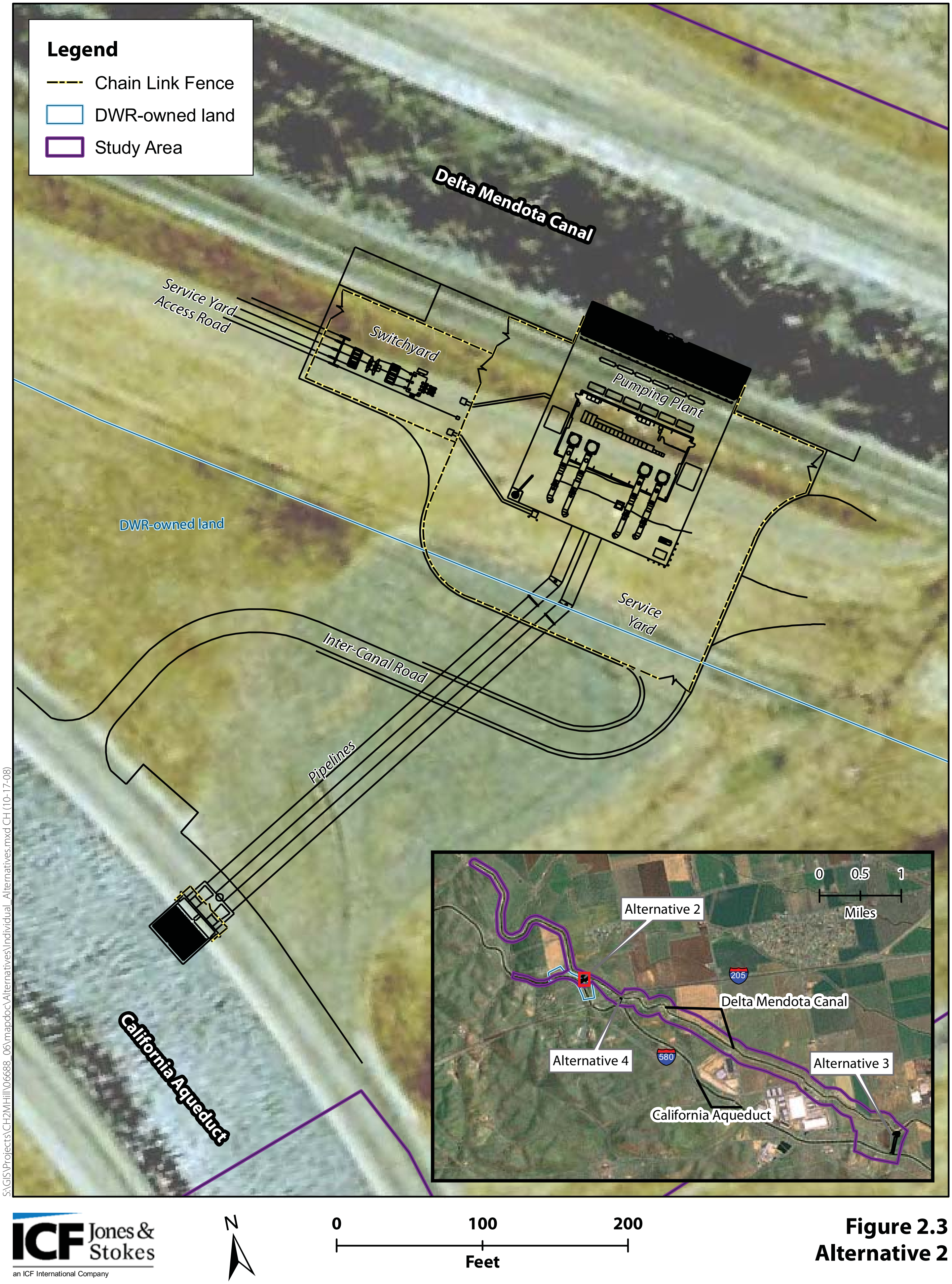

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Figure 2.3
Alternative 2

result in an effect on any sensitive resources such as wetlands or cultural resources. The potential footprint has been surveyed and no resources are within the footprint of the Proposed Action. No material would be hauled or disposed of outside the right-of-way.

Staging and stockpile areas would be located in flat areas along the federal right-of-way on both the sides of the canal. Areas disturbed by construction activities would be restored by grading and revegetating at the completion of construction. During construction, these areas would be controlled using best management practices (BMPs) to minimize potential temporary erosion effects.

Construction of the pumping plant, intake structure, and pipeline would require backhoe and front-end loaders, excavators, dump trucks, a crane, vibratory compactor, vibratory pile hammer, concrete mixers, and boom and scissor lifts. A 10-ton flatbed truck and pickup trucks would deliver materials and equipment. Additional equipment to be used includes a roller, trailer-mounted diesel pump, air compressor, generator, and welder. Construction materials would include contractor offices and various support facilities; pipe, pumps, valves, and other permanent machinery and equipment; temporary equipment such as dewatering systems; and imported earth materials such as gravel and asphalt. Portable generators and air compressors would be used at the pumping plant until the structure is complete and permanent power is installed.

California Aqueduct Turnout Structure

Initial excavation for the California Aqueduct turnout would begin after construction at the pumping plant site is initiated. As with the DMC intake site, relatively deep excavations would be required at the California Aqueduct turnout site. The excavation sideslopes would be shored using sheet piling, and a dewatering system would be installed as necessary to maintain reduced groundwater levels in the construction area.

A prefabricated steel cofferdam would be trucked to the turnout site, and lifted and positioned with a crane at the California Aqueduct. Complete installation of the cofferdam would require approximately 10 days. The turnout cofferdam then would be sealed and dewatered prior to removal of the aqueduct lining. Further excavation for the turnout structure then would proceed. It is estimated that construction of the turnout would take 52 days. Trashracks, grating, slide gates, and bulkhead gates then would be installed over a period of approximately 7 days. The cofferdam would be removed once the gates are tested and the turnout structure is completed. With the gates installed and the canal lining repaired, the cofferdam would be removed.

Installation of the turnout structure and associated components would extend from the end of April through mid-August for approximately 94 days, with a maximum construction crew of 12 people.

Construction equipment would include a grader, excavator, dump truck, crane, vibratory compactor, air compressor, generator, loaders, and concrete mixers. Delivery vehicles, such as pickup trucks and a 10-ton flatbed truck, would deliver preassembled components such as the bulkhead and turnout gates and additional construction materials to the turnout site.

Switchyard

The new switchyard would be located adjacent to the pumping plant on the northwest side. Construction of the switchyard would begin with excavation and fill for the switchyard followed by excavation for the pull boxes. Gates and fencing for the switchyard would be constructed once excavation is completed. A 480-volt engine-generator would be installed as well as a fire detection and suppression system.

Construction of the switchyard and installation of associated electrical equipment would take an estimated 107 days and would extend from mid-July through October, with a maximum construction crew of 8 people.

Construction equipment would include a forklift, excavator, vibratory compactor, roller, grader, crane, dozer, concrete mixer, loaders, and dump trucks. In addition, a water truck would be used to control dust.

Transmission Line

To supply the Intertie with power, a new overhead 69-kilovolt (kV) transmission line connecting to the Tracy substation would be constructed. The transmission line would run parallel to the DMC for approximately 4.5 miles and be built entirely on the west side of the canal. The line would be constructed using approximately 51 wood poles and 25 glue laminate poles, which would be placed in augered holes in the spoil piles from the construction of the canal. The holes would be no more than 3 feet, 5 inches in diameter and approximately than 14 feet in depth, supporting poles approximately 61 feet tall. Although span lengths will vary according to ground and alignment conditions, it is estimated that the average span length across straight segments of the transmission line would be approximately 300 feet.

Typically, following soil excavation/extraction, structure installation is done in three distinct steps: (1) vehicles traverse the transmission line right-of-way delivering materials at each structure site, such as poles, steel, hardware, etc; (2) once the materials are at each site, the structures are assembled prior to erection; and (3) the structures generally are erected with a large crane. The majority of the extracted dirt would be backfilled and compacted to support the poles. The remainder would be placed back onto the spoil piles. Wood poles would be further stabilized by guy wires anchored 50–60 feet from the pole's base. Conductor, fiber optic cable, and optical ground wire would be strung on these poles. Transmission line installation would result in a permanent ground disturbance of approximately 3 to 13 square feet for each pole; the total permanent ground disturbance for the entire transmission line would be 0.005 to 0.02 acre. These estimates are based on a permanent ground disturbance diameter of 2 to 4 feet for each pole.

Temporary staging and stockpile areas would be required to store construction equipment and other construction-related material. Typical construction equipment would include a drill rig, grader, backhoe, loader, dozer, aerial lift truck, line trucks, pole and cable trucks, utility trucks, puller/tensioners, and a crane. Delivery vehicles such as flatbed trucks generally would be used to deliver preassembled and additional support structure components to each pole site. In addition, a water truck would be used to control dust. Construction of the transmission line would take approximately 40 work days.

As described above, there are no sensitive resources within the footprint of the project. Areas disturbed by construction activities would be restored by grading and revegetating at the completion of construction. BMPs to minimize potential temporary erosion effects during construction will be incorporated in the project.

2.4.3 Operation

During startup, the pumping plant would be operated in manual and local automatic mode. Shortly after startup, installation of supervisory control and data acquisition (SCADA) equipment would allow the facility to operate in full automatic mode and would integrate data feedback to the Delta and CVP Operations Centers to facilitate overall system operations. Prior to any operations, Reclamation will seek approval from DWR for the introduction of water into the California Aqueduct. The Intertie would be used under three different scenarios:

1. Up to 467 cfs would be pumped from the DMC to the California Aqueduct to help meet water supply demands of CVP contractors or be stored in the CVP portion of San Luis Reservoir for later release to meet CVP demands. This would allow Jones Pumping Plant to pump to its full-design monthly average capacity of 4,600 cfs in the fall and winter months, subject to all applicable export pumping restrictions for water quality and fishery protections. As modeled and analyzed for this EIS, the Intertie would be operated primarily in September through March.
2. Up to 467 cfs would be pumped from the DMC to the California Aqueduct to minimize impacts on water deliveries attributable to temporary restrictions in flow or water levels in the DMC south of the Intertie, or the California Aqueduct north of the Intertie, for system maintenance or because of an emergency outage.

3. Up to 900 cfs would be conveyed from the California Aqueduct to the DMC using gravity flow to minimize impacts on water deliveries attributable to temporary restrictions in flow or water levels in the California Aqueduct south of the Intertie, or the DMC north of the Intertie, for system maintenance or for an emergency outage of the DMC, Jones Pumping Plant, or Tracy Fish Facility.

During normal Intertie use, water in the DMC would be conveyed to the California Aqueduct via the Intertie. Water diverted through the Intertie would be conveyed through the California Aqueduct to O'Neill Forebay. The CVP water reaching O'Neill Forebay could be pumped into CVP San Luis Reservoir, released to the San Luis Canal and the Dos Amigos pumping plant, or released through the O'Neill Pumping Plant to the section of the DMC south of O'Neill Pumping Plant (lower DMC) and Mendota Pool.

Under reverse flow operations, water would be withdrawn from the California Aqueduct using gravity flow. The pumping plant would incorporate reverse flow pipelines and valves that would bypass the pumping units and discharge directly into the pumping plant sump. The Intertie would provide operational flexibility in using the conveyance capacity of the DMC and the California Aqueduct. These operations would not result in changes to authorized or permitted levels of pumping or capacity of the Jones Pumping Plant or Banks Pumping Plant.

Water conveyed through the Intertie to minimize reductions in water deliveries during system maintenance or an emergency outage of any portion of the CVP or SWP Delta export and conveyance facilities could include pumping CVP water at Banks Pumping Plant or pumping SWP water at Jones Pumping Plant through use of Joint Point of Diversion (JPOD). In accordance with COA Articles 10(c) and 10(d), JPOD may be used to replace conveyance opportunities lost because of scheduled maintenance or unforeseen outages. Use of JPOD for this purpose could occur under Stage 2 operations defined in D-1641 or could occur as a result of a Temporary Urgency request to the State Water Board. Use of JPOD for this purpose does not result in any net increase in allowed exports at CVP and SWP export facilities. Use of Stage 2 JPOD requires review and approval by the State Water Board.

2.4.4 Transmission Line Inspection and Maintenance

Periodic inspection activities may include ground and aerial patrols along the transmission line right-of-way. Inspections generally would involve visual evaluations of components such as conductors, transmission line support structures, and hardware.

Routine minor maintenance within the transmission line right-of-way would include, but would not be limited to, the following activities:

- pole and guy wire–anchor maintenance;

- insulator maintenance;
- cross arms maintenance;
- vegetation clearance, as needed, around poles and guy-wire anchors;
- vehicle and equipment staging; and
- conductor upgrade/maintenance.

These maintenance tasks, as well as other preventive maintenance, would cause no or nominal effects on sensitive resources with the implementation of BMPs. Maintenance equipment may include, but would not be limited to, aerial lift trucks, line trucks, steel-tracked and/or rubber-tired bulldozers, graders, backhoes, and front-end loaders.

2.5 Alternative 3 (TANC Intertie Site)

Alternative 3 is similar in design to the Proposed Action and the same in operation. The only difference is the location of the Intertie and appurtenant structures. The TANC Intertie Site alternative was developed in response to scoping comments submitted by TANC, which requested that the Intertie site be relocated to avoid high-voltage transmission lines. TANC identified two options for alternative sites. Option 1 is evaluated in this EIS because it is most similar in length and distance from the Jones Pumping Plant. Alternative 3 would be located at Milepost 11.6 of the DMC and Milepost 13.8 of the California Aqueduct, where these facilities are approximately 1/4 mile apart (Figure 2-2).

2.5.1 Construction

Construction activities associated with Alternative 3 would be the same as described for Alternative 2. Similar to Alternative 2, Alternative 3 includes the construction of a new transmission line to connect to the Tracy Substation. This transmission line would be longer than the line for Alternative 2 because the Intertie structure is farther from the substation and would cross Interstate 205 (I-205). Approximately 152 poles would be installed for the transmission line; therefore, more excavation would be required to install the additional poles. Total permanent ground disturbance for the entire transmission line would be approximately 0.01 to 0.04 acre. This estimate is based on a permanent ground disturbance diameter of 2 to 4 feet for each pole.

2.5.2 Operation

Operation of Alternative 3 would be the same as described for Alternative 2.

2.6 Alternative 4 (Virtual Intertie)

Alternative 4 (Virtual Intertie) would use Banks Pumping Plant capacity not used by SWP for Table A deliveries to pump the increment of CVP water that cannot be conveyed in the DMC without the Intertie. This would use some of the available pumping and conveyance capacity of the SWP. CVP operations at Jones Pumping Plant therefore would not change. Under the Virtual Intertie alternative, the CVP would use the Banks Pumping Plant to convey CVP water to O'Neill Forebay and CVP San Luis Reservoir.

The permitted pumping capacity at Banks would not change from the No Action Alternative. Under the No Acton Alternative, available CVP water for export that cannot be pumped at Jones because of the DMC conveyance limitations is treated as unused federal share under the COA and can be exported by the SWP at Banks. This water, released from upstream CVP reservoirs for instream or temperature control flows, is often more than is required for Delta outflow and the maximum pumping capacity at the Jones Pumping Plant.

During emergencies, a temporary intertie-like structure would be installed to connect the DMC with the California Aqueduct. This structure would be similar to the structure installed in 2001.

2.6.1 Location and Design

No new facilities other than the temporary intertie would be needed to implement the Virtual Intertie. The temporary intertie would be located approximately 0.5 mile south of the Proposed Action at milepost 7.69 of the DMC and at milepost 9.70 of the California Aqueduct (Figure 2-2) and would be accessible only at the intersection of Mountain House Parkway/Patterson Pass Road and the DMC. The temporary intertie would be installed as needed during emergencies and O&M activities. Figure 2-4 provides a preliminary site plan.

The temporary intertie would use rented portable pumping equipment, piping, and associated accessories. This equipment would be hauled to the site on flatbed trailers. If necessary, the site would be re-graded to create a level pad for the pumps to allow them to be positioned close to the DMC water surface. Similarly, grading near the California Aqueduct may be necessary in order to minimize the elevation difference between the DMC and the California Aqueduct, and thereby reduce the height the pumps need to lift the water. The pumps then would be positioned on the leveled pad near the DMC, and 10 diesel-powered pumps would be hoisted into position with a crane. Each pumping unit would require a suction pipe to be installed in the DMC, and approximately 400 feet of discharge pipe would be positioned on the ground and would extend from the pump outlet to the discharge site in the California Aqueduct. It is estimated that pump and pipe installation would require 5 days. Each pump would have a self-contained diesel-fuel storage tank that would be refilled daily during the period of operation.

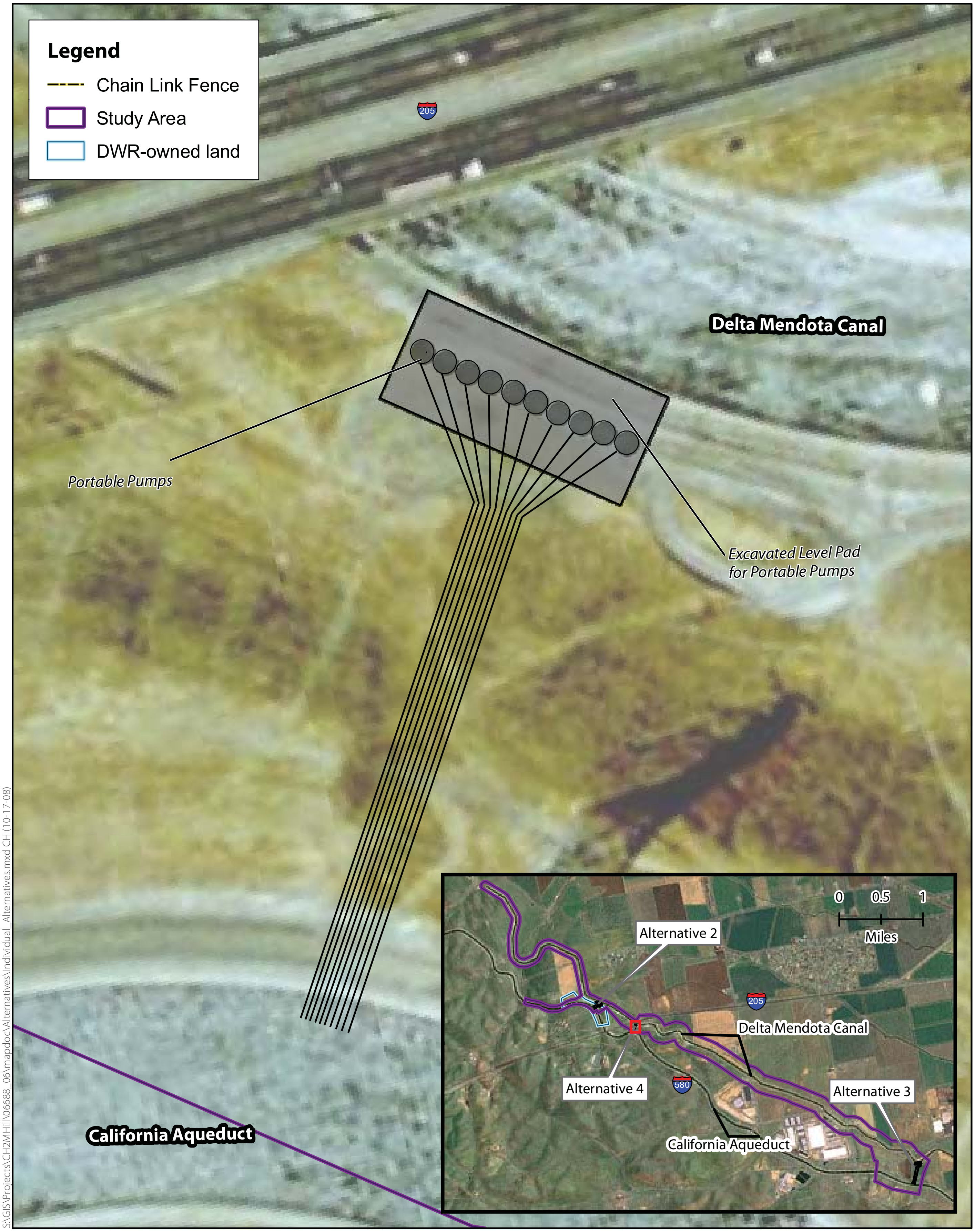

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Figure 2.4
Alternative 4

When not needed, pumps, piping, and accessories would be loaded onto flatbed trucks with a crane and hauled away. The site would be cleaned and restored in a manner that would allow the temporary intertie to be easily reestablished without significant effort. The leveled pumping pad would remain in place.

2.6.2 Operation

Under the Virtual Intertie Alternative, the CVP would be given up to 400 cfs of priority capacity at Banks to pump water that is released from CVP project reservoirs and is available for CVP pumping under the COA allocation rules. This additional capacity would be allowed during the period from September through March when Jones Pumping Plant typically cannot pump at full capacity.

2.7 Summary Comparison of Alternatives

This section provides a summary of how each alternative meets the project purpose and a comparison of the effects associated with each of the project alternatives. Full discussion of effects on resources may be found in the specific resource sections in Chapters 3, 4, 5, and discussion of cumulative and growth-inducing impacts may be found in Chapters 6 and 7, respectively. Table 2-1 provides an overview of the comparison of alternatives.

Table 2-1. Comparison of Relative Effects under Each Alternative

Item	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3 (TANC Intertie Site)	Alternative 4 (Virtual Intertie)
Attainment of Objectives				
Improve the DMC conveyance conditions that restrict the Jones Pumping Plant	0	+	+	+
Improve operational flexibility for the CVP and the SWP	0	+	+	+
Affected Environment				
Water Supply and Delta Water Management;	0	+	+	+
Delta Tidal Hydraulics	0	-	-	-
Delta Water Quality	0	-	-	-
Geology and Soils	0	-	-	-
Transportation	0	-	-	-
Air Quality	0	-	-	-
Noise	0	- -	- -	- -
Climate Change Effects	0	-	-	-

Item	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3 (TANC Intertie Site)	Alternative 4 (Virtual Intertie)
Fish:				
Chinook salmon	0	-	-	-
Steelhead	0	+	+	+
Delta smelt	0	-	-	-
Longfin smelt	0	-	-	-
Splittail	0	-	-	-
Striped bass	0	-	-	-
Green sturgeon	0	-	-	-
Vegetation and Wetlands	0	-	-	-
Wildlife	0	- -	- -	-
Land Use	0	-	-	-
Power Production and Energy	0	-	-	-
Visual Resources	0	- -	- -	-
Cultural Resources	0	-	-	-
Hazards and Hazardous materials	0	-	-	-
Socioeconomics	0	+	+	+
Indian Trust Assets	0	0	0	0
Utilities and Public Services	0	-	-	-
Environmental Justice	0	0	0	0

Notes:
Attainment of Objectives: “+” = achieves objective; “-” = does not achieve objective
Affected Environment: “+” = beneficial effect; “-” = no adverse effect; “- -” = adverse effect; “0” – no effect

2.7.1 Alternative 1 (No Action)

Alternative 1 would not result in changes to operations or conveyance conditions and, therefore, would not result in any increase in pumping at Jones Pumping Plant. With no Intertie in place, Reclamation and DWR would not be able to easily respond to emergencies related to the California Aqueduct and the DMC. Compared to the baseline, there would be no effects associated with the No Action Alternative.

2.7.2 Alternative 2 (Proposed Action)

The simulated (CALSIM II) results for the Intertie indicate that the maximum assumed CVP pumping capacity of 4,600 cfs would be used in many months of most years. The percentage of monthly pumping at 4,600 cfs would be increased to about 30% in July, 50% in August, 50% in September, 30% in October, 60% in

November, 70% in December, 60% in January and 30% in February. The March pumping would be reduced considerably in most years because CVP San Luis would be filled. As such, entrainment of steelhead in March is reduced, and there is a potential beneficial effect on steelhead. However, because pumping in the winter months is increased, there could be adverse effects on smelt and winter-run or spring-run Chinook salmon. Mitigation for these effects is presented in Section 4.1, as mitigation measures FISH-MM-1, “Eliminate the Change in Pumping Attributable to the Intertie in Months when the Chinook Salmon Salvage Density is Higher than the Historical Median”, and FISH-MM-2, “Eliminate the Change in Pumping Attributable to the Intertie in Months when the Delta Smelt Salvage Density is Higher than the Historical Median”. There could be increased entrainment of other species, but these effects were found to be not adverse.

Alternative 2 provides a benefit for water supply with an average increase of 35 taf/yr. Although this change is a relatively small fraction of the total CVP pumping, it is considered a substantial change in CVP pumping capability because it provides increased operational flexibility and increased emergency response capability. With a permanent structure, Reclamation could more easily and quickly respond to maintenance needs and emergencies, and the potential for water supply interruptions would be reduced compared to the No Action Alternative.

Physical effects include temporary and permanent disruption to the land within the footprint of the Intertie structure and associated transmission line. The land disturbed is ruderal grassland. No wetlands would be affected, but there are wetlands near the project site. This particular site is where the California Aqueduct and the DMC are closest together just south of the pumps, so impacts related to land conversion and habitat disturbance is minimized by this location. However, this site lies beneath the COTP, and TANC has raised concerns about the safety of workers and the risks of a power outage caused by construction and maintenance activities in the vicinity of the COTP.

2.7.3 Alternative 3 (TANC Intertie Site)

Alternative 3 is the same operationally as Alternative 2, and therefore would equally meet the project purposes as described above for Alternative 2. Additionally, the water supply and fish effects would be identical.

Alternative 3 is located farther south than Alternative 2, but is comprised of the same components. However, because it is farther from the Tracy Substation, there are greater effects related to disturbance from placement and maintenance of the new transmission line, although effects to sensitive habitats and land uses would be avoided to the extent possible. Similarly, this site is in a location where the California Aqueduct and the DMC are farther apart and some of the land that would be affected is mapped as prime farmland. No wetlands would be affected, but there are wetlands near the project site. This site is not located under the COTP and therefore poses no risk to workers or potential for power outages.

2.7.4 Alternative 4 (Virtual Intertie)

Alternative 4 would use both the Jones and Banks Pumping Plants to increase CVP deliveries by 27 taf/yr, which is similar to the Intertie CVP pumping increment of 35 taf/yr. Therefore the increase in CVP deliveries for the Virtual Intertie was assumed to be similar to the simulated increase in CVP deliveries for the Intertie Alternative. Entrainment effects of Alternative 4 would be similar to those described for Alternatives 2 and 3.During emergencies, a temporary intertie structure would be installed that would result in temporary disturbance to land, which is ruderal grassland.

2.7.5 Summary and Selection of Preferred Alternative

Each of the Alternatives meet the project purpose, although Alternatives 2 and 3 provide Reclamation with more water supply and greater reliability as these alternatives are not dependent on DWR facilities or installation of temporary structures. Alternative 2 is preferred over Alternative 3 because it results in less ground disturbance and associated impacts on habitat. Additionally, Alternative 3 requires conversion of agricultural land, some of which is designated prime farmland.

2.8 Environmental Commitments

The following measures have been incorporated as part of the Proposed Action and would be incorporated into the construction specifications to address project-related impacts on environmental resources. Because the Authority would be responsible for construction, commitments related to construction would be implemented by the Authority.

2.8.1 Soil Disturbance Requirements

Stormwater Pollution Prevention Plan

A stormwater pollution prevention plan (SWPPP) will be developed by a qualified engineer or erosion control specialist and implemented prior to construction. The objectives of the SWPPP will be to (1) identify pollutant sources that may affect the quality of stormwater associated with construction activity and (2) identify, construct, and implement prevention measures to reduce pollutants in stormwater discharges during and after construction. Reclamation and/or its contractor(s) will develop and implement a spill prevention and control program as part of the SWPPP to minimize effects of spills of hazardous, toxic, or petroleum substances during construction of the Proposed Action. The program will be a component of the SWPPP, which will be completed before any groundbreaking or surface-disturbing activities begin. Implementation of this measure would comply with state and federal water quality regulations. The SWPPP will be kept on site during construction activity and will be made available upon request to representatives of the Regional Water Quality Control Board (RWQCB). The SWPPP will include, but is not limited to, the following items:

- a description of potential pollutants of stormwater from erosion,
- a description of the management of dredged sediments and hazardous materials present on site during construction (including vehicle and equipment fuels), and
- details of how the sediment and erosion control practices will comply with state and federal water quality regulations.

County Requirements

The proposed action is located in Alameda County of California. Alameda County's grading and erosion control ordinance is intended to control erosion, runoff, and sedimentation caused by construction activities. As per the Alameda County General Ordinance Code (Alameda County 2006), the County's Grading Ordinance, Chapter 15.36, "Grading, Erosion and Sediment Control," outlines regulations and practices relevant to construction and grading activities in the county. Typically, a grading permit is required for all construction and grading activities in the county. Should Alternatives 3 or 4 be implemented, the sites are located in San Joaquin County of California.

2.8.2 California Building Standards Code

The State of California's minimum standards for structural design and construction are given in the California Building Standards Code (CBSC) (24 California Code of Regulations [CCR]). Reclamation will ensure that all proposed facilities meet or exceed all applicable CBSC standards. Design and construction of the Proposed Action facilities in accordance with these standards will prevent or minimize the potential for structural damage from unstable soils, geologic units, and seismic ground-shaking events.

2.8.3 Geotechnical Report

As part of their general plan, Alameda County requires all new development to be designed and constructed to minimize risk from geologic and seismic hazards, with geotechnical investigations to be performed prior to any planning or construction activities.

Reclamation completed a geotechnical investigation for Alternative 2. The pumping station and its associated facilities, the new access road, and pipelines will be constructed in accordance with recommendations set forth in the two available Geotechnical Reports (Mongano 2004; Sherer 2003). These reports evaluate the feasibility of the proposed construction with respect to the observed subsurface conditions and provide geotechnical recommendations for the project design. Should Alternative 3 or 4 be implemented, Reclamation will conduct appropriate geotechnical studies and reports prior to implementation per San Joaquin County requirements.

2.8.4 Pipeline Corrosion

The project pipelines and other facilities will be constructed to reduce the potential for corrosion and eventual failure to the extent feasible. Construction measures include:

- Construct pipelines and other project facilities to withstand the effects of soil corrosion using standard and tested methods of pipeline protection such as pipeline coating.
- Conduct regular inspections of the pipelines during operation at an interval that is in accordance with safe and standard operating practices. The inspections may be conducted visually or with specialized equipment used to detect potential damage and leaks.

2.8.5 Project Site Safety and Security

Reclamation will develop and implement a project-specific safety and security plan, which will establish policies and procedures to protect workers and the public from potential hazards posed by construction activities. The safety and security plan will include, but not be limited to, the following:

- Definitions for controlled access areas at the construction site according to “non-critical” (e.g., site entrance, visitors’ area, contractor’s office) and “critical” (e.g., restricted personnel and vehicle access areas);
- Personnel access requirements (e.g., contractor personnel with “unescorted access” shall be subjected to a background check and required to complete 1 hour of site-specific security training);
- Vehicle access requirements (e.g., no cranes, aerial lifts, or high profile equipment capable of coming within the minimum safe distance of the transmission line will be allowed to operate within the restricted personnel and vehicle access zone within the “critical area” of the construction site); and

- A safety and health specification section that defines the contractor’s safety responsibilities.

Additionally, the contractor will also develop and maintain a written comprehensive safety plan covering all aspects of the onsite and applicable offsite operations and activities associated with the contract. Reclamation will monitor the contractor’s safety program to ensure compliance with their safety program and contract safety provisions. This will be accomplished by frequent monitoring of job site safety conditions by Reclamation construction personnel, contractor weekly tool box meetings, monthly joint safety meetings, and periodic inspections by Reclamation’s safety professionals. The contractor’s safety plan will include, but not be limited to, the following:

- Statement of compliance with regulations, standards, and codes;
- Site emergency plans;
- Accident investigation and reporting procedures;
- Guidelines for working near exposed energized overhead lines, substations and switchyard;
- Machinery and mechanical equipment inspection and maintenance procedures; and
- A hazardous energy control program (HECP) that establishes the minimum performance requirements to control unexpected energization, release of stored energy, start up of machinery or equipment that could injure employees, as well as to ensure the protection of the TANC 500 kV transmission line. The plan would also include written procedures for the issue of clearances to work or transport equipment within the 200 foot wide easement of the TANC transmission line that crosses the construction right-of-way, the proper training of employees in the HECP, and the administration and periodic inspection of the program.
- Develop a specific Flashover Prevention Plan for all work adjacent to and underneath TANC’s 500-kV transmission line. The plan would identify activities such as smoke from burning debris or power tools or their operation, water spray for dust control, etc., that could lead to fires, smoke, water spray, or other particulate matter or potential for other suspended fines between the ground and the 500-kV conductors. The intent of the plan is to address adequate safety procedures to ensure the insulation level of the air is maintained to avoid flashovers, which occur when higher voltage electricity "jumps across" an air gap to create a conductive path.

Reclamation, will take the following precautions to ensure site safety and security near the 500-kV transmission lines and transmission towers:

- Ensure that there are no cut, fill or spoil bank placement operations that compromise the clearances required for the 500-kV lines in accordance with the present conditions and the applicable government codes.
- Ensure that there are no cut or fill or cofferdam construction/dewatering activities that could affect the stability of the COTP transmission tower footings consistent with all applicable government codes.
- Maintain access to the COTP facilities by TANC and the COTP maintenance representatives at all times. TANC and its contractors, including Western, must be able to access all towers at any time with heavy equipment, and Reclamation will maintain this access during construction. Routine ground patrol to each tower occurs once a year; routine aerial patrol of the transmission lines occur four times a year.
- Allow a TANC representative on site at times when major work is underway on the transmission line right-of-way. Reclamation will provide TANC advance notice of not less than 60 days for all construction schedules to accommodate the necessary communications and arrangements for such TANC on-site representation at TANC’s discretion.
- Consult with TANC and/or Western during the installation of temporary clearance markers to indicate the closest safe distances from the conductors.
- Furnish and install permanent markers on Reclamation’s facilities indicating the proximity of energized high-voltage power line conductors before the completion of construction.
- Review and comply, during and after construction, with all regulatory requirements and industry standards for proper grounding of metallic equipment, structures, fences, platforms, and other metal facilities in the high-voltage electric field.

2.8.6 Traffic Control Plan

Reclamation, in coordination with affected jurisdictions, will develop and implement a traffic control plan, which will include an emergency access plan, to reduce construction-related effects on the local roadway system and to avoid hazardous traffic and circulation patterns during the construction period. All construction activities will follow the standard construction specifications and procedures of the appropriate jurisdictions.

The emergency access plan would include provisions to allow for access into and adjacent to the construction zone for emergency vehicles. The emergency access plan, which requires coordination with emergency service providers before construction, would require effective traffic and navigation direction, substantially reducing the potential for disruptions to response routes.

To the extent necessary, the traffic control plan would include the following actions:

- coordinating with the affected jurisdictions on construction hours of operation;
- following guidelines of the local jurisdiction for road closures caused by construction activities;
- installing traffic control devices as specified in the California Department of Transportation's (Caltrans') *Manual of Traffic Controls for Construction and Maintenance Works Zones* (California Department of Transportation 1996);
- notifying the public of road closures in the immediate vicinity of the construction zone and/or of temporary closures of bike lanes, and recreation trails;
- providing access to driveways and private roads outside the immediate construction zone;
- monitoring road and bike lane damage and repairing roads and bike lanes damaged during construction, or providing compensation for damage to roadways and bikeways; and
- coordinating with Caltrans and the California Highway Patrol if Alternative 3 is implemented. Alternative 3 would require stringing transmission line conductors and fiber over I-205, an activity that would require close coordination with these agencies to minimize hazards to workers and the public.

2.8.7 Coordination with Union Pacific Railroad

Reclamation will consult with Union Pacific Railroad if Alternative 3 is selected. Because of Alternative 3's proximity to an active railroad, it is assumed that permits would be needed to implement this alternative and that the permits would outline necessary setbacks and clearances to ensure that there are no disruptions to rail service, effects on the stability of the line, or changes in access for Union Pacific.

2.8.8 Revegetation

To minimize impacts on vegetation and wildlife resources, Reclamation will revegetate temporarily disturbed areas with seed suitable for the site conditions and land use. Native seed will be used where appropriate.

2.8.9 Avoid Disruption of Underground Public Utilities

Prior to excavating, existing underground utilities crossing the project study area will be identified. Underground utility lines will be avoided during excavation activities or relocated in coordination with the utility company or service provider. Work will be stopped immediately if an unanticipated conflict with a utility facility were to occur. The affected utility would be contacted immediately to (1) notify it of the conflict, (2) aid in coordinating repairs to the utility, and (3) coordinate to avoid further conflicts in the field.

2.8.10 Sensitive Biological Resources

The following environmental commitments have been incorporated into the project description to avoid potential adverse effects on sensitive biological resources. Additional information is provided in Sections 4.2, Vegetation and Wetlands, and 4.3, Wildlife.

Conduct Mandatory Contractor/Worker Biological Resources Awareness Training for Construction Personnel

Before any work, including grading and transmission line installation, occurs in the construction area occurs, a qualified biologist will provide biological resources awareness training to all construction personnel to brief them on the need to avoid effects on environmentally sensitive areas (i.e., wetlands and other waters, riparian habitat, and areas designated as habitat for special-status species) and the penalties for not complying with biological mitigation requirements. The biological resources training will include a description, representative photographs, and legal status of each special-status wildlife species that may occur in the construction area. If new construction personnel are added to the program, the contractor will ensure that the personnel receive the mandatory training before starting work.

Conduct Construction Activities during the Dry Season

All ground-disturbing activities will be conducted during the dry season, between May 1 and October 15, or before the onset of the rainy season, whichever occurs first.

Locate Staging Areas and Spoils Storage Areas Outside of Environmentally Sensitive Areas

Staging areas, laydown areas, and temporary spoils storage areas will be located as far from environmentally sensitive areas as possible. Preferably, staging areas will be located in developed or previously disturbed areas and/or a minimum of 250 feet from environmentally sensitive areas.

Install Construction Barrier Fencing

Reclamation or its contractor will install construction barrier fencing to protect sensitive biological resources (i.e., wetlands and other waters, riparian habitat, and areas designated as habitat for special-status species) within and adjacent to all construction zones, including the transmission line installation area. The construction specifications will require that Reclamation or its contractor retain a qualified biologist to identify environmentally sensitive areas that are to be avoided during construction. Environmentally sensitive areas adjacent to the directly affected area required for construction, including staging and access, will be fenced off to avoid disturbance in these areas. Before construction, the contractor will work with the qualified biologist to identify the locations for the barrier fencing and will place stakes around the environmentally sensitive areas to indicate the locations of the barrier fences. The protected area will be clearly identified on the construction specifications. The fencing will be installed a minimum of 50 feet (except as described in the mitigation measures for specific special-status species, where greater distances may be required) from the environmentally sensitive area and will be in place before construction activities are initiated. The fencing will be commercial-quality, woven polypropylene, orange in color, and at least 4 feet high (Tensor Polygrid or equivalent). The fencing will be tightly strung on posts with a maximum of 10-foot spacing. The fencing will be maintained throughout the duration of the construction period.

Install Erosion Control Measures near Aquatic Habitat for Special-Status Wildlife

Erosion control measures will be implemented in areas adjacent to aquatic habitat to prevent any soil or other materials from entering aquatic habitat. Erosion control features will be placed in areas that are upslope of or within 300 feet of wetlands or creeks to prevent any soil or other materials from entering aquatic habitat. The locations of erosion control features will be reviewed by a qualified biologist and identified on the final grading plans and construction specifications. Natural/biodegradable erosion control measures (i.e., coir rolls, straw wattles, use of straw over disturbed areas) will be used. Plastic monofilament netting (erosion control matting) will not be allowed because frogs and salamanders can become entangled in this type of erosion control material. Previously disturbed areas will be hydroseeded with native plant species upon project completion.

Retain a Biological Monitor

Reclamation will retain a qualified biologist to monitor construction activities adjacent to environmentally sensitive areas. The biologist will assist the construction crew, as needed, to comply with all environmental commitments and avoidance and minimization measures. Reclamation or its contractor will be responsible for maintaining the staked and flagged perimeters of the construction area and staging areas adjacent to sensitive biological resources. The biological monitor will possess qualifications to conduct additional monitoring activities (e.g., preconstruction surveys, inspection of trenches etc.) for special-status species, as described in the mitigation measures in Section 4.3, Wildlife.

Minimize Effects on Wildlife Movement/Migration

To minimize potential effects on wildlife movement/migration between the DMC and California Aqueduct, fencing will be limited to the general areas surrounding the pumping plant and canal turnouts. During the construction phase of the project, after each working day, a minimum 200-foot-wide area will be kept free of impediments that might block the corridor. In addition, upon completion of the construction of the Intertie, only the intake and outlet structures at each canal will be surrounded by permanent fencing. The flow measurement structure will not be enclosed. The corridor will remain unblocked to allowing wildlife to move freely through the area.

Avoid and Minimize the Introduction and Spread of Invasive Plant Species

Reclamation will incorporate the following measures into construction project terms and specifications to avoid and minimize the introduction of new invasive plant species into the project area and the spread of invasive species to undeveloped lands adjacent to the project area:

- clean construction equipment and vehicles at designated stations prior to entering and leaving the site for the duration of construction;
- use certified, weed-free, imported erosion-control materials (or rice straw in upland areas);
- coordinate with the Agricultural Commissioners in Alameda and San Joaquin Counties and land management agencies to ensure that the appropriate BMPs are implemented for the duration of project construction;
- educate construction supervisors and managers about weed identification and the importance of controlling and preventing the spread of invasive plants; and
- include invasive plant avoidance measures in contract documents and ensure that they are implemented by the project contractors.

2.8.11 Air Quality

Because construction of the Proposed Action could cause a short-term increase in particulate matter 10 microns in diameter or less (PM10) emissions, the Proposed Action has committed to comply with the Bay Area Air Quality Management District (BAAQMD) feasible PM10 emission control measures for construction. The BAAQMD's feasible control measures are summarized in Section 3.6, Air Quality.

2.8.12 Cultural Resources

The following avoidance and minimization measures have been incorporated into the project description to avoid potential adverse effects on sensitive cultural resources. See Section 5.7, Cultural Resources, for additional information.

Inadvertent Damage to or Destruction of Buried Archaeological Sites and Human Remains

In the unlikely event that buried cultural resources (such as chipped or ground stone, historic debris, building foundations, or non-human bone) or human remains are inadvertently discovered during ground-disturbing activities, construction work will stop and the following measures will be implemented.

The contractor will immediately cease work within 100 feet of the find. All construction personnel will leave the area. Vehicles and equipment will be left in place until a qualified archaeologist identifies a safe path out of the area. The on-site supervisor will flag or otherwise mark the location of the find and keep all traffic away from the resource. The on-site supervisor will notify the Reclamation archaeologist within 24 hours of the find.

Upon cessation of work and notification of responsible parties, the Reclamation archaeologist will determine whether the resource can be avoided. If avoidance is feasible and impacts on the cultural resource have not occurred, the project can proceed in accordance with recommendations from the Reclamation archaeologist. If the resource cannot be avoided or it already has been affected by construction, treatment of the find must comply with the discovery procedures of Section 106 of the National Historic Preservation Act (NHPA) (36 CFR 800.13[3]). These procedures consist of a determination of significance; consultation among Reclamation, other consulting parties (such as DWR), and State Historic Preservation Officer (SHPO); and, if the resource is determined to be significant, suitable implementation of mitigation, in consultation with the SHPO.

If any burials or fragmentary human remains of Native American origin are encountered as a result of project construction, the contractor will immediately cease work within 100 feet of the find. All construction personnel will leave the area. Vehicles and equipment will be left in place until a qualified archaeologist identifies a safe path out of the area. The on-site supervisor will flag or otherwise mark the location of the find and keep all traffic away from the resource. The on-site supervisor will notify the Reclamation archaeologist within 24 hours of the find. Reclamation is responsible for compliance with the Native American Graves Protection and Repatriation Act (43 CFR 10) if inadvertent discovery of Native American remains occurs on federal lands. Reclamation is responsible for compliance with state laws relating to the disposition of Native American burials (Public Resources Code [PRC] 5097 and California Health and Safety Code 7050.5[b]).

According to California Health and Safety Code, six or more human burials at one location constitute a cemetery (Section 8100), and disturbance of Native American cemeteries is a felony (Section 7052). Section 7050.5 requires that construction or excavation be stopped in the vicinity of discovered human remains until the county coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the Native American Heritage Commission (NAHC). No construction or disturbance of the area will occur until either (1) the descendants of the deceased Native Americans have recommended a means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC 5097.98; or (2) the descendant fails to make a recommendation within 48 hours after being notified by the NAHC.