Cross Valley Canal Contractors

Renewal of Conveyance Contracts
Draft Environmental Impact Report

June 2016

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List of Acronyms

°C	degrees Celsius
AB	Assembly Bill
AEWSD	Arvin-Edison Water Storage District
af	acre feet
Aqueduct	California Aqueduct
Banks	Harvey O. Banks Pumping Plant
BMPs	Best Management Practices
BO	Biological Opinion
BPS	Best Performance Standards
CAA	Clean Air Act
CARB	California Air Resources Board
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
cfs	cubic feet per second
CNDDB	California Natural Diversity Data Base
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2e}	carbon dioxide equivalents
Corps	U.S. Army Corps of Engineers
CSA	County Service Area
CVC	Cross Valley Canal
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CWA	Clean Water Act
DBCP	dibromochloropropane
DEIR	Draft Environmental Impact Report
Delta	Sacramento/San Joaquin Delta
DMC	Delta Mendota Canal
DPS	distinct population segment
DWR	California Department of Water Resources
EA	Environmental Assessment
EIS	Environmental Impact Statement

EO	Executive Order
ETo	evapotranspiration
FESA	Federal Endangered Species Act
FEIR	Final Environmental Impact Report
FKC	Friant-Kern Canal
FONSI	Finding of No Significant Impact
ft	feet
FWA	Friant Water Authority
FWCA	Fish and Wildlife Coordination Act
GHG	greenhouse gas
HCP	Habitat Conservation Plan
HFC	hydrofluorocarbons
HVID	Hills Valley Irrigation District
ID	Irrigation District
IPCC	Intergovernmental Panel on Climate Change
IRC	Interim Renewal Contract
IRP	Independent Review Panel
KCWA	Kern County Water Agency
KTWD	Kern-Tulare Water District
kWh	kilowatt hours
L/s	liters per second
LTCR	Long Term Contract Renewal
LTRID	Lower-Tule River Irrigation District
M&I	municipal and industrial
MT	Metric tons
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NWP	Nationwide Permit
O&M	operations and maintenance
O_3	ozone
OCAP	Operations Criteria and Plan
OPR	Office of Planning and Research
PCEs	Primary Constituent Elements
PEIS	Programmatic Environmental Impact Statement

PFC	perfluorocarbons
PM_{10}	particulate matter of less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PXID	Pixley Irrigation District
Reclamation	U.S. Bureau of Reclamation
RGWD	Rag Gulch Water District
ROD	Record of Decision
ROG	reactive organic gases
RPA	Reasonable and Prudent Alternative
RWQCBs	Regional Water Quality Control Boards
SB	Senate Bill
SGMA	Sustainable Groundwater Management Act
SJRHR	San Joaquin River Hydrologic Region
SJRRP	San Joaquin River Restoration Program
SJV	San Joaquin Valley
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SJVB	San Joaquin Valley Basin
SLDMWA	San Luis and Delta-Mendota Water Authority
SO_2	sulfur dioxide
SOD	South-of-Delta
SWP	State Water Project
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TLBWD	Tulare Lake Basin Water Storage District
TLHR	Tulare Lake Hydrologic Region
TVWD	Tri-Valley Water District
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOCs	volatile organic compounds
WD	water district

Glossary of Terms

Article 55	A provision in most long term SWP contracts giving long term SWP Contractors the right to receive services from any of the SWP transportation facilities to transport water procured by them from non-SWP sources for delivery to their service areas and to interim storage outside their service areas for later transport and delivery to their service areas, subject to the terms and conditions of their long term SWP contract.
CVC Contractor(s)	The CVC Contractor(s) refers to one or all of the seven contractors within the CVC Unit of CVP that contracts for water service with Reclamation.
CVC Contract Water	The Federal reclamation project water supply authorized in a water supply contract executed by the United States Bureau of Reclamation and a CVC Contractor.
Cross Valley Participants	The water agencies that participated in construction of and have capacity rights in the Cross Valley Canal.
Delivery to Exchange Entity	This term refers to the mechanism by which CVC Contractor water is diverted from the Delta and delivered to the Exchange Entity.
Exchange Entity	The water district that agrees to exchange its water for supplies diverted from the Delta for the CVC Contractors.
Pre-1914 Water	The right to appropriate waters of the State for reasonable and beneficial use established prior to the December 19, 1914 Water Commission Act.
Reclamation Law	The terms and conditions under which U.S. Bureau of Reclamation contracts, delivers, and manages the CVP water supply. Reclamation Law is specified by various authorizing statutes including most recently the Central Valley Project Improvement Act of 1992.
Return from Exchange Entity	The return is the mechanism by which the water previously delivered to the Exchange Entity is delivered to the CVC Contractor. This delivered water is not the same water that was exported from the Delta, but is water exchanged from other supplies held by the Exchange Entity.
Section 215 Water	A temporary supply of water authorized by Federal reclamation law (43 U.S.C. 39000) which is made possible as a result of an unusual large water supply not otherwise storable for project purposes or an infrequent and otherwise unmanaged flood flow of short duration which supply is not subject to Federal reclamation law.
Unbalanced Exchange	A water exchange in which one party gives up additional water to the other party as part of the exchange as compensation for the benefit from improved timing or location of delivery.

Unused Capacity	Based on California Water Code Section 1811(e): "Unused capacity" means space that is available within the operational limits of the conveyance system and that the owner is not using during the period for which the delivery is proposed and which space is sufficient to convey the quantity of water proposed to be delivered.
Warren Act Contract	A contract authorized by Federal reclamation law (43 U.S.C. 523) that provides for the impounding, storage and carriage of non-Federal project water in the excess capacity of Federal reclamation project facilities.

Summary

S.1 Introduction

S.1.1 Project Proponents and Background

The Cross Valley Canal (CVC) is a water conveyance facility in the southern San Joaquin Valley that extends from the California Aqueduct near Tupman, east to the Kern River. It can convey water in either direction depending on the operation of the canal. The CVC is used to convey irrigation water to seven contractors (the CVC Contractors) that are located along the east side of the San Joaquin Valley. The CVC Contractors are located within Fresno, Kings, Tulare, and Kern counties.

Each of the seven CVC Contractors is a Central Valley Project (CVP) water contractor. That is, each CVC Contractor is currently a party to its own separate three party contract with both the U.S. Bureau of Reclamation (Reclamation) and the California Department of Water Resources (DWR) to receive water from the CVP and then convey this water. Under the current three-party contracts, Reclamation delivers the CVP water to the Sacramento/San Joaquin Delta (Delta), where it is pumped from the Delta and conveyed south. Because of capacity limitations in the CVP facilities in the Delta, the water has historically been pumped and conveyed from the Delta by DWR in State Water Project (SWP) facilities.

The CVC Contractors are located physically along the Friant-Kern Canal (FKC) and not directly connected with the CVC. Because the CVC Contractors are not directly connected to the CVC, their CVP water is delivered predominately through transfers and exchanges of water with other water districts or agencies. An exchange that has been used in the past involved Arvin Edison Water Storage District (AEWSD) receiving the CVC Contractors' water directly from the CVC and exchanging that water for its CVP supply, which would otherwise be delivered through the FKC. The CVC Contractors then would receive the exchanged water through Millerton Lake or the FKC. There are numerous other similar exchange arrangements that can be (and have been) utilized to deliver the CVC Contractors' water supply from the Delta to the individual CVC Contractors' districts.

The Proposed Project proponents are the CVC Contractors. DWR is a California Environmental Quality Act (CEQA) Responsible Agency for this Environmental Impact Report (EIR). Reclamation is concurrently preparing a separate National Environmental Policy Act (NEPA) document on the related action of executing long-term renewal of federal water supply contracts with the CVC Contractors. Each CVC Contractor must individually comply with CEQA and NEPA relating to its separate action of executing long-term renewal of their respective water supply contracts with Reclamation and executing a conveyance contract with DWR and Reclamation.

The proposed conveyance contract renewal, if signed, will allow DWR to continue to convey the water to the CVC Contractors in a manner substantially similar to the manner it has done in the past. This EIR addresses the impacts of implementing the proponents Proposed Project. This document identifies the potential impacts of executing this long-term contract and evaluates possible alternatives to the Proposed Project.

S.2 Proposed Project

The Proposed Project covered under this document is the renewal through the adoption of a long-term conveyance agreement by each of the CVC Contractors with DWR and Reclamation. This Proposed Project renews the existing three-party contracts whose present term extends to February 28, 2018. The agreement is needed between the CVC Contractors and DWR to cover the pumping and conveyance of the CVC Contractors water supply through SWP facilities. Reclamation is involved in the agreement

because the CVC Contractors' water supply is from the federal CVP and also Reclamation supplies the power that is used for the pumping of the water, and the conveyance of the water through the joint federal/state San Luis Canal. Reclamation may also store the water in the federal share of San Luis Reservoir, or may encroach in the state share, upon the consent of DWR.

Conveyance of CVC Contractors water through SWP facilities has been historically accomplished through separate three-party contracts between each CVC Contractor, Reclamation and DWR, originally executed and entered into an initial twenty (20) year term, with right of renewal, at various times in late 1975 or early 1976. The terms of those contracts were subsequently extended through a series of interim renewal contracts (IRCs), beginning March 1, 1996. The IRCs have typically extended the contractual relationships by either 1 or 2 years, and to date there have been 16 IRCs. In 2001, the CVC Contractors, Reclamation and DWR negotiated IRC-5, which includes the present terms and conditions under which Reclamation has supplied, and DWR has conveyed, CVP water to the CVC Contractors. Subsequent IRCs have all extended the terms and conditions found in IRC-5, including the present IRC, IRC-16.

The three-party contract is a negotiated agreement that each party must agree to before signing the agreement and moving forward with the Proposed Project. As with any negotiated agreement, if mutually-agreeable conditions cannot be reached it is possible that one or more parties would not sign the agreement. This would then result in the negotiation process continuing or being terminated by the parties.

S.3 Project-Related Water Supply and Water Exchanges

S.3.1 Water Supply

The CVC Contractors have an annual CVP water supply totaling 128,300 acre feet (af). Because of water availability, pumping constraints, available transfers/exchanges, and timing of deliveries, the typical CVP delivery to the CVC Contractors is substantially less than the contract amount. From 1998 to 2015, the annual CVP deliveries to CVC Contractors has averaged 41,652 af, with a maximum of 115,170 af and a minimum of 0 af. Recently, from 2011 through 2014, the annual delivery has averaged 27,500 af, with a maximum of 88,740 af (2012) and a minimum of 0 af (2014). The CVC Contractor supply has only been available in late summer and the fall months rather than year round.

Several factors influence and often limit the total diversions from the Delta for delivery to the CVC Contractors. First is the available supply. Every year Reclamation announces a contract delivery target that reflects the percent of the total contract amount that will be delivered to the CVP contractors. A separate delivery target is set for the CVP contractors north of the Delta and south of the Delta (SOD). The target reflects the hydrology for the year, total CVP storage, and regulatory constraints, and the target is often less than 100 percent (full contract delivery).

Another factor in the total water supply is the regulatory constraints in the Delta that influence the amount of water that can be diverted from the Delta. These criteria govern the amount of water that must flow out of the Delta, the total diversion, internal Delta flow, and the total "take" of listed fish species at the federal and state pumping plants. These regulatory criteria have changed significantly since the original three-party contract was signed in the mid-1970s, and are likely to change following the current efforts at Delta restoration.

S.3.2 Historic Transfers and Exchanges

As stated above, CVP water can typically only reach the CVC Contractors service area through exchanges and transfers. This process involves a CVC Contractor negotiating an exchange with one or more other water districts (the Exchange Entity) that exchange the CVP water for a water supply from that entity. These exchanges/transfers typically involve the CVC Contractor and an Exchange Entity, but at times may include another party to facilitate the transfer. The water supply that is delivered to the CVC Contractor district may be CVP water from Millerton Lake or the FKC, or could be water from non-CVP

water projects on the eastside of the San Joaquin Valley, or "pre-1914" water. With the presence of several groundwater banks, the water may be delivered from one of the banks.

S.3.3 Renewal of Long-term Water Service Contracts

The renewal of interim water service contracts for CVP contractors is a federal action that is currently being addressed by Reclamation. It is mentioned here because of the concept that absent a renewal of the CVP contract, there may be no water to convey under the three-party contract considered under this EIR. Non-renewal of existing water service contracts is not an option based on Section 3404(c) of the Central Valley Project Improvement Act (CVPIA), which states "…*the Secretary shall, upon request, renew any existing long-term repayment of water service contract for the delivery of water from the CVP*…". These existing contracts are needed to provide the mechanism for the continued beneficial use of the water developed and managed by the CVP. Non-renewal of water service contracts was considered as an alternative to the Proposed Project but eliminated from further analysis because Reclamation is contractually and legally obligated to renew the CVC Contractors' water service contracts.

S.3.4 Water Service Contract Quantities

The Reclamation Project Act of 1956 and 1963 mandates the renewal of existing water service contract quantities when beneficially used. The water delivered under these contracts is used for agricultural or Municipal and Industrial (M&I) purposes which are beneficial uses recognized under federal Reclamation and California law. Therefore, a reduction in contract quantities is not assumed in this EIR because it would be inconsistent with the CVPIA Programmatic Environmental Impact Statement Record of Decision (ROD) and the balancing requirements of CVPIA (Reclamation 1999). Maintaining the full historic water quantities under contract provides the CVC Contractors with assurances that the water will be made available in wetter years and is necessary to support investments for local storage, water conservation improvements, and capital investments.

S.4 Alternatives to the Proposed Project

S.4.1 No Project Alternative

The No Project Alternative assumes that there will be no three-party contract between the CVC Contractors, DWR, and Reclamation to convey the CVC Contractors CVP supply through the Aqueduct. The CVC Contractors would have to rely on other facilities or arrangements to convey their water supply from the Delta. In the absence of a conveyance agreement with DWR, the CVC Contractors would have to resort to one of several alternative means to obtain the available water supply to meet their water supply needs: 1) seek transfers and exchanges on the east side of the San Joaquin Valley (SJV) using local facilities or the FKC; 2) seek transfers or exchanges with CVP Contractors using the Delta Mendota Canal (DMC); 3) use other available water sources such as local groundwater; and/or 4) reduce water use by fallowing land.

The No Project Alternative assumes the continued delivery in the Delta of available CVP water between the CVC Contractors and the United States, including the terms and conditions required by non-discretionary CVPIA provisions (considered as part of the Preferred Alternative of the CVPIA PEIS (Reclamation 1999). However, the No Project Alternative assumes that the CVC Contractors would endeavor to receive their annual supply through water transfers, exchanges, and/or agreements to convey the water to the CVC Contractors' water use service areas. No changes to the CVC Contractors' water service areas or water contracts are part of the No Project Alternative. The CVC Contractors' CVP water allocation will continue to be available and used for the exact same M&I and agricultural uses (i.e., row crops, orchards, vineyards, irrigated pasture, and various other agricultural uses) that have occurred since 1975.

The No Project Alternative assumes east side exchanges such as the exchanges that have occurred historically. This is similar to existing conditions in that the CVC Contractors are currently provided with conveyance from DWR pursuant to existing IRCs. However, this alternative represents a complete loss of the supply historically conveyed through SWP facilities. The elimination of SWP facilities as part of the overall water service for the CVC Contractors would severely limit the water available for east side exchanges. Ultimately, there would be variability in how the respective CVC Contractors would resolve the issue of non-renewal of a long-term conveyance contract with DWR which would likely result in additional costs and uncertainty in the conveyance and the delivery of water to the CVC Contractors. An estimate of the available surface water supply under this alternative would be 5 to 10 percent of the average historic deliveries. This estimate is based upon the fact that there has been capacity at Jones Pumping Plant in the past to move CVC Contractors water but this has only occurred once in the past 15 years. This is not a sufficient frequency to provide reliable replacement water (Dalke pers. comm.).

In summary, the No Project Alternative assumes that CVP water would continue to be provided to the CVC Contractors, but there would be no mechanism for conveyance of that water through SWP facilities. As a result of reduced water supplies the historic practice of farmers was pumping groundwater to make up the difference. The No Project Alternative assumes a similar response. The long-term increase in groundwater pumping would likely result in local conditions that were present before the CVC was constructed. However with implementation of the Sustainable Groundwater Management Act (SGMA), which requires local agencies to establish sustainable groundwater management plans to protect groundwater availability, groundwater pumping will likely be reduced over time. SGMA requires that by 2040 all high and medium priority groundwater basins achieve sustainability. Groundwater pumping would become less of an option as the SGMA is implemented, and fallowing agricultural land more likely.

S.4.2 Alternative 1: Water Code Section 1810 Short-Term Conveyance Agreements

This alternative allows CVC Contractors to negotiate an agreement with DWR to convey water under the provisions of Water Code sections 1810–1814. These provisions allow water to be conveyed in SWP facilities subject to available conveyance capacity, applicable regulatory constraints, and no harm to SWP contractors because of the conveyance of the water. These would be short-term, likely annual agreements, negotiated for each exchange or transfer that would be conveyed under the above provisions. Therefore, the CVC Contractors may be negotiating one or more of these agreements per year. This would generate additional costs and delays for negotiating the agreements, require additional CEQA review, and create substantial uncertainty in the timing and delivery of available water supply. There would be no guarantees from year to year that contract water would be available through these short-term agreements. The role of Reclamation in the conveyance would be reduced or eliminated, thereby reducing the opportunity for Reclamation and DWR to coordinate water delivery activities in the San Luis Canal (the joint facility). This alternative would result in annual water supply deliveries being 10 to 20 percent of the average historic deliveries. This estimate is based upon the fact that few if any water districts have successfully negotiated a wheeling agreement under Water Code sections 1810–1814 during the entire history of the Cross Valley Canal conveyance contract. The likelihood of success is very limited (Dalke pers. comm.).

S.4.3 Alternative 2: Short-Term Exchange Agreements with SWP Contractor

In this alternative, the CVC Contractors negotiate short-term agreements of transfers or exchanges of water with the long term SWP Contractor. The long term SWP Contractor may request of DWR conveyance services utilizing Article 55 of that SWP contractor's contract to convey the procured non-SWP water. Such an agreement would be subject to DWR having capacity to convey the non-SWP water without compromising the delivery of its SWP supplies for that year, meeting applicable regulatory constraints, and causing no harm to other SWP Contractors.

Similar to Alternative 1, agreements would be negotiated for each exchange or transfer with tremendous variability within a year and between years due to a limited number of potential SWP partners in any

given year. This alternative would generate additional costs for negotiating the transfer or exchange agreements and environmental compliance. Agreements utilizing Article 55 of the SWP contractor's long-term contract with DWR would have increased priority in the delivery of available water supply over water conveyed through short-term agreements under Water Codes sections 1810-1814 or the Proposed Project since Article 55 agreements would fall under the priorities set forth in the respective long-term SWP Contract. Several contractors have utilized Article 55. Based on this historic record, Alternative 2 would result in surface water deliveries being about 50 percent of the average historic deliveries.

S.4.4 Alternative 3: Short Term Conveyance Obligations

This alternative allows existing IRCs to continue to be renewed so that DWR's existing contractual obligations to convey CVC Contract water remains in place. Continued renewal of existing IRCs would allow DWR to continue to convey the water for 1- to 2-year periods. This is similar to existing conditions in that the CVC Contractors are currently provided with conveyance from DWR pursuant to existing IRCs. This alternative would result in improved reliability in the water supply over Alternatives 1 and 2 but not to the extent of the Proposed Project. This would generate additional costs for negotiating the renewal of the existing IRCs every 1 to 2 years. Furthermore, the United States would not have met its statutory mandate pursuant to the CVPIA to enter into long-term water supply contracts with the CVC Contractors, which would substantially undermine water supply reliability and potentially compromise long-term water resource management and planning efforts being undertaken by the CVC Contractors. This alternative would result in surface water deliveries of about 80 to 90 percent of the average historic deliveries. This estimate is based upon the fact that it can take up to 5 months to acquire approvals from DWR and Reclamation for exchanges. Because of the difficulty of identifying annual exchange partners in advance of knowing the availability of the water supply and the time required for approvals, often puts the time frame for this type of program outside the period when the water is needed (Dalke pers. comm.).

S.4.5 Alternatives Considered But Rejected

Non-renewal of water service contracts was considered as an alternative to the Proposed Project but eliminated from further analysis because Reclamation is contractually and legally obligated to renew the CVC Contractors' water service contracts. There were no other alternatives (to the three described above) that were considered but rejected from evaluation in this EIR.

S.4.6 Environmentally Superior Alternative

The Proposed Project is considered the environmentally superior alternative, because it has no significant environmental impacts and avoids the possibility of failing to secure conveyance on individual exchanges. Failure to secure conveyance under the No Project Alternative (because a long-term conveyance contract is not available) creates uncertainty in the water supply for CVC Contractors and may lead to increased reliance on groundwater supplies. This in turn, represents a greater impact to the region's groundwater supply than with the Proposed Project. Alternatives 1 and 2 each had negative direct effects on air quality, greenhouse gas emissions, and surface and groundwater supplies. Alternative 3 has negative direct effects on groundwater because the CVC Contractors would likely increase groundwater pumping for water supply. None of these alternatives improves on the Proposed Project. In summary, the Proposed Project does not have any significant impacts; therefore, there is no need for an alternative to reduce significant impacts.

Finally, the Proposed Project establishes a conveyance mechanism for the term of the contract and the provided certainty in water deliveries until February 28, 2035, when the conveyance agreement expires. This certainty allows the CVC Contractors to focus on changes within each district to improve water use efficiency and water conservation.

S.5 Summary of Impacts and Mitigation

Table S-1 below provides a comparison of the impacts of the alternatives to the Proposed Project. The Proposed Project is considered the environmentally superior alternative because there would be no adverse environmental impacts associated with the continued conveyance of water to the individual exchanges. Unlike the alternatives, the Proposed Project would avoid the possibility of failing to secure water supplies, which would create indirect impacts on agricultural, groundwater and air resources, land use planning, and socioeconomics. Under the No Project Alternative, the failure to secure conveyance (because a long-term conveyance contract is not available) creates uncertainty in the water supply for CVC Contractors and may lead to increased reliance on groundwater supplies. This in turn, represents a greater impact to the region's groundwater supply than with the Proposed Project and fails to meet most of the Proposed Project objectives listed in Section 2.3. In summary:

> No Project Alternative would have direct and indirect impacts related to all resource areas except biology, when compared to the Proposed Project, and would fail to meet most of the Proposed Project objectives.

> Alternatives 1, 2, and 4 have direct and indirect impacts similar to the No Project Alternative, and both would also fail to meet most of the Proposed Project objectives.

  - Alternative 3 has no direct impacts except to groundwater resources, but would have indirect impacts to agriculture, land use, and socioeconomics.

Finally, the Proposed Project establishes a conveyance mechanism for the term of the contract (20 years) and the provided certainty in water deliveries. This certainty allows the CVC Contractors to focus on changes within each district to improve water use efficiency and water conservation.

S.6 Areas of Known Controversy and Issues to be Resolved

There are no known areas of controversy.

Table S-1 Impacts from Implementation of each Alternative Compared to Proposed Project

Affected Resource	Proposed Project Long-term Conveyance Agreement		Alternatives									
			No Project		Alternative 1 Water Code Section 1810 Conveyance		Alternative 2 Article 55 Conveyance		Alternative 3 Short Term Conveyance Obligations		Alternative 4 Constrained Delta Exports	
Impacts	**Direct**	**Indirect**	**Direct**	**Indirect**	**Direct**	**Indirect**	**Direct**	**Indirect**	**Direct**	**Indirect**	**Direct**	**Indirect**
Agriculture	No Impact	No Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact
Air Quality	No Impact	No Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact
Biological	No Impact	No Impact	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
Greenhouse Gas Emissions	No Impact	No Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact
Hydrology and Water Quality												
> Surface Water	No Impact	No Impact	Increased Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	No Change	No Change	Increased Impact	No Change
> Groundwater	No Impact	No Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact
Land Use & Planning	No Impact	No Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact
Socioeconomics	No Impact	No Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact

Notes:

Increased Impact = Impacts are expected to increase in severity when compared to the Proposed Project.

No Change = There would be no change in the level of impact significance when compared to the Proposed Project. Impacts would essentially be the same as those identified for the Proposed Project.

No Impact = There would be no significant impacts associated with the alternative if it were to be implemented.

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1 Introduction

1.1 Intended Use of this Environmental Impact Report

This Environmental Impact Report (EIR) is intended to fulfill the requirements of the California Environmental Quality Act (CEQA) and is prepared for the Cross Valley Canal (CVC) Contractors. The Lower-Tule River Irrigation District (LTRID) is designated as the Lead Agency under CEQA pursuant to an agreement among LTRID, all of the CVC Contractors, and the Department of Water Resources (DWR). The CVC is located in the southern San Joaquin Valley near Bakersfield and connects the California Aqueduct (Aqueduct) on the west side of the valley and the Friant-Kern Canal (FKC) on the east side (Figure 1-1). The CVC is an open channel with six lift stations that can carry water from the west to east or east to west.

The Proposed Project covered under this document is the renewal through the adoption of a long-term conveyance agreement by each of the CVC Contractors with DWR and Reclamation. Conveyance of CVC Contractors water through SWP facilities has been historically accomplished through separate three-party contracts between each CVC Contractor, Reclamation and DWR, originally executed and entered into an initial twenty (20) year term, with right of renewal, at various times in late 1975 or early 1976. The terms of those contracts were subsequently extended through a series of interim renewal contracts (IRCs), beginning March 1, 1996. The IRCs have typically extended the contractual relationships by either 1 or 2 years, and to date there have been 16 IRCs. In 2001, the CVC Contractors, Reclamation, and DWR negotiated IRC-5, which includes the present terms and conditions under which Reclamation has supplied, and DWR has conveyed, CVP water to the CVC Contractors. Subsequent IRCs have all extended the terms and conditions found in IRC-5, including the present IRC, IRC-16.

The need for a three-party conveyance contract arises because while Reclamation can supply the water and power for the action, it generally lacks sufficient conveyance capacity to deliver the Central Valley Project (CVP) supply directly to the CVC Contractors. The State Water Project (SWP) occasionally has unused conveyance capacity (see Glossary of Terms) in the Aqueduct at certain times of the year, and DWR has per the previous three-party contract, 8, 2018, and the long-term conveyance agreement, if executed, will allow DWR to continue to convey the water to the CVC Contractors in a manner substantially similar to the manner it has done in the past.

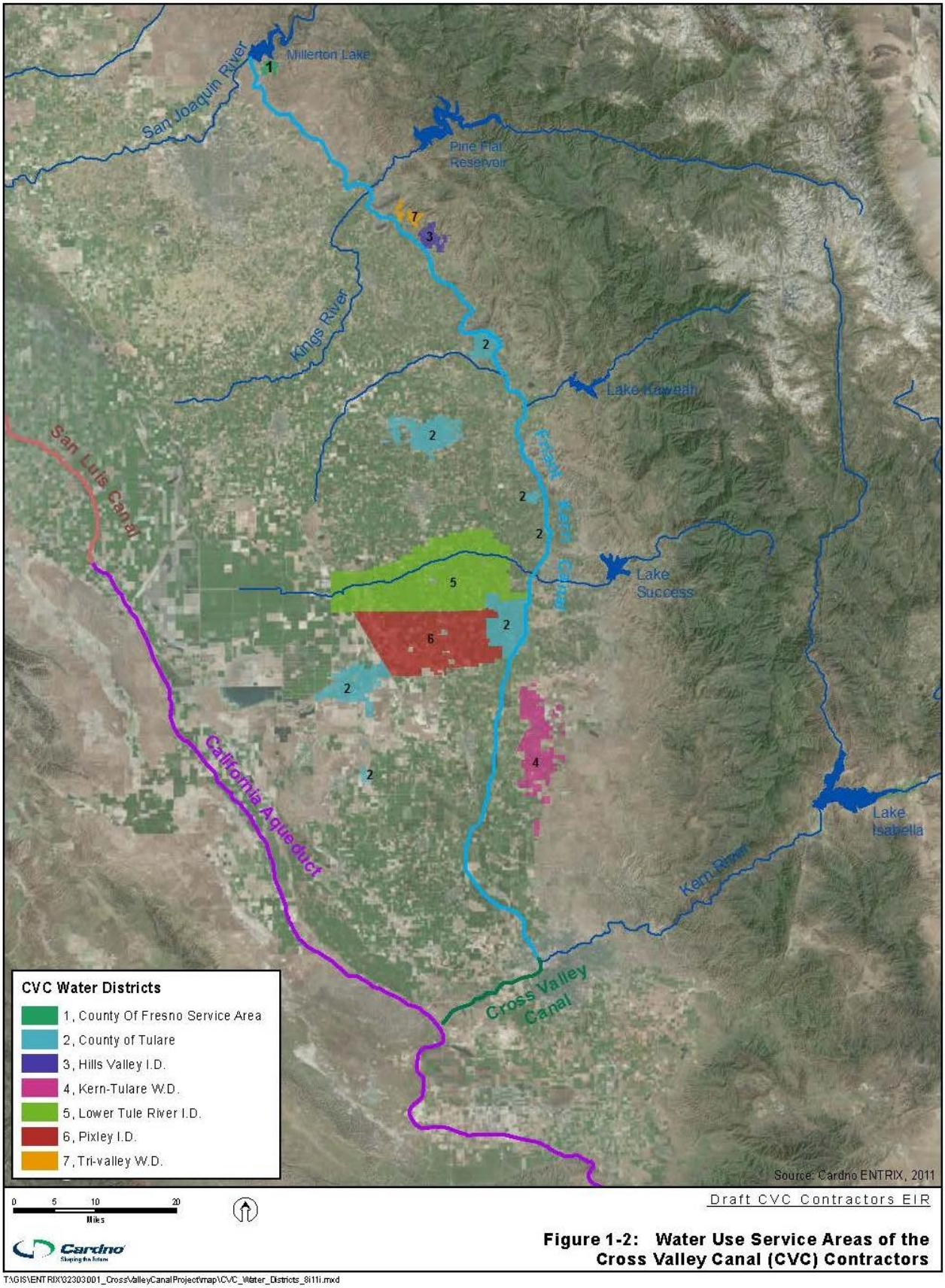
The Proposed Project proponents are the CVC Contractors. DWR is a CEQA Responsible Agency for this EIR. Reclamation is concurrently preparing a separate National Environmental Policy Act (NEPA) document on the related action of executing long-term renewal of federal water supply contracts with the CVC Contractors. Each CVC Contractor must individually comply with CEQA and NEPA relating to its separate action of executing long-term renewal of their respective water supply contracts with Reclamation and executing a conveyance contract with DWR and Reclamation.

1.2 Overview of the Cross Valley Canal Contractors' CVP Water

The CVC Contractors are located along the FKC and consist of seven water districts (WD), irrigation districts (ID), and county contractors: Lower Tule River ID, Pixley ID, Hills Valley ID, Tri Valley WD, County of Tulare, County of Fresno, and Kern-Tulare WD. Previously, Rag Gulch WD was a separate CVC Contractor, until it recently merged with Kern-Tulare Water District. The CVC Contractors are located within Fresno, Kings, Tulare, and Kern counties (Figure 1-2) and historically relied on groundwater and local surface water supplies for their water supply.

Figure 1-1: Project Location

T:\GIS\ENTRIX\23303001_CrossValleyCanalProject\mxd\CVC_Base_Map_8i11i.mxd


Millerton Lake
San Joaquin River
Pine Flat Reservoir
Kings River
Lake Kaweah
San Luis Canal
Friant-Kern Canal
Lake Success
California Aqueduct
Lake Isabella
Kern River
Cross Valley Canal
CVC Water Districts
1, County Of Fresno Service Area
2, County of Tulare
3, Hills Valley I.D.
4, Kern-Tulare W.D.
5, Lower Tule River I.D.
6, Pixley I.D.
7, Tri-valley W.D.
Source: Cardno ENTRIX, 2011
0 5 10 20
Miles
Draft CVC Contractors EIR
Cardno
Figure 1-2: Water Use Service Areas of the Cross Valley Canal (CVC) Contractors
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The water supply contracts provide for delivery of CVP water available in the Delta, and the conveyance of that supply through the Aqueduct to the CVC or other points of delivery mutually agreed upon by the parties. The CVC Contractors' CVP water is pumped from the Delta by DWR (providing the pumping facilities) and Reclamation (providing the power supply) and then conveyed to the San Luis Canal and Aqueduct for delivery into the CVC. Improvements have since been made to the CVC that increases the flexibility to move water between the Aqueduct and the Friant-Kern Canal (FKC) and to deliver water to banking projects along the CVC.

The status and operation of the overall CVP and the water demands of CVP water supply contractors has been described in numerous documents including the Central Valley Project Improvement Act Programmatic Environmental Impact Statement (Reclamation 1999) and the CVP and SWP Operations and Criteria Plan (OCAP), which is a detailed analysis and explanation of the criteria and procedures for conducting combined CVP and SWP operations. Reclamation and DWR conducted endangered species consultations to address the CVP/SWP combined long-term operations leading to the development of BOs on the combined operations of their facilities in 2004. No later than November 30 of each year, Reclamation and NMFS conduct a Science Peer Review to determine if the Reasonable and Prudent Alternative (RPA) should be altered in light of information learned from prior years' operations or research (Delta Stewardship Council 2014). The 2014 peer review results are discussed in Section 3.5.

The CVC Contractors have water supply contracts totaling 128,300 acre-feet (af) annually (Table 1.2-1). The CVC Contractor's CVP water is delivered by Reclamation to the Sacramento/San Joaquin Delta (Delta), whereupon it is diverted and conveyed south by DWR for delivery. The current delivery mechanisms are explained further in Section 1.3. For the purposes of this document, the CVP water contracted by Reclamation to be delivered through the CVC (described in Table 1.2-1) is referred to as CVC Contract water.

Table 1.2-1 Cross Valley Contractors CVP Contract Supply and Total Deliveries by DWR

CVC Contractors	CVC Contract Annual Supply (af)	Average Annual Delivery[1,6] (af)	Percent Received[1,6]
County of Fresno[2]	3,000	2,900[7]	97%
Hills Valley Irrigation District	3,346	945	28%
Kern-Tulare Water District[3]	53,300	16,118	30%
Lower Tule River Irrigation District[4]	31,102	9,378	30%
Pixley Irrigation District	31,102	8,750	28%
Tri-Valley Water District	1,142	282	25%
County of Tulare[5]	5,308	1,505	28%
Total Average Annual Delivery	**128,300**	**39,879**	**31%**

[1] For the period 1998-2015.

[2] County of Fresno includes subcontractor Fresno County Service Area #34.

[3] Combined Kern-Tulare Water District (40,000 af per year) and Rag Gulch Water District (13,300 af per year).

[4] Lower Tule River ID, Saucelito ID, Stone Corral ID and City of Lindsay receive CVP water under more than one contract, either as a Friant and/or Cross Valley Contractors or subcontractor.

[5] County of Tulare includes subcontractors Alpaugh ID, Atwell Island WD, City of Lindsay, Smallwood Vineyards, Hills Valley ID, Saucelito ID, Stone Corral ID, Strathmore Public Utility District, Styrotek, Inc., and City of Visalia

[6] Includes non-CVP transfers/exchanges

[7] Includes deliveries in 2012 and 2013 for San Joaquin River Restoration Program Recapture Water conveyed via Article 3(e). Without recapture water deliveries, the average annual delivery is approximately 900 af, or 30% of contract, for 1998-2015.

1.2.1 Cross Valley Contractors' Water Use

> **County of Fresno** has a CVC Contract for 3,000 af per year, which it provides to one subcontractor, Fresno County Service Area (CSA) #34. The water is used for municipal and industrial (M&I) uses. After the County of Fresno's CVP water has been exchanged with Arvin Edison Water Storage District (AEWSD) or other agencies, CSA #34 diverts the water from Millerton Lake.

> **Hills Valley Irrigation District (HVID)** has a CVC Contract that provides for 3,346 af per year and distributes the water to agricultural users within the district. The district does not provide groundwater service, but individual landowners may have private wells. Historically, the district has received its CVC Contract allocation through exchanges with AEWSD. Hills Valley Irrigation is also a subcontractor to the County of Tulare under its CVC Contract.

> **Kern-Tulare Water District (KTWD)** merged with another CVC Contractor, Rag Gulch Water District (RGWD) to form a combined district. The CVC Contracts total 40,000 af and 13,300 af per year for KTWD and RGWD, respectively. Besides CVC Contracts, current water supplies are derived from the Kern River, and banking and exchange agreements with other water districts. Individual farmers also operate wells and pump groundwater.

> **Lower Tule River Irrigation District (LTRID)** has a CVC Contract totaling 31,102 af per year. LTRID also has water service contracts with Reclamation for Friant Division water from Millerton Lake, local surface water from the Tule River, and groundwater. The district does not provide groundwater service but individual landowners may operate their own well. Because of lack of direct access to the FKC, LTRID has received its water supply by utilizing direct exchanges of its CVC Contract allocation for supplies from other entities, or has needed to sell its CVC Contract allocation with utilization of the proceeds to purchase water supplies on the water market (Reclamation 2010).

> **Pixley Irrigation District (PXID)** has a CVC Contract totaling 31,102 af per year. Other water supplies available to PXID include surface water from Deer Creek and groundwater. PXID has a groundwater recharge program that involves direct recharge in Deer Creek and through the canal system. Because of lack of direct access to the FKC, PXID has received its water supply by utilizing direct exchanges of its CVC Contract allocation for supplies from other entities, or has needed to sell its CVC Contract allocation with utilization of the proceeds to purchase water supplies on the water market. Individual farmers also operate wells and pump groundwater.

> **Tri-Valley Water District (TVWD)** has a CVC Contract that provides for 1,142 af per year, which it provides to agricultural users within its district.

> The **County of Tulare** subcontracts its 5,308 af of CVC Contract allocation to several parties including: Alpaugh ID, Atwell Island WD, City of Lindsay, Hills Valley ID, Frasinetto Farms LLC, Saucelito ID, Stone Corral ID, Strathmore PUD, Styrotek, Inc., and City of Visalia. Water is used for irrigation and M&I demands. Subcontractors to the County of Tulare either pump groundwater, receive Friant Division water, or exchange water with other water agencies.

1.2.2 Cross Valley Contractors' in-Delta Allocation

Each year Reclamation identifies the water allocation for the CVP SOD Contractors. Reclamation has determined that the CVC Contractors could receive delivery of water in the amount of the difference between the actual SOD CVP water allocation and the amount of water potentially available to SOD Contractors, if pumping restrictions in the Delta did not limit exports. Delivery of this water is contingent on the CVC Contractors securing means to convey the water without interfering with the legal rights of another CVP Contractor or non-CVP Contractor. To date, Reclamation has infrequently delivered the supply through CVP facilities (summarized below under Section 1.3.1) to the CVC Contractors, primarily because of limited conveyance capacity.

1.3 Project Background

DWR and Reclamation have built water conservation and water delivery facilities in the Central Valley in order to deliver water supplies to affected water rights holders as well as project contractors (Figure 1-3). DWR and Reclamation's water rights are conditioned by the State Water Resources Control Board (SWRCB) to protect the beneficial uses of water within each respective project and jointly for the protection of beneficial uses in the Sacramento Valley and the Sacramento-San Joaquin Delta Estuary. DWR and Reclamation coordinate the operation of the CVP and SWP to meet the joint water right requirements in the Delta (USFWS 2008).

1.3.1 Sacramento/San Joaquin Delta

The CVC Contractors water is delivered to the Delta by Reclamation before being exported through the Harvey O. Banks Pumping Plant (Banks). The ability to pump the CVC Contractor water is controlled by available capacity at the Banks Pumping Plant, available capacity in the Aqueduct, and also the regulatory conditions in the Delta. Since the three-party contract was first approved in the mid-1970s the regulatory environment in the Delta has changed. Standards specifying pumping rates, delta outflow, reverse flow in the Delta, and other parameters have been implemented through SWRCB rulings, biological opinions, and SWP operating criteria. All of these conditions have resulted changes in the timing and magnitude of diversions at the Banks Pumping Plant, and thereby affect the provision of water for the CVC Contractors under current practices.

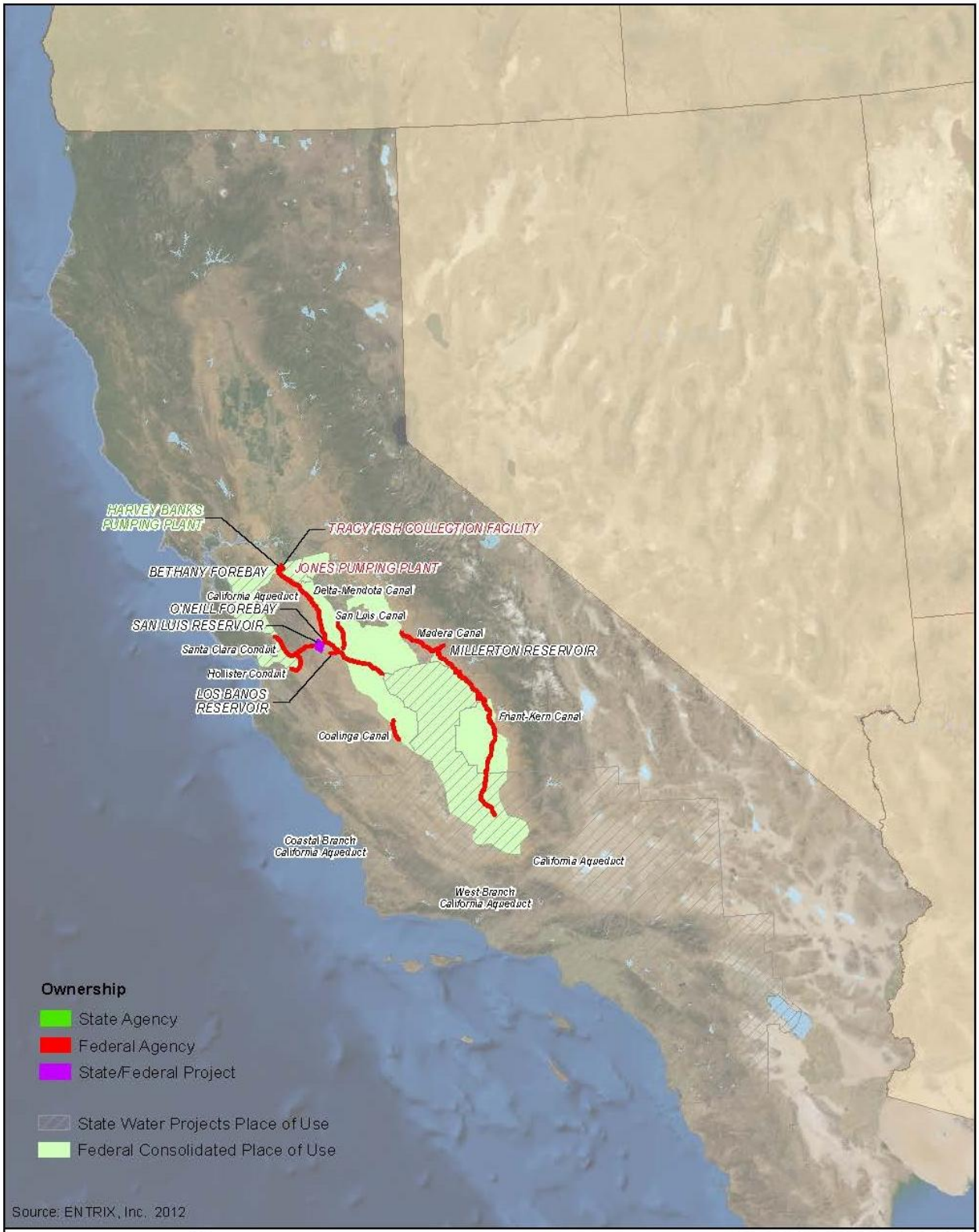
1.3.2 CVP (Federal) Water Facilities

Water is exported from the southern Delta by Reclamation at the Jones Pumping Plant into the Delta Mendota Canal (DMC). The DMC travels south to a point adjacent to the O'Neill Forebay, where it can be pumped into O'Neill Forebay and San Luis Reservoir. The DMC continues south and terminates at the Mendota Pool on the San Joaquin River. Reclamation delivers water along the DMC to certain CVP water contractors (Figure 1-3). Water conveyed in the DMC serves lands within the CVP SOD Place of Use.

1.3.2.1 Friant-Kern Canal

The FKC is part of the Friant Division of the CVP and conveys water from Millerton Lake on the San Joaquin River south to Kern River near Bakersfield. The FKC is owned by Reclamation and is operated and maintained by the Friant Water Authority (FWA). The FKC capacity at the head is 5,000 cubic feet per second (cfs), reducing to 2,000 cfs at the terminus near the Kern River. Along the downstream end of the FKC, there are several check structures (or checks) that allow water to be pumped north in the FKC. This upstream flow is accomplished by pumps at the checks that lift the water over the check to the upstream section of the FKC. The facilities include Shafter Check, the Poso Creek Check, and the Lake Woollomes Check. If all three checks are used, water can be conveyed north from the CVC to KTWD, the southern-most CVC Contractor. This upstream flow has been used historically to move CVC Contract water from the CVC to Friant Division Contractors or some of the CVC Contractors, such as KTWD. The practice introduces Delta water with a higher total dissolved solids concentration than Friant water, into the FKC. However, this concern as it relates to these specific supplies is addressed further in the CVC operating agreement, to which AEWSD is a party.

Millerton Lake is part of the Friant Division of the CVP and is located on the San Joaquin River. Impounded by Friant Dam, Millerton Lake has a maximum storage capacity of 520,500 af. Water stored in Millerton Lake supplies the FKC (which flows south) and the Madera Canal (which flows north), in addition to releases to the San Joaquin River. The FKC starts at the southwest corner of Friant Dam. The current San Joaquin River Restoration Program (SJRRP) is analyzing flow releases from Millerton Lake to the San Joaquin River for restoration of river function and aquatic habitat (http://www.restoresjr.net/activities/if/index.html).


HARVEY BANKS PUMPING PLANT
TRACY FISH COLLECTION FACILITY
BETHANY FOREBAY
JONES PUMPING PLANT
California Aqueduct
Delta-Mendota Canal
O'NEILL FOREBAY
SAN LUIS RESERVOIR
San Luis Canal
Madera Canal
MILLERTON RESERVOIR
Santa Clara Conduit
Hollister Conduit
LOS BANOS RESERVOIR
Friant-Kern Canal
Coalinga Canal
Coastal Branch California Aqueduct
California Aqueduct
West Branch California Aqueduct
Ownership
State Agency
Federal Agency
State/Federal Project
State Water Projects Place of Use
Federal Consolidated Place of Use
Source: ENTRIX, Inc. 2012
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Draft CVC Contractors EIR
Figure 1-3: Map of California CVP and SWP Service Areas south-of-Delta
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1.3.3 SWP (State of California) Water Facilities

Water is exported from the Delta by the state of California using SWP facilities. Diversion occurs at the Clifton Court Forebay then flows through the Banks Pumping Plant into the Aqueduct. The Aqueduct is a feature of the SWP and is operated by DWR. The first portion of the Aqueduct extends to O'Neill Forebay, where water can be pumped into San Luis Reservoir. The segment of the Aqueduct between the O'Neill Forebay and the State Highway 41 Bridge near Kettleman City is a joint-use facility shared between DWR and Reclamation, also known as the San Luis Canal (see Figure 1-3). Water deliveries in this section are made to both CVP and SWP Contractors. CVP water can be delivered from this section to the CVP contractors located SOD. The Aqueduct continues south from the State Highway 41 Bridge to storage and distribution facilities in Kings and Kern counties and south to the greater southern California area.

In addition to exports, a portion of water flowing into the Delta is subject to consumptive uses in the Delta, while the remainder flows to San Francisco Bay and eventually to the ocean.

1.3.4 Cross Valley Canal

The CVC improves the management of water supplies in the central and lower San Joaquin Valley (SJV). Water supplies originating in the Delta are conveyed in the Aqueduct to the headworks of the CVC, where it can be conveyed through the CVC into the FKC for direct deliveries to KTWD. More commonly, water is delivered to the CVC Contractors via water exchanges, typically with AEWSD.

The CVC was constructed in the mid-1970s by the CVC Contractors, KCWA, Cawelo WD, and Rosedale-Rio Bravo Water Storage District. The CVC capacity was expanded by Kern County Water Agency, AEWSD, and Kern Delta WD in 2008. The CVC is 17 miles long and is located in the southern SJV where it connects the Aqueduct with the FKC (see Figure 1-2). The connection with the Aqueduct is south of the town of Tupman in Reach 12E of the Aqueduct. On the eastern end, the canal ends near the southern end of the FKC. Water in the canal can flow in either the east or west direction. To flow east from the Aqueduct to the FKC, water is lifted through a series of six pump stations. Water flows west in the canal by gravity. The maximum CVC capacity from west to east is 1,312 cfs and from east to west is 500 cfs. Five 24-inch pipelines connect the CVC to the FKC were installed by the KTWD. Each pipe has a capacity of approximately 15 cfs. In 2008, an Intertie was constructed between the CVC and the FKC. The Intertie connects the existing FKC to a pump station and junction box that takes water from the afterbay of CVC Pumping Plant #6b. About 880 feet (ft) of an 8-foot diameter pipeline was installed parallel to the AEWSD Intake Canal to provide up to 500 cfs of flow between the FKC and the CVC, in either direction. As part of the 2008 canal expansion and construction of the Intertie, a contract for operating the Cross Valley Canal and Intertie was executed. Article 9(c) of this contract reads:

> *"Use of the Intertie for delivery of water from the Cross Valley Canal to the Friant-Kern Canal may result in adverse water quality impacts to Arvin-Edison. Due consideration for such impacts shall be negotiated between those Participants desiring to introduce water into the Friant-Kern Canal and Arvin-Edison; provided, however, no such consideration shall be due with respect to any water provided under existing contracts and renewals thereof between Rag Gulch, Kern-Tulare and the Fresno-Tulare Group and the United States for providing for deliveries from the California Delta or Rag Gulch or Kern-Tulare supplies delivered pursuant to Federal approval"*

The contractors that participated in the construction and have capacity rights in the CVC are referred to as the Cross Valley Participants. The Cross Valley Participants are responsible for the operations and maintenance costs of the CVC. Each agency identified in Table 1.3-1 has capacity in the CVC and can assign other Cross Valley Participants the ability to use their capacity and have the right to use any unused capacity in the CVC. These contractors also have capacity in the CVC/FKC Intertie.

Table 1.3-1 Cross Valley Participants Share of CVC and Intertie Capacity[1]

Agency	CVC Capacity		Intertie Capacity	
	(cfs)	(% of Total)	(cfs)	(% of Total)
Cross Valley Contractors	445	33.9	169	33.9
Arvin Edison Water Storage District	113	8.6	43	8.6
Cawelo Water District	170	13.0	65	13.0
Kern County Water Agency	377	28.7	144	28.7
Rosedale-Rio Bravo	7	0.5	3	0.5
Kern Delta Water District	200	15.2	76	15.2
Total Supply	**1,312**	**100**	**500**	**100**

[1] Capacity listed for CVC Reach 3. Total capacity for Reaches 1 and 2 are 1,422 cfs and 1,343 cfs, respectively.

1.3.5 CVC Contractor Water Exchanges/Conveyance

The CVC Contractors receive their CVP water through a series of exchanges or transfers from other water agencies throughout the SJV. For the purposes of this document, an agency participating in an exchange with a CVC Contractor is referred to as the Exchange Entity. The range of potential Exchange Entities includes those agencies in the CVP SOD Place of Use (Figure 1-4). The types of exchanges are varied and may involve one or more agencies. The following exchange mechanisms are currently used and will continue to be used once the long-term conveyance contracts are renewed. For each of the current exchange mechanisms, Reclamation provides CVP water to CVC Contractors in the Delta and then that water is conveyed and delivered to a water agency. The water is then exchanged and an amount of water is returned to the CVC Contractors through other conveyance or storage facilities. An exchange may be balanced or unbalanced in volume or time. That is, the CVC Contractors may, in an unbalanced exchange, give up some amount of water in the exchange (up to 2:1 average exchange ratio over a 10-year period) or the exchange may involve different times of the year.

Exchange agreements have been negotiated between CVC Contractors individually or collectively with other water agencies. Such exchanges with AEWSD and others are authorized in the existing CVC Contractors water supply contracts, and may continue to use SWP Facilities under the Proposed Project for the exchanges with AEWSD. The water provided to the Exchange Entity by the CVC Contractors is only used within the Exchange Entity boundaries as part of its existing annual water supply while the water released by the Exchange Entity is used in the CVC Contractor's service area as part of the existing annual CVC supply. For example, CVC exchange water is delivered to AEWSD through the CVC and an amount of AEWSD Friant Division supply is delivered to the CVC Contractors through Millerton Lake, as is presently the case for the County of Fresno, or for the remaining CVC Contractors through the FKC.

1.3.5.1 Delivery of CVC Contractor Water to the Exchange Entity

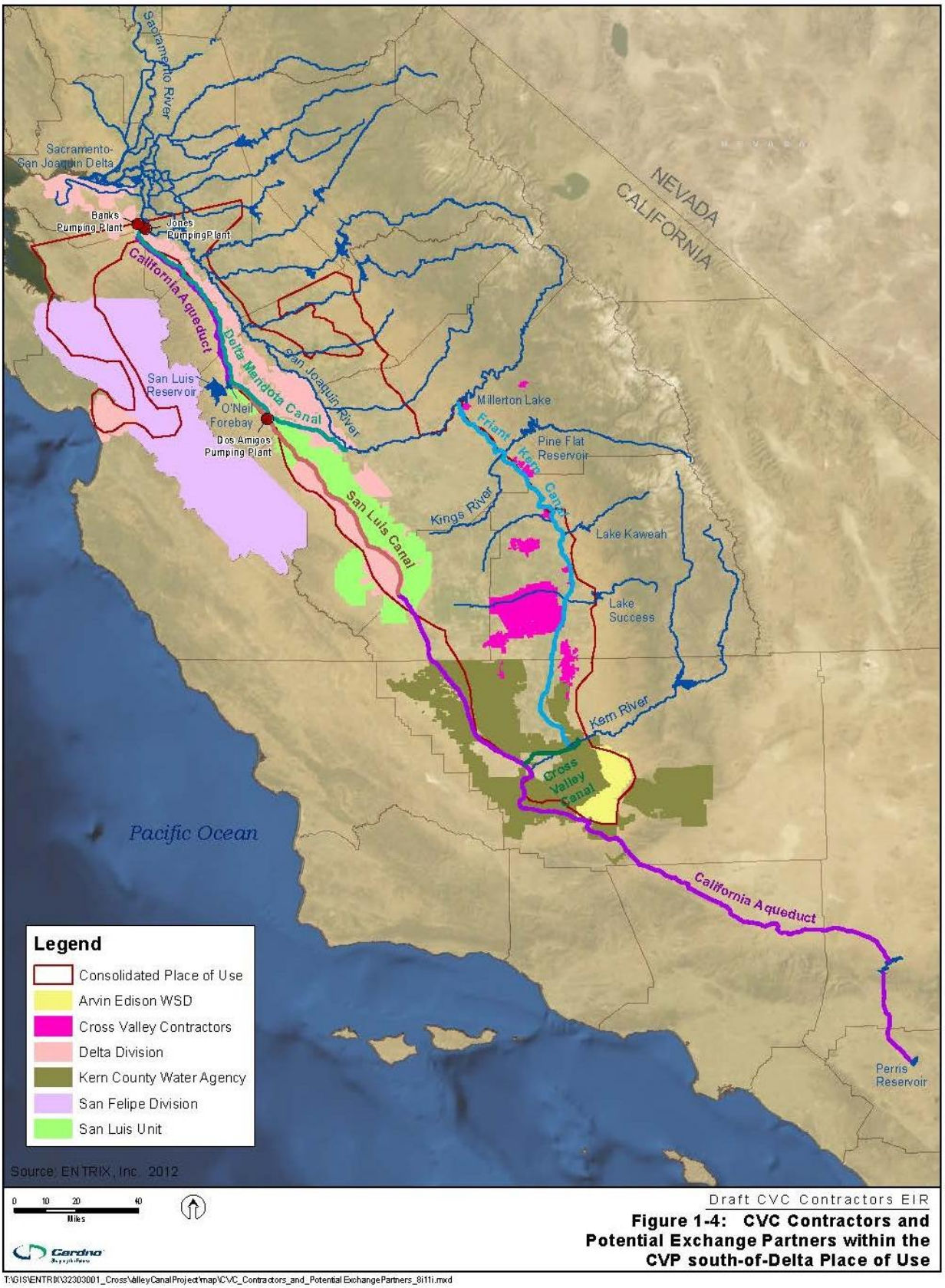
Reclamation makes available CVP water at a location where it can be diverted or exchanged for CVC Contract water. The locations include:

> The Delta

> O'Neill Forebay

> CVP share of San Luis Reservoir

> Millerton Lake


Sacramento River
Sacramento-San Joaquin Delta
Banks Pumping Plant
Jones Pumping Plant
California Aqueduct
Delta Mendota Canal
San Joaquin River
San Luis Reservoir
O'Neill Forebay
Dos Amigos Pumping Plant
San Luis Canal
Millerton Lake
Friant
Kern Canal
Pine Flat Reservoir
Kings River
Lake Kaweah
Lake Success
Kern River
Cross Valley Canal
California Aqueduct
Perris Reservoir
NEVADA
CALIFORNIA
Pacific Ocean
Legend
Consolidated Place of Use
Arvin Edison WSD
Cross Valley Contractors
Delta Division
Kern County Water Agency
San Felipe Division
San Luis Unit
Source: ENTRIX, Inc. 2012
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Miles
Cardno
Draft CVC Contractors EIR
Figure 1-4: CVC Contractors and Potential Exchange Partners within the CVP south-of-Delta Place of Use
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The CVP water may be available through surplus water (Section 215 water available from the Delta), recirculation water originating from the San Joaquin River, CVP water transferred from another CVP contractor, or water transferred or exchanged with another water agency. The delivery of water from the Delta to the Exchange Entity depends on the availability of capacity at the federal or state export pumps and also the capacity in the Aqueduct or DMC. As part of the delivery, Reclamation provides power at the needed facilities for pumping of the exchange water. The description of delivery mechanisms is meant to bracket the range of delivery options considered as part of this Proposed Project. If an option is clearly impractical, it was eliminated from further consideration. The possible delivery mechanisms are as follows.

Diversion at the Jones Pumping Plant

Reclamation would divert the CVC Contract water into the DMC through the Jones Pumping Plant and the water would be conveyed to either:

> O'Neill Forebay,

> CVP SOD contractor's turnout off of the San Luis Canal, or

> Federal share (CVP) of San Luis Storage.

In each case, Reclamation provides federal power at the Jones Pumping Plant and Dos Amigos Pumping Plant as part of delivery to the Exchange Entity. If the water is delivered to the O'Neill Forebay, DWR would need to convey the water through the San Luis Canal to the same delivery points as discussed under the "Diversion at the Banks Pumping Plant" below.

Diversion at the Banks Pumping Plant

DWR would divert the water at the Banks Pumping Plant into the Aqueduct and convey the CVC Contractor water in SWP facilities. The point of delivery from DWR is:

> CVP Contractor turnout along the San Luis Canal,

> SWP Contractor turnout along the San Luis Canal,

> SWP Contractor turnouts along the Aqueduct,

> CVC turnout along the Aqueduct, or

> AEWSD turnout along the Aqueduct.

Reclamation provides federal power at the Banks Pumping Plant and Dos Amigos Pumping Plant except when the Exchange Entity is an SWP contractor. DWR will provide power when Article 55 of the long term SWP Contract is used to convey water for the SWP Contractor.

Delivery through the Cross Valley Canal

As mentioned above, DWR can convey the water to the CVC turnout on the Aqueduct. As operator of the CVC, KCWA then conveys water in the CVC to either:

> CVP contractor turnout along the CVC,

> SWP Contractor,

> FKC through the CVC/FKC Intertie or KTWD's pipelines, or

> Groundwater storage projects along the CVC (banked water).

In each case, Reclamation provides federal power at the Dos Amigos Pumping Plant. Water enters the FKC as CVP water subject to Reclamation Law with no requirement for a Warren Act Contract.

Delivery through the Friant-Kern Canal

If water is delivered to the FKC through the CVC/FKC Intertie, the FWA would convey and deliver the water to a Friant Contractor. The point of delivery is:

> Friant Contractor turnout along the FKC, or

> KTWD (a CVC Contractor).

Water can be conveyed north on the FKC through the use of check structures and pumps. This practice has been used in the past but depends on the current demands along the FKC. In dry years when deliveries along the FKC are low, this mechanism can be used. The practical limit of this mechanism is the KTWD, about 30 miles north of the CVC/KFC Intertie.

Water is also delivered from Millerton Lake. This mechanism is currently used by the County of Fresno.

1.3.5.2 Return of Water from the Exchange Entity

After water has been delivered to the Exchange Entity there has to be an exchange (return) from that agency to the CVC Contractor. The return of CVC Contractor exchange water can occur from several sources as described below.

Return water from Millerton Lake (Friant Division) and delivered through the FKC

The CVC Contractor would receive FKC water in exchange for the CVC Contractor's water that was delivered from the Delta to the Exchange Entity. FWA would in most cases convey the water through the FKC to the CVC Contractor. Water is delivered to both the CVC Contractor and Friant Contractor as CVC Contract water subject to Reclamation law with no requirement for a Warren Act Contract. The exchanged water is CVP water stored in Millerton Lake.

Return water from SWP Contractor and delivered through the CVC

The CVC Contractor would receive the SWP water, or previously banked water, in exchange for CVC Contract water that was delivered from the Delta to the Exchange Entity. KCWA would then convey the water through the CVC for delivery to the CVC Contractor. Water is delivered to the CVC Contractor as CVC Contract water subject to Reclamation law with no requirement for a Warren Act Contract. CVC Contract water is delivered to the Exchange Entity as non-project water not subject to Reclamation law.

Return from a Non-CVP Agency

This option has been used previously, involving the TLBWD (an SWP contractor). The non-CVP agency would deliver non-project (non-CVC Contract) water (from pre-1914 water rights holders) from Pine Flat, Kaweah, or Success Reservoirs to Friant Division Contractors on its local system. Then, the Friant Division Contractor(s) would deliver Friant-Kern water to the CVC Contractor. This mechanism involves three groups: the CVC Contractor, the non-CVP agency, and the Friant Division Contractor. Water is delivered to the CVC Contractor as CVC Contract water subject to Reclamation law with no requirement for a Warren Act Contract. CVC Contract water is delivered to the Exchange Entity as non-project (non-CVC Contract) water not subject to Reclamation law.

1.3.5.3 Timing of Exchanges

The difference in timing between when CVC Contract water is available in the Delta and when it is needed in the districts or counties is addressed in Reclamation's water contract renewal environmental documents. Historically, the Exchange Entity puts the exchanged CVP water to beneficial use when the water is available and water can be delivered to the CVC Contractor during the same year to meet the CVC Contractor's delivery requirements. There is also the option to store the water for longer periods of time in the San Luis Reservoir (CVP share) or at a groundwater bank. With such a storage system, CVP

water could be diverted at one period of time, then stored, and delivered to the CVC Contractor at a later point in time. Temporary or long-term storage is often an element of water exchanges.

1.4 Public Scoping and Identification of Issues

A Notice of Preparation (NOP) of an Environmental Impact Report (EIR) was filed with the State Clearinghouse on May 10, 2011, and was circulated for a 30-day review and comment period ending June 8, 2011 (SCH Number 2011051022). A copy of the NOP is presented in Appendix A. The NOP was distributed to agencies, organizations, and individuals on the Proposed Project mailing list.

On June 1, 2011, LTRID conducted a public and agency scoping meeting in Tipton, California, to solicit input on the issues, impacts, and alternatives that should be evaluated in the Draft EIR (DEIR). No one appeared at the scoping meeting to provide oral comments.

Scoping comments were received prior to the close of the public review period. Comment letters from the Native American Heritage Commission (NAHC) and the AEWSD are contained in Appendix A. Scoping comments were made concerning the following resource issues:

> Cultural/Archeological/Historical Resources: Letter included state and federal statues and request for early consultation with Native American tribes on the attached list of contacts.

> Compliance with state and federal statements relating to Native American historic properties of religious and cultural significance to American Indian tribes and interested Native American individuals as “consulting parties” under both state and federal law.

> Hydrology and Water Quality (Surface Water Resources): AEWSD is concerned with discharge of water into the FKC that could have potentially significant water quality impacts to AEWSD’s surface and groundwater supplies, water banking programs, and crops and land uses within the District. AEWSD indicated that it is uncertain whether the EIR is to address this issue and subsequent conveyance therein

Comments received during the scoping process were considered by the lead agency in determining the scope of the Draft EIR.

1.5 Report Organization

The DEIR is organized as follows: Chapter 2 describes the Proposed Project; Chapter 3 describes the environmental setting for each of the resources with the potential to be affected by the Proposed Project as well as potential impacts and mitigation measures; Chapter 4 evaluates the alternatives to the Proposed Project; Chapter 5 addresses the potential cumulative impacts on the resources identified; and Chapter 6 evaluates any growth inducing impacts and the level of significance of the proposed impacts. Chapters 7 and 8 list the persons and agencies contacted throughout development of the DEIR and references, respectively. All appendices are included herein at the end of the document.

Following this Introduction, Chapter 2 describes the Proposed Project and Project Area. Potential impacts to the following resources are evaluated further in Chapter 3.

> Agriculture and Forestry Resources

> Air Quality

> Biological Resources

> Greenhouse Gas Emissions

> Hydrology and Water Quality (Surface Water and Groundwater Resources)

> Land Use and Planning

> Socioeconomics

CEQA Guidelines Section 15126 requires a discussion of environmental impacts including direct and indirect impacts associated with all phases of the Proposed Project and to resources potentially affected (those listed above), focusing on significant environmental impacts, and identifying other impacts as listed below in the appropriate sections:

> Chapter 4, Alternatives to the Proposed Project
  - Alternatives Considered and Eliminated from Further Consideration
  - No Project Alternative

> Chapter 5, Cumulative Impacts

> Chapter 6, Other CEQA Considerations/Required Disclosures
  - Growth Inducement
  - Irreversible and Irretrievable Commitment of Resources
  - Significant and Unavoidable Impacts
  - Energy Requirements
  - Consistency with Local Plans

1.6 EIR Process and Public Review

An EIR is intended to provide information about the environmental impacts of a proposed project to decision makers such as the lead agency, and responsible and trustee agencies that have permit or review authority over the project, and to the public. On behalf of the CVC Contractors, the LTRID must certify that the Final EIR (FEIR) has been completed in compliance with CEQA, that it reviewed and considered the information in the FEIR, and that the FEIR reflects LTRID's independent judgment and analysis. Once LTRID approves the project, it will file a Notice of Determination (NOD) with the State Clearinghouse and the County Clerk.

Each CVC Contractor is currently a party to its own separate three party contract with both Reclamation and DWR to receive water from the CVP and then convey this water. Therefore, the CVC Contractors must individually comply with CEQA utilizing information contained in this EIR. DWR will consider the information in this EIR and reach its own conclusion on whether and how to approve each separate three party contract. . Similarly, each CVC Contractor must individually comply with the National Environmental Policy Act (NEPA) utilizing Reclamation's Environmental Impact Statement (EIS) addressing the related federal action that is concurrently being prepared with this EIR.

It is not the purpose of an EIR to recommend approval or denial of a project. Although the EIR does not dictate the lead agency's ultimate decision on a project, LTRID must consider information in the EIR during the approval process. LTRID must respond to each significant impact (if any) identified in the EIR. Under CEQA, if significant, adverse environmental impacts are identified in the EIR, approval of the project must be accompanied by written findings. If mitigation measures are made a condition of project approval, a mitigation monitoring or reporting plan must be adopted before the project can be approved.

CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits of a proposed project against its unavoidable environmental risks when determining whether to approve a project. When an agency approves a project that will result in significant and unavoidable impacts, it must make a Statement of Overriding Considerations as part of the approval process. The NOD filed for the project must discuss whether the lead agency certified the EIR, prepared findings, adopted a mitigation monitoring or reporting plan, and prepared a Statement of Overriding Considerations.

This DEIR will be circulated for a 45-day review period, beginning June 30, 2016 and ending August 13, 2016. During the review period, public and agency comments will be received by LTRID and responses to comments will be addressed in the FEIR.

During the public review period, written comments may be sent to:

> Daniel Vink, General Manager
Lower-Tule River Irrigation District
357 East Olive Avenue
Tipton, CA 93272

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2 Description of the Proposed Project

2.1 Introduction

The scope of this Draft Environmental Impact Report (EIR) is to analyze the environmental effects of the Proposed Project which is the approval, execution and implementation of three-party conveyance contracts (a contract with California Department of Water Resources [DWR], and the U.S. Bureau of Reclamation [Reclamation], and one for each of the seven Cross Valley Canal [CVC] Contractors), providing for the long-term conveyance of the CVC Contractors' existing Central Valley Project (CVP) water supply in the Sacramento-San Joaquin Delta (Delta) through State Water Project (SWP) facilities only when supplies are physically and legally available in the Delta and capacity exists in the Aqueduct (see Figure 1-1). Each CVC contractor would have a separate contract with DWR and Reclamation. The DEIR also evaluates the No Action Alternative of not approving the execution and implementation of the three-party conveyance contracts. The term of the proposed agreement is to February 28, 2035. The draft conveyance agreement is found in Appendix B. The authority to convey non-SWP water, including CVP water in the Aqueduct comes from the California Water Code, Section 1810-1814 and 12930-12944 (The Burn-Porter Act). This allows DWR to convey water through unused capacity in SWP facilities for other entities such as the CVC Contractors. For a detailed description of the Proposed Project, see Section 2.4 below.

The CVC Contractors almost exclusively receive their CVP allocation through exchanges with other water agencies. Implementation of this Proposed Project does not affect the ability of the CVC Contractors to enter into exchange agreements nor does it specify the nature of those agreements. The types of future exchanges, not described in this DEIR, would be speculative at this time and would be subject to a follow on environmental review when such exchanges are actually known and proposed.

2.2 Project Location and the Project Area

The Proposed Project is generally located in the eastern San Joaquin Valley (SJV) and includes the service areas of the CVC Contractors (see Figure 1-2), as well as the CVP south-of-Delta (SOD) Place of Use where actual and or potential Exchange Agencies are located under the Proposed Project. The CVC Contractors have interim water service contracts with Reclamation for CVP water and are currently working on long-term contracts. The water supply point of delivery for CVC Contractors is the Delta. These contractors are not directly connected to the Delta export facilities and have to exchange their CVC Contract water with other water agencies to receive the contracted supply. The CVC Contractors and potential Exchange Agencies (other CVP contractors and non-CVP contractors) are located primarily within that portion of Fresno, Kings, Tulare, and Kern counties within the CVP SOD Place of Use (Reclamation July 2010), referred to as the Project Area in this DEIR (see Figure 1-4).

2.3 Project Purpose and Objectives

The renewal of the three-party conveyance contracts are negotiated agreements that generally maintain the status quo under the existing conveyance contracts, whose term presently extends to February 28, 2018.

The purpose of the Proposed Project is to ensure that water supplies continue to be conserved and used at maximum efficiency taking into consideration timing, availability, and variability of CVP and non-CVP water supplies. Additionally, the action is needed to preserve groundwater levels within the Proposed Project Area. Quite often, CVC Contractors and private landowners within water district boundaries have fewer water supply options and more quickly turn to pumping groundwater to meet their water demands. In order to preserve groundwater levels, CVC Contractors rely on surface water imported from CVP supplies to offset groundwater use. To accomplish importing Delta water, CVC Contractors need to transfer or exchange surface water supplies using direct exchange or banking the water in reservoirs or

groundwater banks. Therefore, there is a need for a long-term dependable water supply that the CVC Contractors can count on in the annual water supply planning. Short of a dependable long-term supply, the contractors have water supply reliability issues that it turn, affect groundwater conditions, crop selection, irrigated land, and crop viability for permanent crops.

The need for a three-party conveyance contract arises because Reclamation supplies the water and power for the action, but generally lacks sufficient conveyance capacity to deliver the CVP supply directly to the CVC Contractors. The SWP may have unused conveyance capacity at certain times of the year, and DWR has offered to continue to convey the water to the CVC Contractors in this available capacity in a manner substantially similar to the ways it has done in the past. Reclamation will prepare a separate National Environmental Policy Act (NEPA) document on the related action of executing separate long-term renewal contracts to continue to provide the CVC Contractors with a CVP water supply.

The Proposed Project would help CVC Contractors maintain and continue the following water management related objectives (or existing practices):

> Avoid long-term overdraft by achieving a balanced groundwater budget;

> Maintain a diversified water supply, sufficient to supply water for all uses, even during supply shortages;

> Integrate groundwater management with use of CVP and other surface water supplies as available;

> Include conjunctive use as a groundwater management tool as geologic conditions allow;

> Maintain and enhance groundwater recharge and maximize groundwater recharge as geologic conditions allow;

> Make use of current distribution systems to fully utilize all water supplies;

> Create sufficient recharge capacity or storage to fully utilize available CVP water supplies;

> Avoid or correct groundwater levels that are too low to support existing wells or too high to protect the root zone or prevent groundwater recharge;

> Provide water supplies that meet drinking water quality standards to municipalities and community water service providers, as applicable;

> Prevent contamination of groundwater from spills, leaks, confined animal feeding operations, and stormwater runoff;

> Minimize long-term dissolved solids concentrations in groundwater;

> Maximize cropland preservation;

> Meet water quality standards in conveyance facilities receiving CVC water;

> Develop cooperative agreements between water agencies and land use planning agencies; and

> Monitor groundwater characteristics.

2.4 Project Description

The Proposed Project is the approval, execution, and implementation of three-party conveyance contracts (each of the seven CVC Contractors, DWR, and Reclamation) providing for the continued conveyance of the CVC Contractors' existing CVP water supply in the Delta through SWP facilities only when supplies are physically and legally available in the Delta and capacity exists in the Aqueduct.

There are numerous regulatory constraints in the Delta that control the timing and quantity of water that is pumped through CVP and SWP facilities. These constraints have changed significantly since the initial

three-party contract was signed in the mid-1970s. The revised three-party contract will have to operate under the current and future pumping constraints. Some of the Delta constraints include:

> Delta Outflow requirements

> X2 location criteria

> Export pumping rates

> Operations criteria for the federal and state pumps

> Fish "take" numbers

The term of the proposed agreement extends to February 28, 2035. The revised three-party contract, accounting for pumping constraints, allows DWR to convey water through unused capacity in SWP facilities for the CVC Contractors.

As discussed in the previous chapter, there are numerous existing conveyance mechanisms that the CVC Contractors currently employ to meet the Proposed Project objectives, each of which are described fully in this DEIR (Section 1.3.5). For each exchange mechanism, Reclamation makes available CVP water for CVC Contractors in the Delta and the SWP or the CVP conveys the water to another public agency, and then water is returned to the CVC Contractors through SWP, CVP, or other facilities. Exchange agreements have been negotiated between CVC Contractors individually or collectively and other water agencies. Such exchanges are authorized in the CVC Contractors' Original Contracts. The Interim Renewal Contracts (IRCs) recognize that such exchanges may occur pursuant to applicable law.

The Proposed Project assumes that annually up to the full contract quantity of 128,300 acre-feet (af) will continue to be conveyed by DWR through SWP facilities, when Aqueduct capacity and CVP water supply are available. The water is made available to the CVC Contractors through exchange agreements negotiated by the CVC Contractors. The agreements could include conveying CVC water into the Friant-Kern Canal (FKC) using the Intertie, then using the FKC check structures to move the water upstream to Friant Division or CVC Contractors. The Proposed Project does not include the evaluation of any future unrelated projects for conveying Delta water into the FKC. The Proposed Project would enable deliveries of CVP supply similar to historic and current/future (proposed) water supply deliveries and exchanges explained in Section 2.5 below. Water can also be delivered from Millerton Lake as is currently the County of Fresno practice.

2.5 Overview of Water Supply Deliveries

2.5.1 Historic Water Supply Deliveries and Exchanges

The CVC Contractors historically relied on groundwater for their water supply. Then, in late 1975 and early 1976, the CVC Contractors signed their individual three-party contracts ("CVC Contracts") with Reclamation and DWR for delivery and conveyance of CVP water to the respective CVC Contractors. Historically, DWR conveyed CVP water under these contracts using the SWP facilities including the Banks Pumping Plant and the Aqueduct. DWR conveyed this water only when the CVC Contractors' CVP water supplies were physically and legally available in the Delta and capacity existed in the Aqueduct. Starting in 1995, the CVC Contracts have been renewed by several 1- and 2-year IRCs. The present IRCs (IRC-16) are for a 2-year term that commenced March 1, 2016, and continues through February 28, 2018.

The CVC Contractors' water supply is made available by Reclamation in the Delta. The water may be derived from releases from CVP facilities north of the Delta, or SOD on the Friant or New Melones Units. DWR pumps the water from the Delta at the Banks Pumping Plant and conveys this water in the Aqueduct to the CVC. The Banks Pumping Plant has been historically used because of a lack of export capacity at the Jones Pumping Plant and the Delta Mendota Canal (DMC). However, at times the CVC Contractors' water supply is conveyed through the DMC to O'Neill Forebay.

To receive their Contract water allocation, the CVC Contractors must exchange this exported water for water supplies from the east side of the SJV or water already in the SJV as part of a water banking program. The CVC Contractors must then convey their supplies through the exchange into their respective districts on the east side of the SJV. The mechanism for current exchange agreements is set forth in Article 5 of the proposed water service contract. This article in part states that:

> *"...the parties acknowledge that Project Water furnished to the Contractor...shall be delivered to the Contractor by direct delivery via the Cross Valley Canal and/or by exchange arrangements involving Arvin Edison Water Storage District or others. The parties further acknowledge that such arrangements are not transfers subject to Section 3405(a) of the Central Valley Project Improvement Act (CVPIA)."*

'Project Water' means all water that is developed, diverted, stored, or delivered by the Secretary of Interior in accordance with the statutes authorizing the Project and in accordance with all terms and conditions of water rights acquired by the United States for the CVP pursuant to California law (Reclamation 2005).

DWR only pumps and conveys CVP water through the Aqueduct if, and when, SWP requirements have been met. Historically, AEWSD obtained this water and used it beneficially within AEWSD. In exchange, Friant CVP water that would have flowed to AEWSD in the FKC is diverted by the CVC Contractors along the FKC and used beneficially.

Although the CVC Contract water allocation is made available by Reclamation in the Delta, DWR has a hierarchy for meeting the SWP water supplies, and the CVP water supplies are subordinate to SWP uses. During periods when export capacity is limited by the total export demand or by regulatory considerations, DWR is unable to pump the annual allocation of water supplies to the CVC Contractors. The record of past deliveries of CVC Contract water indicates that deliveries typically occur in the spring or late summer to fall. The deliveries are generally outside the growing season and therefore the exchange agreements are needed to compensate for the timing. Because of the differences in the timing of delivery, the exchanges are often-times "unbalanced." An unbalanced exchange means that the CVC Contractor provides more water to the Exchange Entity than it receives.

The historic exchanges have also used the Dos Amigos Pumping Plant along the San Luis Canal. Reclamation provides power to the pumping plant when moving CVP water through this facility.

2.5.2 Current/Future Water Supply Deliveries and Exchanges

Each of the seven CVC Contractors has a CVP water supply contract through Reclamation that is up for long-term renewal. Because the CVC Contractors are located on the east side of the SJV and are not directly connected with their CVP water supply in the Delta, the CVC Contractors receive water through exchange agreements with other water districts. Through these agreements the CVC Contractors exchange their Delta water for water available to the east side of the SJV. Following contract renewal, the CVC Contractors will continue to use existing exchange mechanisms to deliver their CVP supply to their districts. Pursuant to the long-term contract, at Reclamation's discretion the CVC Contractors alternatively could receive the CVP water supply from Millerton Lake after Friant Division demands are met. However, the typical water demands and instream flows for the Friant Division result in this delivery option being rarely available for the CVC Contractors.

In addition to its contract allotment, occasionally, in wet years, surplus water may be available in the Friant Division (referred to as Section 215 water) that could be delivered to CVC Contractors. This water does not need to be conveyed by DWR and is not part of the annual contract supply, and therefore is not considered in this report.

2.5.2.1 Agencies Involved in Water Exchanges

Under existing exchange agreements, there are several agencies that are potentially involved with exchanges to deliver CVC Contract water from the Delta to the CVC Contractors (Table 2.5-1 and Appendix C). The Proposed Project would also include continued historical exchanges for instance between the CVC Contractors and AEWSD. These agencies typically contract for the delivery of the water, but certain of the actions associated with the service and delivery are not regarded as discretionary. For example, Reclamation is directed by law to renew the water service contracts. Similarly, these agencies convey the water through canals as described in contracts with the CVC Contractors.

Table 2.5-1 Agencies Involved with Delivering Water to the CVC Contractors

Agency	Role in Exchange
U.S. Bureau of Reclamation	Reclamation is the federal contracting agency for the CVP water supply. It supplies CVC contract water to the Delta, may divert water from the Delta, and approves all deliveries of CVP water.
California Department of Water Resources	DWR is the state contracting agency for SWP. DWR diverts water from the Delta and conveys water south through the Aqueduct.
San Luis Delta-Mendota Water Authority	San Luis Delta Mendota Water Users Authority is the non-federal entity that wheels the water though federal facilities such as the San Luis Canal.
Kern County Water Agency	Kern County Water Agency is one of the CVC Participants and wheels water through the CVC.
Friant Water Authority	Friant Water Authority is the non-federal entity that wheels water through the FKC.

The water districts that potentially could become Exchange Entities for future exchanges are varied (refer to Appendix C). In general, the exchanges involve an agency that has the ability to make water deliveries on the FKC. Therefore, an exchange could involve multiple parties that include a Friant Division Contractor or CVP SOD Contractor along the San Luis Canal or DMC. There are different agencies that could be involved in exchanges including CVP Contractors, SWP Contractors, and non-CVP (or SWP) Contractors. Exchanges with the Friant Division Contractors are the most common exchange used to date. Possible exchange agreements could be completed as follows.

Exchange with AEWSD

The CVC Contractors' CVP water is conveyed down the Aqueduct where it would be diverted by AEWSD turnouts off the Aqueduct or CVC. In return, AEWSD's Friant Division CVP water is diverted from Millerton Lake, as is presently the case for the County of Fresno, or for the remaining CVC Contractors through the FKC into the CVC Contractors' respective turnouts. The exchange may be an Unbalanced Exchange, up to 2:1 average exchange ratio over a 10-year period, or differ in time (received in 1 month and delivered in another).

Exchange with Friant Division Contractor

The CVC Contractors' water is conveyed down the Aqueduct and diverted into the CVC. The water is then pumped from the CVC into the FKC and delivered to a Friant Division CVP Contractor. In return, the Friant Division CVP Contractor's water is diverted from the FKC into the CVC Contractors' respective turnouts. The exchange may be an Unbalanced Exchange, up to 2:1 average exchange ratio over a 10-year period.

The direct exchanges of CVC Contract water with the Friant Division Contractors are limited by the extent that water can be moved north through the FKC by using the checks and pumps. Shafter-Wasco ID,

Southern San Joaquin Municipal Utility District, and Delano-Earlimart ID have turnouts on the FKC that can be reached when water is conveyed north through the FKC.

Other Friant Division Contractors with turnouts further north on the FKC could participate in an exchange with CVC Contractors but only if a third party, non-CVP Contractor was involved. In these cases, a non-CVP Exchange Entity would provide water from a river or reservoir on the east side and convey the water to a Friant Division Contractor through the use of local facilities.

Exchange with CVP SOD Contractors

An exchange with a CVP SOD Contractor would involve the conveyance by DWR through the Aqueduct following the exchange and would include a Friant Division Contractor to achieve delivery along the FKC. The CVP SOD Contractor returns water to the CVC Contractor from either the O'Neil Forebay or previously banked water in Kern County. The exchange may be an Unbalanced Exchange, up to 2:1 average exchange ratio over a 10-year period.

Exchanges with SWP Contractors

The CVC Contractors' water is conveyed down the Aqueduct where it is diverted by an SWP Contractor. In return, the SWP Contractor's water or water from the SWP Contractor's SWP allotment is delivered to the CVC Contractor(s). The exchange may be an Unbalanced Exchange, up to 2:1 average exchange ratio over a 10-year period.

Exchanges with Tulare Lake Basin Water Storage District Contractor

The CVC Contractors' water is conveyed down the Aqueduct where it is diverted by an SWP Contractor. In return, the SWP Contractor delivers non-project water from Pine Flat, Kaweah, or Success Lake to Friant Division CVP Contractors utilizing the same local system (non-CVP facilities). The Friant Division CVP Contractors' water is then diverted from the FKC by the CVC Contractors. The exchange may be an Unbalanced Exchange, up to 2:1 average exchange ratio over a 10-year period.

3 Environmental Setting, Impacts, and Mitigation

3.1 Introduction

The environmental setting and potential impacts of the Proposed Project, which includes the areas that would receive water as part of the Proposed Project, are described in this section pursuant to California Environmental Quality Act (CEQA) Guidelines. A brief description of the environmental setting for each resource evaluated in this EIR is presented below. For each section in which resources are evaluated, a regulatory setting is summarized for key requirements that affect the determination of an environmental effect/impact. This chapter also identifies the resources not evaluated and explains why those resources are not evaluated and summarizes the environmental compliance documents prepared for water contract amounts from the Central Valley Project (CVP) and State Water Project (SWP).

The context for this DEIR is the eastern San Joaquin Valley (SJV) located primarily within that portion of Fresno, Kings, Tulare, and Kern counties within the CVP south-of-Delta (SOD) Place of Use. Water districts within this Project Area are characterized as either CVP Contractors or other water districts (non-CVP Contractors) who would participate as a potential Exchange Entity (described further in Section 2.4.2) (see Figure 1-4). The exchange mechanisms that have been used in the past are described in this document. However, there are other potential exchanges that could occur in the future. Proposals for new exchange agreements not covered in this CEQA review process would require separate and/or tiered environmental review to cover the site specific proposal and analysis of environmental impacts to the human environment. Previous exchanges have been analyzed in environmental documents developed for those exchanges (Appendix D).

The only Cross Valley Canal (CVC) Contractor water supply available for conveyance as part of the Proposed Project is water physically and legally available in the Sacramento-San Joaquin Delta (Delta). Therefore, any water resources north of the Delta including the Trinity, Sacramento and American Rivers are beyond the scope of this DEIR. Several environmental documents and associated programs address north of Delta water resources including:

- **Bay Delta Conservation Plan (BDCP)/California WaterFix joint EIR/EIS.** This EIR/EIS, and associated environmental compliance documents, addresses a water conveyance facility consisting of three new intakes on the Sacramento River and dual tunnels to convey water to existing state and federal pumping plants. The conveyance facility will be operated in conjunction with existing south Delta operations and will be coordinated with CVP operations. Since release of the December 2013 Draft EIR/EIS, a partially recirculated Draft EIR/Supplemental Draft EIS has been prepared and was circulated to the public for review and comment from July 10, 2015 through October 30, 2015. DWR and Reclamation are currently working on responses to the comments in preparation of the Final EIR/EIS. The recirculated Draft EIR/Supplemental Draft EIS updates information on alternatives, analyzes several alternatives, including those analyzed as part of the BDCP EIR/EIS, as well as adds analysis on three additional alternatives.
- The **Trinity River Restoration Program** was developed to restore the Trinity River as a viable fishery. The 2001 Record of Decision (ROD) issued for the program specifies four modes of restoration including: flow management prescriptions through releases from Lewiston Dam, construction of channel rehabilitation sites, augmentation of spawning gravels, control of fine sediments, and infrastructure improvements to accommodate high flow releases.
- The **CVP Conservation Program** was formally established to address U.S. Bureau of Reclamation's (Reclamation) requirements under the Endangered Species Act (ESA). Over 80 projects have been funded by the CVP Conservation Program since its beginning and more recent budgets are allowing for funding of seven to fourteen projects annually.

> The **Habitat Restoration Program** was established under Title 34 of the Central Valley Project Improvement Act (CVPIA) to protect, restore, and mitigate for past fish and wildlife impacts of the CVP not already addressed by the CVPIA.

> The **Programmatic Environmental Impact Statement (PEIS)** for the Central Valley Project Implementation Act adopted by both Reclamation and U.S. Fish and Wildlife Service (USFWS) in 2000.

> The **North-of-Delta Offstream Storage** is a potential offstream surface storage facility north of the Delta, which is being currently investigated by DWR and Reclamation. As of May 2014, a preliminary engineering report and preliminary administrative draft EIR has been completed.

3.1.1 Key Environmental Issues in the Project Area

The DEIR considers the potential impacts of the approval, execution, and implementation of three-party conveyance contracts providing for the continued conveyance of the CVC Contractors' existing CVP water supply in the Delta through SWP facilities on the following resources:

> Agriculture and Forestry Resources

> Air Quality

> Biological Resources

> Greenhouse Gas Emissions

> Hydrology and Water Quality (Surface Water and Groundwater Resources)

> Land Use and Planning

> Socioeconomics

3.1.2 Resources Not Evaluated

The following environmental resources were determined to be unlikely to be affected by the Proposed Project, in comparison to existing 2011 conditions, so they are not evaluated further in this DEIR for the reasons stated below.

Aesthetics

The Proposed Project would not affect a scenic vista, substantially damage scenic resources, degrade the existing visual quality of the Project Area, or create a new source of light or glare. Because the Proposed Project would not change the dominant features of the Project Area, a full evaluation of aesthetics was not deemed necessary for this DEIR.

Agriculture and Forest Resources

Existing conditions of the Project Area consist primarily of agricultural row crop lands and/or municipal/urban lands. There are potential impacts to agricultural resources from implementation of the Proposed Project and these are further analyzed below.

No forested areas lie near or adjacent to the Proposed Project and therefore, the Proposed Project would not conflict with or cause the rezoning of forest land, timberland, or Timberland Production land. Nor would the Proposed Project result in the loss or conversion of forest land. Therefore, forest resources are not evaluated further in this EIR.

Cultural Resources

The Proposed Project would not change the significance of a historical resource, change an archaeological resource, destroy a paleontological resource or geologic feature, or disturb and human remains. Therefore, cultural resources are not evaluated further in this EIR.

Geology and Soils

The Proposed Project would not expose people or structures to potential risk from rupture of a known earthquake fault, seismic ground shaking, seismic-related ground failure, or landslides. The Proposed Project would not result in substantial soil erosion or topsoil loss, located in a region of unstable soils, be located on expansive soils, or be located in areas unable to support the use of septic tanks. Therefore, geology and soils in the Project Area would not be affected from the Proposed Project and are not evaluated further. The issue of subsidence is addressed in Section 3.8 Hydrology and Water Quality (Groundwater Resources).

Hazards and Hazardous Materials

The Proposed Project would not create a significant public hazard through transport or disposal of hazardous materials, through upset or accident conditions, through hazardous emissions, through location on a hazardous materials site, through location near an airport, through interference with emergency response, or through exposure of people to risk from a wildland fire. Therefore, hazards and hazardous materials in the Project Area would not be affected from the Proposed Project and are not evaluated further.

Mineral Resources

The Proposed Project would not result in the loss of availability of a known mineral resource or the loss of a locally important mineral resource. Therefore, mineral resources in the Project Area would not be affected from the Proposed Project and are not evaluated further.

Noise

The Proposed Project will not expose people to the generation of noise levels in excess of standards, excessive groundborne vibration or groundborne noise, a substantial temporary or permanent increase in ambient noise levels, or excessive airport-related noise. Since the Proposed Project would not introduce new or worsen existing noise-generating activities to the Project Area, noise impacts are not evaluated further.

Population and Housing

The Proposed Project would not involve any new development, including new housing, and would not result in population growth and/or the need for new housing. The Project also would not result in any additional water supplies, and thus would not indirectly lead to potential population growth. Therefore, population and housing effects are not evaluated further in this EIR.

Public Services

The Proposed Project would not result in new development and, therefore, would not place a substantial demand on any public services including public facilities and health and emergency response services. Therefore, public services are not evaluated further in this EIR.

Recreation

The Proposed Project does not require construction or expansion of existing parks, or construction of new parks. Therefore, recreation resources are not evaluated further in this EIR.

Transportation and Traffic

The Proposed Project would not conflict with existing traffic, circulation, congestion management, or adopted public transportation plans. Nor does the Proposed Project result in changes air or ground traffic levels, increase risks from hazards from design features or incompatible uses, or alter emergency access. Therefore, transportation and traffic is not evaluated further in this EIR.

Utilities and Service Systems

The Proposed Project would not substantially increase demand for water supplies or wastewater treatment services, exceed wastewater treatment requirements, require the construction of new water and wastewater treatment facilities, or result in a determination by the wastewater treatment provider that it does not have adequate capacity to serve projected area demand. In addition, there would be no impacts to stormwater drainage facilities and landfills from the Proposed Project. Therefore, utilities and service systems are not evaluated further in this EIR.

3.1.3 Terminology Used

CEQA Guidelines Section 15382 defines a significant impact on the environment as a substantial, or potentially substantial, adverse change in any of the physical conditions in the area affected by the Proposed Project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. Under CEQA, economic or social changes, by themselves, are not considered significant impacts, but a social or economic change related to a physical change may be considered in determining whether the physical change is significant.

Consistent with the CEQA Statutes and Guidelines, this DEIR uses the following terminology to denote the significance of potential environmental impacts:

> **Threshold of significance** is the criterion used to define at what level the lead agency would consider an impact significant. Significance criterion is based on examples found in the CEQA Statutes or Guidelines, in scientific or factual data, in the policies and regulatory guidance of affected jurisdictions, and other factors.

> A **less-than-significant impact** or **no impact** would not result in a substantial, or potentially substantial, adverse change in the environment. This impact level does not require mitigation.

> A **significant impact** could, or would, cause substantial, adverse physical changes in the environment. Feasible mitigation measures are recommended to reduce the magnitude of impacts to less-than-significant levels.

> A **significant and unavoidable impact** is one that could, or would, result in a substantial adverse effect on the environment that cannot be avoided if a project is implemented. Mitigation may be recommended, but would not reduce the impact to a less-than-significant level. A project with significant and unavoidable impacts can still be approved, but, pursuant to CEQA Guidelines Section 15093, the lead agency must prepare a Statement of Overriding Considerations containing specific reasons for approving the project.

Impacts for each resource or issue are analyzed and evaluated based on the following factors:

> A **direct impact** is an impact characterized by a direct physical change in the environment caused by, and immediately related to, the project.

> An **indirect impact** is one that causes an indirect physical change in the environment that is not immediately related to the project, but is brought upon by another change to the environment that was caused by a direct, project-related physical change. Indirect impacts must be considered reasonably foreseeable and not speculative or unlikely.

> **Intensity** describes whether an impact would be negligible (imperceptible or not detectable), minor (slightly perceptible and generally localized), moderate (apparent and having the potential to become larger), or major (substantial, highly noticeable and possibly permanent).

> **Duration** describes the length of time over which an impact would occur and whether the effect would be short-term (only occurring or lasting through the construction period), or long-term (effects associated with operations and mitigation that would occur beyond the construction period).

Impacts are also evaluated according to their location in the overall Project Area. The following terms are used to identify the location of project resources, impacts, and mitigations:

> **Project location** identifies the general geographical location of the project including state, county, and references and distances to nearby landmarks and municipalities.

> **Environmental setting** identifies the physical environmental conditions near the Proposed Project, as they existed at the time the lead agency published the NOP. The environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. It is often referred to as the existing condition in making a determination of whether there is an impact or not.

3.2 Exchange Entity Area Analysis

As explained in Section 2.1, the Proposed Project is the approval, execution and implementation of three-party conveyance contracts (CVC Contractors, California Department of Water Resources [DWR], and Reclamation) providing for the continued conveyance of the CVC Contractors' existing CVP water supply in the Delta through SWP facilities when supplies are physically and legally available in the Delta and capacity exists in the Aqueduct. To accomplish importing Delta water, CVC Contractors need to transfer or exchange surface water supplies using direct exchange or banking the water in reservoirs or groundwater banks. Each of the seven CVC Contractors has a CVP water supply contract through Reclamation. Because the CVC Contractors are located on the east side of the SJV and are not directly connected with their CVP water supply in the Delta, the CVC Contractors receive water through exchange agreements with other water districts (other CVP and SWP contractors).

Water provided for exchange through CVP and non-CVP water users must be consistent with the Exchange Entity's existing contractual supplies contained in long-term and/or interim agreements with Reclamation (for CVP) and DWR (for SWP). These deliveries are incorporated into existing water supplies and occur when full contract deliveries cannot otherwise be made for agriculture and M&I purposes (or when conveyance capacity is available). Exchanges that are equal (i.e., 1 acre-foot supplied for 1 acre-foot exchanged [1 for 1]) amount to simply changing the source of a portion of the water that will be used by an Exchange Entity that year. Unbalanced Exchanges (e.g., 2 for 1) that result in additional water supplied to the Exchange Entity can only occur when capacity is available, and typically offsets an existing shortfall or replaces groundwater pumping. The additional water received by the Exchange Entity via the Unbalanced Exchange is incorporated into the annual water supply of that agency. This water is not of sufficient quantity in any Exchange Entity to bring new land under irrigation, but rather is used to offset existing shortfalls and replace groundwater pumping. Therefore, water use patterns and quantities of applied water are not expected to change for the Exchange Agencies as a result of balanced or Unbalanced Exchanges.

Appendix D summarizes the environmental analyses of previous exchanges contained in National Environmental Policy Act (NEPA) and CEQA documents and are incorporated by reference in this DEIR. Many of these actions are related to the Proposed Project through similar facilities, water supplies, water districts, and/or regulatory criteria. These documents explain the environmental effects to these Exchange Agencies from receiving the water supplies and subsequent use as part of the agency's annual water supply.

On October 30, 1992, the President signed into law the Reclamation Projects Authorization and Adjustment Act of 1992 (Public Law 102-575) that included Title 34, the CVPIA. CVPIA Sections 3404(c) and 3409 stipulate that Reclamation must prepare a PEIS analyzing the direct and indirect impacts and benefits of implementing the CVPIA before renewing long-term CVP water service contracts. The complexity of the analysis associated with the CVPIA PEIS extended its completion until October 1999, with a ROD approved on January 9, 2001.

The PEIS evaluated CVP-wide impacts of Long Term Contract Renewals (LTCR). As contract renewal negotiations were completed, Reclamation prepared environmental documents that tiered from the PEIS to analyze the local effects of LTCRs at the division, unit, or facility level. In accordance with CVPIA Section 3404(c), Reclamation may execute interim renewal water service contracts. Interim Renewal Contracts (IRCs) are undertaken under the CVPIA's authority to provide a bridge between the expiration of the original long-term water service contract and the execution of a new long-term water service contract.

Furthermore, biological opinions (BOs) by the Services (USFWS and National Marine Fisheries Service [NMFS]) on long-term contract renewals and interim contract renewals under the CVP are also identified in Section 3.5.5.1.

3.3 Agriculture and Forestry Resources

3.3.1 Introduction

As indicated above, no forested areas lie near or adjacent to the Project Area, nor would forest resources be introduced to the area. Therefore, no impacts to forested lands or conversion to or from forested lands would result from the Proposed Project. This section evaluates potential impacts on agriculture resources located primarily within that portion of Fresno, Kings, Tulare, and Kern counties within the CVP SOD Place of Use. The environmental setting provides an overview of the agricultural resources within the Project Area, and contains state and local regulations and ordinances applicable to the Proposed Project.

3.3.2 Environmental Setting

There are over 190,000 acres of land within the CVC Contractors' water use service areas, which are located along the eastern edge of the southern SJV, stretching from Fresno County in the north to Bakersfield in Kern County to the south (Reclamation 2010a). As CVC Contract water is used only for agricultural and M&I purposes and no forested areas lie near or adjacent to the Project Area, this section focuses solely on potential impacts to agriculture resources.

3.3.2.1 Agriculture

The Project Area is located in the San Joaquin portion of California's Central Valley, an important agricultural region for both California and the U.S. This area has one of the most diversified agricultural economies in the world, producing more than 250 crop and livestock commodities. Farmers have raised crops throughout this area for almost 150 years. Primary crops in the CVC Contractors' water use service areas include cotton, orchards, vineyards, alfalfa hay, and grains such as corn and wheat. Of the 868,330 acres of grapes grown in California, 43 percent are within Fresno, Kings, Tulare, and Kern counties (U.S. Department of Agriculture 2009). Virtually all crop acreage is irrigated, as average rainfall is significantly less than crop requirements.

Total agricultural land use for rangeland and crops in these four counties is estimated to be approximately 7,869,000 acres (Table 3.3-1), with crop acreage totaling 5,195,000 acres. Of total crop acreage, approximately 30 percent is in such high value crops as seeds, vegetables, fruits and nuts, and nursery.

In 2014, many agricultural growers received from 0-10 percent of their full allocation from the SWP and the CVP, forcing growers in the Central Valley to turn to groundwater pumping and water markets to sustain crops. A multi-agency research project led by National Atmospheric and Space Administration (NOAA) estimated that peak summer acreage of farmland idled in California in 2014 was 1.7 million acres, almost 700,000 acres more than in 2011, a recent wet year (DWR 2014).

Table 3.3-1 Agricultural Acreage in the Project Area

Crop/Group	Fresno	Kern	Kings	Tulare	Total
Field Crops	1,271,733	414,273	644,285	1,307,930	**3,638,221**
Seed Crops	21,910	3,425	3,990	168	**29,493**
Vegetables	243,710	83,005	33,769	7,977	**368,461**
Fruits and Nuts	467,976	333,460	57,668	296,730	**1,155,834**
Nursery	925	2,036	N/A	N/A	**2,961**
Rangeland	850,000	1,498,000	232,933	93,000	**2,673,933**
Total	**2,856,254**	**2,334,199**	**972,645**	**1,705,805**	**7,868,903**

N/A = Data does not include nursery acreage of Kings and Tulare Counties, not available

3.3.3 Regulatory Framework

The key issue regarding the regulatory framework is whether the continued use of the CVC to convey water to and from the FKC is consistent with county policies for resource conservation and the support of agriculture. Each county and city in California is required by Section 65300 of the California Government Code to have a comprehensive, long-term general plan for the physical development of the county or city. This section summarizes key goals and policies related to agriculture that are contained in the general plans for the four counties in the vicinity of the Project Area and are summarized in Table 3.3-2 below.

Table 3.3-2 County General Plan Agricultural Policy Summary

County	Goals and Objectives
Fresno	**Fresno General Plan, October 2000** Maintain agriculturally designated areas for agriculture use and direct urban growth away from valuable agricultural lands to other areas planned for such development. Draft Revised Fresno General Plan, September 2014 > LU-A.1 Agricultural Land Conversion – The County shall maintain agriculturally designated areas for agriculture use and shall direct urban growth away from valuable agricultural lands to cities, unincorporated communities, and other areas planned for such development where public facilities and infrastructure are available or can be provided consistent with the adopted General or Community Plan. > LU-A.20 Water Resources – The County shall adopt and support policies and programs that seek to protect and enhance surface water and groundwater resources critical to agriculture.
Kern	**Kern County General Plan, September 2009** > Protect the economic strength of agriculture by containing new development in areas large enough for need but in locations other than areas of agricultural production. > Prevent premature conversion of agricultural lands. > Prevent encroachment of urban development into intense agriculture areas. > Support policies and programs that will provide economic incentives to safeguard agriculture resource lands in the long-term. > Ensure that supplies of quality water are available to agricultural users. > Restrict uses of land best used for agriculture by limiting new nonagricultural industrial uses. > Encourage groundwater recharge activities in numerous zone districts. > Foster development of groundwater management plans, Urban Water Management Plans and support funding for water providers. > Support participation in the Williamson Act program or Farmland Security Zone program of qualifying agricultural lands.

Table 3.3-2 County General Plan Agricultural Policy Summary

County	Goals and Objectives
Kings	**Kings County General Plan, January 2010** Preserve agricultural lands by preventing encroachment of urban use areas that are incompatible and sustaining large parcel sizes. > Encourage the rights of farmers to operate economically. > Approve agricultural support services to locate in General Agriculture areas. > Support housing on farmland to be used by individuals using the land to farm and encourage construction of seasonal farm housing for employees. > Protect agricultural lands from fringe area development under the Williamson Act program. > Honor property owner rights in existing Rural Residential zones while also avoiding conflict between agricultural and nonagricultural land use. > Protect agricultural productivity in the long term by supporting soil resource conservation. > Promote soil management programs to sustain soil productivity.
Tulare	**2030 Update Tulare County General Plan, August 2012** > AG-1.1 Primary Land Use – The County shall maintain agriculture as the primary land use in the valley region of the County, not only in recognition of the economic importance of agriculture, but also in terms of agriculture's real contribution to the conservation of open space and natural resources. > AG-1.2 Coordination – The County shall coordinate its agricultural policies and programs with State and federal regulations to preserve agricultural lands. > AG-1.7 Preservation of Agricultural Lands – The County shall promote the preservation of its agricultural economic base and open space resources through the implementation of resource management programs such as the Williamson Act, Rural Valley Lands Plan, Foothill Growth Management Plan or similar types of strategies and the identification of growth boundaries for all urban areas located in the County. > AG-1.17 Agricultural Water Resources – The County shall seek to protect and enhance surface water and groundwater resources critical to agriculture

3.3.4 Impact Assessment Methodology

3.3.4.1 Significance Criteria

The Proposed Project activities are evaluated in accordance with the Agriculture and Forest Resources section of Appendix G of the CEQA Environmental Checklist. The Proposed Project would have a significant impact on agriculture and forestry resources if implementation would:

> Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of California Resources Agency, to non-agricultural use;

> Conflict with existing zoning for agricultural use, or a Williamson Act contract;

> Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g));

> Result in the loss of forest land or conversion of forest land to non-forest use; and

> Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use.

> The third through fifth criteria above apply to forestry resources, which were dismissed from further consideration in Section 3.1.2. Only the first two significance criteria are considered in the impact analysis below.

3.3.5 Project Impacts

Existing conditions of the Project Area consist primarily of agricultural row crop lands and/or municipal/urban lands. No forested areas lie near or adjacent to the Project Area, nor would forest resources be introduced to the area. Therefore, no impacts to forested lands or conversion to or from forested lands would result from Proposed Project implementation.

Impact AG-1: Potential to convert prime farmland, unique farmland, or farmland of statewide importance.

The Proposed Project would continue conveyance of the CVC Contractors' existing CVP water supply and would not result in construction of any new facilities. Therefore, the Proposed Project would not directly or indirectly affect existing prime farmland, unique farmland, or farmland of statewide importance within the Project Area. **No Impact** would occur, and no mitigation is required.

Impact AG-2: Potential to conflict with existing zoning for agricultural use, or a Williamson Act contract.

The Proposed Project would continue conveyance of the CVC Contractors' existing CVP water supply and would not result in construction of any new facilities would not directly or indirectly conflict with the zoning or use of agricultural lands within the Project Area. **No Impact** would occur, and no mitigation is required.

Mitigation

No impacts to agriculture would occur, so no mitigation is required.

3.4 Air Quality

3.4.1 Introduction

This section addresses the potential for increased air emissions to result from the implementation of the Proposed Project. The Proposed Project is located in the San Joaquin Valley Air Basin (SJVAB), which is under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD).

3.4.2 Environmental Setting

3.4.2.1 Topography and Climate

The SJVAB is located SOD and is approximately 250 miles long and 35 miles wide. The SJVAB is defined by the Sierra Nevada Mountains in the east, the Coast Ranges in the west, and the Tehachapi mountains in the south. The SJV is basically flat with a slight downward gradient to the northwest. Although marine air generally flows into the SJVAB from the Delta, the region's topographic features restrict air movement through and out of the basin. Local climatological effects, including wind speed and direction, temperature, inversion layers, and precipitation and fog, can exacerbate air quality problem in the SJVAB (SJVAPCD 2002a).

During the winter months, the SJV experiences light, variable winds, less than 10 mph. Low wind speeds, combined with low inversion layers in the winter, create conditions conducive to high concentrations of carbon monoxide (CO) and respirable particulate matter less than 10 microns in diameter (PM_{10}) concentrations. The SJVAB has an "inland Mediterranean" climate averaging over 260 sunny days per year. The SJV floor is characterized by warm, dry summers and cooler winters. The vertical dispersion of air pollutants in the SJVAB is limited by the presence of persistent temperature inversions. Precipitation

on the SJVAB floor and in the Sierra Nevada decreases from north to south. Precipitation in the SJVAB is confined primarily to the winter months with some also occurring in late summer and fall. Average annual rainfall for the entire SJV is 9.25 inches on the SJV floor. Between winter storms, high pressure and light winds allow cold moist air to pool on the SJV floor. This creates strong low-level temperature inversions and very stable air conditions. This situation leads to the SJV's Tule fog. The water droplets in fog can act as a sink for CO and nitrogen oxides (NOx), lowering pollutant concentrations. At the same time, fog can help in the formation of secondary particulates such as ammonium sulfate. These secondary particulates are believed to be a significant contributor of winter season violations of the PM_{10} and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) standards (SJVAPCD 2002a).

3.4.2.2 Air Quality in the San Joaquin Valley

Nonattainment Classifications

The SJVAB is designated as extreme nonattainment for the federal 8-hour ozone standard and nonattainment for the federal $PM_{2.5}$ standard (federal and state standards are discussed below under Regulatory Framework). It also is designated as being in severe nonattainment for the state 1-hour ozone standard and nonattainment for the state 8-hour ozone, PM_{10}, and $PM_{2.5}$ standards For all other pollutants for which there are federal or state standards, the SJVAB is either attainment or unclassified (SJVAPCD 2012).

Key Air Pollutants and their Sources

Ozone is not emitted directly into the atmosphere, but is formed by a complex series of chemical reactions between reactive organic gases (ROG), NO_x, and sunlight. ROGs are photochemically reactive hydrocarbons that are important for ozone formation. ROG and NO_x are emitted from automobiles, trucks, farm equipment, oil and gas production, solvents, and fuel combustion, the sources of which are widespread throughout the SJVAB. CO is formed by the incomplete combustion of fuels and is emitted directly into the air (unlike ozone). The main source of CO in the SJVAB is on-road motor vehicles, although other CO sources in the SJV include other mobile sources and burning of wastes. PM_{10} and $PM_{2.5}$ are composed of dust, sand, salt spray, metallic, and mineral particles, pollen, smoke, mist, and acid fumes. $PM_{2.5}$ sources tend to be combustion sources like vehicles, power generation, industrial processes, and wood burning, while PM_{10} sources include these same sources plus roads and farming activities. Fugitive windblown dust and other area sources also represent sources of airborne dust in the SJVAB (SJVAPCD 2002a).

Sensitive Receptors

As defined by the Environmental Protection Agency, "Sensitive receptors include, but are not limited to, hospitals, schools, daycare facilities, elderly housing and convalescent facilities. These are areas where the occupants are more susceptible to the adverse effects of exposure to toxic chemicals, pesticides, and other pollutants. Extra care must be taken when dealing with contaminants and pollutants in close proximity to areas recognized as sensitive receptors. The facilities involved with water conveyance (canals and pumps) are predominately in rural areas and are not close to sensitive receptors. The Aqueduct passes by the communities of Kettleman City, Lost Hills, and Tupman. The pumping facilities (Banks Pumping Plant and Dos Amigos) are not near sensitive receptors.

3.4.3 Regulatory Framework

3.4.3.1 Federal and State

The U.S. Environmental Protection Agency (USEPA) has been authorized to implement national air quality programs, drawing its mandate primarily from the federal Clean Air Act (CAA). The USEPA has established National Ambient Air Quality Standards. In areas that exceed these standards, the CAA requires preparation of a State Implementation Plan (SIP), detailing how the state will attain the standards

within mandated time frames. The state standards, established by the California Air Resources Board (CARB), are called the California Ambient Air Quality Standards. Pollutants that have established national or state ambient air quality standards are referred to as "criteria pollutants" and include CO, ozone, PM_{10}, $PM_{2.5}$, nitrogen dioxide, SO_2 and lead.

3.4.3.2 Regional

The SJVAPCD has adopted several attainment plans to achieve state and federal air quality standards to comply with California CAA and Federal CAA requirements. The SJVAPCD must continuously monitor its progress in implementing attainment plans and must periodically report to the California Air Resources Board (CARB) and the USEPA. It must also periodically revise its attainment plans to reflect new conditions and requirements in accordance with schedules mandated by the California CAA and Federal CAA. The SJVAPCD's primary means of implementing air quality plans is by adopting rules and regulations, although it has adopted a number of voluntary programs as well.

3.4.4 Impact Assessment Methodology

3.4.4.1 Significance Criteria

The Proposed Project activities were evaluated in accordance with the guidelines presented in the Air Quality section of Appendix G of the CEQA Environmental Checklist. The Proposed Project would have a significant impact on air quality if it would:

> Conflict with or obstruct implementation of any applicable air quality plan;

> Violate any air quality standard or contribute substantially to an existing or projected air quality violation;

> Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds of ozone precursors;

> Expose sensitive receptors to substantial pollutant concentrations; or

> Create objectionable odors affecting a substantial number of people.

The SJVAPCD has established specific thresholds to assist in determining whether an impact would be significant during construction or operations and maintenance (SJVAPCD 2014). The SQVAPCD recommends the following thresholds to assess the significance of an air quality impact in an environmental impact report:

> Emit particulate matter with a diameter of 10 microns or less (PM_{10}) in excess of 15 tons/year, or particulate matter that is 2.5 microns or less ($PM_{2.5}$) in excess of 15 tons/year.

> Emit ozone precursor air pollutants (ROG or NO_x) in excess of 10 tons per year, either directly or indirectly.

> Emit estimated CO concentrations that exceed the California Ambient Air Quality Standards of 9 parts per million (ppm) averaged over 8 hours and 20 ppm for 1 hour, either directly or indirectly.

> Frequently expose members of the public to objectionable odors.

> Expose sensitive receptors (including residential areas) or the general public to substantial levels of toxic air contaminants.

Additionally, any project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact. Impacts of local pollutants are cumulatively significant when modeling shows that the combined emissions from the project and other existing and planned projects will exceed air quality standards.

PM_{10} is the pollutant of greatest concern during construction. Regulation VIII is a series of rules designed to reduce fugitive dust from construction sites, parking and staging areas, open areas, material storage areas, etc. No permits are required by this regulation, but failure to comply can result in fines and penalties. The SJVAPCD's approach to CEQA analyses of construction PM_{10} impacts is to require implementation of effective and comprehensive control measures rather than to require detailed quantification of emissions. The SJVAPCD has determined that compliance with Regulation VIII, Fugitive PM_{10} for all construction sites will constitute sufficient mitigation to reduce PM_{10} impacts to a level considered less-than-significant.

3.4.5 Project Impacts

This section evaluates the Proposed Project with respect to each of the CEQA significance thresholds applicable to air quality. All of the infrastructure and facilities needed to convey and use water by the CVC Contractors are already in place. The Proposed Project would not involve any new construction, so there would be no emissions associated with construction. Similarly, there would be no change in operations and maintenance activities associated with the Proposed Project, or change in the amount of vehicle traffic, so there would be no increase above existing levels for emissions of air pollutants.

Impact AQ-1: Conflict with or obstruct implementation of the applicable air quality plan.

No changes over current conditions would occur; thus, the Proposed Project would not conflict with or obstruct implementation of any applicable air quality plans. Electric power to lift water into the Aqueduct would continue to be provided by means of Reclamation's hydropower facilities and therefore would not produce air emissions. The conveyance of CVP water to the CVC Contractors and potential Exchange Agencies (other CVP Contractors or non-CVP Contractors) would continue to be implemented via gravity flow and/or pumping using electric motors, which have no direct emissions. **No Impact** would occur, and no mitigation is required.

Impact AQ-2: Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

The current operations do not violate any air quality standards or contribute to an existing or projected air quality violation. As discussed above under Impact AQ-1, no changes over current conditions would occur. Therefore, no direct or indirect impacts would occur. **No Impact** would occur, and no mitigation is required.

Impact AQ-3: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment.

The current operations do not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment. As discussed above under Impact AQ-1, no changes over current conditions would occur. Therefore, no direct or indirect impacts would occur. **No Impact** would occur, and no mitigation is required.

Impact AQ-4: Expose sensitive receptors to substantial pollutant concentrations.

The current operations do not expose sensitive receptors to substantial pollutant concentrations, because the facilities involved in the conveyance of CVC Contract water are located in rural areas that are not in proximity to sensitive resources. As discussed above under Impact AQ-1, no changes over current conditions would occur. Therefore, no direct or indirect impacts would occur. **No Impact** would occur, and no mitigation is required.

Impact AQ-5: Create objectionable odors affecting a substantial number of people.

The current operations do not create objectionable odors because pumping either relies on gravity flow or electrical power. Therefore, no direct or indirect impacts would occur. **No Impact** would occur, and no mitigation is required.

Mitigation

No impacts to air quality would occur, so no mitigation is required.

3.5 Biological Resources

3.5.1 Introduction

This section discusses the biological resources within the Project Area. This section includes descriptions of vegetation communities, wildlife habitat, special-status plant species and their habitat requirements, special-status wildlife species and their habitat requirements, and the regulatory environment. In cases where potential impacts have been determined to be "significant," mitigation measures have been proposed to reduce these impacts to less-than-significant levels. Section 3.4.3, Regulatory Framework, describes the regulations and ordinances that would apply to aquatic and wildlife resources.

3.5.2 Environmental Setting

The environmental setting includes the point of diversion for the CVC Contractors' Water Supply (the Delta), the general region across which water is conveyed from the Delta (the SJV), the facilities by which water is delivered to an Exchange Entity, and facilities by which water is conveyed from the Exchange Entity to the CVC Contractor.

3.5.2.1 Aquatic Habitat

Sacramento-San Joaquin Delta

The Delta lies near the confluence of the Sacramento and San Joaquin rivers between the towns of Hood, Vernalis, and Martinez. The Delta is the transition zone between freshwater river habitats of the Central Valley Rivers and the successively more saline habitats of Suisun, San Pablo, and San Francisco bays. These habitats are affected by the tides, which cause diurnal changes in flow patterns and water quality, as well as river outflow, which cause more seasonal changes in habitat. The Delta has been substantially modified from its historic condition by levees, agriculture, toxic contaminants from municipal, industrial, and agricultural sources, and water diversions. The estuary is home to a diverse array of native and introduced species, some of which reside in the estuary throughout the year, and others that use the estuary seasonally.

The fish fauna that currently characterizes the Delta (native and nonnative species) include planktivores such as delta and longfin smelt, threadfin shad, juvenile striped bass, American shad, hitch, and inland silversides. Small benthic predators include native prickly sculpin, tule perch, starry flounder, juvenile white sturgeon, juvenile splittail, and staghorn sculpin, as well as introduced yellowfin goby, shimofuri goby, bigscale logperch, and juvenile catfishes. Bottom-feeding omnivores include common carps, adult splittail, and Sacramento sucker. The most abundant piscivores in the system are striped bass, white catfish, channel catfish, and largemouth bass, which often prey on smaller migratory fishes such as juvenile salmon and steelhead (Moyle 2002).

San Joaquin Valley

The SJV is contained within the Central Valley subprovince of the larger Sacramento-San Joaquin ichthyological province (Moyle 2002). The subprovince drains the Sacramento and San Joaquin rivers. Aquatic species native to this subprovince have distinct morphology, physiology, and life-history patterns,

reflecting an adaptation to a climate characterized by extended droughts as well as massive floods (Moyle 2002). The climate is characterized by hot, dry summers and cool, damp winters. The rainy season occurs from mid-Autumn through spring, with the northern portion receiving greater precipitation than the southern half.

Within the Central Valley, four native fish assemblages are largely distinguished by elevation ranges (from lowest to highest elevation): 1) the deep-bodied assemblage, 2) the pikeminnow-hardhead-sucker assemblage, 3) the California roach assemblage, and 4) the rainbow trout assemblage (Moyle 2002).

The deep-bodied fish assemblage occurs on the Central Valley floor in habitats that include low gradient river channels, swamps, sloughs, and long stretches of open water. Native deep-bodied fishes, such as Sacramento perch and tule perch, occupy the stagnant backwaters, while specialized adult cyprinids (hitch, blackfish, and splittail) inhabit the long stretches of open water (Table 3.5-1). Large pike minnows and suckers are also abundant, migrating upstream to spawn in tributaries. Anadromous salmon (i.e., steelhead) and sturgeon pass through this zone on their way upstream to spawn (Moyle 2002). This domain is now dominated by introduced species including largemouth bass and white and black crappie, bluegill, inland silverside, white catfish and brown and black bullhead, and common carp.

Table 3.5-1 Federally or State-listed, Proposed, or Candidate Plant Species Potentially Present in the Project Area or Vicinity

Common Name ***Scientific Name***	**Status**	**Critical Habitat In or Near Project Area**
Bakersfield smallscale *Atriplex tularensis*	CE, RPR 1A	No
Succulent (fleshy) owl's-clover *Castilleja campestris* ssp. *succulenta*	FT, CE, RPR 1B	Yes
California jewel-flower *Caulanthus californicus*	FE, CE, RPR 1B	No
Hoover's spurge *Chamaesyce hooveri*	FT, RPR 1B	Yes
Springville clarkia *Clarkia springvillensis*	FT, CE, RPR 1B	No
Kern mallow *Eremalche kernensis*	FE, RPR 1B	No
Striped adobe-lily *Fritillaria striata*	CT, RPR 1B	No
San Joaquin woollythreads *Monolopia congdonii*	FE, RPR 1B	No
Bakersfield cactus *Opuntia basilaris* var. *treleasei*	FE, CE, RPR 1B	No
San Joaquin Valley Orcutt grass *Orcuttia inaequalis*	FT, CE, RPR 1B	Yes
Hartweg's golden sunburst *Pseudobahia bahiifolia*	FE, CE, RPR 1B	No
San Joaquin adobe sunburst *Pseudobahia peirsonii*	FT, CE, RPR 1B	No

CE - State-listed as Endangered
CT - State-listed as Threatened
FE - federally listed as Endangered
FT - federally listed as Threatened
RPR - Rare Plant Rank (designated by the California Department of Fish and Wildlife)
1A - plants believed to be extinct in California
1B - Plants rare or endangered in California and elsewhere

The pikeminnow-hardhead-sucker assemblage occurs just above the valley floor at elevations of 80 to 1,500 ft (Moyle 2002). This assemblage typically inhabits streams with average summer flows of >300 L/s, with deep, rocky pools and wide shallow riffles. Water quality and habitat complexity is usually high, although some streams may become intermittent during summer, and summer water temperatures may exceed 25 degrees centigrade (°C). Sacramento pikeminnow and Sacramento sucker are generally the most abundant fishes of this assemblage, while hardhead are confined to cooler waters in reaches with deep, rock-bottomed pools.

The California roach assemblage overlaps substantially in elevation with the pikeminnow-hardhead-sucker assemblage, although it does not extend to the lowest elevations (Moyle 2002). This assemblage is found in small, warm tributaries to larger streams that flow through open foothill woodlands of oak and foothill pine. These streams are typically intermittent during summer, resulting in the formation of stagnant pools that can exceed 30°C during the day. In the winter and spring these streams are swift and vulnerable to flooding. These streams provide habitat for the California roach, which is capable of withstanding high temperature and low oxygen levels due to its small size.

The rainbow trout assemblage overlaps with the upper elevations of the pikeminnow-hardhead-sucker and California roach assemblage and extends to the highest elevations (Moyle 2002). These streams are characterized by swift, permanent flows, steep gradients, and cool temperatures. The water is well oxygenated and cover is abundant. Sculpin, Sacramento sucker, and speckled dace are often part of this assemblage, as well as introduced brook and brown trout, although they generally do not occur at the lower elevations.

3.5.2.2 Vegetation Communities and Terrestrial Wildlife Habitat

The Project Area traverses areas that are primarily agricultural and grazing lands, although portions of the Project Area parallel the Kern River and are near areas of freshwater marsh or riparian woodlands. The water transfer areas are primarily agricultural. Although all water deliveries would be to agricultural areas, there are patches of native habitat within the boundaries of the CVC Contractors' water use service areas, including mixed oak savanna, lower montane blue-oak-foothill pine woodland and savanna, and riparian and wetland (Cal-GAP 2008).

Mixed Oak Savanna

Mixed oak savanna in the Central Valley of California is typically dominated by valley oak (*Quercus lobata*), but may also include any of several other oak species: interior live oak (*Quercus wislizeni*), coast live oak (*Quercus agrifolia*), or blue oak (*Quercus douglasii*) (NatureServe 2008). Other trees characteristic of these savannas include California buckeye (*Aesculus californica*) and California juniper (*Juniperus californica*). The understory is dominated by non-native grasses such as wild oat (*Avena* spp.), various brome grasses (*Bromus diandrus, B. hordeaceus, B. madritensis* ssp. *rubens*) and Italian ryegrass (*Lolium perenne* ssp. *multiflorum*), as well as, both native and exotic forbs (Holland 1986).

Lower Montane Blue-Oak-Foothill Pine Woodland and Savanna

Lower montane blue-oak-foothill pine woodland and savanna in the CVC Project Area is found along the valley margins and foothills of the Sierra Nevada. This vegetation community consists of open stands of foothill pine (*Pinus sabiniana*), blue oak, interior live oak, valley oak, and California buckeye (NatureServe 2008). A variety of shrubs may be found in this vegetation community and the understory is dominated by a dense cover of both native and exotic annual species.

Riparian

Riparian vegetation (valley and foothill riparian) in the CVC Project Area is found along rivers and streams. The strips of riparian vegetation along a stream are frequently a mosaic of stands dominated by riparian shrubs or trees. Dominant trees include cottonwoods (*Populus* spp.), California sycamore

(*Platanus californica*), and valley oak (Mayer and Laudenslayer 1988). Subcanopy trees include white alder (*Alnus rhombifolia*), boxelder (*Acer negundo*), and Oregon ash (*Fraxinus oregana*). The shrub layer may include wild grape (*Vitis californica*), wild rose (*Rosa* spp.), blackberry (*Rubus* spp.), and willows (*Salix* spp.). The herbaceous layer consists of sedges (*Carex* spp.), rushes (*Juncus* spp.), grasses, Douglas sagewort (*Artemisia douglasii*), and other wetland species.

Wetland

Wetlands refer to herbaceous wetlands, the equivalent of Fresh Emergent Wetlands (Mayer and Laudenslayer 1988) or freshwater marsh. These vegetation communities are dominated by sedges, rushes, and grasses on the upper margins and by cattails (*Typha* spp.) and bulrush (*Scirpus* spp.) in the wetter locations.

Agriculture

Agricultural land includes orchards, vineyards, and field crops. Land used exclusively for livestock pasture may be mapped as either agricultural land (pasture) or as annual grassland. Agricultural lands provide limited habitat for wildlife species.

3.5.2.3 Special-Status Species Known to Occur within the Project Area

Based on records in the California Department of Fish and Wildlife's (CDFW 2014) California Natural Diversity Data Base (CNDDB) and U.S. Fish and Wildlife Service (USFWS) lists for the Project Area quadrangles (USFWS 2011), 77 special-status species are potentially present in the vicinity of the Project Area. However, no special-status species are expected to be affected by the approval, execution, or implementation of the long-term three-party conveyance contracts resulting from the Proposed Project. A list of these 77 special-status species and their habitats is provided in Appendices E and F, respectively. Thirty-five of these species are federally or state-listed, proposed for listing, or candidate species. These species include 12 plant species (see Table 3.5-1) and 23 animal species (Table 3.5-2).

Table 3.5-2 Federally or State-listed, Proposed, or Candidate Wildlife Species Potentially Present in the Project Area or Vicinity

Common Name *Scientific Name*	Status	Critical Habitat In or Near Project Area
Invertebrates		
Conservancy fairy shrimp *Branchinecta conservatio*	FE	No
Vernal pool fairy shrimp *Branchinecta lynchi*	FT	Yes
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	No
Vernal pool tadpole shrimp, *Lepidurus packardi*	FE	Yes
Fish		
Green sturgeon *Acipenser medirostris*	FT	Yes
Delta smelt *Hypomesus transpacificus*	SE, FT	Yes
Central Valley steelhead *Oncorhynchus mykiss*	FT, CT	Yes
Central Valley spring-run Chinook salmon *Oncorhynchus tshawytscha*	FT, CT	Yes

Table 3.5-2 Federally or State-listed, Proposed, or Candidate Wildlife Species Potentially Present in the Project Area or Vicinity

Common Name *Scientific Name*	Status	Critical Habitat In or Near Project Area
Sacramento River winter-run Chinook salmon *Oncorhynchus tshawytscha*	FE, CE	Yes
Amphibians		
California tiger salamander *Ambystoma californiense*	FT, CT, CSC	Yes
California red-legged frog *Rana draytonii*	FT	No
Southern mountain yellow-legged frog *Rana muscosa*	FE, CE	No
Reptiles		
Blunt-nosed leopard lizard *Gambelia sila*	FE, CE, FP	No
Giant garter snake *Thamnophis gigas*	FT, CT,	No
Birds		
Swainson's hawk *Buteo swainsoni*	CT	No
Willow flycatcher *Empidonax traillii* (only *Empidonax traillii extimus* is FE)	FE, CE	No
California condor *Gymnogyps californianus*	FE, CE, FP	No
Mammals		
Nelson's antelope squirrel *Ammospermophilus nelsoni*	CT	No
Giant kangaroo rat *Dipodomys ingens*	FE, CE,	No
Fresno kangaroo rat *Dipodomys nitratoides exilis*	FE, CE	No
Tipton kangaroo rat *Dipodomys nitratoides nitratoides*	FE, CE,	No
Buena Vista Lake ornate shrew *Sorex ornatus relictus*	FE, CSC	No
San Joaquin kit fox *Vulpes macrotis mutica*	FE, CT,	No

CE = State=listed as Endangered
CFP = California Fully Protected
CSC = California Species of Special Concern
CT = State=listed as Threatened
FC = federal Candidate for listing
FE = federally listed as Endangered
FT = federally listed as Threatened
RPR = Rare Plant Rank (designated by the California Department of Fish and Wildlife)
1A = plants believed to be extinct in California
1B = Plants rare or endangered in California and elsewhere
2 = Plants rare or endangered in California, but more common elsewhere

Special-Status Plants

Twelve plant species that are federally or state-listed, proposed for listing, or candidate species are potentially present in the vicinity of the Project Area (see Table 3.5-1). Twenty-two other special-status plant species are potentially present in this area (Appendix E and Appendix F). However, no special-status plant species are expected to be affected by the approval, execution, or implementation of the 3-party conveyance agreements resulting from the Proposed Project.

Special-Status Wildlife Species

Twenty-three wildlife species that are federally or state-listed, proposed for listing, or candidate species are potentially present in the vicinity of the Project Area (see Table 3.5-2). Twenty other special-status wildlife species are potentially present in this area (Appendix E and Appendix F). However, no special-status wildlife species are expected to be affected by the approval, execution, or implementation of the 3-party conveyance agreements resulting from the Proposed Project.

3.5.3 Regulatory Framework

3.5.3.1 Federal

Federal Endangered Species Act

The Federal Endangered Species Act (FESA) defines “endangered” species as those in danger of extinction throughout all or a significant portion of their range. A “threatened” species is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Additional special-status species include “candidate” species and “species of concern.” Candidate species are those for which the USFWS, or National Marine Fisheries Service (NMFS) if applicable, has enough information on file to propose listing as endangered or threatened. “Species of concern” are those for which listing is possibly appropriate, but for which the USFWS or NMFS lacks sufficient information to support a listing proposal. A species that has been “delisted” is one whose population has met its recovery goal target and is no longer found to be in jeopardy of extinction. These agencies also may designate “Critical Habitat” for listed species.

Federally-listed species may be addressed for a proposed project in one of two ways: 1) a non-Federal government entity may resolve potential adverse impacts to species protected under FESA Section 10, or 2) a federal lead agency regulates an action in accordance with FESA Section 7. Section 7 defines a process for the federal lead agency to consult with the responsible Federal resource agency (USFWS or NMFS), to determine whether the proposed water transfer program is likely to adversely affect species that are listed or proposed for listing. The Section 7 process typically requires the preparation of a Biological Assessment by the federal lead agency followed by the preparation of Biological Opinion by the responsible federal resource agency. Consultation under Section 7 is limited to projects with a federal nexus. Other projects that may result in take or harm of a federally listed species require a Section 10 permit from the USFWS or NMFS. The Section 10 process typically requires the project proponent to prepare a Habitat Conservation Plan (HCP). A permit is issued by the USFWS or NMFS once the HCP is approved.

Fish and Wildlife Coordination Act

This Fish and Wildlife Coordination Act (FWCA) establishes a general policy that fish and wildlife conservation shall receive equal consideration with other project purposes and will be coordinated with other features of water resources development projects. To accomplish this, section 2(b) of the FWCA establishes that preconstruction planning on project development shall be coordinated with the USFWS, The FWCA authorizes the USFWS and state agencies responsible for fish and wildlife resources to investigate proposed federal actions that would impound, divert, deepen, or otherwise control or modify a stream or waterbody and to make mitigation and enhancement recommendations to the involved federal agency. According to the act:

"Recommendations … shall be as specific as practicable with respect to features recommended for wildlife conservation and development, lands to be utilized or acquired for such purposes, the results expected, and shall describe the damage to wildlife attributable to the project and the measures proposed for mitigating or compensating for these damages."

Magnusson-Stevenson Fishery Conservation and Management Act 1996 (Public Law 94-265)

This law provides for the conservation and management of all fish resources within the exclusive economic zone of the U.S. and supports and encourages the implementation and enforcement of international fisheries agreements for conservation and management of highly migratory species. It called for the establishment of Regional Fisheries Management Councils to develop, implement, monitor, and revise fish management plans to promote domestic commercial and recreational fishing. Specifically to this Program, it calls for the protection of essential fish habitat in review of projects conducted under federal permits, licenses, or other authorities that affect or have the potential to affect such habitat. NMFS is responsible for the administration of this Act.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (16 United States Code 703–711) makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). Disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young) may be considered a "take" and is potentially punishable by fines and/or imprisonment.

Executive Order 11990 (Protection of Wetlands)

Federal Executive Order (EO) 11990 (Protection of Wetlands) requires federal agencies to take actions to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands when undertaking federal activities and programs. Any agency considering a proposal that might affect wetlands must evaluate factors affecting wetland quality and survival. These factors should include the proposal's effects on the public health, safety, and welfare due to modifications in water supply and water quality; maintenance of natural ecosystems and conservation of flora and fauna; and other recreational, scientific, and cultural uses.

3.5.3.2 State

California Endangered Species Act

The California Endangered Species Act (CESA) and the Native Plant Protection Act authorize the California Fish and Game Commission to designate endangered, threatened, and rare species and to regulate the taking of these species (Sections 2050–2098, Fish and Game Code). CESA defines "endangered" species as those whose continued existence in California is jeopardized. State-listed "threatened" species are those not presently threatened with extinction but which may become endangered if their environments change or deteriorate. Protection of special-status species is detailed in Sections 2050 and 2098 of the Fish and Wildlife Code. In addition to recognizing three levels of endangerment, CDFW[1] can provide interim protection to candidate species while they are being reviewed by the Fish and wildlife Commission. Formal consultation must be initiated with CDFW for projects that may have an adverse effect on a state-listed species in accordance with the state lead agency.

[1] "At the direction of Assembly Bill 2402 (Huffman) and Governor Brown, the name of the California Department of Fish and Game has been changed to the 'California Department of Fish and Wildlife' as of January 1, 2013. Our mission has not changed. Updating all references to reflect the Department's new name will require some time, so we appreciate your understanding during this transition." – CDFW website

California Fish and Wildlife Codes

Section 2080 of the California Fish and Wildlife Code prohibits the taking of state-listed plants and animals. CDFW also has the authority to designate State endangered and rare plants and provide specific protection measures for identified populations under the Native Plant Protection Act of 1977. CDFW also designates "fully protected" or "protected" species as those that may not be taken or possessed without a permit from the Fish and Wildlife Commission and/or CDFW. Species designated as fully protected or protected may or may not be listed as endangered or threatened.

CDFW also maintains a list of animal "Species of Special Concern," most of which are species whose breeding populations in California may face extirpation. Although these species have no legal status, CDFW recommends consideration of them during analysis of the impacts of proposed projects to protect declining populations and avoid the need to list them as endangered in the future.

CDFW's implementation of CESA has created a program that is similar in structure to, but different in detail from, the USFWS program implementing FESA.

3.5.4 Impact Assessment Methodology

The impact assessment for aquatic wildlife species relied upon knowledge of aquatic resource habitat requirements and expected changes to habitat or populations from implementation of the Proposed Project.

Impacts on terrestrial biological resources were qualitatively evaluated using a vegetation/habitat-based approach that links predicted environmental effects of the Proposed Project to potential effects on habitat quantity and quality. Effects on wildlife biological resources can be direct, as in the mortality of individual specimens, and indirect, as in effects that do not cause the immediate mortality of an individual but that may reduce the habitat or eliminate the species over time.

3.5.4.1 Significance Criteria

The Proposed Project activities are evaluated in accordance with the mandatory findings of significance as explained in CEQA, Pub. Res. Code Sec. 21083; guidelines Sec. 15065; and the Biological Resources Quality section of Appendix G of the CEQA Environmental Checklist. The mandatory findings of significance indicate that a Project would have a significant impact on biological resources if implementation would:

> Substantially degrade environmental quality;

> Substantially reduce fish or wildlife habitat;

> Cause a fish or wildlife habitat to drop below self-sustaining levels;

> Threaten to eliminate a plant or animal community; or

> Substantially reduce the numbers or range of a rare, threatened, or endangered species.

Additionally, based on the CEQA Environmental Checklist, the Proposed Project would have a significant impact on biological resources if implementation would:

> Cause a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW, NMFS, or USFWS;

> Cause a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW and USFWS;

> Cause a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

> Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native fish nursery sites;

> Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

> Conflict with the provisions of an adopted HCP; Natural Community Conservation Plan; or other approved local, regional, or State HCP.

3.5.5 Project Impacts

The potential impacts to biological resources from implementation of the Proposed Project are discussed below. Many potential effects and resultant mitigation related to the continued conveyance of existing CVP water supply in the Delta through SWP facilities have been addressed in other documents that are incorporated here by reference and include:

> Programmatic Biological Opinion for the Implementation of the CVPIA Preferred Alternative and Proposed Record of Decision (NMFS 2000).

> Conclusion of Consultation on Long Term Renewal of Water Service Contracts in the Delta-Mendota Canal Unit (USFWS 2005b).

> Biological Opinion on the Operations and Maintenance Program on Reclamation Lands within the South-Central California Area Office.

> Programmatic Biological Opinion on Implementation of the CVPIA and Continued Operation and Maintenance of the CVP (USFWS 2000).

> Biological Opinions for the Continued Long Term Operation of the Central Valley Project (CVP) and State Water Project (SWP) (USFWS 2004a, NMFS 2004, USFWS 2008a; NMFS 2009b).

> Biological Opinion on Reclamation Long Term Contract Renewal of Friant Division and Cross Valley Unit Contractors (Reclamation 2001a).

> Biological Opinion on the Effects of the Long-Term Coordinated Operations of the Central Valley Project (CVP) and State Water Project (SWP) (USFWS 2008).

> Biological Opinion on the Effects of the Long-Term Central Valley Project and State Water Project Operations Criteria and Plan (NMFS 2009).

3.5.5.1 Biological Opinion Summaries

Since the mid-1990s, the USFWS and the NMFS have issued a series of BOs that provide Reclamation and other agencies with guidelines for operation of the CVP, implementation of the CVPIA, and for the interim or long-term renewal of CVP water service contracts. This section summarizes the results of endangered species consultations with USFWS on the LTCRs and IRCs and with NMFS as applicable for other related actions.

Biological Opinion on the Long-Term Central Valley Project and SWP Operations and Criteria and Plan (OCAP)

The OCAP is a detailed analysis and explanation of the criteria and procedures for conducting combined CVP and SWP operations. Reclamation and DWR conducted endangered species consultations to address the CVP/SWP combined long-term operations leading to the development of BOs on the combined operations of their facilities in 2004 (USFWS 2004). Reclamation was the lead Federal agency and the DWR was the lead state agency for these consultations. Reclamation consulted with USFWS and NMFS regarding potential operational impacts to species listed pursuant to the ESA. DWR consulted with

CDFW regarding potential operational impacts to species listed pursuant to the California ESA. These BOs have undergone legal challenges since their issuance and have been retracted and rewritten as a result of court rulings, discussed further below.

No later than November 30 of each year, Reclamation and NMFS conduct a Science Peer Review to determine if the RPA should be altered in light of information learned from prior years' operations or research. Refer to Section 3.5 for additional information (NMFS 2011).

Formal Endangered Species Consultation on the Operations and Maintenance Program Occurring on Bureau of Reclamation Lands within the South-Central California Area Office

Reclamation conducted consultation with USFWS on the Operations and Maintenance Program occurring on Reclamation lands within the South-Central California Area Office. This consultation and associated BO (USFWS 2005b) addressed potential impacts on delta smelt, Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, valley elderberry longhorn beetle, California red-legged frog, California tiger salamander, blunt-nosed leopard lizard, giant garter snake, California condor, bald eagle, California clapper rail, giant kangaroo rat, salt marsh harvest mouse, San Joaquin kit fox, San Joaquin wooly-threads, succulent (fleshy) owl's clover, Hoover's spurge, Greene's tuctoria, San Joaquin Valley Orcutt grass. The USFWS determined that the Operations and Maintenance occurring on Reclamation lands within Reclamation's South-Central California Area Office, as proposed, is not likely to jeopardize the continued existence of these species. This BO includes reasonable and prudent measures to minimize incidental take of these species.

The USFWS also concurred that the proposed action is not likely to adversely affect the vernal pool tadpole shrimp, valley elderberry longhorn beetle, California red-legged frog, California tiger salamander, blunt-nosed leopard lizard, giant garter snake, California condor, bald eagle, California clapper rail, giant kangaroo rat, salt marsh harvest mouse, San Joaquin kit fox, San Joaquin wooly-threads, succulent owl's clover, Hoover's spurge, Greene's tuctoria, and San Joaquin Valley Orcutt grass.

The USFWS noted that Reclamation had determined that the proposed action would have no effects on large-flowered fiddle neck, Lange's metalmark butterfly, Aleutian Canada goose, California jewelflower, soft bird's-beak, palmate-bracted bird's-beak, Fresno kangaroo rat, Contra Costa wallflower, bay checkerspot butterfly, Contra Costa goldfields, Alameda whipsnake, riparian woodrat, Antioch Dunes evening-primrose, Bakersfield cactus, hairy Orcutt grass, Hartweg's golden sunburst, Keck's checkerbloom, and riparian brush rabbit; and designated critical habitat for large-flowered fiddle neck, valley elderberry longhorn beetle, Fresno kangaroo rat, Contra Costa goldfields, Antioch Dunes evening-primrose, and hairy Orcutt grass.

Biological Opinion for Formal and Early Section 7 Endangered Species Consultation on the Coordinated Operations of the CVP and SWP and the Operational Criteria and Plan to address Potential Critical Habitat Issues

This consultation and associated BO (USFWS 2005) addressed potential impacts on the delta smelt and its critical habitat. This BO also concurs that the coordinated operations are not likely to adversely affect the riparian brush rabbit, riparian wood rat, salt marsh harvest mouse, California clapper rail, giant garter snake, California red-legged frog, valley elderberry longhorn beetle, soft bird's beak, and Suisun thistle. The BO also concludes that no additional effects to the bald eagle are expected beyond those addressed in a 1993 BO.

Litigation by environmental organizations and commercial fishermen resulted in the overturning of these BOs issued by the USFWS for delta smelt (above) and NMFS for anadromous fish. Operational limitations on the SWP and CVP were imposed by the Court to protect delta smelt (while new BOs were under preparation), although no new limitations were imposed to protect salmon and steelhead. The judicial action had the effect of reducing SWP deliveries through June 2008 by about 500,000 af (Wilkinson 2011).

Revised Biological Opinions for Delta Smelt and Salmon and Steelhead

A new delta smelt BO was issued by USFWS on December 15, 2008 (USFWS 2008) and a new BO for salmon and steelhead was issued by NMFS on June 4, 2009 (NMFS 2009). Both of these are "jeopardy opinions" and include additional limitations on water deliveries by both the SWP and CVP and have redirected that water through the Delta for fishery purposes.

Additional litigation by several water user groups has ensued on both BOs. On May 18, 2010, in the salmon cases and, on May 27, 2010, and on December 14, 2010, in the smelt cases, the Federal court issued major opinions dealing with preliminary injunction and summary judgment motions brought by plaintiffs to lift the limitations restricting SWP/CVP pumping. The Court's (December 14, 2010) opinion granted a summary judgment, overturning the smelt BO and remanding the opinion to the USFWS. Because the smelt BO is being remanded "without vacature" (the SWP and CVP need the accompanying "incidental take" authorization to operate), additional Court activity to determine interim operational criteria for both projects has occurred as discussed below.

9th Circuit Court of Appeals Decision to Overturn 2011 Wanger Ruling

The U.S. 9th Circuit Court of Appeals reversed much of a 2011 lower court ruling by U.S. District Court Judge Oliver Wanger that had overturned regulations in the delta smelt BO. Under the ruling, the USFWS will not have to revamp the plan aimed at protecting the Delta smelt, but the Bureau must analyze the potential environmental effects of that plan.

While the 9th Circuit acknowledged that, among other things, "the BiOp is a bit of a mess," and "[t]he BiOp is a jumble of disjointed facts and analyses," the court disagreed with Judge Wanger's lower court ruling that USFWS experts acted in an "arbitrary and capricious" manner in their preparation of the BO. Although the lower court ordered the USFWS to rewrite the 2008 BO on how the CVP and SWP would affect the Delta smelt, the Ninth Circuit found that a great deal of science and consideration had gone into the plan, and that it should stand. The court held that the Bureau should have prepared a NEPA EIS when it adopted and implemented the BO and reasonable and prudent alternative of the BO (Law360 2014). Reclamation will be preparing an EIS on its implementation of future BOs and developing interim operational criteria for both the CVP and SWP Formal Consultation on the Proposed San Luis Drainage Feature Re-evaluation for Fresno, Kings, and Merced Counties, California

As part of this consultation, Reclamation determined that the proposed action would have no effect on Buena Vista Lake ornate shrew, Fresno kangaroo rat, giant kangaroo rat, riparian woodrat, bald eagle, California condor, California red-legged frog, blunt-nosed leopard lizard, vernal pool fairy shrimp and vernal pool tadpole shrimp, valley elderberry longhorn beetle, palmate-bracted bird's-beak, California jewelflower, San Joaquin wooly-threads, and delta smelt and delta smelt critical habitat. USFWS concurred that the proposed action is not likely to adversely affect Tipton kangaroo rat and California tiger salamander. USFWS concluded that the proposed action is not likely to jeopardize the continued existence of the San Joaquin kit fox, giant garter snake, and California least tern. Critical habitat has not been designated for these species; therefore, none will be affected. Terms and conditions for the San Joaquin kit fox and California least tern are included in the BO (USFWS 2006).

Biological Opinion on U.S. Bureau of Reclamation Long Term Contract Renewal of Friant Division and Cross Valley Unit Contractors

In October of 2000, Reclamation initiated informal consultation with both USFWS and NMFS on the renewal of long-term water service contracts in the Cross Valley Canal Unit and Friant Division of CVP. Subsequently, formal consultation was initiated by Reclamation and BOs were issued by both agencies in January 2001 (January 19, 2001, for USFWS and January 20, 2001, for NMFS) to address the proposed renewal by Reclamation of water service contracts with the CVP's Friant Division and Cross Valley Units for the 25-year period from 2001 through 2006.

The USFWS concluded in its BO (USFWS 2001) that the proposed action was not likely to jeopardize the following 35 federally-listed species, four proposed species, and three candidate species: Aleutian Canada goose, Bakersfield cactus, bald eagle, blunt-nosed leopard lizard, Buena Vista lake ornate shrew, California condor, California jewelflower, California red-legged frog, California tiger salamander, Colusa grass, Conservancy fairy shrimp, delta smelt, fleshy owl's-clover, Fresno kangaroo rat, giant garter snake, giant kangaroo rat, Greene's tuctoria, hairy Orcutt grass, Hartweg's golden sunburst, Hoover's spurge, Hoover's wooly star, Keck's checker-mallow, Kern mallow, least Bell's vireo, mountain plover, palmate-bracted bird's-beak, Sacramento splittail, San Joaquin adobe sunburst, San Joaquin kit fox, San Joaquin Valley Orcutt grass, San Joaquin wooly-threads, southwest willow flycatcher, Tipton kangaroo rat, valley elderberry longhorn beetle, vernal pool fairy shrimp, and vernal pool tadpole shrimp, or destruction or adverse modification of critical habitat of California condor, delta smelt, Fresno kangaroo rat, southwestern willow flycatcher, or valley elderberry longhorn beetle.

USFWS concluded that the proposed action, described in this opinion, is not likely to adversely affect the bald eagle and California condor. USFWS also concluded that, because of their close proximity, historic range and inclusion in future consultation actions, the riparian brush rabbit and riparian woodrat should continue to be a focus of conservation efforts for this proposed action, if conservation efforts in this project description are determined to be expandable to encompass the needs of these species.

The NMFS Opinion concluded that the proposed action is not likely to jeopardize the continued existence of winter-run Chinook salmon, Central Valley spring-run Chinook salmon, or Central Valley steelhead, and/or adversely modify their critical habitat.

Consultation on Long-Term Renewal of Water Service Contracts Regarding the Delta-Mendota Canal Unit

As part of this biological opinion (USFWS 2005), USFWS concluded and determined that the proposed renewal of long- term water service contracts is not likely to adversely affect San Joaquin kit fox, giant garter snake, riparian brush rabbit, riparian wood rat, palmate-bracted bird's beak, and the California red-legged frog, or proposed or designated critical habitat, in 20 water districts: Broadview Water District, Coelho Family Trust, Eagle Field Water District, Reclamation District # 1606, Fresno Slough Water District, West Stanislaus Irrigation District, James Irrigation District, Patterson Irrigation District, Laguna Water District, Centinella Water District, Tranquility Public Utility District (Mardella/Melvin Hughes Property), San Joaquin National Cemetery, Del Puerto Water District, Mercy Springs Water District (unassigned portion), The West Side Irrigation District, Oro Lorna Water District, Banta Carbona Irrigation District, Tranquillity Irrigation District, Byron/Bethany Water District (Plain View Water District), and Widren Water District.

In this 2005 BO, the USFWS also concluded that the renewal of CVP water service contracts in the DMC unit may affect, but is not likely to adversely affect, the San Joaquin kit fox and the giant garter snake.

As detailed above, a new delta smelt BO was issued by USFWS on December 15, 2008 (USFWS 2008) and a new BO for salmon and steelhead were issued by NMFS on June 4, 2009 (NMFS 2009). These biological opinions are continuing to be reviewed, updated, and implemented by the United States and State of California consistent with various court orders consistent with the requirements of the Federal Endangered Species Act and other associated Federal and State laws.

Additionally, on April 16, 2014, the Ninth Circuit Court of Appeal reversed the Federal District Court's judgment approving long-term renewal of 18 water service contracts in the Delta-Mendota Canal Unit, of the Central Valley Project. Specifically, the Ninth Circuit reversed the district' court's judgment and remanded the case for further proceedings consistent with its opinion. The case is currently before the Federal District Court as ordered by the Ninth Circuit and the United States continues to proceed with the renewal of these long-term water service contracts consistent with the requirements of the Federal

Endangered Species Act, Federal Reclamation Law, and other associated Federal and State laws as directed by the courts.

Interim Renewal Contracts for the Period March 1, 2008 through February 28, 2010 for Cross Valley and Delta Division Contractors in San Joaquin, Santa Clara, Tulare, Fresno, Kings, and Kern Counties

As part of this BO (USFWS 2008), USFWS concluded that the interim renewal of 15 water service contracts, as proposed, is not likely to jeopardize the continued existence of any special-status species, and is not likely to destroy or adversely modify critical habitat of listed vernal pool species, the California red-legged frog, or the central population of the California tiger salamander. Specifically, for the Cross Valley Unit, the BO addressed the potential effects to blunt-nosed leopard lizard, California jewel flower, California tiger salamander (Central population), San Joaquin adobe sunburst, and vernal pool fairy shrimp and critical habitat for the California red-legged frog.

Conclusion of Consultation on the IRCs for the San Luis Water District and Panoche Water District in Merced and Fresno Counties, California

USFWS (2008) concluded that issuance of two IRCs for the SLWD and PWD, for periods of 26 months, beginning on January 1, 2009, may affect, but is not likely to adversely affect, the federally -listed San Joaquin kit fox and giant garter snake or critical habitats designated under the federal ESA.

Consultation on the Renewal of IRCs for the Cross Valley and Delta Division Contractors in San Joaquin, Santa Clara, Tulare, Fresno, Kings, and Kern Counties

USFWS (2010) determined that issuing 24-month IRC's for the following contractors would not likely adversely affect listed species: City of Tracy (partial assignment from West Side ID); City of Tracy (partial assignment from Banta Carbona ID); County of Fresno; Hills Valley ID; Kern-Tulare Water District; Lower Tule River ID; Pixley ID; Tri-Valley Water District; and County of Tulare.

Consultation on the IRCs with San Luis Water District and Panoche Water District

Reclamation has determined that the proposed action will have no effect on the following federally-listed species or critical habitats and is not requesting concurrence with those determinations: San Joaquin woolly-threads, valley elderberry longhorn beetle, longhorn fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, blunt-nosed leopard lizard, California red-legged frog, California tiger salamander, Fresno kangaroo rat, and giant kangaroo rat.

USFWS concurred that issuance of two IRCs, for SLWD and PWD, for a 24-month period, beginning March 1, 2011, and going through February 28, 2013, may affect, but is not likely to adversely affect the federally -listed San Joaquin kit fox, giant garter snake, and delta smelt, including delta smelt designated critical habitat.

Informal Consultation on Central Valley Project Cross Valley Contractors IRCs and Article 5 Exchanges, 2012-2014

USFWS (2012) determined that the proposed 2-year IRCs for CVC Unit contractors and Article 5 Exchanges for the contract period March 1, 2012, through February 28, 2014, may affect, but are not likely to adversely affect the federally-listed Buena Vista Lake ornate shrew, San Joaquin kit fox, Tipton kangaroo rat, blunt-nosed leopard lizard, Kern mallow, and San Joaquin woolly-threads.

2014 Long-term Operations Biological Opinions Annual Science Review

As discussed above, NOAA's NMFS and the USFWS have each issued a BO on the long-term operations of the CVP and SWP that include Reasonable and Prudent Alternatives (RPAs) designed to alleviate jeopardy to listed species and adverse modification of critical habitat. NMFS' RPA requires the Bureau and NMFS to host a workshop no later than November 30 of each year to review the prior water year's

operations and to determine whether any measures prescribed in the RPA should be altered in light of information learned from the prior year's operations or research. Under direction from the Secretaries of Commerce and Interior, this review has been expanded to include a review of the implementation of the USFWS Long-term Operations BO. The DWR also participates in the review because it operates the SWP. The 2014 review is the fifth to occur (Delta Stewardship Council 2014).

The 2014 annual review occurred in November 2014 and focused on the implementation of the Long-term Operations Biological Opinion RPAs for operations and fisheries for water year 2014 (October 1, 2013 through September 30, 2014). Specifically, this year's annual review focused primarily on:

> Implementation of NMFS's RPAs associated with modified Delta Cross Channel (DCC) Gate opening criteria in the Drought Operations Plan;

> Proposed modifications to the Juvenile Production Estimate (JPE) calculation and use/application of data from acoustically-tagged Chinook Salmon releases;

> Proposed calculations for Cumulative Salvage Index values used in estimating take of adult Delta Smelt under the USFWS Old and Middle River flow RPAs; and

> General implementation of RPA actions under dry year conditions based on prior IRP concerns about RPA implementation under such conditions.

The independent review panel concluded it was encouraged by signs of movement toward the application of research aimed at linking the survival and behavior of fishes to water operations, but clear, quantifiable associations between specific RPA actions and population-level responses in species targeted for protection remain elusive. The review panel encouraged the development of methods that will explicitly link the success or failure of achieving desired temperatures, flows, and other physical targets to the biological/ecological responses of the listed species (Delta Stewardship Council 2014).

3.5.5.2 Biological Opinion Measures to Minimize Take

The CVC Contractors, as part of this Proposed Project, will continue to implement in a timely manner relevant environmental commitments, conservation measures, and terms and conditions from other BOs as appropriate. These include commitments from USFWS' BOs on the implementation of the CVPIA and Continued O&M of the CVP (November 21, 2000, Service File No. 98-F-0124), the Friant and Cross Valley Canal Unit Long-Term Contract Renewals (Service File No. 01-F-0027), and the Operations and Maintenance Program Occurring on Reclamation Lands within the South-Central California Area Office (Service File No. 04-F-0368).

2001 Friant/Cross Valley BO

6. Monitor land use change and ongoing activities within District(s) receiving CVP water.
7. Landowners obtain USFWS/Reclamation approval prior to taking actions on endangered species habitat with no Federal involvement.
8. Ensure Section 7 consultation on future actions impacting endangered species where there is Federal involvement. The Friant Division and Cross Valley Unit CVP water contractors, whose contracts are currently up for renewal, have also made "Applicant Commitments" that they will not deliver CVPIA Project Water for the purpose of converting any native lands to agricultural or M&I uses unless and until appropriate ESA compliance has determined that such conversion will not likely affect protected species or appropriate mitigation has been provided.

18. Identify and analyze impacts of all water assignments executed since 1991 for Friant and 1995 for Interim contractors, and coordination on future assignments to ensure ESA compliance.
19. Reclamation will apply applicable criteria to all water transfers.

22. Curtail deliveries associated with discovery of conversion of native lands without consideration of ESA.[2]

24. Reclamation shall consult with USFWS on any deliveries of water using Friant facilities beyond that addressed in this biological opinion.

2000 CVPIA BO

1. Long-term contracts will be renewed, and Reclamation will complete tiered site specific consultations with the USFWS. No CVP water will be delivered or applied outside current contract service areas until either formal or informal consultation, as appropriate, is complete. Once formal site specific consultation has occurred that is in compliance with this BO, it is assumed that changes in land-use practices, and impacts to listed and proposed species, in the Districts, have been addressed.

4. Reclamation and USFWS will write a joint letter to the water districts, any member agencies, Planning Department of cities or counties within the districts using CVP water, and other responsible parties regarding requirements under the ESA. The letter will include: 1) a discussion of Reclamation's need to ensure that CVP water is not used in a manner which could jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated *critical habitat*, and 2) an explanation of the prohibitions described under Section 9 of the ESA in regard to *take*. This letter will discuss the appropriate protection measures as described here and in subsequent contract renewal consultation and will be completed within 60 days of execution of long-term contracts.

5. Conservation strategies will be in place for the districts or areas receiving CVP water. The types of strategies that could be accepted are: *Habitat Conservation Planning* as described in section 10(a) of the ESA; programmatic land management actions that include protection of listed and proposed species; requirements resulting from site specific Section 7 consultation; or an expansion of the existing CVP Conservation Program that adequately compensates for the direct and indirect effects of increased water delivery to an area.

6. Reclamation will, subsequent to a determination of *may affect* to listed species and/or adverse modification to designated *critical habitat* in consultation with USFWS' SFWO Endangered Species Division, consult on all Federal actions that result in changes in purpose of use for CVP water contracts, including changes from Agriculture to Agriculture/M&I purposes.

7. USFWS and Reclamation will work together to convey information to the water districts, and individual water users (as appropriate), on listed species needs. Reclamation will establish an outreach and education program, in collaboration with USFWS, to help water users integrate implementation of the CVPIA and requirements of the contract renewal process as it relates to ESA.

8. USFWS and Reclamation will work closely with the water users, providing them maps of listed species habitats within their service-areas and guiding them through the consultation process to address site-specific effects. Reclamation may encourage CVP contractors to complete HCPs encompassing the affected areas.

10. Reclamation and CVP contractors will comply with all applicable opinions related to the CVP (listed on pages 1-11 to 1-12). Flow standards that form the environmental baseline of the 1995 OCAP BO will be met, and Reclamation will take no discretionary actions (e.g., new contracts, contract amendments, facility construction) that would incrementally increase diversions and alter hydrologic and environmental conditions in the Delta until any required consultation is reinitiated and completed.

[2] Reclamation and USFWS eventually agreed to this definition of "native lands": lands never tilled or lands fallowed and untilled for 3 or more years.

11. Contractors are required to conform with any applicable provisions of any biological opinions addressing contract renewal so as to prohibit the use of CVP water that results in unauthorized *take* or conversion of wildland habitat determined to have the potential to be occupied by listed species, or violation of any terms of the contracts pertaining to the conservation of listed species. All contracts (or related BOs) will also stipulate Reclamation will not undertake any discretionary action allowing the delivery of CVP water to native habitat for listed species depicted on the maps attached to the 18-month notices unless clearance pursuant to the ESA has been obtained from USFWS.

13. Reclamation will make certain that applicable measures to ensure ESA compliance for the renewal of CVP water service contracts are provided within the text of new and/or amended long-term water contracts and related actions.

14. Reclamation will provide information related to proposed new water assignments of Project water to USFWS' SFWO Endangered Species Division prior to execution of the assignment. *Inclusions and Exclusions* [*Lead Agency: Reclamation*]

15. Reclamation will provide USFWS with documentation of its procedures for processing exclusions and conducting site investigations. Reclamation will coordinate with USFWS via the process described on page 2-40 of the BO on (a) any requested inclusions or exclusions from contract service areas, and (b) any water contracts or water deliveries involving Reclamation facilities within the Final PEIS study area for service areas that are not addressed in any existing BO. This coordination will address all endangered species that may be affected by these actions.

3.5.5.3 Summary of Potential Impacts

Both the CVP and SWP are operated under State Water Resource Control Board (SWRCB) Water Right (WR) 95-06 and WR 98-09 in a manner to minimize impacts on Delta species, primarily aquatic species. The USFWS addressed special-status aquatic and terrestrial species in their *Biological Opinion for Long-term Contract Renewal for the Friant Division and Cross Valley Canal Unit* (LTCR BO). NMFS also issued BOs for the long-term contract renewals and concluded in these BOs that based upon available scientific and commercial information, implementation of the long-term contract renewals in not likely to jeopardize the continued existence of anadromous species such as winter-run and spring-run Chinook salmon and steelhead, or result in the destruction or adverse modification of designated critical habitat for those species. As part of this Proposed Project, the non-CVP Contractors are not covered by the LTCR BO or the CVPIA BO; however, all exchanges other than AEWSD, including the non-CVP Contractors, would be required to accept all the environmental commitments for the Proposed Project in order for the Contracting Officer to approve any individual proposed exchange.

The unbalanced nature of some of the exchanges may affect the terrestrial environment differently than a balanced transfer. This is because of changes in the volume and timing of an unbalanced transfer relative to a balanced transfer. However, the CVP water exported from the Delta by Reclamation annually that would be involved in the exchanges are supplies already allocated to the CVC Contractors and no additional water supplies would be diverted from rivers or lakes. Both balanced and unbalanced transfers are part of the water supply picture for the CVC Contractors. Furthermore, the Proposed Project would not result in the increase of water levels in reservoirs that release water to the Project Area, because each entity cannot exceed their authorized allocations. Any water not taken from reservoirs within the Project Area as a result of a CVC Contractor receiving water under an exchange would have to be released if it would cause the storage capacity to be exceeded. Therefore, species utilizing the shorelines of reservoirs would not be affected by potential flooding of breeding habitat.

The proposed exchanges, conveyance, and approvals are subject to applicable laws including the "no injury" rule.[3] No additional water would be conveyed. Because no additional water would be conveyed, there would be no effects on federally-listed species or critical habitats beyond those addressed by the current BOs for the continued long term operation of the CVP and SWP.

Under the Proposed Project, the CVC Contractors would not expand their service areas, bring native or fallowed lands (fallowed for 3 years or more) into cultivation, or alter current environmental conditions without further environmental review and approval. Most of the species addressed are not adapted to highly disturbed conditions and are poor colonizers. Thus, these species are unlikely to become established on land that has been fallowed for 2 years or less and are not expected to occur on land that is under cultivation or is otherwise highly disturbed.

Impact BIO-1: Potential to affect either directly or through habitat modifications any special-status plant species or any critical habitat.

The federally- or state-listed plant species that could occupy the Proposed Project Area are: Kern mallow and San Joaquin woolly-threads. CVC Contractors have made contractual commitments under the current three-party contracts to comply with the various BOs listed above in Section 3.5.5.2. Those contractual commitments will be included as part of the Project to ensure continued compliance with the various BOs. These include commitments from USFWS' BOs on the implementation of the CVPIA and Continued O&M of the CVP (November 21, 2000, Service File No. 98-F-0124), the Friant and Cross Valley Canal Unit Long-Term Contract Renewals (Service File No. 01-F-0027), and the Operations and Maintenance Program Occurring on Reclamation Lands within the South-Central California Area Office (Service File No. 04-F-0368).

The findings and recommendations of these documents are incorporated by reference and summarized in Section 3.5.5.2. These documents provide Reclamation and other agencies with guidelines for operation of the CVP, implementation of the CVPIA, and for the interim or long-term renewal of CVP water service contracts. The CVC Contractors, as part of this Proposed Project, will continue to implement in a timely manner relevant environmental commitments, conservation measures, and terms and conditions from other BOs as appropriate and required. These contractual commitments would continue to ensure that special-status plant species would not be affected by the continued conveyance of the existing CVP water supply.

The CVC Contractors would receive only the amount of water historically available. These contractual commitments would also protect native lands within the Project Area. These native lands include critical habitat for owl's-clover, Hoover's spurge, and San Joaquin Valley Orcutt grass. These contractual commitments also protect other special-status species that may occur in the vicinity of the Project Area. Therefore, the Proposed Project is not expected to result in any direct or indirect effects on special-status plant species (including federally-listed or proposed species) or any critical habitat.

With continued implementation of relevant environmental commitments, conservation measures, and terms and conditions from BOs as appropriate and required as summarized in Section 3.5.5.2, there would be **No Impact** on these species or critical habitat; therefore, no additional mitigation is required for this Proposed Project.

[3] "The 'no injury' rule is short-hand for several sections of the Water Code related to changes in existing water rights. A water transfer is one reason water right changes are sought. Water transfers are mentioned in several places in the Water Code. However, there is one general provision that applies to all water right changes. Water right changes cannot cause "injury to any legal user of the water involved." This condition applies to modern water rights through section 1702 and applies to pre-1914 water rights through section 1706. The SWRCB supervises changes to post-1914 water rights." (SWRCB 1999)

Impact BIO-2: Potential to affect either directly or through habitat modifications any special-status fish species.

Under the Proposed Project, CVP and SWP operations and deliveries would be the same as under existing conditions. Critical habitat for the delta smelt, Central Valley steelhead, Central Valley spring-run Chinook salmon, Sacramento winter-run Chinook salmon, and the southern DPS of North American green sturgeon occurs within the Delta but not within the Project Area (NMFS 1993, 2005, 2006a, USFWS 1994). The Proposed Project does not change the magnitude or timing of water diversions from the Delta relative to current conditions. Furthermore, operations of the CVP and SWP are regulated by an existing USFWS BO on the coordinated operations of the CVP and SWP (USFWS 2008a), from which an RPA was developed to protect the delta smelt and its habitat. Similarly, the long-term operations of the CVP and SWP are regulated by an existing NMFS BO (NMFS 2009b), from which an RPA was developed to protect Central Valley steelhead, Central Valley spring-run Chinook salmon, Sacramento winter-run Chinook salmon, and the Southern DPS of North American green sturgeon and their habitats within the Delta. To the extent a subsequent reconsultation of any of these BOs results in future modifications to the operation of the CVP and/or SWP or there are future orders by a Court directing a modification to operations, any such required modification to the operation of the CVP and SWP will be fulfilled by Reclamation and/or DWR, including the CVC Contractors, as required through binding contractual obligations included within the CVC Contractors' water service contracts. The diversion from the Delta of CVP water to fulfill the CVC Contractors water rights occurs subject to the terms outlined in the issued USFWS (2008a) and NMFS (2009b) BOs, as modified by and subject to applicable Court orders. Therefore, less-than-significant impacts to delta smelt, Central Valley steelhead, Central Valley spring-run Chinook salmon, Sacramento winter-run Chinook salmon, and the southern DPS of North American green sturgeon, and/or their habitat are anticipated from implementation of the Proposed Project.

Under the Proposed Project, delivery of return water from Millerton Lake through the FKC, as part of an exchange between a CVC Contractor and an Exchange Entity, could impact San Joaquin River species and their habitats. Critical habitat for Central Valley steelhead extends into the lower San Joaquin River to the Merced River confluence. Under the San Joaquin River Settlement (Reclamation 2011, DWR 2011), spring-run Chinook salmon will be reintroduced to the San Joaquin River between Friant Dam and the Merced River no later than December 31, 2012. The settlement also established goals to maintain "fish populations in good condition in the mainstem San Joaquin River below Friant Dam to the confluence of the Merced River" and to "reduce or avoid adverse water supply impacts on all of the Friant Division long-term contractors," along with identifying specific volumes of water to be released from Friant Dam (Millerton Lake) under different water year types (e.g., wet and dry) and establishing a program to make water available to Friant Division CVP Contractors (who could act as an Exchange Entity). Assuming return water from Millerton Lake delivered through the FKC meets the stipulations of the San Joaquin River Settlement (Reclamation 2011, DWR 2011), no impacts to San Joaquin River special-status species and/or their habitat are anticipated from implementation of the Proposed Project.

Conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp may potentially occur within the Project Area, as well as potential critical habitat. Implementation of the Proposed Project would not involve construction or land disturbing activities, leaving biological conditions similar to those under existing conditions. Recent BOs (Reclamation 2001a, USFWS 2005b, NMFS 2004, 2011) found there would be no jeopardy to the above species if the provisions of those opinions were implemented. Under the Proposed Project, it is assumed that the provisions of the BOs would be implemented so no direct or indirect impacts are anticipated to these species.

With continued implementation of relevant environmental commitments, conservation measures, and terms and conditions from BOs as appropriate and required, as summarized in Section 3.5.5.2, there would be **No Impact** on these species or critical habitat; therefore, no additional mitigation is required for this Proposed Project.

Impact BIO-3: Potential to affect either directly or through habitat modifications any special-status terrestrial wildlife species.

The federally- or state-listed species that could occupy these lands are: blunt-nosed leopard lizard, western burrowing owl, Swainson's hawk, Buena Vista Lake ornate shrew, San Joaquin kit fox, and Tipton kangaroo rat. The CVC Contractors have existing contractual commitments to comply with the various BOs listed above (Sections 3.5.5.1 and 3.5.5.2). These commitments would continue, as part of the Proposed Project, to ensure that special-status species would not be affected by the continued conveyance of the existing CVP water supply. The CVC contractors would receive only the amount of water historically available. These commitments would also protect native lands within the Project Area. These native lands include critical habitat for the Buena Vista Lake ornate shrew, California condor, California tiger salamander, vernal pool fairy shrimp, and vernal pool tadpole shrimp. These commitments also protect other special-status species that may occur in the vicinity of the Project Area. Therefore, the Proposed Project is not expected to result in any direct or indirect effects on special-status species (including federally listed or proposed species) or any critical habitat.

With continued implementation of relevant environmental commitments, conservation measures, and terms and conditions from BOs as appropriate and required as summarized in Section 3.5.5.2, there would be **No Impact** on these species or critical habitat; therefore, no additional mitigation is required for this Proposed Project.

Impact BIO-4: Potential to affect any riparian habitat or other sensitive natural community.

The Proposed Project would not any affect any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS, because no new construction or diversions are being proposed, and the CVC Contractors would not be able to expand their water use service areas, bring native or fallowed lands (fallowed for 3 years or more) into cultivation, or alter current environmental conditions without further environmental review and approval. Therefore, the Proposed Project would not result in direct or indirect adverse impacts to riparian habitats or other sensitive natural communities. **No Impact** would occur, and no mitigation is required.

Impact BIO-5: Potential to affect federally-protected wetlands.

The Proposed Project would not affect any federally-protected wetlands, because no new construction or diversions are being proposed, and the CVC Contractors would not be able to expand their water use service areas, bring native or fallowed lands (fallowed for 3 years or more) into cultivation, or alter current environmental conditions without further environmental review and approval. Therefore, the Proposed Project would not result in direct or indirect adverse impacts to federally-protected wetlands. **No Impact** would occur, and no mitigation is required.

Impact BIO-6: Potential to interfere substantially with the movement of any native resident or migratory fish or impede the use of native fish nursery sites.

Central Valley steelhead, Central Valley spring-run Chinook salmon, Sacramento winter-run Chinook salmon, and the Southern DPS of North American green sturgeon are anadromous species that migrate to the ocean from freshwater as juveniles and return from the ocean to freshwater as adults to spawn. Water diversions can impede migration by dewatering stream channels, entraining juveniles in irrigation canals, impinging juveniles on screens covering diversion points, emplacing structures that create physical barriers to movement, or creating false migration pathways from attraction flows at diversion points. Under the Proposed Project, CVP and SWP operations and deliveries would be the same as under existing conditions. The Proposed Project does not change the magnitude or timing of water diversions from the Delta relative to current conditions. Furthermore, operations of the CVP and SWP are regulated by existing BOs (refer to Section 3.5.5.1 above) developed to protect aquatic species such as delta smelt, steelhead and salmon species, and North American green sturgeon. As the Proposed Project would occur within existing

conveyance facilities, no construction is associated with the Proposed Project, and the CVC Contractors' water supply contracts would require continued implementation of relevant environmental commitments, conservation measures, and terms and conditions from BOs as appropriate as summarized in Section 3.5.5.2, the Proposed Project would not have a direct or indirect adverse effect on the movement of any native or resident or migratory fish. Therefore, **No Impac**t would occur, and no mitigation is required.

Impact BIO-7: Potential to affect the movement of any native resident or migratory wildlife species or with established native resident or migratory wildlife corridors.

The Proposed Project would not interfere with the movement of any native resident or migratory wildlife species, with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites, because no new construction or facilities are being proposed. Therefore, the Proposed Project would not result in direct or indirect adverse impacts related to the movement of wildlife species. **No Impact** would occur, and no mitigation is required.

Impact BIO-8: Potential to conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

The Proposed Project of continued conveyance of the CVC Contractors' existing CVP water supply would not conflict with any local policies or ordinances protecting biological resources, **No Impact** would occur, and no mitigation is required.

Impact BIO-9: Potential to conflict with provisions of an adopted HCP, NCCP, or other approved local, regional, or State HCP.

Although several existing HCPs cover portions of the Project Area and additional HCPs are in the process of being prepared (i.e., Kern Water Bank HCP, Kern County Valley Floor HCP, and the Metropolitan Bakersfield HCP), the Proposed Project would not conflict with provisions of any of the existing and/or proposed plans. **No Impact** would occur, and no mitigation is required.

Mitigation

No impacts to special-status biological species, critical habitat, or sensitive natural communities would occur, so no additional mitigation measures are required.

3.6 Greenhouse Gas Emissions

3.6.1 Introduction

This section focuses on the potential for the Proposed Project to affect global climate change through the release of greenhouse gases (GHG) into the atmosphere; it also considers the effects of climate change on the Proposed Project. Global warming is the name given to the increase in the average temperature of the Earth's near-surface air and oceans since the mid-20th century and its projected continuation.

The causes of this warming have been suggested as both natural processes and as the result of human actions. The principal GHGs are carbon dioxide (CO_2), methane, nitrous oxide, sulfur hexafluoride, perfluorocarbons (PFC), hydrofluorocarbons (HFC), and water vapor. Each of the principal GHGs has a long atmospheric lifetime (one year to several thousand years).

The primary man-made processes that release these gases include burning of fossil fuels for transportation, heating and electricity generation; agricultural practices that release methane such as livestock grazing and crop residue decomposition; and industrial processes that release smaller amounts of high global warming potential gases such as sulfur hexafluoride (SF_6), PFCs, and HFCs.

3.6.2 Environmental Setting

Local and regional climate is discussed in Section 3.3.2.1, under Air Quality.

3.6.3 Regulatory Framework

The CEQA Guidelines require that a project be evaluated to determine the extent to which it complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. The following paragraphs describe the federal, state, and local agencies and the laws and regulations governing air quality and GHG emissions.

3.6.3.1 Federal Law, Policies, and Plans

Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, the USEPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), that required USEPA to develop *"… mandatory reporting of greenhouse gases above appropriate thresholds in all sectors of the economy…."* The Reporting Rule would apply to most entities that emit 25,000 metric tons of carbon dioxide equivalents (CO_2e) or more per year. Starting in 2010, facility owners are required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The Reporting Rule would also mandate recordkeeping and administrative requirements in order for USEPA to verify annual GHG emissions reports.

U.S. Environmental Protection Agency **Endangerment and Cause and Contribute Findings**

On December 7, 2009, the USEPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the CAA:

> Endangerment Finding: the current and projected concentrations of the six key well-mixed GHGs (CO_2, methane, nitrous oxide, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations.

> Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

3.6.3.2 State Law, Policies, and Plans

Table 3.6-1 summarizes state laws and state executive orders that address climate change. The most significant laws and orders related to the Proposed Project are discussed in greater detail below.

California Environmental Quality Act and Senate Bill 97

CEQA requires lead agencies to consider the reasonably foreseeable adverse environmental effects of projects they are considering for approval. GHG emissions have the potential to adversely affect the environment because they contribute to global climate change. In turn, global climate change has the potential to: raise sea levels, affect rainfall and snowfall, and affect habitat. California SB 97 directed the California Office of Planning and Research (OPR) to prepare, develop, and transmit to the Resources Agency amendments to the CEQA Guidelines related to the analysis and mitigation of GHG emissions. The amendments became effective on March 18, 2010.

Table 3.6-1 Summary of State Laws and Executive Orders that Address Climate Change

Legislation Name	Signed into Law / Ordered	Description	California Environmental Quality Act Relevance
Senate Bill (SB) 1771	09/2000	Establishment of California Climate Registry to develop protocols for voluntary accounting and tracking of GHG emissions.	In 2007, DWR began tracking GHG emissions for all departmental operations.
AB 1473	07/2002	Directs ARB to establish fuel standards for noncommercial vehicles that would provide the maximum feasible reduction of GHGs.	Reduction of GHG emissions from noncommercial vehicle travel.
SB 1078, 107, EO S-14-08	09/2002, 09/2006, 11/2008	Establishment of renewable energy goals as a percentage of total energy supplied in the State.	Reduction of GHG emissions from purchased electrical power.
EO S-3-05, AB 32	06/2005, 09/2006	Establishment of statewide GHG reduction targets and biennial science assessment reporting on climate change impacts and adaptation and progress toward meeting GHG reduction goals.	Projects required to be consistent with statewide GHG reduction plan and reports will provide information for climate change adaptation analysis.
SB 1368	09/2006	Establishment of GHG emission performance standards for base load electrical power generation.	Reduction of GHG emissions from purchased electrical power.
EO S-1-07	01/2007	Establishment of Low Carbon Fuel Standard.	Reduction of GHG emissions from transportation activities.
SB 97	08/2007	Directs the Office of Planning and Research (OPR) to develop guideline amendments for the analysis of climate change in CEQA documents.	Requires climate change analysis in all CEQA documents.
SB 375	09/2008	Requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans.	Reduction of GHG emissions associated with housing and transportation.
EO S-13-08	11/2008	Directs the Resource Agency to work with the National Academy of Sciences to produce a California Sea Level Rise Assessment Report. And directs CAT to develop a California Climate Adaptation Strategy.	Information in the reports will provide information for climate change adaptation analysis.

Preliminary Draft Staff Proposal: Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under CEQA

CEQA gives discretion to lead agencies to establish thresholds of significance based on individual circumstances. To assist in that exercise, and because OPR believes the unique nature of GHGs warrants investigation of a statewide threshold of significance for GHG emissions, OPR engaged the CARB technical staff to recommend a methodology for setting thresholds of significance. In October 2008, CARB released a Preliminary Draft Staff Proposal: *Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act* (CARB 2008a). To date, these standards have not been adopted or finalized as a basis to evaluate the significance of a project's contribution to climate change.

Executive Order S-3-05

EO S-3-05 made California the first state to formally establish GHG emissions reduction goals. EO S-3-05 includes the following GHG emissions reduction targets for California: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

Assembly Bill 32

In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill (AB) No. 32; California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32). AB 32 further details and puts into law the mid-term GHG reduction target established in EO S-3-05—reduce GHG emissions to 1990 levels by 2020. AB 32 also identifies CARB as the state agency responsible for the design and implementation of emissions limits, regulations, and other measures to meet the target.

As part of the implementation of AB 32, California has developed a cap and trade program that regulates GHG emissions from large sources. Major industrial and utility sources, and transportation fuels are currently being regulated. Water conveyance and use is currently not regulated under this program.

Climate Change Scoping Plan

On December 11, 2008, pursuant to AB 32, CARB adopted the Climate Change Scoping Plan (CARB 2008b). This plan outlines how emissions reductions will be achieved from significant sources of GHGs via regulations, market mechanisms, and other actions. Six key elements, outlined in the scoping plan, are identified to achieve emissions reduction targets:

> Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;

> Achieving a statewide renewable energy mix of 33 percent;

> Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;

> Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;

> Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and

> Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation.

3.6.3.3 Regional Plans and Policies

California Air Resources Board Scoping Plan

The CARB Scoping Plan (CARB 2008b) states that local governments are "essential partners" in the effort to reduce GHG emissions. The Scoping Plan also acknowledges that local governments have "broad influence and, in some cases, exclusive jurisdiction" over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Many of the proposed measures to reduce GHG emissions rely on local government actions. The Scoping Plan encourages local governments to reduce GHG emissions by approximately 15 percent from current levels by 2020 (CARB 2008b).

DWR Climate Action Plan

GHG emissions resulting from the use of SWP facilities have been analyzed by DWR, but this analysis only applies to the portion of the project involving use of SWP facilities and does not include the power needs or GHG emissions of Reclamation or the CVC Contractors. In May 2012, DWR adopted the *DWR Climate Action Plan-Phase I: Greenhouse Gas Emissions Reduction Plan* (GGERP), which details DWR's efforts to reduce its greenhouse gas (GHG) emissions consistent with Executive Order S-3-05 and the Global Warming Solutions Act of 2006 (Assembly Bill (AB) 32). DWR also adopted the Initial Study/Negative Declaration prepared for the GGERP in accordance with the CEQA Guidelines review and public process. Both the GGERP and Initial Study/Negative Declaration are incorporated herein by reference and are available at: http://www.water.ca.gov/climatechange/CAP.cfm.

The GGERP provides estimates of historical (back to 1990), current, and future GHG emissions related to operations, construction, maintenance, and business practices (e.g. building-related energy use). The GGERP specifies aggressive 2020 and 2050 emission reduction goals and identifies a list of GHG emissions reduction measures to achieve these goals.

DWR specifically prepared its GGERP as a "Plan for the Reduction of Greenhouse Gas Emissions" for purposes of CEQA Guidelines §15183.5. That section provides that such a document, which must meet certain specified requirements, "may be used in the cumulative impacts analysis of later projects." Because global climate change, by its very nature, is a global cumulative impact, an individual project's compliance with a qualifying GHG Reduction Plan may suffice to mitigate the project's incremental contribution to that cumulative impact to a level that is not "cumulatively considerable." (See CEQA Guidelines, § 15064, subd. (h)(3).)

DWR and agencies using DWR facilities that were analyzed in the GGERP may rely on the GGERP in the cumulative impacts analyses of later project-specific environmental documents. "An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project." (CEQA Guidelines § 15183.5, subd. (b)(2).)

The proposed project will use SWP facilities to convey and store water. The energy associated with the operation of these facilities will likely result in the emission of GHGs. However, DWR as part of the analysis provided in the GGERP has fully described and analyzed the potential for GHG emissions from operations associated with use of SWP facilities by other agencies to convey and store water and has committed to overall near-term and long-term GHG emissions reductions that will ensure that no significant environmental impact will occur as a result of DWR's emissions.

San Joaquin Valley Air Pollution Control District Plans and Policies

In August 2008, the SJVAPCD's Governing Board adopted the Climate Change Action Plan (SJVAPCD 2008). The plan directed the SJVAPCD's Air Pollution Control Officer to develop guidance to assist Lead Agencies, project proponents, permit applicants, and interested parties in assessing and reducing the impacts of project-specific GHG emissions on global climate change. On December 17, 2009, the SJVAPCD adopted Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA (SJVAPCD 2009). The guidance and policy rely on the use of performance based standards, otherwise known as Best Performance Standards (BPS), to assess significance of project-specific GHG emissions on global climate change during the environmental review process, as required by CEQA.

Kern County

In Kern County, the Kern Council of governments (COG) is conducting two climate change projects: the Region Energy Action Plans (Kern REAP) project and the development of GHG inventories. The scope of work for these projects includes (Seto 2012):

> A complete GHG inventory for municipal operations

> A Regional Energy Action Plan (EAP) Template focusing on municipal operations

> Tools for conducting cost/benefit analysis of energy efficiency opportunities

> Municipal EAPs for each participating jurisdiction

> Municipal Energy Efficiency Savings Analysis for Annual GHG Inventories

> Regional Information Sharing Plan

The final EAPs will include actionable policies (e.g., green building ordinance, retro-commissioning policies), as well as specific energy conservation measures that are appropriate for municipal facilities. To date, specific GHG reduction goals for irrigation or water users are not included.

Fresno County

Fresno County has completed a GHG inventory (Fresno county 2012). Specific GHG emission reduction targets have not been developed.

Kings County

Kings County Association of Governments (KCAG 2014) is in the process of developing a voluntary regional climate action plan that will evaluate greenhouse gas emissions by sector and will outline strategies businesses, citizens, and local governments can voluntarily use to lower their overhead costs while simultaneously reducing greenhouse gas emissions. A draft Regional Climate Action Plan (CAP) has been prepared (Rincon Consultants 2014) that identifies cost-effective measures to reduce GHG emissions from activities within Kings County. The CAP is voluntary, and it does not specify GHG emission limits or targets for water suppliers or users.

Tulare County

Tulare County has developed a Draft Climate Action Plan (Brandman Associates 2010). The draft plan identifies voluntary measures for agriculture, such as use of reclaimed wastewater, smart irrigation systems such as drip and micro sprinkler systems, and water well efficiency upgrades. It also identifies additional GHG emission reduction measures that require additional investigation, including best management practices in agriculture and animal operations to reduce emissions, conserve energy and water, and utilize alternative energy sources, including biogas, wind and solar. The plan does not specify GHG emission limits or targets for water suppliers or users.

Based on the preceding discussion, there are no regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction plans or mitigation of GHG emissions that would apply to the Proposed Project.

3.6.4 Impact Assessment Methodology

The impact analysis considers whether the Proposed Project would result in an increase in direct GHG emissions from such factors as operation of construction equipment or passenger vehicle trips. It also considers the potential for an increase in indirect GHG emissions to increase from the generation of electricity used for Proposed Project operations.

Although climate change is expected to affect water supplies and demands in the Central Valley over time, it would not change the impact analysis in this DEIR, because the Proposed Project would not result in a change in water supplies, water demand, or the regulatory environment that controls deliveries. Additionally, more unstable water supplies in the future would lead to a greater need for the Proposed Project. The overall effects of climate change on the CVP and SWP water supplies are being investigated in ongoing water supply studies by DWR and Reclamation. Thus, the impacts of climate change on the Proposed Project are not considered further.

Potential GHG Sources

The energy intensity of water used for agriculture in California is based on the volume of water transported, the distance, and the changes in topography along its route (CEC 2005). Energy consumed for agriculture varies depending on a number of factors. During a wetter-than-average year, the volume of surface water deliveries will be higher, and the energy used for groundwater pumping will decrease.

During dry years or several back-to-back dry years, additional energy will be used because of increased on-farm groundwater pumping to offset reduced surface water supplies. The predominant form of energy used to convey and use agricultural water in California is electricity used for pumping. Historically, electricity has made up about 91 percent of all agricultural water energy demand, with diesel (8 percent) and natural gas (1 percent) contributing much smaller amounts (Cal Poly 2003). Changes to air quality regulations in agricultural regions is also leading to conversion of many diesel-powered pumps to electric pumps, so the electricity demand is likely even greater today (CEC 2005). GHG emissions associated with electricity demand for pumping was therefore used to evaluate GHGs for the Proposed Project. The Proposed Project involves three principal components that have the potential to generate GHGs as a result of conveyance pumping, groundwater pumping, and on-farm pumping to power irrigation systems. These components are:

> **Delta Delivery.** Delivery of CVC Contractors CVP water supply from the Sacramento/San Joaquin Delta to the California Aqueduct and Delta Mendota Canal.

> **SWP Transport.** Transport of CVC Contractor CVP water by the DWR via the California aqueduct.

> **End Use.** Transport and delivery of “exchange” water to CVC Contractors and use at CVC Contractor farms.

Table 3.6-2 summarizes these potential GHG sources, and each is further discussed as follows.

Table 3.6-2 Potential GHG Emissions from CVC Contractor Water Deliveries

Water Supply	Agency or Entity	Delivery Mechanism	Power Source	GHG Mitigation or Offsets	Net GHG Increase?
Delta	Bureau of Reclamation	Harvey O. Banks & Jones Pumping Plants	CVP Hydroelectric	None needed	No
California Aqueduct	DWR	Dos Amigos Pumping plant	CVP Hydroelectric	100% offset as per DWR GHG reduction Plan (DWR 2014)	No
End Use by CVC Contractors	Released to CVC Contractors by Exchange Entities	**Surface Water** Friant Kern Canal, Millerton Lake, SWP water, Non-CVP water, local supplies (eastside reservoirs) **Groundwater** Electric Pumps	Principally electricity from grid, with some local diesel pumps	No	Yes

> **Delta Delivery.** CVP water is delivered by Reclamation to the Delta and pumped for this Project at the Banks Pumping Plant into the California Aqueduct. Water is also exported by Reclamation for other CVP uses from the southern Delta into the DMC at the Jones Pumping Plant. CVP-generated hydroelectric power is used at the Banks Pumping Plant to pump the CVC water. Because no fossil fuels are used to generate this power, there are no net GHG emissions associated with this pumping.

> **SWP Transport.** As discussed above, the DWR has developed a climate action plan to entirely offset the GHG emissions associated with pumping needed to transport water in the Aqueduct. In addition, the power for the Dos Amigos Pumping Plant when pumping water for this Project will come from CVP hydroelectric power. Based on the analysis provided in the DWR GGERP, GHG emissions associated with the use of SWP facilities for this project will not constitute a cumulatively considerable contribution to atmospheric levels of GHG emissions and are therefore, less than significant.

> **End Use.** The CVC Contractors obtain water by means of banking and exchange agreements with other water storage districts or agencies. Some of this water is derived from groundwater pumping and some from surface water sources. Water is transported to individual farms, where additional pumping may be needed in order to power spray irrigation systems. Individual farms may also have private wells and pump groundwater.

GHG Emissions

DWR only pumps and conveys CVC water through the Aqueduct if and when SWP contractor requirements have been met and there is surplus capacity in the Aqueduct. While the CVC Contractors have a maximum potential supply of 128,300 AF, because of water availability and other constraints, typical CVP deliveries to CVC Contractors is substantially less, and may be zero. Because of this wide variability, along with variable groundwater pumping and end use applications, it isn't possible to derive a single GHG emissions estimate. Therefore, this analysis estimates the average, and maximum, GHG emissions that could be associated with the Proposed Project.

To evaluate potential end use GHG emissions, information was assembled for the DWR modified evapotranspiration (ETo) zones that each of the seven CVC Contractors fall into. Based on historical records for the areas in which CVC Contractor water is used, about 60 percent of applied irrigation water is delivered from irrigation district surface water sources, 38 percent from on-farm groundwater pumping, and 3 percent from irrigation district groundwater pumping. (CalPoly 2003).

Historical data for each zone were assembled to define the annual energy demand (KWh/AF/yr) for each of the CVC Contractors, including irrigation district surface water, irrigation district groundwater, and on-farm groundwater pumping. In addition, the energy demand associated with on-farm booster pumping to power spray and other irrigation systems was identified for each of the CVC Contractor zones. To provide a range of GHG emissions, the 12-year average (1998–2010) and maximum (contract maximum) water deliveries were tabulated (from Table 1.2-1) for each CVC Contractor. Using the historical mix between surface and groundwater, along with the annual energy demand for each, the estimated energy use was calculated. Based on applicable utility conversion factors, the GHG emissions for average and maximum deliveries were estimated for each CVC Contractor. Table 3.6-3 presents a summary of the analysis.

Based on water deliveries for average conditions, end use GHG emissions are estimated to be about 2,000 metric tons (MT) CO_2e per year. If all CVC Contractors received their maximum water allotments, end use GHG emissions are estimated to be about 9,440 MT CO_2e /yr.

Table 3.6-3 Estimated GHG Emissions

CVC Contractor	Water Deliveries		Total GHG Emissions	
	Average[1] (AF/yr)	Contract Maximum (AF/yr)	Average Deliveries (MT CO2e /yr)	Contract Deliveries (MT CO_2e /yr)
County of Fresno	912	3,000	47	156
Hills Valley Irrigation District	542	3,346	36	223
Kern-Tulare Water District	9,337	53,300	485	2,771
Lower Tule River Irrigation District	7,064	31,102	879	3,868
Pixley Irrigation District	7,253	31,102	483	2,070
Tri-Valley Water District	208	1,142	14	76
County of Tulare	1,053	5,308	55	276
Totals	**26,369**	**128,300**	**1,999**	**9,440**

Notes:

[1] Average for the period 1998-2010. Equivalent to the proposed Project
CO_2e = CO_2 equivalent
MT = metric tons

3.6.4.1 Significance Criteria

The Proposed Project activities are evaluated in accordance with the GHG Emissions section of Appendix G of the CEQA Environmental Checklist and CEQA Guidelines Section 15064.4. The Proposed Project would have a significant impact on GHG emissions if implementation would:

> Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

> Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing GHG emissions.

As described in Section 15064.4 of the CEQA Guidelines, a lead agency should consider the following factors when assessing the significance of GHG impacts:

> The extent to which a project may increase or reduce GHG emissions as compared to the existing environmental setting;

> Whether a project's emissions exceed a threshold of significance that the lead agency determines applies to that project.

> The extent to which a project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

No quantitative GHG thresholds of significance applicable to the Proposed Project have been established at the federal, state, or local levels. The impact analysis determining whether the Proposed Project would generate GHG emissions that may have a significant impact on the environment is based on the SJVAPCD's guidance for determining whether project-specific GHG emissions would have a significant effect (SJVAPCD 2009a). The guidance is based on the premise that the effects of project-specific GHG emissions are cumulative, and unless reduced or mitigated, their incremental contribution to global climate change could be considered cumulatively considerable. The SJVAPCD suggests use of BPS as a method of streamlining the CEQA process of determining significance. Projects implementing BPS would be determined to have a less than cumulatively significant impact. Otherwise, demonstration of a 29 percent reduction in GHG emissions, from business-as-usual, is required to determine that a project would have a less than cumulatively significant impact.

3.6.5 Project Impacts

Impact GHG-1: Potential to generate greenhouse gas emissions, either directly or indirectly.

The Proposed Project is the approval, execution, and implementation of three-party conveyance contracts providing for the continued conveyance of the CVC Contractors' existing CVP water supply in the Delta through SWP facilities. No changes over current conditions would occur. No construction would be required, nor would the number of vehicle trips increase over current levels. The conveyance of CVP water to the CVC Contractors and potential exchange partners would continue to be implemented via gravity flow and/or pumping using electric motors. Electricity demand for pumping would produce GHG emissions. As discussed above, if all CVC Contractors received their maximum water allotments, end use GHG emissions are estimated to be about 9,400 MT CO_2e/yr. Under the historic average deliveries, the end use GHG emissions are estimated to be about 2,000 MT CO_2e/yr.

There are no established GHG emission limits for irrigation districts or water users. To put the potential CVC Contractor GHG emission levels into perspective, under the USEPA's Greenhouse Gas Reporting Rule, mandatory reporting of GHG emissions is required for large GHG sources, which are considered to be 25,000 MT/yr or greater. Similarly, under California's cap and trade program, enforced by the ARB, "major GHG-emitting sources" (25,000 MT/yr or greater) are required to offset their GHG emissions. The Proposed Project's estimated maximum GHG emissions (9,440 MT/yr) are less than half of this benchmark defining a major source, and are just over 10 percent of this benchmark under average conditions. Since the Proposed Project is the continuation of existing contracts, impacts related to GHGs (and potentially to climate change) would remain unchanged.

In addition, based on the analysis provided in the DWR GGERP, GHG emissions associated with the use of SWP facilities for this project will not constitute a cumulatively considerable contribution to atmospheric levels of GHG emissions and are therefore, less than significant.

Therefore, the Proposed Project would not result in direct or indirect GHG impacts. **No Impact** would occur, and no mitigation is required.

Impact GHG-2: Potential to conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing GHG emissions.

The Proposed Project would not generate any additional GHG emissions and therefore would not conflict with any applicable plan, policy or regulation of an agency adopted for the purposes of reducing GHG emissions; therefore, **No Impact** would occur, and no mitigation is required.

Mitigation

No impacts related to the generation of GHG emissions would occur, so no mitigation is required.

3.7 Hydrology and Water Quality (Surface Water Resources)

3.7.1 Introduction

This section describes the hydrologic setting of the Project Area and vicinity, including important water bodies and resources, and the potential hydrologic conditions that could affect or be affected by the Proposed Project. The general discussion includes surface water features including natural and man-made. The description of the setting also includes a characterization of surface water quality within the Project Area. This discussion is followed by a summary of pertinent federal, state, and local laws related to water resources, an analysis of the potential impacts related to hydrologic and water quality conditions in the Project Area, and a discussion of any mitigation measures to reduce potentially significant impacts to less-than-significant levels.

3.7.2 Environmental Setting

For the purpose of defining the affected surface water environment of the Proposed Project, the Project Area is generally defined as the eastern SJV including the conveyance system facilities and the service areas of the CVC Contractors, as well as the areas that could receive water under the Proposed Project (as described Chapter 2 of this DEIR).

3.7.2.1 Climate

The SJV is that portion of the Central Valley south of the Delta. The climate is arid-to-semiarid hot, Mediterranean. Precipitation during an average year ranges from 5 to 18 inches in the SJV, generally increasing from south to north and west to east. Dramatic deviations from average climatic conditions are manifested as droughts or floods. Most of the Central Valley is prone to flooding. About 85 percent of the precipitation falls during November through April. The SJV is hot and dry during the summer, and cool and damp in the winter, when the area frequently is covered by a ground ("tule") fog. Reference ETo is relatively high, and ranges from 49 inches in the northern SJV to 56 inches in the south. Because of these arid conditions, most of the valley is in a state of perennial water deficiency (Faunt 2009).

3.7.2.2 Rivers and Lakes

The SJV is bounded to the north by the Delta, to the west by the Coast Ranges, to the east by the Sierra Nevada, and to the south by the Tehachapi Mountains. DWR (2009a) divides the SJV into two hydrologic regions, the San Joaquin River Hydrologic Region (SJRHR) in the north and the Tulare Lake Hydrologic Region (TLHR) in the south. The regions are generally separated by merging alluvial fans (near the Kings River) that form a low drainage divide. The dominant river in the SJRHR is the San Joaquin River, which flows southwestward through the Sierra Nevada then northwestward (to the Delta) through the axis of the SJV. Major tributaries to the San Joaquin River that drain the Sierra Nevada include the Stanislaus, Tuolumne, and Merced Rivers.

Within the TLHR, the rivers flowing southwestward out of the Sierra Nevada (including from north to south: Kings, Kaweah, Tule, White, and Kern Rivers) flow to sinks (or depressions) in the middle of the SJV. These depressions were historically occupied by shallow lakes, including Tulare, Kern, and Buena Vista Lakes. Although the lakes have generally been drained and converted to agriculture and a large portion of the river flows are diverted for agricultural and urban use, these areas frequently flood during high runoff events.

3.7.2.3 Surface Water Conveyance Facilities

The CVC Contractors are not proposing any changes in water deliveries or use of the water as compared to existing conditions under the Proposed Project. The CVP water is delivered and used for the irrigation of agricultural areas and for M&I uses. The largest use of CVP water is for agricultural irrigation of row crops, orchards, vineyards, irrigated pasture, and various other agricultural uses. The greatest demand for irrigation water occurs in mid- to late summer, as crops mature and crop water use increases. During the winter, farmers also use water for frost control and pre-irrigation of fields to saturate the upper soil as well as for irrigation of permanent crops (Reclamation 2010a).

The primary components of the conveyance system are the CVP facilities (including the Jones Pumping Plant, the DMC, and the FKC); the SWP facilities (including Clifton Court Forebay and the California Aqueduct); the joint federal/state San Luis Canal and San Luis Reservoir; and the CVC. The water use service areas of the seven CVC Contractors are generally located along the east and west sides of the FKC.

The CVC Contractors collectively have contracts for up to 128,300 af per year of CVP water exported from the Delta by Reclamation. The actual annual allocations are based on available water supplies, meeting Delta water quality standards, environmental and flow requirements, Aqueduct capacity, and pumping capacity as well as other hydrologic and operational factors. The CVC Contractors' CVP Contract water allocations are made available by Reclamation in the Delta and are diverted either through the Banks pumping plant or the Jones pumping plant. Additionally, DWR pumps the CVC Contractors' Delta water allocations after all other needs of the SWP have been met. The CVP water is subordinate in the SWP system to SWP contractors. Capacity for conveyance of the CVC Contract water in CVP facilities occurs only very infrequently due to limited capacity. CVC Contractors have a limited capability to receive Delta water directly from the CVC. Because of the above factors, the CVC Contractors utilize exchanges between the CVC Contractors and other water districts, and these exchanges may include arrangements for water imbalances due to the hydrological conditions, the time of year the water is delivered, and value of such water.

Historically, the various exchanges of CVC Contract water has, in certain instances, included CVC water conveyed into the FKC; using the check structures in the FKC to move the water upstream. This practice introduces Delta water with a higher total dissolved solids concentration than Millerton Lake into the FKC. The CVC water introduced into the FKC serves Friant Division Contractors through exchanges and CVC Contractors in the lower end of the FKC.

3.7.2.4 Cross Valley Canal Contractors' Water Use

The CVC Contractors' water service areas receive water from the CVP, other non-CVP surface water sources, and groundwater. KTWD provides irrigation water to over 17,749 acres of high-value permanent crops in Kern and Tulare Counties. The annual irrigation demand is approximately 40,000 af (2.2 af/acre) of imported KTWD water. The remaining 14,000 af per year (0.8 af/acre) is from groundwater pumped by water users. There are four regulating reservoirs in KTWD's service area totaling 510 af of storage. Because KTWD's distribution system is inadequate to fully satisfy irrigation demands and system capacities must be prorated during the summer months, water users rely upon privately-owned wells, even in the wettest of years (Reclamation 2010a).

The water supplies for the LTRID are groundwater, water rights on the Tule River, and CVP water. The Tule River flows approximately 22 miles through the central part of the LTRID and supplies approximately 70,000 af per year. The LTRID does not own or control groundwater extraction facilities; therefore, each landowner must provide privately owned wells to sustain irrigation during periods when the LTRID does not have enough surface water available (Reclamation 2010a).

The PXID's water supply is derived from groundwater, diversions from Deer Creek, and purchased CVP water. The PXID currently contains 69,550 acres of which 48,302 are irrigated. Deer Creek flows westerly through the entire length of the PXID. Similar to LTRID, PXID does not own or operate any groundwater

facilities; however, groundwater is the primary water supply source available to lands within the PXID. Approximately 31,957 acres of lands rely on groundwater pumping for irrigation (Reclamation 2010a).

The County of Fresno has a CVP water service contract for 3,000 af of water which the County currently supplies to one subcontractor (County Service Area #34) for M&I purposes. This subcontractor draws their water directly from Millerton Lake after their Cross Valley Delta supply has been exchanged for Friant supplies.

The County of Tulare has entered into a long-term water service contract with Reclamation in 1975 for 5,308 af of which the County supplies to 10 subcontractors (Alpaugh ID, Atwell Island WD, Hills Valley ID, City of Lindsay, Saucelito ID, Frasinetto Farms LLC, Stone Corral ID, Strathmore Public Utility District, Styrotek, Inc., and City of Visalia) (Reclamation 2010a).

The HVID receives up to 2,913 af per year of CVP water under its contract with the County of Tulare. Currently, the HVID comprises 19,453 acres of which 19,057 are irrigated. The HVID has five individual water users that have rights in Poplar Irrigation Company of 9.5 shares at 55 af per share from Mole Ditch.

The Tri-Valley Water District (TVWD) has approximately 1,840 irrigable acres. The TVWD has a contract with Reclamation to receive up to 1,142 af for irrigation and M&I uses (Reclamation 2010a).

3.7.3 Regulatory Framework

3.7.3.1 Federal

Federal Clean Water Act

The USEPA is the federal agency responsible for water quality management. The USEPA administers the federal Water Pollution Control Act Amendments of 1972 and 1987, collectively known as the Clean Water Act (CWA) (33 U.S.C. Section 1251 et seq.). The CWA establishes the principal federal statutes for water quality protection. It was established with the intent "to restore and maintain the chemical, physical, and biological integrity of the nation's water, to achieve a level of water quality which provides for recreation in and on the water, and for the propagation of fish and wildlife." Several key sections of CWA guide the regulation of water pollution in the U.S.:

- **Section 208 Water Quality Control Plans**. This section requires the preparation of local water quality control plans by regulatory agencies throughout the nation. Each water quality control plan covers a defined drainage area. The primary goal of each water quality control plan is to attain water quality standards established by the CWA and the state governments within the defined area of coverage. Minimum content requirements, preparation procedures, time constraints, and federal grant funding criteria pertaining to the water quality control plans are established in Section 208 of the CWA. Preparation of the water quality control plans has been delegated to the individual states by the USEPA.
- **Section 303(d) Impaired Watersheds**. This section of the CWA requires the designation of "impaired waterbodies" be applied to any watershed exceeding specified thresholds for various pollutants or water temperatures.
- **Section 319 Nonpoint Source Management Program**. This section of the CWA established a national program to control nonpoint sources of water pollution through the development of assessment reports, adoption of management programs, and implementation of those management programs. The USEPA awards grants to states to assist them in implementing the nonpoint source pollution management programs (33 USC Section 1329).
- **Section 401 Water Quality Certifications**. This section of CWA requires that, prior to the issuance of a federal license or permit for an activity or activities that may result in a discharge of pollutants into navigable waters (see Section 404 discussed below), the permit Applicant must first obtain a certification from the state in which the discharge would originate. A state certification indicates that

the proposed activity or activities would not result in a violation of applicable water quality standards established by federal or state law, or that there are no water quality standards that apply to the proposed activity.

> **Section 402 NPDES**. The National Pollutant Discharge Elimination System (NPDES) requires permits for pollution discharges into water bodies such that the permitted discharge does not cause a violation of federal and state water quality standards. NPDES permits define quantitative and/or qualitative pollution limitations for the permitted source, and control measures that must be implemented to achieve the pollution limitations. Pollution control measures are often referred to as Best Management Practices (BMPs).

> **Section 404 Discharge of Dredge and Fill Material**. Section 404 assigns the U.S. Army Corps of Engineers (Corps), with permitting authority for proposed discharges of dredged and fill material into waters of the United States, defined as "*…waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; territorial seas and tributaries to such waters.*" Section 404 is applicable to projects in which fill material would be placed within or below the ordinary high water mark of a stream. Any project requiring a 404 permit also requires a Section 401 water quality certification (discussed above).

3.7.3.2 State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (California Water Code Division 7, Section 13000 et seq.) requires that "any person discharging waste, or proposing to discharge waste, within any region that could affect the waters of the State to file a report of discharge" with the Regional Water Quality Control Board (RWQCB) through an application for waste discharge (Water Code Section 13260(a)(1)). The term "waters of the State" is defined as any surface water or groundwater, including saline waters within the boundaries of the state. It should be noted that pursuant to the Porter-Cologne Water Quality Control Act, the RWQCB also regulates "isolated wetlands" or those wetlands considered to be outside of the Corps jurisdiction.

State Water Resources Control Board

The SWRCB and the local RWQCBs are responsible for ensuring implementation and compliance with the provisions of the federal CWA and California's Porter-Cologne Water Quality Control Act. While the Corps administers permitting programs that authorize impacts to waters of the U.S., including wetlands, and other waters, any Corps permit authorized for a proposed project would be invalid unless it is a Nationwide Permit (NWP) that has been certified for use in California by the SWRCB, or if the RWQCB has issued a project specific certification or waiver of water quality. Certification of NWP's requires a finding by the SWRCB that the activities permitted by the NWP will not violate water quality standards individually or cumulatively over the term of the issued NWP (typically a 5-year term). Certification must be consistent with the requirements of the federal Clean Water Act, CEQA, CESA, and the SWRCB's mandate to protect beneficial uses of waters of the state. Any denied (i.e., not certified) NWPs, and all Individual Corps permits, would require a project specific RWQCB certification or waiver or water quality.

Central Valley Regional Water Quality Control Board Irrigated Lands Program

The Regional Board's Irrigated Lands Program addresses irrigation return flows and stormwater runoff from agricultural lands that are currently exempted from the NPDES permit program. On July 11, 2003, the Regional Board adopted two conditional waivers of Waste Discharge Requirements for discharges from irrigated lands: coalition group waiver and individual discharger waiver. The conditional waivers allow time for coalition groups to form and begin to identify and deal with water quality problems in their watersheds. The Regional Board has renewed the Coalition Group Conditional Waiver until July 2013

(Order No. R5-2006-0053). The waiver has been amended three times. The CVC Contractors are participating in the Southern San Joaquin Valley Water Quality Coalition.

Department of Water Resources

The State DWR is the state agency responsible for managing California's water resources, including conducting technical studies of surface water and groundwater in cooperation with local agencies, overseeing certain flood prevention and floodplain management programs, and developing and implementing water conservation and efficient water use strategies and programs in cooperation with local agencies. DWR constructed and currently operates and maintains the SWP, a system of storage and conveyance facilities that provides drinking water and agricultural irrigation water to 29 public water agencies throughout the state. DWR has also has the responsibility for overseeing the preparation Groundwater Management Plans.

State NPDES Program

The SWRCB and the nine RWQCBs in California implement the state and federal clean water laws, including the NPDES permitting process. The program regulates point source discharges from industrial, municipal, and other facilities if their discharges go directly to surface waters. In 1987, the NPDES program also began a phased approach to addressing non-point source pollution from streets, parking lots, constructions sites, homes, businesses, and other sources.

Under Phase I of the NPDES stormwater program, all medium separate storm sewer systems (serving a population of 100,000 to 249,000) and large separate storm systems (serving a population of 250,000 or more) are required to obtain a municipal permit. Under Phase II of the program, small storm sewer systems are also required to obtain coverage under a Regional Board-issued permit. A small storm sewer system is defined as an unpermitted municipal separate storm sewer system located in an urbanized area with a population of 50,000 and a population density of 1,000 per square mile.

The NPDES permit program also affects construction sites that disturb 1 acre or more. Under the Phase I NPDES stormwater program, construction sites that are larger than 5 acres were required to obtain a General Construction Activity Stormwater Permit. Under the Phase II NPDES program, construction sites disturbing 1 to 5 acres of land are also required to obtain coverage under the General Construction Activity Stormwater Permit. Permit applicants are required to prepare a Stormwater Pollution Prevention Plan (SWPPP), implement construction-related BMPs, monitor discharges, and implement post-construction BMPs. As of July 1, 2010, the new Construction General Permit (SWRCB Permit 2009-0009-DWQ) will become effective. This new permit substantially modifies the pervious permit and will require significant effort to ensure compliance.

California Water Plan Update 2013

The California Water Plan Update 2013 (October 28, 2014) advances the Governor's Water Action Plan, released by the administration of Governor Edmund G. Brown Jr. in January 2014. The governor's 5-year plan sets forth 10 priority actions to meet urgent needs and set the foundation for sustainable management of California's water resources. These actions are:

1. Make conservation a California way of life;
2. Increase regional self-reliance and integrated water management across all levels of government;
3. Achieve the co-equal goals for the Delta;
4. Protect and restore important ecosystems;
5. Manage and prepare for dry periods;
6. Expand water storage capacity and improve groundwater management;

7. Provide safe water for all communities;
8. Increase flood protection;
9. Increase operational and regulatory efficiency;
10. Identify sustainable and integrated financing opportunities.

The California Water Plan Update 2013 planning horizon extends to the year 2050. There are 17 cross-cutting objectives and over 300 specific actions to reinforce the implementation of the Governor's Water Action Plan. The goals of that Plan are to make conservation a way of life, provide safe drinking water and expand water storage capacity, improve public safety, and secure wastewater systems for all communities, and foster environmental stewardship.

Bay Delta Conservation Plan/California WaterFix

All of the actions in the California Water Plan center on sustaining supplies of water for people, the environment, industry, and agriculture. The Bay Delta Conservation Plan (BDCP) is identified in the California Water Plan as one action to achieve the co-equal goals for the Sacramento-San Joaquin Delta.

A joint CEQA Draft Environmental Impact Report (EIR)/NEPA Environmental Impact Statement (EIS), and associated environmental compliance documents, addresses a water conveyance facility consisting of three new intakes on the Sacramento River and dual tunnels to convey water to existing state and federal pumping plants. The conveyance facility will be operated in conjunction with existing south Delta operations and will be coordinated with CVP operations. Since release of the December 2013 Draft EIR/EIS, a partially recirculated Draft EIR/Supplemental Draft EIS has been prepared and was circulated to the public for review and comment from July 10, 2015 through October 30, 2015. DWR and Reclamation are currently working on responses to the comments in preparation of the Final EIR/EIS. The recirculated Draft EIR/Supplemental Draft EIS updates information on alternatives, analyzes several alternatives, including those analyzed as part of the BDCP EIR/EIS, as well as adds analysis on three additional alternatives.

This newly defined project is known as the BDCP/California WaterFix. As one part of California's overall water plan, the BDCP/WaterFix would modernize California's water delivery system, address water supply challenges, and climate change, while protecting the Delta ecosystem.

Bay-Delta Water Quality Control Plan

The State Water Board holds dual responsibilities of allocating surface water rights and protecting water quality. While most water quality control planning is done by the Regional Water Boards, the State Water Board also has authority to adopt statewide Water Quality Control Plans. It adopts the Bay-Delta Plan Water Quality Control Plan (Bay-Delta Plan) because of its importance as a major source of water supply for the state.

The Bay-Delta Plan identifies beneficial uses of the Bay-Delta, water quality objectives for the reasonable protection of those beneficial uses, and a program of implementation for achieving the objectives. The Bay-Delta Plan, when implemented, can determine the amount and timing of water entering and moving through the Delta. The 45,600-square-mile Delta watershed provides all or a portion of surface water or groundwater supplies to more than 96 percent of residents in California (based on population estimates by city and county, Department of Finance 2011).

The State Water Board is in the process of developing and implementing updates to the Bay-Delta Plan and flow objectives for priority tributaries to the Delta to protect beneficial uses in the Bay-Delta watershed.

> Phase 1 of this work involves updating San Joaquin River flow and southern Delta water quality requirements included in the Bay-Delta Plan.

> Phase 2 involves other comprehensive changes to the Bay-Delta Plan to protect beneficial uses not addressed in Phase 1.

> Phase 3 involves changes to water rights and other measures to implement changes to the Bay-Delta Plan from Phases 1 and 2 (Phase 3 has not commenced.).

> Phase 4 involves developing and implementing flow objectives for priority Delta tributaries outside of the Bay-Delta Plan updates.

The State Water Board intends to develop flow objectives and associated implementation plans for six to nine Sacramento-San Joaquin Delta priority tributaries by June 2018 (SWRCB 2014).

3.7.4 Impact Assessment Methodology

The surface water resources impact assessment methodology involved a qualitative evaluation of potential changes on surface water conditions (including existing water quality, natural drainage patterns, and flooding hazards) under the Proposed Project. Regional information on surface water conditions available from DWR and the U.S. Geological Survey (USGS) were reviewed. Potential impacts relate to possible changes in surface water deliveries were evaluated relative to current and historic surface water conditions.

3.7.4.1 Significance Criteria

The Proposed Project activities are evaluated in accordance with the Hydrology and Water Quality section of Appendix G of the CEQA Environmental Checklist. The Proposed Project would have a significant impact on surface water resources if implementation would:

> Violate any water quality standards or waste discharge requirement,

> Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site;

> Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;

> Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;

> Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map; place within a 100-year flood hazard area structures that would impede or redirect flood flows; or expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or

> Contribute to inundation by seiche, tsunami, or mudflow.

3.7.5 Project Impacts

Impact SW-1: Potential to violate water quality standards or discharge requirements.

Implementation of the Proposed Project would not result in any direct or indirect change in the quality of water delivered to the CVC Contractors. The water supply source(s) would remain the same as would the means of conveyance. Potential sources of contaminants, such as accidental spills or leaks into the conveyance system or source water, would be similar to those under existing conditions. The potential for source water to infiltrate to groundwater would remain the same. It is possible that the CVC Contractors' supply could be exchanged to supplement existing groundwater banking facilities. Given the relatively high quality of the CVP water, use of the water for recharge may result in increased quality of groundwater

supply in some situations. The introduction of CVC Contractor water into the FKC could reduce the quality (in terms of TDS) of the FKC water depending on if there is any comingling of the CVC and Millerton Lake water supplies. The practice of occasionally introducing CVC water to the FKC has historically occurred and has not affected the use of the water for agricultural purposes. Furthermore, the Proposed Project would not result in the construction of any new facilities. No potential construction-related water quality impacts would occur. Therefore, no direct or indirect impacts to water quality standards or discharge requirements would occur. **No Impact** would occur, and no mitigation is required pursuant to current standards.

Impact SW-2: Potential to substantially alter the existing drainage pattern of the Project Area in a manner which would result in substantial erosion, siltation, or increased flooding.

The Proposed Project would not result in any direct or indirect change in the direction of flow in any natural or man-made channels relative to existing conditions. The options for conveyance of CVP water to the CVC Contractors would remain the same. The CVC conveyance system is strictly controlled by the CVC Contractors to avoid exceeding the capacity of the system. The potential for uncontrolled release of conveyed water (and any resulting erosion, sedimentation or flooding) is very low. Therefore, no direct or indirect impacts related to increased erosion, siltation, or increased flooding. **No Impac**t would occur, and no mitigation is required.

Impact SW-3: Potential to create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

Implementation of the Proposed Project would not result in any direct or indirect change in the potential to increase runoff. No new facilities or impervious surfaces would be constructed. No new sources of runoff would be created, and therefore, no direct or indirect impacts would occur. There would be **No Impact** and no mitigation is required.

Impact SW-4: Placement of housing in a 100-year flood hazard area or increased flood risk to people or structures.

No housing would be constructed anywhere as part of the Proposed Project. Implementation of the Proposed Project would not result in the construction of any other new structures. Operation of the conveyance system delivering CVP water to CVC Contractors would remain the same and no additional people would be needed to operate the system. The Proposed Project would not increase flood risk for people or structures. Therefore, no direct or indirect impacts would occur. There would be **No Impact** and no mitigation is required.

Impact SW-5: Potential to contribute to inundation by seiche, tsunami, or mudflow.

The Proposed Project would not contribute to the potential to contribute to inundation by a seiche or tsunami. Under existing conditions, the potential for a seiche or tsunami is very low due to the absence of water bodies capable of generating such waves. The relatively gentle topography does not present a hazard of inundation by a mudflow. These conditions would not change under the Proposed Project. Therefore, no direct or indirect impacts would occur. There would be **No Impact** and no mitigation is required.

Mitigation

No impacts to surface water resources would occur, so no mitigation is required.

3.8 Hydrology and Water Quality (Groundwater Resources)

3.8.1 Introduction

Groundwater resources are generally defined as useable water contained within the saturated subsurface. Groundwater can occur within soil, sediment, and bedrock. Movement of groundwater is generally very slow relative to surface water flow and is controlled by hydrostatic pressure and the characteristics of the porous material medium. This section presents an analysis of the existing conditions and potential impacts on groundwater resources related to implementation of the Proposed Project. The analysis evaluates impacts on the quantity of groundwater, its movement, and quality. For purposes of this analysis, the Project Area is defined as the five hydrogeologic subbasins of the eastern and southern portions of the TLHR as defined by the DWR (2003). The combined surface area of the subbasins is approximately 4,363,000 acres.

3.8.2 Environmental Setting

3.8.2.1 Hydrogeologic Conditions

The CVC Contactors are located on the eastern side of the southern SJV, the southern portion of the Central Valley of California. The SJV is bounded to the east by the foothills of Sierra Nevada, to the west by the Coast Range and to the South by the Tehachapi Mountains. The SJV is an asymmetric trough filled with alluvial sediments derived from the erosion of the surrounding mountain ranges. These sediments are underlain by marine and continental sedimentary bedrock, which extend to depths of up to 32,000 ft.

The primary source of groundwater is the unconfined, semi-confined, and confined aquifers within the upper 1,000 ft of alluvial sediments. Three general hydrogeologic units have been identified in these sediments. Coast Range alluvium extends from the west and merges with the Sierra Nevada alluvium near the SJV trough. These relatively coarse-grained (silts, sands, and gravels) unconsolidated sediments range in thickness from less than 10 ft at the valley margins to over 800 ft in the axis of the SJV. The third unit, flood-basin deposits, consists of relatively fine-grained sediments (silts and clays) lie along and beneath the valley trough. The thickness of this unit can be up to 35 ft (Faunt 2009). Notably, the sediments include a relatively thick (up to 200 ft) and continuous, low permeability clay layer, the Corcoran Clay, which divides the groundwater flow into an upper semi-confined aquifer and a lower confined aquifer. Prior to development of the valley, the surface water flows and subsurface flows from the adjacent uplands were the primary source of recharge for aquifers. Under developed conditions, deep infiltration of irrigation water is the primary source of recharge with additional recharge from streams and agricultural ditches and precipitation.

These alluvial deposits form a groundwater basin, referred to as the San Joaquin Valley Basin (SJVB), which provides groundwater resources for agriculture, industrial, and municipal uses. The aquifers of the SJVB are recharged by a combination of runoff and subsurface flow originating in the Sierra Nevada and, to a lesser extent, the Coast Range and infiltration of precipitation and applied irrigation water. The northern portion of SJVB is referred to as the San Joaquin River Basin and the southern portion as the Tulare Lake Basin. The SJVB is further subdivided into distinct subbasins. Six of these subbasins could be affected by the Proposed Project: Madera, Kings, Kaweah, Tulare Lake, Tule, and Kern County subbasins. The characteristics of the subbasins are summarized in Table 3.8-1.

Table 3.8-1 Summary of Groundwater Subbasin Characteristics

Subbasin Name	Area (acres)	Range of Well[1] Depths (ft)	Range of Well Yields (gal/min)	Groundwater Storage[2] (acre feet)	General Water Quality Type	Typical Total Dissolved Solids (TDS) (mg/L)	Water Quality Impairments
Madera	394,000	100-600	750-2,000	24,000,000	Calcium-Sodium bicarbonate	100-400	High hardness, iron, nitrate, chloride
Kings	976,000	100-500	500-1,500	93,000,000	Bicarbonate	200-700	DBCP and nitrates in eastern portion; elevated fluoride, boron and sodium in localized areas
Kaweah	446,000	100-500	100-500	34,000,000	Calcium-Sodium bicarbonate	300-600	Localized elevated nitrates in eastern portion; high salinity in localized areas
Tulare Lake	524,000	150-2,000	300-1,000	37,000,000	Calcium-Sodium bicarbonate	200-600	High salinity in shallow waters of southern portion; hydrogen sulfide near Hanford; localized areas of high arsenic
Tule	467,000	200-1,400	50-3,000	33,000,000	Calcium-Sodium bicarbonate	200-600	High salinity in shallow waters of western portion; localized areas
Kern County	1,950,000	150-1,200	200-4,000	40,000,000	Calcium bicarbonate (east) Calcium-Sodium sulfate (west)	400-450	High TDS, sodium chloride, and sulfate in shallow waters; arsenic, Nitrate, DBCP, and EDB above MCLs

Source: DWR 2003

Notes:

[1] Municipal and irrigation wells

[2] Estimated storage to a depth of 1,000 ft.

mg/L = milligrams per liter

Groundwater Quality

In general, groundwater quality throughout the region is suitable for most urban and agricultural uses with only local impairments (see Table 3.8-1). The primary constituents of concern are high total dissolved solids (TDS), nitrate, arsenic, and organic compounds. High TDS levels are found in areas along the west side of the SJV and in the trough of the valley. On the west side of the valley, high TDS content is related to recharge of the aquifers by surface flow originating from areas of the Coast Range underlain by marine sediments. High TDS content in the trough of the valley is related to infiltration of surface waters with high concentration of salts resulting from of evaporation and poor drainage. In areas where the Corcoran Clay confining layer is present, water quality is generally better in water-bearing units beneath the clay than in units above it.

Of particular concern, elevated selenium levels occur in shallow groundwater in portions of the SJV. The impact of trace element selenium in agricultural drain water in the western SJV has been extensively evaluated, since high selenium concentrations entering Kesterson Reservoir from agricultural drain water were recognized in 1983. The elevated selenium levels were apparently responsible for the high mortality rates in birds at the Kesterson Reservoir. Shallow groundwater selenium concentrations resulting from leaching of soil salts and concentration of dissolved solids by evapotranspiration can be as high as several thousand micrograms per liter (Dubrovsky et al. 1990).

Nitrates may occur naturally or as a result of disposal of human and animal waste products and fertilizer. Areas of high nitrate concentrations are known to exist near the Town of Shafter and other isolated areas in the SJV. Elevated arsenic levels have been reported in the Tulare Lake, Kern Lake and Buena Vista Lake bed areas. Two general sources of organic contaminants are present in the valley. Agricultural pesticides and herbicides have been detected throughout the SJV, but primarily along the east side where soil permeability is higher and depth to groundwater is shallower. The most notable agricultural contaminant is dibromochloropropane (DBCP), a now-banned soil fumigant. Industrial organic contaminants include common solvents such as trichloroethylene and dichloromethane.

Groundwater Use

Collectively, groundwater basins are the state's largest reservoir, 10 times the size of all its surface reservoirs combined (DWR 2014b). Groundwater is an important water supply for agricultural and urban uses in the Tulare Basin. Within the Tulare Lake Hydrologic Region, the total annual water demand (including agricultural and urban demands) is on the order of 11 million af. Approximately 41 percent of the demand is met by groundwater extraction (DWR 2003). As a result of high groundwater use during the period 1962 to 2003, groundwater storage within the Tulare Basin has decreased approximately 70 million af. The condition when groundwater is extracted at rate that exceeds recharge is generally referred to as "overdraft." The estimated hydraulic head (a measure of groundwater levels) within the aquifer has declined as much as 0 to 120 ft in the eastern portion of the Tulare Basin (Faunt 2009). The rate of decline in hydraulic head has decreased dramatically relative to the historic period up to 1961 when declines of up to 300 ft occurred. The decrease in the rate of decline is generally attributed to increased delivery of surface water to the Tulare Basin. The average annual groundwater extraction during the period 1962 to 2003 was approximately 5.6 million af while the average annual surface water deliveries were 5.2 million af.

By the end of 2014, California was in a Critically Dry water year type, that followed a Dry and Below Normal water year types. During this time groundwater resources provided an increasing percentage of California's water supply. A comparison of average low springtime groundwater levels between 1900 and 1998 to more recent low spring levels between spring 2008 and 2014 are summarized in Appendix G. Since spring 2008, groundwater levels are at or near historical lows (for the period of record) in most areas of the state especially in the southern SJV (DWR 2014b).

In 2009, SB X7-6 bill was passed and aims to modify the California Water Plan by requiring parties who wish to monitor their groundwater supply to notify and begin reporting to DWR. SB X7-6 is now known as DWR's California Statewide Groundwater Elevation Monitoring (CASGEM) program. As part of this effort, DWR prepared the Groundwater Basin Prioritization, which is a statewide ranking of groundwater basin importance that incorporates groundwater reliance and focuses on basins producing more than 90 percent of the state's annual groundwater. Finalized in June 2014, the Basin Prioritization indicates that 127 of California's 515 groundwater basins and subbasins are High and Medium priority. These basins account for 96 percent of California's annual groundwater pumping and supply 88 percent of the population which resides over groundwater basins. The remaining 388 basins are Low and Very Low priority and comprise 75 percent of the groundwater basins in the State (DWR 2014b).

By the end of 2014, California was in a Critically Dry water year type, that followed a Dry and Below Normal water year types. During this time groundwater resources provided an increasing percentage of California's water supply (DWR 2014b). The Project Area is located within the CASGEM South Central Region, which has been given a High priority ranking. The South Central Region accounts for 94 percent of California's annual groundwater pumping and supplies water to 90 percent of the population that resides over the groundwater basins (DWR 2014b). For the Project Area, the average minimum springtime groundwater elevation has declined by over 30%, and in some areas over 50% from historic conditions. There are many areas of the SJV where recent groundwater levels are more than 100 feet below previous historical lows (DWR 2014b).

Subsidence

One potential result of groundwater overdraft and the decline in hydraulic head is land subsidence. Significant reductions in groundwater levels (or hydraulic head) can result in permanent and irreversible compression or consolidation of sediments within the aquifer(s). The loss of volume can result in the subsidence of the land surface. Subsidence has occurred historically and is continuing in many areas in California, most notably in the San Joaquin, Antelope, Coachella, and Sacramento Valleys (DWR 2014c).

Since development of the SJV, up to 30 ft of subsidence has occurred in the western portion of the SJV during the period 1926 to 1970, mostly the result of groundwater withdrawal (Ireland 1986). The rates of subsidence decreased significantly in the 1970s as increased surface water deliveries resulted in decreased groundwater pumping. However, periods of drought (e.g., 1976–1977 and 1987–1992) and increased groundwater pumping resulted in renewed subsidence in some areas (Faunt 2009).

Recent groundwater levels in portions of the SJV are more than 100 feet below previous historical lows. These areas correspond to areas of recent subsidence. As of 2014, several monitoring locations in the SJV have measured recent subsidence between 5 and 10 inches (DWR 2014c). Most of the groundwater basins with a higher estimated potential for future subsidence are ranked as High or Medium priority by the CASGEM Basin Prioritization Process, including the SJV.

3.8.3 Regulatory Framework

The federal and state laws that apply to surface water resources, (refer to Section 3.7.3 above), jointly apply to groundwater resources.

Sustainable Groundwater Management Act

In September 2014 legislation was passed to strengthen local management and monitoring of groundwater basins most critical to the state's water needs. Three bills were passed and together make up the Sustainable Groundwater Management Act (SGMA). The three bills include:

> **SB 1168.** Instructs local agencies to create management plans.

> **AB 1739.** Establishes when the state government can intervene if the local groups don't sufficiently do their job.

> **SB 1319.** Postpones the state's action in certain places where surface water has been affected by groundwater pumping.

The SGMA allows local agencies to tailor sustainable groundwater plans to their regional economic and environmental needs. The bills establish a definition of sustainable groundwater management and require local agencies to adopt management plans. The SGMA prioritizes groundwater basins that are currently overdrafted and sets a timeline for implementation:

> By 2017 local groundwater management agencies must be identified;

> By 2020 over-drafted groundwater basins must have sustainability plans;

> By 2022 other high and medium priority basins not currently in overdraft must have sustainability plans; and

> By 2040 all high and medium priority groundwater basins must achieve sustainability.

Additionally, the SGMA provides measurable objectives and milestones to reach sustainability and a state role of limited intervention when local agencies are unable or unwilling to adopt sustainable management plans.

3.8.4 Impact Assessment Methodology

The groundwater resources impact assessment methodology involved a qualitative evaluation of potential changes in groundwater use under the Proposed Project. Regional information on groundwater conditions (quantity and quality) and groundwater use available from DWR and the USGS were reviewed. Potential impacts related to possible changes in surface water deliveries were evaluated relative to current and historic groundwater use.

3.8.4.1 Significance Criteria

The Proposed Project activities are evaluated in accordance with the Hydrology and Water Quality section of Appendix G of the CEQA Environmental Checklist. The Proposed Project would have a significant impact on groundwater resources if implementation would:

> Violate any water quality standards or waste discharge requirement; or

> Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

3.8.5 Project Impacts

Impact GW-1: Potentially violate water quality standards or discharge requirements.

Implementation of the Proposed Project would not result in any direct or indirect change in the quality of water delivered to the CVC Contractors. The water supply source(s) would remain the same as would the means of conveyance. Potential sources of contaminants, such as accidental spills or leaks into the conveyance system or the source water, would be similar to those under existing conditions. The potential for source water to infiltrate to groundwater would remain the same. It is possible that the CVC Contractors' supply could be exchanged for groundwater pumping or to supplement existing groundwater banking facilities. Given the relatively high quality of the CVP water, use of the water for recharge may result in increased quality of groundwater supply in some situations. The Proposed Project would not

result in the construction of any new facilities; therefore, no potential direct or indirect construction-related water quality impacts would occur. **No Impact** would occur, and no mitigation is required.

Impact GW-2: Potential increases in groundwater extraction and related depletion of groundwater supplies.

The water districts strive to provide surface water at affordable prices to discourage groundwater pumping. However, due to 3 years of drought, much of the SJV is in groundwater overdraft conditions. Quite often, CVC Contractors and private landowners within water district boundaries have fewer water supply options and more quickly turn to pumping groundwater to meet their water demands. Fresno County Service Area (CSA) #34, KTWD, Alpaugh ID, and Atwell WD are located in areas with inadequate groundwater supplies and unsuitable for groundwater recharge in support of groundwater banking. Water districts located in the Kern County Basin have been exchange partners with the CVC Contractors in the past and will likely continue to do so in the future because of the availability of groundwater storage facilities and conveyance facilities in Kern County. Therefore, groundwater supply could improve temporarily in Kern County. However, short of a dependable long-term supply, the Contractors have water supply reliability issues that in turn, affect groundwater conditions.

A benefit of the Proposed Project is to ensure that water supplies continue to be conserved and used at maximum efficiency taking into consideration timing, availability, and variability of CVP and non-CVP water supplies. The Proposed Project is needed to preserve groundwater levels within the Project Area. The Proposed Project would help CVC Contractors maintain and continue existing water management practices. These include:

> Avoid long-term overdraft by achieving a balanced groundwater budget;

> Maintain a diversified water supply, sufficient to supply water for all uses, even during supply shortages;

> Integrate groundwater management with use of CVP and other surface water supplies as available;

> Include conjunctive use as a groundwater management tool as geologic conditions allow;

> Maintain and enhance groundwater recharge and maximize groundwater recharge as geologic conditions allow;

> Make use of current distribution systems to fully utilize all water supplies;

> Create sufficient recharge capacity or storage to fully utilize available CVP water supplies;

> Avoid or correct groundwater levels that are too low to support existing wells or too high to protect the root zone or prevent groundwater recharge;

> Provide water supplies that meet drinking water quality standards to municipalities and community water service providers, as applicable;

> Prevent contamination of groundwater from spills, leaks, confined animal feeding operations, and stormwater runoff;

> Minimize long-term dissolved solids concentrations in groundwater;

> Maximize cropland preservation;

> Meet water quality standards in conveyance facilities receiving CVC water;

> Develop cooperative agreements between water agencies and land use planning agencies; and

> Monitor groundwater characteristics.

Implementation of the Proposed Project, including the continued implementation of the above-listed practices, would continue to improve, maintain, and conserve groundwater resources in the Project Area. In addition, the Proposed Project would ensure compliance with recent groundwater legislation intended to better manage and monitor groundwater resources throughout the state. The Proposed Project could provide an increase of water to areas suitable for groundwater recharge. However, it is not expected that the Proposed Project would result in significant changes in existing groundwater conditions. Therefore, the Proposed Project would not directly or indirectly result in adverse impacts to groundwater quality or quantity. **No Impact** would occur, and no mitigation is required.

Mitigation

No impact to groundwater resources would occur, and no mitigation is required.

3.9 Land Use and Planning

3.9.1 Introduction

This section describes existing land uses within the Project Area, primarily within that portion of Fresno, Kings, Tulare, and Kern counties within the CVP SOD Place of Use, and evaluates the potential impacts of the Proposed Project on these uses. This analysis focuses on agricultural land use as it is the primary land use affected by CVC Contractors' water supply; although a small portion of water is also used for M&I purposes. The Proposed Project is evaluated for consistency with local land use and general plan policies in the vicinity of the Project Area.

3.9.2 Environmental Setting

3.9.2.1 M&I

Although the primary use of CVC Contract water is for agriculture, it is also used for M&I purposes in Fresno and Tulare Counties. The County of Fresno, as an M&I water provider without a local groundwater option, has relied upon transfers through exchange agreements from the City of Fresno or Fresno ID when CVP water has not been available (Reclamation 2010a). M&I uses in Fresno County are in CSA #34, which includes the planned community of Millerton. In addition to residential uses, the land use in this area is rangeland (not prime farmland) with soils not suitable for irrigated agriculture. Some CVC Contract water is also used for M&I purposes in the TVWD and the County of Tulare.

3.9.3 Regulatory Framework

3.9.3.1 Local

Each county and city in California is required by Section 65300 of the California Government Code to have a comprehensive, long-term general plan for the physical development of the county or city. Mandatory elements of the general plan that have bearing on the Proposed Project are land use, open space, and conservation. Additional optional plan elements potentially relevant to the Proposed Project include agriculture, fish and wildlife habitat, and water resources.

This section summarizes key goals and policies contained in the general plans for the four counties in the vicinity of the Project Area. Water from the Proposed Project is used for irrigated agriculture, as well as some M&I uses in Fresno and Tulare Counties. The key issue regarding the regulatory framework is whether the continued use of the CVC to convey water to and from the FKC is consistent with county policies for resource conservation, urban development and the support of agriculture.

The goals and policies of each county relevant to the Proposed Project are summarized in Table 3.9-1. For Fresno County, goals and policies in the Fresno General Plan are provided as well as goals from the Millerton Specific Plan, which covers the area served by CSA #34 with CVC water for M&I uses.

Table 3.9-1 County General Plan Policy Summary

County	Goals and Objectives
Fresno	**Fresno General Plan 2000** > Maintain agriculturally designated areas for agriculture use and direct urban growth away from valuable agricultural lands to other areas planned for such development. > Direct intensive development to cities, unincorporated communities, and other areas where public facilities and infrastructure are available. > Limit expansion of existing designated rural residential areas and minimize the environmental and service impact s of continued development within areas already designated for rural development. > Create well-designed, mixed-use, higher-density developments in which jobs, commercial activities, and amenities are located along transit corridors and closer to residential areas to encourage pedestrian and transit access. **Draft Revised Fresno General Plan, September 2014** > LU-A.1 Agricultural Land Conversion – The County shall maintain agriculturally designated areas for agriculture use and shall direct urban growth away from valuable agricultural lands to cities, unincorporated communities, and other areas planned for such development where public facilities and infrastructure are available or can be provided consistent with the adopted General or Community Plan. > OS-A.1 Sewer, Stormwater, and Water Systems – The County shall develop, implement, and maintain a plan for achieving water resource sustainability, including a strategy to address overdraft and the needs of anticipated growth. > OS-A.2 Water Resources Management Leadership – The County shall provide active leadership in the regional coordination of water resource management efforts affecting Fresno County and shall continue to monitor and participate in, as appropriate, regional activities affecting water resources, groundwater, and water quality. > OS-A.3 Groundwater Management Leadership – The County shall provide active leadership in efforts to protect, enhance, monitor, and manage groundwater resources within its boundaries. > OS-A.4 Groundwater Management Plan – The County shall update, implement, and maintain its Groundwater Management Plan. > OS-A.9 Groundwater Monitoring Program – The County shall develop, implement, and maintain a program for monitoring groundwater quantity and quality within its boundaries. The results of the program shall be reported annually and shall be included in the water resource database. > OS-A.1312 Groundwater Recharge – The County shall encourage, where economically, environmentally, and technically feasible, efforts aimed at directly or indirectly recharging the county's groundwater > OS-A.13 Groundwater Recharge Protection – The County shall ensure that new development does not limit the capacity or function of groundwater recharge areas. > OS-A.14 Groundwater Recharge Areas – The County shall direct, to the extent feasible, its available water resources to groundwater recharge areas. > OS-A.15 Groundwater Recharge Sites Inventory – The County should, in cooperation with respective Integrated Regional Water Management Plans, develop and maintain an inventory of sites within the county that are suitable for groundwater recharge. The sites shall be incorporated into the County GIS and included in the water resource database. > OS-A.1416 Water Banking – The County shall support and/or engage in water banking (i.e., recharge and subsequent extraction for direct and/or indirect use on lands away from the recharge area) based on the following criteria: a. The amount of extracted water will never exceed the amount recharged; b. The water banking program will result in no net loss of water resources within Fresno County; c. The water banking program will not have a negative impact on other water users within Fresno County; d. The water banking program will not create, increase, or spread groundwater contamination; and e. The water banking program includes sponsorship, monitoring, and reporting by a local public agency;

County	Goals and Objectives
	f. The groundwater banking program will not cause or increase land subsidence; g. The water banking program will not have a negative impact on agriculture within Fresno County; and > OS-A.1517 Local Groundwater Management Authority – The County shall, to the maximum extent possible, maintain local groundwater management authority and pursue the elimination of unwarranted institutional, regulatory, permitting, and policy barriers to groundwater recharge within Fresno County. > OS-A.1719 Aquifer Recharge Program – The County shall directly and/or indirectly participate in the development, implementation, and maintenance of a program to recharge the aquifers underlying the county. The program shall make use of flood and other waters to offset existing and future groundwater pumping. > OS-A.2022 San Joaquin River Protection – The County shall support the policies of the San Joaquin River Parkway Master Plan to protect the San Joaquin River as an aquatic habitat, recreational amenity, aesthetic resource, and water source. > OS-A.2325 Groundwater Quality Protection – The County shall protect groundwater resources from contamination and overdraft by pursuing the following efforts: a. Identifying and controlling sources of potential contamination; b. Protecting important groundwater recharge areas; c. Encouraging water conservation efforts and supporting the use of surface water for urban and agricultural uses wherever feasible; d. Encouraging the use of treated wastewater for groundwater recharge and other purposes (e.g., irrigation, landscaping, commercial, and nondomestic uses); e. Supporting consumptive use where it can be demonstrated that this use does not exceed safe yield and is appropriately balanced with surface water supply to the same area; f. Considering areas where recharge potential is determined to be high for designation as open space; and g. Developing conjunctive use of surface and groundwater. h. The water banking program will provide a net benefit to Fresno County. > OS-A.1517 Local Groundwater Management Authority – The County shall, to the maximum extent possible, maintain local groundwater management authority and pursue the elimination of unwarranted institutional, regulatory, permitting, and policy barriers to groundwater recharge within Fresno County. > OS-A.1719 Aquifer Recharge Program – The County shall directly and/or indirectly participate in the development, implementation, and maintenance of a program to recharge the aquifers underlying the county. The program shall make use of flood and other waters to offset existing and future groundwater pumping > OS-A. 2022 San Joaquin River Protection – The County shall support the policies of the San Joaquin River Parkway Master Plan to protect the San Joaquin River as an aquatic habitat, recreational amenity, aesthetic resource, and water source > OS-A.2325 Groundwater Quality Protection – The County shall protect groundwater resources from contamination and overdraft by pursuing the following efforts: a. Identifying and controlling sources of potential contamination; b. Protecting important groundwater recharge areas; c. Encouraging water conservation efforts and supporting the use of surface water for urban and agricultural uses wherever feasible; d. Encouraging the use of treated wastewater for groundwater recharge and other purposes (e.g., irrigation, landscaping, commercial, and nondomestic uses); e. Supporting consumptive use where it can be demonstrated that this use does not exceed safe yield and is appropriately balanced with surface water supply to the same area; f. Considering areas where recharge potential is determined to be high for designation as open space; and g. Developing conjunctive use of surface and groundwater. **Millerton Specific Plan**

County	Goals and Objectives
	> Provide a balanced community of mixed land uses, with a strong sense of community identify > Ensure that development will be sensitive to and enhance the area's topography, including small grassland valleys and prominent knolls. > Encourage development to reflect a higher level of community design that is planned as a unified and integrated whole. > Provide for the necessary facilities and services, to be made available at the time they are needed, to be paid for by those receiving the benefit.
Kern	**Kern County General Plan, September 2009** > Protect the economic strength of agriculture by containing new development in areas large enough for need but in locations other than areas of agricultural production. > Prevent premature conversion of agricultural lands. > Prevent encroachment of urban development into intense agriculture areas. > Support policies and programs that will provide economic incentives to safeguard agriculture resource lands in the long-term. > Make certain supplies of quality water are available to agricultural users. > Restrict uses of land best used for agriculture by limiting new nonagricultural industrial uses. > Encourage groundwater recharge activities in numerous zone districts. > Foster development of groundwater management plans, Urban Water Management Plans and support funding for water providers. > Support participation in the Williamson Act program or Farmland Security Zone program of qualifying agricultural lands.
Kings	**Kings County General Plan, January 2010** > Preserve agricultural lands by preventing encroachment of urban use areas that are incompatible and sustaining large parcel sizes. > Encourage the rights of farmers to operate economically. > Approve agricultural support services to locate in General Agriculture areas. > Support housing on farmland to be used by individuals using the land to farm and encourage construction of seasonal farm housing for employees. > Protect agricultural lands from fringe area development under the Williamson Act program. > Honor property owner rights in existing Rural Residential zones while also avoiding conflict between agricultural and nonagricultural land use. > Protect agricultural productivity in the long term by supporting soil resource conservation. > Promote soil management programs to sustain soil productivity.
Tulare	**2030 Update Tulare County General Plan, August 2012** > LU-2.1 Agricultural Lands – The County shall maintain agriculturally-designated areas for agriculture use by directing urban development away from valuable agricultural lands to cities, unincorporated communities, hamlets, and planned community areas where public facilities and infrastructure are available. a. Water Principle 2: New Sources – Identify and encourage the development of new sources for water that do not deplete or negatively impact groundwater. b. Water Principle 3: Recharge – Identify and encourage the development of locations where water recharge systems can be developed to replenish water supplies. c. Water Principle 4: Adequate Supply – Plan delivery systems to ensure adequate water is available to meet demand. > WR-1.1 Groundwater Withdrawal – The County shall cooperate with water agencies and management agencies during land development processes to help promote an adequate, safe, and economically viable groundwater supply for existing and future development within the County. These actions shall be intended to help the County mitigate the potential impact on ground water resources identified during planning and approval processes. > WR-1.2 Groundwater Monitoring – The County shall support the collection of monitoring data for

County	Goals and Objectives
	facilities or uses that are potential sources of groundwater pollution as part of project approvals, including residential and industrial development > WR-1.3 Water Export Outside County – The County shall regulate the permanent export of groundwater and surface water resources allocated to users within the County to cities and service providers outside the County to the extent necessary to protect the public health, safety, and welfare. The County shall strive for a "no net loss" where there may be water exchanges serving a public purpose. > WR-1.4 Conversion of Agricultural Water Resources – For new urban development, the County shall discourage the transfer of water used for agricultural purposes (within the prior 10 years) for domestic consumption except in the following circumstances: a. The water remaining for the agricultural operation is sufficient to maintain the land as an economically viable agricultural use, b. The reduction in infiltration from agricultural activities as a source of groundwater recharge will not significantly impact the groundwater basin. > WR-1.7 Collection of Additional Groundwater Information – The County shall support additional studies focused on furthering the understanding of individual groundwater source areas and basins. > WR-1.8 Groundwater Basin Management – The County shall take an active role in cooperating in the management of the County's groundwater resources. > WR-1.9 Collection of Additional Surface Water Information – The County shall support the additional collection of water quality and flow information for the County's major drainages as part of project approvals. > WR-1.11 Groundwater Overdraft – The County shall consult with water agencies within those areas of the County where groundwater extraction exceeds groundwater recharge, with the goal of reducing and ultimately reversing groundwater overdraft conditions in the County. > WR-3.1 Develop Additional Water Sources – The County shall encourage, support and, as warranted, require the identification and development of additional water sources through the expansion of water storage reservoirs, development of groundwater banking for recharge and infiltration, and promotion of water conservation programs, and support of other projects and programs that intend to increase the water resources available to the County and reduce the individual demands of urban and agricultural users. > WR-3.2 Develop an Integrated Regional Water Management Plan – The County will participate with other agencies and organizations that share water management responsibilities in the County to enhance modeling, data collection, reporting and public outreach efforts to support the development and implementation of appropriate Integrated Regional Water Management Plans (IRWMP) within the County. > WR-3.4 Water Resource Planning – The County shall continue participation in State, regional, and local water resource planning efforts affecting water resource supply and quality. > WR-3.7 Emergency Water Conservation Plan – The County shall develop an emergency water conservation plan for County operated water systems to identify appropriate conservation policies that can be implemented during times of water shortages caused by drought, loss of one or more major sources of supply, contamination of one or more sources of supply, or other natural or man-made events. > WR-3.9 Establish Critical Water Supply Areas – The County shall designate Critical Water Supply Areas to include the specific areas used by a municipality or community for its water supply system, areas critical to groundwater recharge, and other areas possessing a vital role in the management of the water resources in the County, including those areas with degraded groundwater quality. > WR-3.11 Policy Impacts to Water Resources – The County shall monitor actions taken at the federal and State level which impact water resources in order to evaluate the effects of these actions on the County's resources. > WR-3.12 Joint Water Projects with Neighboring Counties – Tulare County will work with neighboring counties to promote development of joint water projects, such as a cross-valley canal, and other efforts to expand water supply. > WR-3.13 Coordination of Watershed Management on Public Land – The County shall work cooperatively with State and federal land managers to coordinate watershed management on public land.

County	Goals and Objectives
	> PFS-2.1 Water Supply – The County shall work with agencies providing water service to ensure that there is an adequate quantity and quality of water for all uses, including water for fire protection, by, at a minimum, requiring a demonstration by the agency providing water service of sufficient and reliable water supplies and water management measures for proposed urban development.

3.9.4 Impact Assessment Methodology

The impacts on land use are assessed qualitatively. The potential for direct land use change is based on whether the Proposed Project would result in construction of new facilities or removal of existing facilities. The potential for indirect land use change is based on how the cost, quality, and quantity of water resources for the CVC Contractors may change due to Proposed Project implementation, and what the resulting effect may be on municipal or agricultural land uses. This assessment relies on the surface water and groundwater resources sections to assess the effects of the Proposed Project on water supply, and relies on the socioeconomic section to assess the resulting effect on the agricultural and municipal development economics within the Project Area.

3.9.4.1 Significance Criteria

The Proposed Project activities are evaluated in accordance with the Land Use and Planning section of Appendix G of the CEQA Environmental Checklist. The Proposed Project would have a significant impact on land use if implementation would:

> Physically divide an established community;

> Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect;

> Conflict with any applicable habitat conservation plan or natural community conservation plan;

> Cause land subsidence (from potential increased drawdown on groundwater) that would affect land use;

> Result in substantial changes to the rate of municipal development (by 3 percent or more); or

> Conflict with any general plan land use designations and/or other policies for local zoning within the Project Area.

3.9.5 Project Impacts

No direct effects of the Proposed Project on agricultural land use are expected, as no new facilities would be constructed and no facilities removed. No indirect effects on prime farmland, unique farmland, or farmland of statewide importance are expected, while indirect effects on other agricultural lands are expected to be limited. In Fresno County, CSA #34 currently uses approximately 500 af per year for M&I purposes, which is less than the full amount of 1,520 af available to CSA #34 under the long-term exchange agreement with AEWSD. Receipt of CVC Contract water at increased levels (up to the exchange agreement amount of 1,520 af) from AEWSD would enable planned development to occur in the CSA #34 area. This development would occur in areas already approved for development in the planned community of Millerton New Town, and would be in accordance with the general policies and goals in the Fresno County General Plan as well as the specific land use designations and goals outlined in the Millerton Specific Plan for the area served by CSA #34.

Impact LU-1: Potential to divide an established community.

The Proposed Project is the approval, execution, and implementation of three-party contracts providing for the continued conveyance of the CVC Contractors' existing CVP water supply in the Delta through

SWP. The Proposed Project does not propose construction of facilities or infrastructure. Therefore the Proposed Project has no potential to directly or indirectly divide an established community. **No Impact** would occur, and no mitigation is required.

Impact LU-2: Potential to conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect.

The Proposed Project would allow for continued conveyance of existing water supply. It would not result in any changes to land use. Existing and planned land uses would not be affected by the Proposed Project. Therefore, the Proposed Project would not directly or indirectly conflict with current land use policies and zoning. **No Impact** would occur, and no mitigation is required.

Impact LU-3: Potential to conflict with any applicable habitat conservation plan or natural community conservation plan.

The Proposed Project would not change any land uses or require the development of new facilities. In addition, the Project would continue to remain in compliance with the existing BOs. Therefore, the Proposed Project would not directly or indirectly create a potential conflict with applicable habitat and natural community conservation plans. **No Impact** would occur, and no mitigation is required.

Impact LU-4: Potential to cause land subsidence.

As discussed for Impact GW-2, due to 3 years of drought much of the SJV is in groundwater overdraft conditions. As a result, subsidence has occurred in some areas of the Project Area. However, the Proposed Project would help CVC Contractors maintain and continue existing water management practices, including those that address groundwater quantity, thus minimizing resultant subsidence. Therefore, the Proposed Project would not directly or indirectly result in increased land subsidence. **No Impact** would occur, and no mitigation is required.

Impact LU-5: Potential to change the rate of municipal development (by 3 percent or more).

As discussed in the socioeconomic section below, there is no anticipated effect on the cost of water resources due to implementation of the Proposed Project. As no change in water resource cost, supply, or quality is anticipated, the Proposed Project would not directly or indirectly affect existing or future municipal development. **No Impact** would occur, and no mitigation is required.

Impact LU-6: Potential to conflict with any general plan land use designations and/or other policies for agriculture and/or local zoning.

The Proposed Project would allow for continued conveyance of existing water supply, subject to available capacity. The Proposed Project would not result in any changes to land use designations or zoning. The various general plan policies related to sustaining agriculture would be supported by allowing continued water supply. Therefore, the Proposed Project would not conflict with current land use and agriculture policies and zoning. **No Impact** would occur, and no mitigation is required.

Mitigation

No impacts to land use would occur, so no mitigation is required.

3.10 Socioeconomics

3.10.1 Introduction

This chapter describes the anticipated effects of the Proposed Project on socioeconomics within that portion of Fresno, Kings, Tulare, and Kern counties within the CVP SOD Place of Use. The focus of this analysis is on population and employment within the Project Area and on the importance of agriculture to the local and regional economy. The primary impact variables of interest for this analysis are population, income, and employment.

3.10.2 Environmental Setting

This section describes the existing socioeconomic conditions in Fresno, Kings, Tulare, and Kern counties within the vicinity of the Project Area. The key resources addressed include population, employment, and agriculture. This section presents information on existing (or baseline) conditions in the Project Area related to these key parameters.

Primary data sources include the California Department of Finance; California Employment Development Department; U.S. Census Bureau; Fresno, Kings, Tulare, and Kern counties; and other documents.

3.10.2.1 Population and Employment

Within the vicinity of the Project Area, the largest cities include Fresno in Fresno County, Bakersfield in Kern County, Hanford in Kings County, and Visalia in Tulare County. As of January 2011, Fresno County has the largest population at 940,220 people, followed by Kern County with 846,833 people. The 2011 population of Tulare County is 446,837, while Kings County has the smallest population among the four counties at 153,165 people (California Department of Finance 2011). For the period from 1990–2011, annual population growth in each of the four counties ranged from 1.73 percent to 2.24 percent. Specifically, Fresno County grew at a compound annual rate of 1.73 percent, Tulare County grew at a 1.81 percent annual rate, Kings County grew at a 2.08 percent annual rate, and Kern County grew at a 2.24 percent annual rate (see Table 3.10-1).

Total employment for Fresno, Kings, Tulare, and Kern counties in all industries was 1,786,600 in 2010, an increase of 110,200 jobs from 2000 (Table 3.10-2). The importance of agriculture is indicated by its share of total industry employment within these four counties. Farming employment accounted for 7.7 percent of total employment in 2010, down from 8.74 percent in 2000. These figures are for direct employment in production agriculture only, and exclude jobs in the many sectors supporting and supported by agriculture.

Among industries, only the state/local government sector employed more people than farming in the four-county area in 2010. The only sectors with declining employment from 2000 to 2010 were information, construction, total farm, manufacturing, and other services.

Table 3.10-1 Population and Population Growth in the Four-County Area

County/City	Population		Compound Annual Growth 1990–2011
	January 1, 1990	January 1, 2011	
Fresno	667,490	940,220	1.73%
Kern	543,477	846,883	2.24%
Kings	101,469	153,165	2.08%
Tulare	311,921	446,837	1.81%

Source: California Department of Finance, various years, E-1, City/County Population Estimates with Annual Percentage Change; E-2, California County Population Estimates and Components of Change by Year, July 1; and E-4, Population Estimates for Cities, Counties, and the State. http://www.census.gov/population/cencounts/ca190090.txt (for 1990 data)

Table 3.10-2 Employment and Employment Growth within Fresno, Kern, Kings, and Tulare Counties

Economic Sector	Employment		Employment in All Industries 2010	Growth 2000–2010
	2000	2010		
State and Local Government	134,000	149,900	19.2%	11.9%
Total Farm	146,500	137,600	17.6%	-6.1%
Trade, Transportation and Utilities	116,600	124,300	15.9%	6.6%
Educational and Health Services	60,500	81,200	10.4%	34.2%
Professional and Business Services	57,500	60,800	7.8%	5.7%
Leisure and Hospitality	50,400	59,000	7.5%	17.1%
Manufacturing	53,700	52,700	6.7%	-1.9%
Construction	31,900	28,000	3.6%	-12.2%
Financial Activities	26,000	26,200	3.3%	0.8%
Federal Government	23,600	24,300	3.1%	3.0%
Other Services	20,500	20,400	2.6%	-0.5%
Natural Resources and Mining	8,600	10,200	1.3%	18.6%
Information	8,900	7,500	1.0%	-15.7%
Total Employment	**739,700**	**782,600**	**100.0%**	**5.8%**

Source: California Employment Development Department, 2008, Employment by Industry Data, available at http://www.labormarketinfo.edd.ca.gov/.

Agriculture

The total annual value of crops grown in these four counties in 2009 is estimated to be over $10.1 billion based on farm-level prices (see Table 3.10-3). Approximately 85 percent of this value is from fruit and nuts crops, although these crops only account for 29 percent of acreage.

Table 3.10-3 Crop Acres, Value per Acre, and Total Crop Value (2009)

Crop/Group	Acres	Value/Acre	Total Value ($1000s)	Percent of Acres	Percent of Value
Field Crops	3,638,221	$361.45	1,315,036	70.03%	13.01%
Seed Crops	29,493	$2,015.16	59,433	0.57%	0.59%
Vegetables	368,461	$6,126.70	2,257,451	7.09%	22.34%
Fruits and Nuts	1,155,834	$5,443.80	6,292,131	22.25%	62.26%
Nursery	2,961[1]	$61,742[2]	182,818[2]	0.0005%	1.81%
Total	**5,194,970[1]**	**$1,945[2]**	**10,106,869[2]**	**100%**	**100%**

Source: County Agricultural Commissioner Reports, 2010.

Notes:

[1] Data does not include nursery acreage of Kings and Tulare Counties, not available

[2] Total does not include nursery total value for Kings County

3.10.3 Regulatory Framework

No regulations are applicable to socioeconomic resources.

3.10.4 Impact Assessment Methodology

CEQA Guidelines state that economic or social information may be included in an EIR (Section 15131). However, such effects should not be treated as significant impacts on the environment, although an EIR may trace the chain of cause and effect from economic to environmental impacts focusing on the resultant physical change in the environment [Section 15131(a)]. Therefore, the impacts on socioeconomics from implementation of the Proposed Project are assessed qualitatively.

The potential for direct impacts is based on whether the Proposed Project entails construction or operations activities that would directly affect socioeconomics (e.g., through hiring additional personnel). The potential for indirect impacts is based on how the cost, quality, and quantity of water resources for the CVC Contractors may change due to the Proposed Project, and what the resulting effect may be on socioeconomics and water supply services. The assessment relies on the surface water resources and groundwater resources sections to assess the effects of the Proposed Project on water supply, and assesses the resulting effect on water supply cost and availability throughout the Project Area. Changes in water cost are estimated based on the cost of substituting groundwater for potential changes in surface water supply deliveries. Finally, the section assesses the overall effect on the agricultural and municipal development economics within the Project Area, including effects on agricultural production, employment, and income.

3.10.4.1 Significance Criteria

Under CEQA, determining the significance of economic impacts is not required. Instead, the results of the economic analysis are used to provide information of the significance of physical impacts on agricultural resources. Accordingly, no formal thresholds of significance for economics exist; rather, the following criteria are used to evaluate the magnitude of economic impacts (i.e., whether they are substantial or minor).

Would the Proposed Project result in a:

> Substantial loss of agricultural production values or income;

> Substantial reduction in regional economic activity (output, jobs, and income) due to land fallowing; or

> Substantial loss in property tax revenues realized by local governments.

3.10.5 Project Impacts

Impact S-1: Potential for substantial loss of agricultural production values or income, reduction in regional economic activity, or loss in property tax revenues.

No direct effects of the Proposed Project on socioeconomics are expected, as no new facilities would be constructed and no facilities removed. Consequently, the Proposed Project would not result in hiring of workers or in the displacement or relocation of people.

The Proposed Project would enable conveyance to continue as under existing conditions, with conveyance and delivery subject to available capacity at the federal or state export pumps and in the Aqueduct or DMC. Furthermore, there is no expected indirect adverse impact on socioeconomic conditions including agricultural production, because there is no change in the cost, quality, or availability of water due to Proposed Project implementation compared to existing conditions.

Mitigation

No impacts to socioeconomics would occur, so no mitigation is required.

4 Alternatives to the Proposed Project

4.1 Development and Selection of Alternatives

The California Environmental Quality Act (CEQA) Guidelines Section 15126.6 sets forth the requirements for consideration and discussion of alternatives to the Proposed Project including the requirement that "*An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation (Section 15126.6(a)).*" This section identifies three project alternatives that were evaluated further in detail as part of the Draft Environmental Impact Report (DEIR) in addition to the required No Action Alternative. No alternatives other than non-renewal of water service contracts (discussed below as a key assumption) were initially considered and subsequently rejected as infeasible.

The three-party conveyance contract is a negotiated contract. The general objective of the contract is to convey water through state facilities, similar to previous water supply operations, for use by the Cross Valley Canal (CVC) Contractors. However, if the long-term renewal of the conveyance obligations by California Department of Water Resources (DWR) under the existing three-party contracts is not renewed, then there would be no conveyance using State Water Project (SWP) facilities and no other actions would be taken by DWR for conveyance (No Project). The CVC Contractors would have to develop other conveyance mechanisms (other alternatives). This scenario relies on the assumption that long-term water service contract renewals with Reclamation would still be completed.

4.1.1 Key Assumption: Water Service Contract Quantities

The renewal of interim water service contracts for CVP contractors is a federal action that is currently being addressed by Reclamation. It is integral here because absent a renewal of the CVC Contract, there may be no water to convey under the three-party contract considered under this EIR. Non-renewal of existing water service contracts is considered infeasible based on Section 3404(c) of the Central Valley Project Improvement Act (CVPIA), which clearly states "…*the Secretary shall, upon request, renew any existing long-term repayment of water service contract for the delivery of water from the CVP*…". These existing contracts are needed to provide the mechanism for the continued beneficial use of the water developed and managed by the Central Valley Project (CVP). Non-renewal of water service contracts was considered but eliminated from further analysis because Reclamation is contractually and legally obligated to renew the CVC Contractors' water service contracts.

The Reclamation Project Act of 1956 and 1963 mandates the renewal of existing water service contract quantities when beneficially used. The water delivered under these contracts is used for agricultural or municipal and industrial (M&I) purposes which are beneficial uses recognized under federal Reclamation and California law. Therefore, a reduction in contract quantities is not assumed in this EIR because it would be inconsistent with the Programmatic Environmental Impact Statement (PEIS) Record of Decision (ROD) and the balancing requirements of CVPIA (Reclamation 1999). Maintaining, the full historic water quantities under contract provides the CVC Contractors with assurances that the water will be made available in wetter years and is necessary to support investments for local storage, water conservation improvements, and capital repairs. Furthermore, as seen in the alternatives below, there are potential transfers and exchanges available to the CVC contractors that would require a conveyance agreement even when the water supply is not derived from the CVP.

4.2 Project Alternatives

4.2.1 No Project Alternative

CEQA Guidelines Section 15126.6(e) requires a description and analysis of impacts of a No Project Alternative. This requirement is done to allow decision makers to compare the impacts of approving the project with the impacts of not approving the project. The impacts of No Project are based on a comparison to the existing condition and the Proposed Project.

Beginning in late 1975 and early 1976, the CVC Contractors signed individual three-party contracts ("CVC Contracts") with Reclamation and DWR for delivery and conveyance of CVP water to the respective CVC Contractors. Starting in 1995, the CVC Contracts have been succeeded by several 1- and 2-year Interim Renewal Contracts (IRCs). The present IRCs (IR-16) are for a 2-year term that commenced March 1, 2016, and continues through February 28, 2018. These water supply contracts provide for delivery of CVP water available in the Delta, and the conveyance of that supply through the Aqueduct to the CVC or other points of delivery mutually agreed upon by the parties. The CVC Contractors' CVP water is pumped from the Delta by DWR (providing the pumping facilities) and Reclamation (providing the power supply) and then conveyed to the San Luis Canal and Aqueduct for delivery into the CVC. Improvements have since been made to the CVC that increases the flexibility to move water between the Aqueduct and the Friant-Kern Canal (FKC) and to deliver water to banking projects along the CVC. Except as provided in separate agreements, failure to execute a long-term conveyance contract with DWR would reduce the flexibility for the CVC Contractors to take their CVP water in the Delta through SWP facilities. There would be no use of the Aqueduct.

The No Project Alternative assumes that there will be no three-party contract between the CVC Contractors, DWR, and Reclamation to convey the CVC Contractors CVP supply through the Aqueduct. The CVC Contractors would have to rely on other facilities or arrangements to convey their water supply from the Delta. The water supply for the No Project Alternative assumes the potential for continued delivery in the Delta of available CVP water between the CVC Contractors and the United States, including the terms and conditions required by non-discretionary CVPIA provisions (considered as part of the Preferred Alternative of the CVPIA PEIS (Reclamation 1999)). However, the CVC Contractors would endeavor to receive their annual supply through water transfers, exchanges, and/or agreements to convey the water to the CVC Contractors' water use service areas.

No changes to the CVC Contractors' water service areas or water contracts are part of the No Project Alternative. The CVC Contractors' CVP water allocation will continue to be available and used for the exact same M&I and agricultural uses (i.e., row crops, orchards, vineyards, irrigated pasture, and various other agricultural uses) as has occurred since 1975. Water can be available pursuant to CVC Contractors' water supply contracts with the United States in quantities up to the contract total, although it is likely that the availability will be less than the contract total as shown in historic deliveries. Although the water supply is available from CVP through interim contracts, the No Project Alternative assumes that DWR would have no contractual obligations to convey that water supply through SWP facilities. In practical terms, without SWP conveyance, reductions in deliveries would occur and would be substantial.

In the absence of a conveyance agreement with DWR, the CVC Contractors would have to resort to one or more alternative means to attempt to meet their water supply needs: 1) seek transfers and exchanges of CVP supply on the east side of the San Joaquin Valley (SJV) using local facilities or the FKC; 2) seek transfers or exchanges of CVP supply with CVP Contractors using the Delta-Mendota Canal (DMC); 3) use other available water sources such as local groundwater; and/or 4) reduce water use by fallowing land. The No Project Alternative represents a complete loss of the supply historically conveyed through SWP facilities. The elimination of SWP facilities as part of the overall water service for the CVC Contractors would severely limit the available water even if transfers and exchanges using only local facilities, FKC, or the DMC could be accomplished. Ultimately, there would likely be variability in how the respective CVC Contractors would resolve the issue of non-renewal of a long-term conveyance contract

with DWR which would likely result in additional costs and uncertainty in the conveyance and the delivery of water to the CVC Contractors. An estimate of the available surface water supply under this alternative would be 5 to 10 percent of the average historic deliveries. This estimate is based upon the fact that there has been capacity at Jones Pumping Plant in the past to move CVC Contractors water but this has only occurred once in the past 15 years. This is not a sufficient frequency to provide reliable replacement water (Dalke pers. comm.).

Use of groundwater under the No Project Alternative would likely result in overdraft conditions, which could lead to land subsidence. By the end of 2014, California was in one of the driest years on record, following 2 years of drought. During this time groundwater resources provided an increasing percentage of California's water supply (Appendix G). Subsidence has occurred historically and is continuing in many areas in California, most notably in the San Joaquin Valley (DWR 2014c). Recent groundwater levels in the SJV are more than 100 feet below previous historical lows. These areas correspond to areas of recent subsidence. As of 2014, several monitoring locations in the SJV have measured recent subsidence between 5 and 10 inches (DWR 2014c). However with implementation of the Sustainable Groundwater Management Act (SGMA), which requires local agencies to establish sustainable groundwater management plans to protect groundwater availability, groundwater pumping will likely be reduced over time. SGMA requires that by 2040 all high and medium priority groundwater basins achieve sustainability. Groundwater pumping would become less of an option as the SGMA is implemented, and fallowing agricultural land more likely

In summary, the No Project Alternative assumes that CVP water would continue to be provided to the CVC Contractors, but there would be no mechanism for conveyance of that water through SWP facilities. As a result of reduced water supplies the historic practice of farmers was pumping groundwater to make up the difference. The No Project Alternative assumes a similar response. Therefore the long-term increase in groundwater pumping would likely result in local conditions that were present before the CVC was constructed.

4.2.1.1 Impact Analysis

The following sections evaluate the comparison of the No Project Alternative with existing conditions in 2011, with short-term and long-term impacts addressed as appropriate.

Agriculture Resources

Implementation of the No Project Alternative would have no direct effect on agriculture as the Project would not result in construction of facilities or other direct conversion of land use or zoning. However, the No Project Alternative could have an indirect effect on agriculture as the availability of CVC Contract Water may be reduced to only 5 to 10 percent of average historic deliveries; using the 5 percent figure, the CVC Contractors would receive only 1,984 acre feet (af) of CVC Contract Water, which equates to 37,000 af reduction in average historic deliveries. It is expected that farmers will respond to reduced surface water supplies by increasing groundwater extraction. This represents an increased cost to farmers and, overtime, would cumulatively contribute to the overdraft condition in the regional aquifer; thereby, increasing pumping depth and pumping costs per acre-foot of groundwater used, as well as increasing the potential for land subsidence.

Groundwater pumping depths in the Project Area typically vary between 300 and 500 ft (refer to Section 3.7, Groundwater Resources). The associated cost to pump groundwater from this depth is approximately $85 to $150 per acre-foot. For crops requiring 2 to 3 af of water, this is equivalent to approximately $200 to $400 in groundwater pumping cost per acre. If this cost exceeds the net revenue from growing certain crops, farmers may respond by fallowing lands previously used to grow low-value crops. Farmers may also respond by fallowing if intensified groundwater pumping resulted in severe localized drops in groundwater levels. At the maximum level of impact to agriculture resources, if farmers fallowed all lands previously irrigated by the 37,000 af of surface water deliveries that would be lost under

the No Project Alternative, and assuming application of 2.5 af of water per acre, farmers may fallow up to 15,000 acres. As farmers have historically used groundwater, it is expected that groundwater will be substituted for reduced surface water supplies. Land fallowing is expected to be low, as long as groundwater supplies are available. However with implementation of SGMA, which requires local agencies to establish sustainable groundwater management plans to protect groundwater availability, groundwater pumping will likely be reduced over time. SGMA requires that by 2040 all high and medium priority groundwater basins achieve sustainability. Groundwater pumping would become less of an option as the SGMA is implemented, and fallowing agricultural land more likely.

Replacement of 90 to 95 percent of the historic surface water supply with groundwater will cause a return to the conditions in the Project Area that existed before construction of the CVC. As the water table declines and the cost of pumping increases, it is expected that land fallowing will increase or there will be a shift in crop patterns. However, even with additional fallowing, it is assumed under the No Project Alternative that direct conversion of farmland to other uses would not occur since these areas are currently zoned, designated, and historically used for agriculture. To assume farmland would be converted to non-agricultural uses is too speculative. Therefore the No Project Alternative would not conflict with existing zoning for agricultural use or a Williamson contract. However, if existing farmland is removed from production and fields are fallowed as a result of reduced water supplies, the No Project Alternative would reduce agricultural production potentially causing adverse effects to the regional economy, as well as potentially creating conflicts with Williamson Act contracts and policies pertaining to maintaining agriculture. Compared to the Proposed Project, the No Project Alternative could ultimately result in significant impacts on agriculture.

Air Quality

Under the No Project Alternative, additional groundwater pumping to make up for reduced surface water deliveries would occur. As a result, the electrical source for those pumps would be supplied from the electrical grid and not from CVP power. Power from the grid could come from power plants that are nuclear, hydroelectric, or fossil fuel burning. Reliance on fossil fuel burning power plants would lead to an increase in emissions. Also, farmers may choose to fallow land because of the reduced water supply. Fallowing land could lead to additional wind-borne dust emissions from vacant parcels. Estimating the change in emissions is speculative at this time because it is not known how farmers would react to a reduced surface water supply. However, the increase in dust emissions caused by fallowing would result in greater impacts on air quality compared to the Proposed Project.

Biological Resources

Under the No Project Alternative, CVP deliveries through SWP facilities to the CVC Contractor's water service areas would cease. Assuming the CVC Contractor's south-of-delta (SOD) water is allocated to another contractor, water deliveries from the Delta would be the same as under existing conditions. Therefore, no changes to habitat for common or special-status aquatic resources or to habitat that might affect the movement of native resident or migratory fish would occur as a result of water diversions or delivery. Further, continued operation and delivery of water would not involve construction or land disturbing activities that may impede migration.

Under the No Project Alternative, there could be changes in water deliveries to agricultural land and related changes in the types of crops grown and fallowing patterns. However, these changes are not expected to substantially affect native habitat for special-status plant or wildlife species or critical habitat in the vicinity of the croplands, interfere with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. The CVC Contractors would not be able to construct new diversions, expand their water use service areas, bring native or fallowed lands (fallowed for 3 years or more) into cultivation, or alter current environmental conditions without further environmental review and approval. Therefore, the No Project Alternative is not expected to result in any direct or indirect effects on special-status wildlife species (including federally listed or proposed species) or any critical habitat.

The No Project Alternative would also not affect any federally-protected wetlands, riparian habitat, or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS, because the CVC Contractors would not be able to construct new diversions, expand their water use service areas, bring native or fallowed lands (fallowed for 3 years or more) into cultivation, or alter current environmental conditions without further environmental review and approval.

In summary, similar to the Proposed Project, the No Project Alternative would not directly or indirectly impact biological resources.

Greenhouse Gas Emissions

Because of the reduced surface water deliveries under the No Project Alternative, many farmers would resort to pumping groundwater to make up for the reduced supply. As described above, under the No Project Alternative, the availability of CVC Contract Water could be reduced to 5 to 10 percent of average historic deliveries, resulting in increased groundwater pumping to make up the difference. Increased groundwater pumping to replace up to 95 percent of the historic surface water deliveries would result in increased greenhouse gas (GHG) emissions as a result of the increased electricity used for groundwater pumping, compared with the Proposed Project. While the pumping of groundwater would use electric pumps, the power would be supplied from the electrical grid and not from CVP power. Power from the grid could come from power plants that are nuclear, hydroelectric, or fossil fuel burning. To evaluate the change in GHG emissions under a No Project alternative, it was assumed that surface water would make up only 5 percent of CVC Contractor supplies, with the rest made up by groundwater pumping. Under this scenario, total GHG emissions for delivery of contract maximum deliveries are estimated to be 19,980 metric tons per year (MT/yr), compared to 9,440 MT/yr for delivery of the contract maximum with the Proposed Project. This would represent more than a doubling of GHG emissions, and a GHG emission rate of 19,980 MT/yr would approach the level considered by the U.S. Environmental Protection Agency (USEPA) and State of California to be a major GHG source. The GHG emissions for the No Project alternative if deliveries were at the historic levels are estimated to be about 4,180 MT/yr, compared with the estimated emissions of 2,000 MT/yr for the Proposed Project with historic deliveries. Therefore, there would be an overall increase in GHG emissions compared to the Proposed Project.

Hydrology and Water Quality (Surface Water Resources)

Under the No Project Alternative, surface water supplies to the Project Area would be provided through water transfers, exchanges, and/or conveyance agreements delivered through conveyance facilities other than the SWP. The source of water deliveries cannot be accurately known but based on historic practices, the supply would be reduced in the absence of SWP facilities.

As with the Proposed Project, implementation of the No Project Alternative would not result in construction of any new facilities or associated impervious surfaces. Therefore, the alternative would not result in: 1) any direct or indirect change in the direction of flow in any natural or man-made channels relative to existing conditions; 2) increased runoff and associated discharge of pollutants; 3) construction of housing within a 100-year flood hazard zone; or 4) new or increased exposure to the effects of tsunamis or seiches.

Hydrology and Water Quality (Groundwater Resources)

The No Project Alternative would significantly reduce the reliability of deliveries of surface water to the CVC contractors. If water transfers, exchanges, and/or conveyance agreements to convey the water to the CVC Contractors' water service areas are not successfully negotiated, it is probable that groundwater pumping would increase within the area served by the CVC Contractors to provide the needed supply. A reasonable estimate of the surface water supply under this alternative would be 5 to 10 percent of the average historic deliveries (Dalke pers. comm.). Assuming the lower estimate, the annual groundwater extraction within the service area could increase by 37,000 af per year. This volume represents

approximately 0.8 percent of the average annual groundwater pumping rate (4.6 million af per year) for the groundwater basins within the service area. The incremental increase in groundwater pumping could have an adverse effect on regional groundwater levels and regional overdraft. The effect would appear as localized decreases in groundwater levels if the additional extraction were concentrated in portions of the CVC Contractors' service areas (i.e., at individual wells or well clusters). The declines would be similar to the declines seen in the historic record (Appendix G) during drought periods. There is not sufficient evidence available to determine where within the service area concentrated extraction may occur.

The incremental increase in groundwater pumping could be up to 95 percent of the surface water supply, which would represent a return to conditions present in the 1970s before construction of the CVC. The expected additional pumping could contribute to the existing adverse impacts caused by the current overdraft condition in the regional aquifer, including reduced groundwater levels or storage, deterioration of groundwater quality due to higher concentration of salts, and potential subsidence. However with implementation of SGMA, which requires local agencies to establish sustainable groundwater management plans to protect groundwater, groundwater pumping will be reduced over time. SGMA requires that by 2040 all high and medium priority groundwater basins achieve sustainability. Groundwater pumping would become less of an option as the SGMA is implemented, and fallowing agricultural land more likely. Groundwater pumping (and associated impacts) would be reduced if fields Groundwater pumping (and associated impacts) would be reduced if fields are fallowed, but such reduced agricultural production has the potential of causing adverse effects to agriculture as well as the regional economy. It is likely there would be an increase in groundwater pumping under the No Project Alternative which would result in increased impacts to groundwater and its associated quality compared to the Proposed Project.

Land Use and Planning

No direct effects on land use are expected under the No Project Alternative, as no new facilities would be constructed and no facilities removed. However, the No Project Alternative may indirectly reduce planned development in Fresno County. In Fresno County, the County Service Area (CSA) #34 currently uses approximately 500 af per year for M&I purposes, which is less than the full amount of 1,520 af available to CSA #34 under the long-term exchange agreement with Arvin-Edison Water Storage District (AEWSD). Reduced receipt of CVC Contract water from AEWSD compared to existing conditions may prevent planned development to occur in the CSA #34 area. This development would occur in areas already approved for development in the planned community of Millerton New Town, and would be in accordance with the general policies and goals in the Fresno County General Plan, as well as the specific land use designations and goals outlined in the Millerton Specific Plan for the area served by CSA #34.

The No Project Alternative would not result in: 1) the division of an established community, 2) conflict with applicable policies or regulations, 3) conflict with applicable conservation plans, or 4) conflict with general land use designations. However, the No Project Alternative has the potential to create conflicts with planned development in the CSA #34 area. Therefore, the No Project Alternative could result in increased impacts compared to the Proposed Project.

Socioeconomics

No direct effects of the No Project Alternative on socioeconomics are expected as no new facilities would be constructed and no facilities removed. Consequently, the No Project Alternative would not result in the hiring of workers or the relocation of people. However, the No Project Alternative would result in indirect socioeconomic impacts if, as described above under agricultural resources, irrigation water costs to farmers rise and/or lands are fallowed. Increased costs results in reduced net income to farmers. Additionally, if farmers fallow lands, then total farm employment and farm labor income may decline in the region. Based on the data presented in Chapter 3 on total farm employment (137,600 employees) and total non-rangeland acres cultivated in the four-county region (5,194,970 acres), there is approximately one farm employee per 38 crop acres cultivated. If, in the maximum impact scenario, 15,000 acres are

fallowed (see discussion under agricultural resources), then not only will on-farm income decline, but there may be a reduction of up to 400 farm jobs. This maximum impact scenario is unlikely, however, as farmers have historically used groundwater to irrigate a diverse array of crops, and it is expected that at least in the short-term they will either substitute groundwater for reduced surface water supplies or potentially find alternative surface water supplies or conveyance methods. Fallowing could occur, particularly in the long-term with implementation of SGMA, which requires all high and medium priority groundwater basins achieve sustainability by 2040. Fallowing could occur if intensified groundwater pumping resulted in severe localized drops in groundwater levels and costs of groundwater pumping become too high or if well replacement becomes necessary and is too costly for farmers. The No Project Alternative therefore could result in 1) loss of agricultural production values or income, 2) reduction in regional economic activity due to land fallowing and/or 3) loss in property revenues realized by local governments. The potential socioeconomic impacts associated with the No Project Alternative would be greater than the Proposed Project.

4.2.2 Alternative 1: Water Code Section 1810 Short-Term Conveyance Agreements

This alternative allows CVC Contractors to negotiate an agreement with DWR to convey water under the provisions of Water Code sections 1810-1814. These provisions allow water to be conveyed in SWP facilities subject to available conveyance capacity, applicable regulatory constraints, and no harm to SWP contractors because of the conveyance of the water. These would be short-term, likely annual agreements, negotiated for each exchange or transfer that would be conveyed under the above provisions. Therefore, the CVC Contractors may be negotiating one or more of these agreements per year. This would generate additional costs and delays for negotiating the agreements, require additional CEQA review, and create substantial uncertainty in the timing and delivery of available water supply. There would be no guarantees from year to year that contract water would be available through these short-term agreements. The role of Reclamation in the conveyance would be reduced or eliminated, thereby reducing the opportunity for Reclamation and DWR to coordinate water delivery activities in the San Luis Canal (the joint facility). This alternative would result in annual water supply deliveries being 10 to 20 percent of the average historic deliveries. This estimate is based upon the fact that few if any water districts have successfully negotiated a wheeling agreement under Water Code sections 1810–1814 during the entire history of the Cross Valley Canal conveyance contract. The likelihood of success is very limited (Dalke pers. comm.).

Similar to the No Project Alternative, the CVC Contractors would likely increase groundwater pumping or potentially other water supplies as discussed under the No Project Alternative. The long-term increase in groundwater pumping would likely result in local conditions that were present before the CVC was constructed. However with implementation of the SGMA, which requires local agencies to establish sustainable groundwater management plans to protect groundwater availability, groundwater pumping will likely be reduced over time. SGMA requires that by 2040 all high and medium priority groundwater basins achieve sustainability. Groundwater pumping would become less of an option as the SGMA is implemented, and fallowing agricultural land more likely.

> There are constraints on this alternative that could influence its feasibility. They are:

> Conveyance services are limited to 75 percent of unused Aqueduct capacity.

> Conveyance is available to a “bona fide transferor.” Section 1811(a) defines “bona fide transferor” as an entity with a contract for sale of water. The CVP water service contracts are not characterized as water sales. Exchanges of the CVP water with third parties (see Chapter 2) may be considered water sales.

> Water conveyance under 1810 is subject to displacement or interruption by any SWP water service contractor that requires conveyance services.

> Each individual transfer or exchange would have to be negotiated with DWR.

4.2.2.1 Impact Analysis

The following sections evaluate the comparison of Alternative 1 with existing conditions in 2011 and the Proposed Project, with short- and long-term impacts addressed, as appropriate.

Agriculture Resources

Implementation of Alternative 1 would have no direct effects on agriculture, as Alternative 1 would not result in the construction of facilities or other direct conversion of land use or zoning. However, Alternative 1 could have an indirect effect on agriculture as the reliability of surface water deliveries would be significantly reduced to 10 to 20 percent of average historic deliveries; using the 10 percent figure this equates to 35,000 af reduction of historic CVC Contract Water deliveries. It is expected that farmers will respond to reduced surface water supplies by increasing groundwater extraction. This represents an increased cost to farmers, and over time, would cumulatively contribute to the overdraft condition in the regional aquifer; thereby increasing pumping depth and pumping costs per acre-foot of groundwater used, as well as increasing the potential for land subsidence.

Groundwater pumping depths in the Project Area typically vary between 300 and 500 ft (refer to Section 3.7, Groundwater Resources); the associated cost to pump groundwater from this depth is approximately $85 to $150 per acre-foot. For crops requiring 2 to 3 af of water, this is equivalent to approximately $200 to $400 in groundwater pumping cost per acre. If this cost exceeds the net revenue from growing certain crops, farmers may respond by fallowing lands previously used to grow low-value crops. Farmers may also respond by fallowing if intensified groundwater pumping resulted in severe localized drops in groundwater levels. At the maximum level of impact to agriculture resources, if farmers fallowed all lands previously irrigated by the 35,000 af of historic CVC Contract Water deliveries, and assuming application of 2.5 af of water per acre, farmers may fallow up to 14,000 acres. As farmers have historically used groundwater, it is expected that groundwater will be substituted for reduced surface water supplies. Land fallowing is expected to be low, as long as groundwater supplies are available. However with implementation of SGMA, which requires local agencies to establish sustainable groundwater management plans to protect groundwater availability, groundwater pumping will likely be reduced over time. SGMA requires that by 2040 all high and medium priority groundwater basins achieve sustainability. Groundwater pumping would become less of an option as the SGMA is implemented, and fallowing agricultural land more likely.

The maximum impact scenario under this alternative is unlikely. Land fallowing is expected to be low in most years due to either groundwater extraction or the use of substitute surface water supplies available through transfers, exchanges, or other conveyance agreements to deliver water through non-SWP facilities. Alternative 1 is not expected to result in the direct conversion of farmland to other uses, such as urban uses, and therefore would not conflict with existing zoning for agricultural use or a Williamson contract. However, if existing farmland is removed from production and fields are fallowed as a result of reduced water supplies, Alternative 1 would reduce agricultural production potentially causing adverse effects to the regional economy, as well as potentially creating conflicts with Williamson Act contracts and policies pertaining to maintaining agriculture. Compared to the Proposed Project, Alternative 1 could result in potentially significant impacts on agriculture.

Air Quality

Air quality impacts would be similar to those described under the No Project Alternative and are speculative at this time because the magnitude of the change is surface water supply and the associated response of the farmers is unknown. In general, an increased reliance on groundwater will increase the power requirements associated with pumping which in turn could impact air quality depending on the source of the power. Power from the grid could come from power plants that are nuclear, hydroelectric, or fossil fuel burning. Reliance on fossil fuel burning power plants would lead to an increase in emissions. Also, farmers may choose to fallow land because of the reduced water supply. In addition, the fallowing of lands could lead to dust generation and associated air quality impacts. Therefore the impact to air quality under Alternative 1 would be greater compared to the Proposed Project.

Biological Resources

The impacts to biological resources from implementation of Alternative 1 would be similar to those described under the No Project Alternative. There could be changes in water deliveries to agricultural land and related changes in the types of crops grown and fallowing patterns. However, these changes are not expected to substantially affect native habitat for special-status plant or wildlife species or critical habitat in the vicinity of the croplands, interfere with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. The CVC Contractors would not be able to construct new diversions, expand their water use service areas, bring native or fallowed lands into cultivation, or alter current environmental conditions without further environmental review and approval. Therefore, as with the Proposed Project, Alternative 1 would not directly or indirectly impact biological resources.

Greenhouse Gas Emissions

GHG emissions would be similar to those described under the No Project Alternative, although slightly less in magnitude because 80-90 percent of historic deliveries could be replaced with groundwater pumping under this alternative, compared to 90-95 percent under the No Project alternative. The exact magnitude of the increase in GHG emissions is unknown because the change is surface water supply and the associated response of the farmers is unknown. However, increased pumping would result in increased GHG emissions compared to the Proposed Project.

Hydrology and Water Quality (Surface Water Resources)

Under Alternative 1, surface water supplies to the Project Area would be provided through water transfers, exchanges, and/or conveyance agreements delivered through SWP facilities. The source of water deliveries would be similar to those provided under existing conditions. Therefore, no change in the quality of water delivered to the CVC Contractors would be expected. It is possible, however, that the quantity of delivered water could be reduced due to uncertainties associated with securing individual transfers. Reduced deliveries would not be expected to adversely affect the flow of streams within the service area.

Alternative 1 would not result in construction of any new facilities or associated impervious surfaces. Therefore, Alternative 1 would not result in: 1) any direct or indirect change in the direction of flow in any natural or man-made channels relative to existing conditions; 2) increased runoff and associated discharge of pollutants; 3) construction of housing within a 100-year flood hazard zone; or 4) new or increased exposure to the effects of tsunamis or seiches. Therefore, Alternative 1 impacts to surface water would be similar to the Proposed Project.

Hydrology and Water Quality (Groundwater Resources)

Alternative 1 would be expected to significantly reduce the reliability of deliveries of surface water to the CVC contractors. If water transfers, exchanges, and/or conveyance agreements to convey the water to the CVC Contractors' water use service areas are not successfully negotiated (and deliveries of surface supplies are reduced), it is possible that groundwater pumping would increase within the area served by the CVC to provide the needed supply. A reasonable estimate of the surface water supply under this alternative would be 10 to 20 percent of the average historic deliveries. Assuming the lower estimate, the annual groundwater extraction within the service area could increase by 35,000 af per year. This volume represents approximately 0.8 percent of the average annual groundwater pumping rate (4.6 million af per year) for the groundwater basins within the service area. The incremental increase in groundwater pumping would have a negligible effect on regional groundwater levels. However, localized decreases in groundwater levels would occur if the additional extraction were concentrated in the CVC service area (i.e., at individual wells). There is not sufficient evidence available to determine where within the service area concentrated extraction may occur. Such an increase in groundwater pumping to replace up to 90 percent of the surface water supply could have localized impacts, similar to conditions that were present before the CVC was

constructed (Appendix G). However with implementation of the SGMA, which requires local agencies to establish sustainable groundwater management plans to protect groundwater availability, groundwater pumping will likely be reduced over time. SGMA requires that by 2040 all high and medium priority groundwater basins achieve sustainability. Groundwater pumping would become less of an option as the SGMA is implemented, and fallowing agricultural land more likely.

Although the incremental increase in groundwater pumping would not result in substantial or significant adverse impacts on groundwater levels or storage, the increased extraction would cumulatively contribute to the overdraft condition in the regional aquifer resulting in a greater impact to groundwater resources compared to the Proposed Project. However, the potential effects of increased groundwater pumping could be offset by the option for farmers to fallow fields to reduce the demand for surface water or ground water supplies.

Land Use and Planning

As with the Proposed Project no direct effects on land use are expected under Alternative 1, as no new facilities would be constructed and no facilities removed. However, similar to the No Project Alternative, Alternative 1 may indirectly reduce planned development in Fresno County, as reduced receipt of CVC Contract water from AEWSD compared to existing conditions may prevent planned development to occur in the CSA #34 area.

Alternative 1 would not result in: 1) the division of an established community, 2) conflict with applicable policies or regulations, 3) conflict with applicable conservation plans, or 4) conflict with general land use designations. However, Alternative 1 has the potential to create conflicts with planned development in the CSA #34 area. Therefore, Alternative 1 could result in increased impacts compared to the Proposed Project.

Socioeconomics

No direct effects of Alternative 1 on socioeconomics are expected, as no new facilities would be constructed and no facilities removed. Consequently, Alternative 1 would not result in the hiring of workers or the relocation of people. However, similar to the No Project Alternative, Alternative 1 would result in indirect socioeconomic impacts if, as described above under agricultural resources, costs to farmers rise and/or lands are fallowed. Increased costs results in reduced net income to farmers. Additionally, if farmers fallow lands, then total farm employment and farm labor income may decline in the region. Based on the data presented in Chapter 3 on total farm employment (137,600 employees) and total non-rangeland acres cultivated in the four-county region (5,194,970 acres), there is approximately one farm employee per 38 crop acres cultivated. If, in the maximum impact scenario, 14,000 acres are fallowed (see discussion under agricultural resources), then not only will on-farm income decline, but there may be a reduction of up to 370 farm jobs. This maximum impact scenario is unlikely, however, as farmers have historically used groundwater to irrigate a diverse array of crops, and it is expected that in the short-term at least they will either substitute groundwater for reduced surface water supplies or potentially find alternative surface water supplies or conveyance methods. Fallowing could occur, particularly in the long-term with implementation of SGMA, which requires all high and medium priority groundwater basins achieve sustainability by 2040. Fallowing could occur if intensified groundwater pumping resulted in severe localized drops in groundwater levels and costs of groundwater pumping become too high or if well replacement becomes necessary and is too costly for farmers.

Thus, while in the short-term Alternative 1 may not result in significant socioeconomic impacts, in the long-term there could be: 1) loss of agricultural production values or income, 2) reduction in regional economic activity due to land fallowing, or 3) loss in property revenues realized by local governments. Furthermore, if farmers increase groundwater pumping to offset potential reductions in surface water, then on-farm income would be reduced due to increased costs of irrigation water. Therefore, the potential socioeconomic impacts associated with Alternative 1 would be greater than the Proposed Project.

4.2.3 Alternative 2: Short-Term Exchange Agreements with SWP Contractor

In this alternative, the CVC Contractors negotiate short-term agreements of transfers or exchanges of water with the long term SWP Contractor. The long term SWP Contractor may request of DWR conveyance services utilizing Article 55 of that SWP contractor's contract to convey the procured non-SWP water. Such an agreement would be subject to DWR having capacity to convey the non-SWP water without compromising the delivery of its SWP supplies for that year, meeting applicable regulatory constraints, and causing no harm to other SWP Contractors.

Similar to Alternative 1, agreements would be negotiated for each exchange or transfer with tremendous variability within a year and between years due to a limited number of potential SWP partners in any given year. This alternative would generate additional costs for negotiating the transfer or exchange agreements and environmental compliance. Agreements utilizing Article 55 of the SWP contractor's long-term contract with DWR would have increased priority in the delivery of available water supply over water conveyed through short-term agreements under Water Codes sections 1810-1814 or the Proposed Project since Article 55 agreements would fall under the priorities set forth in the respective long-term SWP Contract. Several contractors have utilized Article 55. Based on this historic record, Alternative 2 would result in surface water deliveries being about 50 percent of the average historic deliveries.

Similar to the No Project Alternative, the CVC Contractors would likely increase groundwater pumping or potentially other water supplies as discussed under the No Project Alternative. However with implementation of the SGMA, which requires local agencies to establish sustainable groundwater management plans to protect groundwater availability, groundwater pumping will likely be reduced over time. SGMA requires that by 2040 all high and medium priority groundwater basins achieve sustainability. Groundwater pumping would become less of an option as the SGMA is implemented, and fallowing agricultural land more likely.

There are constraints on this alternative that could influence its feasibility. They are:

> Use of Article 55 conveyance must involve a transfer or exchange with a long term SWP contractor.

> Generally SWP contractors have little need for CVC water that is available only in the spring or fall. However, if the CVC contractor were to offer a 2 for 1 exchange, a SWP contractor could be interested if the SWP contractor had local storage available either in surface storage, groundwater banking, or the SWP share of San Luis Reservoir in years when this reservoir does not fill.

4.2.3.1 Impact Analysis

The following sections evaluate the comparison of Alternative 2 with existing conditions in 2011 and the Proposed Project, with short- and long-term impacts addressed, as appropriate.

Agriculture Resources

Implementation of Alternative 2 would have no direct effects on agriculture, as Alternative 2 would not result in construction of facilities or other direct conversion of land use or zoning. However, Alternative 2 could have an indirect effect on agriculture as the reliability of surface water deliveries would be reduced to 50 percent of average historic deliveries; using the 50 percent figure this equates to 19,500 af of reduction in historic CVC Contract Water deliveries. It is expected that farmers will respond to reduced surface water supplies by increasing groundwater extraction. This represents an increased cost to farmers, and overtime, would cumulatively contribute to the overdraft condition in the regional aquifer (thereby increasing pumping depth and pumping costs per acre-foot of groundwater used).

Groundwater pumping depths in the Project Area typically vary between 300 and 500 ft (refer to Section 3.7, Groundwater Resources); the associated cost to pump groundwater from this depth is approximately $85 to $150 per acre-foot. For crops requiring 2 to 3 af of water, this is equivalent to approximately $200 to $400 in groundwater pumping cost per acre. If this cost exceeds the net revenue from growing certain crops,

farmers may respond by fallowing lands previously used to grow low-value crops. Farmers may also respond by fallowing if intensified groundwater pumping resulted in severe localized drops in groundwater levels. At the maximum level of impact to agriculture resources, if farmers fallowed all lands previously irrigated by the 19,500 af of historic CVC Contract Water deliveries, and assuming application of 2.5 af of water per acre, farmers may fallow up to 7,800 acres. As farmers have historically used groundwater, it is expected that groundwater will be substituted for reduced surface water supplies. This maximum impact scenario is unlikely. Land fallowing is expected to be low in most years due to either groundwater extraction or the use of substitute surface water supplies available through transfers, exchanges, or other conveyance agreements to deliver water through non-SWP facilities. However with implementation of SGMA, which requires local agencies to establish sustainable groundwater management plans to protect groundwater availability, groundwater pumping will likely be reduced over time. SGMA requires that by 2040 all high and medium priority groundwater basins achieve sustainability. Groundwater pumping would become less of an option as the SGMA is implemented, and fallowing agricultural land more likely.

Alternative 2 is not expected to result in the direct conversion of farmland to other uses, such as urban uses, and therefore would not conflict with existing zoning for agricultural use or a Williamson contract. However, if existing farmland is removed from production and fields are fallowed as a result of reduced water supplies, Alternative 2 would reduce agricultural production potentially causing adverse effects to the regional economy, as well as potentially creating conflicts with Williamson Act contracts and policies pertaining to maintaining agriculture. Compared to the Proposed Project, Alternative 2 could result in potentially significant impacts on agriculture.

Air Quality

Air quality impacts would be similar to those described under the No Project Alternative but with a reduced potential for dust impacts from fallowed lands. The overall effects are speculative at this time, because the magnitude of the change is surface water supply and the associated response of the farmers is unknown. In general, an increased reliance on groundwater would increase the power requirements associated with pumping which in turn could impact air quality depending on the source of the power. Power from the grid could come from power plants that are nuclear, hydroelectric, or fossil fuel burning. Reliance on fossil fuel burning power plants would lead to an increase in emissions. Also, farmers may choose to fallow land because of the reduced water supply. In addition, the fallowing of lands could lead to dust generation and associated air quality impacts. Therefore, the impact to air quality would be greater under Alternative 2 compared to the Proposed Project.

Biological Resources

The impacts to biological resources from implementation of Alternative 2 would be similar to those described under the No Project Alternative and Alternative 1. There could be changes in water deliveries to agricultural land and related changes in the types of crops grown and fallowing patterns. However, these changes are not expected to substantially affect native habitat for special-status plant or wildlife species or critical habitat in the vicinity of the croplands, interfere with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. The CVC Contractors would not be able to construct new diversions, expand their water use service areas, bring native or fallowed lands into cultivation, or alter current environmental conditions without further environmental review and approval. Therefore, as with the Proposed Project, Alternative 2 would not directly or indirectly impact biological resources.

Greenhouse Gas Emissions

GHG emissions would increase under this alternative. Impacts would be similar to those described under the No Project Alternative, although less in magnitude because about 50 percent of historic deliveries could be replaced with groundwater pumping under this alternative, compared to 90-95 percent under the No Project alternative. The exact magnitude of the increase in GHG emissions is unknown because the

change is surface water supply and the associated response of the farmers is unknown. However increased pumping would result in increased GHG emissions compared to the Proposed Project.

Hydrology and Water Quality (Surface Water Resources)

Similar to the Proposed Project and Alternative 1, surface water supplies to the Project Area under Alternative 2 would be provided through water transfers, exchanges, and/or conveyance agreements delivered through the SWP. The source of water deliveries would be reduced from deliveries provided under existing conditions. Therefore, a reduction in the quantity of water delivered to the CVC Contractors would be expected. This is because of uncertainties associated with securing individual transfers. Implementation of Alternative 2 would not result in construction of any new facilities or associated impervious surfaces. Therefore, Alternative 2 would not result in: 1) any direct or indirect change in the direction of flow in any natural or man-made channels relative to existing conditions; 2) increased runoff and associated discharge of pollutants; 3) construction of housing within a 100-year flood hazard zone; or 4) new or increased exposure to the effects of tsunamis or seiches. Therefore, Alternative 2 impacts to surface water would be similar to the Proposed Project.

Hydrology and Water Quality (Groundwater Resources)

Under Alternative 2, the uncertainty of negotiating year-to-year contracts with other SWP Contractors would be expected to reduce the reliability of deliveries of surface water to the CVC Contractors. If water transfers, exchanges, and/or conveyance agreements to convey the water to the CVC Contractors' water use service areas are not successfully negotiated (and deliveries of surface supplies are reduced), it is possible that groundwater pumping would increase within the area served by the CVC to provide the needed supply. A reasonable estimate of the surface water supply under this alternative would be 50 percent of the average historic deliveries (Dalke pers. comm.). The annual groundwater extraction within the service area could increase by 19,500 af per year. This volume represents approximately 0.4 percent of the average annual groundwater pumping rate (4.6 million af per year) for the groundwater basins within the Project Area. The incremental increase in groundwater pumping would have a negligible effect on regional groundwater levels. However, localized decreases in groundwater levels would occur if the additional extraction were concentrated in the CVC service area (i.e., at individual wells). There is not sufficient evidence available to determine where within the service area concentrated extraction may occur. Additional pumping in localized areas to replace up to 50 percent of the lost surface water supply could cause a decline in groundwater storage similar to that experienced before the CVC was in operation or as experienced in drought periods (Appendix G). However with implementation of SGMA, which requires local agencies to establish sustainable groundwater management plans to protect groundwater, groundwater pumping will be reduced over time. SGMA requires that by 2040 all high and medium priority groundwater basins achieve sustainability. Groundwater pumping would become less of an option as the SGMA is implemented, and fallowing agricultural land more likely.

Although the incremental increase in groundwater pumping would not result in substantial or significant adverse impacts on groundwater levels or storage, the increased extraction would cumulatively contribute to the overdraft condition in the regional aquifer resulting in increased impacts to groundwater resources compared to the Proposed Project. The potential effects of increased groundwater pumping could be offset by the option for farmers to fallow fields to reduce the demand for surface water or groundwater supplies.

Land Use and Planning

As with the Proposed Project, no direct effects on land use are expected under Alternative 2, as no new facilities would be constructed and no facilities removed. However, similar to the No Project Alternative, Alternative 2 may indirectly reduce planned development in Fresno County, as reduced receipt of CVC Contract water from AEWSD compared to existing conditions may prevent planned development to occur in the CSA #34 area.

Alternative 2 would not result in: 1) the division of an established community, 2) conflict with applicable policies or regulations, 3) conflict with applicable conservation plans, or 4) conflict with general land use designations. However, Alternative 2 has the potential to create conflicts with planned development in the CSA #34 area. Therefore, Alternative 2 could result in increased impacts compared to the Proposed Project.

Socioeconomics

No direct effects of Alternative 2 on socioeconomics are expected to occur, as no new facilities would be constructed and no facilities removed. Consequently, Alternative 2 would not result in the hiring of workers or the relocation of people. However, similar to the No Project Alternative, Alternative 2 would result in indirect socioeconomic impacts if, as described above under agricultural resources, costs to farmers rise and/or lands are fallowed. Increased costs results in reduced net income to farmers. Additionally, if farmers fallow lands, then total farm employment and farm labor income may decline in the region. Based on the data presented in Chapter 3 on total farm employment (137,600 employees) and total non-rangeland acres cultivated in the four-county region (5,194,970 acres), there is approximately one farm employee per 38 crop acres cultivated. If, in the maximum impact scenario, 7,800 acres are fallowed (see discussion under agricultural resources), then not only will on-farm income decline, but there may be a reduction of up to 200 farm jobs. This maximum impact scenario is unlikely, however, as farmers have historically used groundwater to irrigate a diverse array of crops, and it is expected at least in the short-term that they will either substitute groundwater for reduced surface water supplies or potentially find alternative surface water supplies or conveyance methods. Fallowing could occur, particularly in the long-term with implementation of SGMA, which requires all high and medium priority groundwater basins achieve sustainability by 2040. Fallowing could occur if intensified groundwater pumping resulted in severe localized drops in groundwater levels and costs of groundwater pumping become too high or if well replacement becomes necessary and is too costly for farmers. Thus, while in the short-term Alternative 2 may not result in significant socioeconomic impacts, in the long-term there could be: 1) loss of agricultural production values or income, 2) reduction in regional economic activity due to land fallowing, and/or 3) loss in property revenues realized by local governments. Furthermore, if farmers increase groundwater pumping to offset potential reductions in surface water, then on-farm income would be reduced due to increased costs of irrigation water. Therefore, the potential socioeconomic impacts associated with Alternative 2 would be greater than the Proposed Project.

4.2.4 Alternative 3: Short Term Conveyance Obligations

This alternative allows existing IRCs to continue to be renewed so that DWR's existing contractual obligations to convey CVC Contract water remains in place. Continued renewal of existing IRCs would allow DWR to continue to convey the water for 1- to 2-year periods. This is similar to existing conditions in that the CVC Contractors are currently provided with conveyance from DWR pursuant to existing IRCs. This alternative would result in improved reliability in the water supply over Alternatives 1 and 2 but not to the extent of the Proposed Project. This would generate additional costs for negotiating the renewal of the existing IRCs every 1 to 2 years. Furthermore, the United States would not have met its statutory mandate pursuant to the CVPIA to enter into long-term water supply contracts with the CVC Contractors, which would substantially undermine water supply reliability and potentially compromise long-term water resource management and planning efforts being undertaken by the CVC Contractors. This alternative would result in surface water deliveries of about 80 to 90 percent of the average historic deliveries. This estimate is based upon the fact that it can take up to 5 months to acquire approvals from DWR and Reclamation for exchanges. Because of the difficulty of identifying annual exchange partners in advance of knowing the availability of the water supply and the time required for approvals, often puts the time frame for this type of program outside the period when the water is needed (Dalke pers. comm.). The reductions in water deliveries relates to the timing of available water relative to the time it takes to get regulatory and permit approvals to transfer, exchange, and conveyance of the water. This process can often take months and by the time it is completed, the water identified for transfer is no longer available.

Similar to the No Project Alternative, the CVC Contractors would likely increase groundwater pumping or potentially develop and utilize other water supplies as discussed under the No Project Alternative. However with implementation of the SGMA, which requires local agencies to establish sustainable groundwater management plans to protect groundwater availability, groundwater pumping will likely be reduced over time. SGMA requires that by 2040 all high and medium priority groundwater basins achieve sustainability. Groundwater pumping would become less of an option as the SGMA is implemented, and fallowing agricultural land more likely.

4.2.4.1 Impact Analysis

The following sections evaluate the comparison of Alternative 3 with existing conditions in 2011 and the Proposed Project, with short- and long-term impacts addressed, as appropriate.

Agriculture Resources

Implementation of Alternative 3 would have no direct effects on agriculture, as Alternative 3, similar to all the other alternatives, would not result in construction of facilities or other direct conversion of land use or zoning. However, Alternative 3 could have an indirect effect on agriculture as the reliability of surface water deliveries would be reduced to 80 to 90 percent of average historic CVC Contract Water deliveries; using the 10 percent figure this equates to 7,800 af reduction of surface water. It is expected that farmers will respond to reduced surface water supplies by increasing groundwater extraction. This represents an increased cost to farmers, and overtime, would cumulatively contribute to the overdraft condition in the regional aquifer (thereby increasing pumping depth and pumping costs per acre-foot of groundwater used).

Groundwater pumping depths in the Project Area typically vary between 300 and 500 ft (refer to Section 3.7, Groundwater Resources); the associated cost to pump groundwater from this depth is approximately $85 to $150 per acre-foot. For crops requiring 2 to 3 af of water, this is equivalent to approximately $200 to $400 in groundwater pumping cost per acre. If this cost exceeds the net revenue from growing certain crops, farmers may respond by fallowing lands previously used to grow low-value crops. Farmers may also respond by fallowing if intensified groundwater pumping resulted in severe localized drops in groundwater levels. At the maximum level of impact to agriculture resources, if farmers fallowed all lands previously irrigated by the 7,800 af of surface water deliveries, and assuming application of 2.5 af of water per acre, farmers may fallow up to 3,100 acres. As farmers have historically used groundwater, and are expected to substitute groundwater for reduced surface water supplies, this maximum impact scenario is unlikely. Land fallowing is expected to be low in most years due to either groundwater extraction or the use of substitute surface water supplies available through transfers, exchanges, or other conveyance agreements to deliver water through non-SWP facilities. However with implementation of SGMA, which requires local agencies to establish sustainable groundwater management plans to protect groundwater availability, groundwater pumping will likely be reduced over time. SGMA requires that by 2040 all high and medium priority groundwater basins achieve sustainability. Groundwater pumping would become less of an option as the SGMA is implemented, and fallowing agricultural land more likely.

Alternative 3 is not expected to result in the direct conversion of farmland to other uses, such as urban uses, and therefore would not conflict with existing zoning for agricultural use or a Williamson contract. However, if existing farmland is removed from production and fields are fallowed as a result of reduced water supplies, Alternative 3 would reduce agricultural production potentially causing adverse effects to the regional economy, as well as potentially creating conflicts with Williamson Act contracts and policies pertaining to maintaining agriculture. Compared to the Proposed Project, Alternative 3 could result in potentially significant impacts on agriculture.

Air Quality

Air quality impacts would be similar to those that currently occur because it is anticipated that water would continue to be conveyed either via gravity flow or electric pumps served by CVP hydropower facilities. Therefore, as with the Proposed Project, Alternative 3 is not expected to create significant air quality impacts.

Biological Resources

Under Alternative 3, there could be changes in water deliveries to agricultural land and related changes in the types of crops grown and fallowing patterns. However, these changes are not expected to substantially affect native habitat for special-status plant or wildlife species or critical habitat in the vicinity of the croplands, interfere with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. The CVC Contractors would not be able to construct new diversions, expand their water use service areas, bring native or fallowed lands into cultivation, or alter current environmental conditions without further environmental review and approval. Therefore, as with the Proposed Project, Alternative 3 would not directly or indirectly impact biological resources.

Greenhouse Gas Emissions

GHG emissions would slightly increase under Alternative 3 compared to the Proposed Project, but be less than the No Project Alternative since groundwater pumping would still be expected, resulting in increased electricity use and subsequent GHG emissions. The exact magnitude of the increase in GHG emissions is unknown because the change in surface water supply and the associated response of the farmers is unknown. However increased pumping would result in increased GHG emissions compared to the Proposed Project.

Hydrology and Water Quality (Surface Water Resources)

Under Alternative 3, no direct or indirect change in the quality of water delivered to the CVC Contractors would be expected. The water supply source(s) would remain the same as would the means of conveyance. Potential sources of contaminants, such as accidental spills or leaks into the conveyance system or the source water, would be similar to those under existing conditions. The potential for source water to infiltrate to groundwater would remain the same. It is possible that the CVC Contractors' supply could be exchanged to supplement existing groundwater banking facilities.

Alternative 3 does not involve the construction of any new facilities or associated impervious surfaces. Therefore, Alternative 3 would not result in: 1) any direct or indirect change in the direction of flow in any natural or man-made channels relative to existing conditions; 2) increased runoff and associated discharge of pollutants; 3) construction of housing within a 100-year flood hazard zone; or 4) new or increased exposure to the effects of tsunamis or seiches. Therefore, Alternative 3 impacts to surface water would be similar to the Proposed Project.

Hydrology and Water Quality (Groundwater Resources)

Under Alternative 3, the uncertainty of negotiating renewals of existing IRCs with DWR could result in reduced reliability for deliveries of surface water to the CVC Contractors. If interim contracts to convey the water to the CVC Contractors' water use service areas are not successfully negotiated (and deliveries of surface supplies are reduced), it is possible that groundwater pumping would increase within the area served by the CVC to provide the needed supply. A reasonable estimate of the surface water supply under this alternative would be 80 to 90 percent of the average historic deliveries (Dalke pers. comm.). Assuming the lower estimate, the annual groundwater extraction within the Project Area could increase by 7,800 af per year. This volume represents approximately 0.2 percent of the average annual groundwater pumping rate (4.6 million af per year) for the groundwater basins within the Project Area. The incremental increase in groundwater pumping would have a negligible effect on regional groundwater levels. Localized decreases in

groundwater levels could occur if the additional extraction were concentrated in CVC service area (i.e., at individual wells). However with implementation of the SGMA, which requires local agencies to establish sustainable groundwater management plans to protect groundwater availability, groundwater pumping will likely be reduced over time. SGMA requires that by 2040 all high and medium priority groundwater basins achieve sustainability. Groundwater pumping would become less of an option as the SGMA is implemented, and fallowing agricultural land more likely. There is not sufficient evidence available to determine where within the CVC Contractors' water use service areas concentrated extraction may occur. There would be localized decline in groundwater levels but to a lesser extent than under the No Project Alternative (Appendix G).

Although the incremental increase in groundwater pumping would not result in substantial or significant adverse impacts on groundwater levels or storage, the increased extraction would cumulatively contribute to the overdraft condition in the regional aquifer compared to the Proposed Project. The potential effects of increased groundwater pumping could be offset by the option for farmers to fallow fields to reduce the demand for surface water or groundwater supplies.

Land Use and Planning

No direct effects on land use and planning are expected under Alternative 3, as no new facilities would be constructed and no facilities removed. However, similar to the other action alternatives, Alternative 3 may indirectly reduce planned development in Fresno County, as reduced receipt of CVC Contract water from AEWSD compared to existing conditions may prevent planned development to occur in the CSA #34 area. Alternative 3 would not result in: 1) the division of an established community, 2) conflict with applicable policies or regulations, 3) conflict with applicable conservation plans, or 4) conflict with general land use designations. However, the Alternative 3 has the potential to create conflicts with planned development in the CSA #34 area. Therefore, Alternative 3 could result in increased impacts compared to the Proposed Project.

Socioeconomics

No direct effects of Alternative 3 on socioeconomics are expected, as no new facilities would be constructed and no facilities removed. Consequently, Alternative 3 would not result in the hiring of workers or the relocation of people. However, similar to the No Project Alternative, Alternative 3 would result in indirect socioeconomic impacts if, as described above under agricultural resources, costs to farmers rise and/or lands are fallowed. Increased costs results in reduced net income to farmers. Additionally, if farmers fallow lands, then total farm employment and farm labor income may decline in the region. Based on the data presented in Chapter 3 on total farm employment (137,600 employees) and total non-rangeland acres cultivated in the four-county region (5,194,970 acres), there is approximately one farm employee per 38 crop acres cultivated. If, in the maximum impact scenario, 3,100 acres are fallowed (see discussion under agricultural resources), then not only will on-farm income decline, but there may be a reduction of up to 80 farm jobs. This maximum impact scenario is unlikely, however, as farmers have historically used groundwater to irrigate a diverse array of crops, and it is expected at least in the short-term that they will either substitute groundwater for reduced surface water supplies or potentially find alternative surface water supplies or conveyance methods. Fallowing could occur, particularly in the long-term with implementation of SGMA, which requires all high and medium priority groundwater basins achieve sustainability by 2040. Fallowing could occur if intensified groundwater pumping resulted in severe localized drops in groundwater levels and costs of groundwater pumping become too high or if well replacement becomes necessary and is too costly for farmers.

Thus, while in the short-term Alternative 3 is not expected to result in: 1) the substantial loss of agricultural production values or income, 2) reduction in regional economic activity due to land fallowing, or 3) loss in property revenues realized by local governments some of these effects may be felt in the long-term if severe localized groundwater declines are experienced. Furthermore, if farmers increase groundwater pumping to offset potential reductions in surface water, then on-farm income would be

reduced due to increased costs of irrigation water. Therefore, the potential socioeconomic impacts associated with Alternative 3 would be greater than the Proposed Project.

4.2.5 Alternative 4. Constrained Delta Exports

This alternative assumes that application of export regulations or similar uncontrollable circumstances has severely curtailed Delta exports at both the state and federal pumping plants, and there is only enough export capacity to meet the SWP contractor requests. Likewise, the ability to seek exchanges and transfers for CVP supply with CVP Contractors utilizing the DMC is similarly curtailed. Under this scenario there is no additional export capacity in the Delta to pump the CVC contract water. Therefore, Delta diversions to CVC would cease and most or all of that water supply would flow downstream to the Pacific Ocean. The water supply could only be delivered through exchanges not involving Delta pumping, which would be limited to those entities with local access to the Delta or eastside tributaries in the San Joaquin Valley.

Similar to the No Project Alternative, the CVC Contractors would likely increase groundwater pumping, but in this case to a greater extent. That is because the potential to utilize other water supplies as discussed under the No Project Alternative would also not be available under this alternative. The exact form of the conversion to other water supplies, if available at all, would be through entities with local access to the Delta, therefore it assumed that groundwater would be a primary component of the water supply. However with implementation of the SGMA, which requires local agencies to establish sustainable groundwater management plans to protect groundwater availability, groundwater pumping will likely be reduced over time. SGMA requires that by 2040 all high and medium priority groundwater basins achieve sustainability. Groundwater pumping would become less of an option as the SGMA is implemented, and fallowing agricultural land more likely.

There are constraints on this alternative that could influence its feasibility. They are:

> The magnitude of the remaining export capacity is a function of hydrology (water year type), upstream storage, and in-Delta conditions and is variable throughout the year and between years. While the export capacity may change, this alternative assumes the CVC Contractor access to the capacity would remain zero under this alternative due to export restrictions or other uncontrollable circumstances.

> Competition for water delivered through transfers and exchanges will be maximized under this alternative. This alternative assumes that the reduction in exports at Banks is not a pre-planned event and therefore, SWP contractors will not receive the deliveries they had anticipated resulting in a reduced delivery to SWP for the period the constraint is in effect. SWP contractors will also be seeking additional water supplies to offset any reductions in planned deliveries and therefore competition of transfers and exchanges will increase.

> Therefore, for the assumptions above, groundwater use would be greater under this alternative compared with the No Project Alternative.

4.2.5.1 Impact Analysis

The following sections evaluate the comparison of Alternative 4 with existing conditions in 2011 and the Proposed Project, with short- and long-term impacts addressed, as appropriate.

Agriculture Resources

Implementation of Alternative 4 would have no direct effects on agriculture because Alternative 4, similar to all the other alternatives, would not result in construction of facilities or other direct conversion of land use or zoning. However, Alternative 4 could have an indirect effect on agriculture as the reliability of surface water deliveries would be reduced to 0 percent of average historic CVC Contract Water deliveries through the Aqueduct. Under a 100 percent reduction, this equates to 39,700 af per year reduction of surface water (see Table 1.2-1). It is expected that farmers will respond to reduced surface water supplies

by increasing groundwater extraction. This represents an increased cost to farmers, and over time, would cumulatively contribute to the overdraft condition in the regional aquifer (thereby increasing pumping depth and pumping costs per acre-foot of groundwater used).

Groundwater pumping depths in the Project Area typically vary between 300 and 500 ft (refer to Section 3.7, Groundwater Resources). The associated cost to pump groundwater from this depth is approximately $85 to $150 per acre-foot. For crops requiring 2 to 3 af of water, this is equivalent to approximately $200 to $400 in groundwater pumping cost per acre. If this cost exceeds the net revenue from growing certain crops, farmers may respond by fallowing lands previously used to grow low-value crops. Farmers may also respond by fallowing if intensified groundwater pumping resulted in severe localized drops in groundwater levels. At the maximum level of impact to agriculture resources, if farmers fallowed all lands previously irrigated by the 39,700 af of surface water deliveries that would be lost under this Alternative 4, and assuming application of 2.5 af of water per acre, farmers may fallow up to 16,000 acres. As farmers have historically used groundwater, it is expected that groundwater will be substituted for reduced surface water supplies. Land fallowing is expected to be low, as long as groundwater supplies are available. However with implementation of SGMA, which requires local agencies to establish sustainable groundwater management plans to protect groundwater availability, groundwater pumping will likely be reduced over time. SGMA requires that by 2040 all high and medium priority groundwater basins achieve sustainability. Groundwater pumping would become less of an option as the SGMA is implemented, and fallowing agricultural land more likely.

Replacement of 100 percent of the historic surface water supply with groundwater would cause a return to the conditions in the Project Area that existed before construction of the CVC. As the water table declines and the cost of pumping increases, it is expected that land fallowing will increase or there will be a shift in crop patterns.

Alternative 4 is not expected to result in the direct conversion of farmland to other uses, such as urban uses, and therefore would not conflict with existing zoning for agricultural use or a Williamson contract. However, if existing farmland is removed from production and fields are fallowed as a result of reduced water supplies, Alternative 4 would reduce agricultural production potentially causing adverse effects to the regional economy, as well as potentially creating conflicts with Williamson Act contracts and policies pertaining to maintaining agriculture. Compared to the Proposed Project, Alternative 4 could result in potentially significant impacts on agriculture.

Air Quality

Air quality impacts would be similar to those described under the No Project Alternative and are speculative at this time because the magnitude of the change in surface water supply and the associated response of the farmers is unknown. In general, an increased reliance on groundwater will increase the power requirements associated with pumping which in turn could impact air quality depending on the source of the power. Power from the grid could come from power plants that are nuclear, hydroelectric, or fossil fuel burning. Reliance on fossil fuel burning power plants would lead to an increase in emissions. Also, farmers may choose to fallow land because of the reduced water supply. In addition, the fallowing of lands could lead to dust generation and associated air quality impacts. Therefore the impact to air quality under Alternative 4would be greater compared to the Proposed Project.

Biological Resources

The impacts to biological resources from implementation of Alternative 4 would be similar to those described under the No Project Alternative. There could be changes in water deliveries to agricultural land and related changes in the types of crops grown and fallowing patterns. However, these changes are not expected to substantially affect native habitat for special-status plant or wildlife species or critical habitat in the vicinity of the croplands, interfere with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. The CVC Contractors would not be able to construct new

diversions, expand their water use service areas, bring native or fallowed lands into cultivation, or alter current environmental conditions without further environmental review and approval. Therefore, as with the Proposed Project, Alternative 4 would not directly or indirectly impact biological resources.

Greenhouse Gas Emissions

Under this alternative, 100 percent of the water could be derived from groundwater pumping. The total GHG emissions for delivery of contract maximum deliveries are estimated to be 20,720 MT/yr, compared to 9,440 MT/yr for delivery of the contract maximum with the Proposed Project. This would represent more than a doubling of GHG emissions, and a GHG emission rate of 20,720 MT/yr would approach the level considered by the USEPA and State of California to be a major GHG source resulting in greater GHG emissions than the Proposed Project. The exact magnitude of the increase in GHG emissions is unknown because the change is surface water supply and the associated response of the farmers is unknown.

Hydrology and Water Quality (Surface Water Resources)

Under Alternative 4, there would be an indirect change in the quality of water delivered to the CVC Contractors because of the shift in water supply sources. Potential sources of contaminants, such as accidental spills or leaks into the conveyance system or the source water, would be similar to those under existing conditions. The potential for source water to infiltrate to groundwater would remain the same.

Alternative 4 does not involve the construction of any new facilities or associated impervious surfaces. Therefore, Alternative 4 would not result in: 1) any direct or indirect change in the direction of flow in any natural or man-made channels relative to existing conditions; 2) increased runoff and associated discharge of pollutants; 3) construction of housing within a 100-year flood hazard zone; or 4) new or increased exposure to the effects of tsunamis or seiches. Therefore, Alternative 4 impacts to surface water would be similar to the Proposed Project.

Hydrology and Water Quality (Groundwater Resources)

Alternative 4 will result in reduced surface water deliveries to the CVC Contractors. As stated above this would likely result in increased groundwater pumping. If the full amount of the average historic deliveries is made up with groundwater, the result would be an increase in pumping of 39,700 af annually.

This volume represents approximately 0.8 percent of the average annual groundwater pumping rate (4.6 million af per year) for the groundwater basins within the Project Area. The incremental increase in groundwater pumping would have a negligible effect on regional groundwater levels. However, localized decreases in groundwater levels would occur if the additional extraction were concentrated in CVC service area (i.e., at individual wells). However with implementation of SGMA, which requires local agencies to establish sustainable groundwater management plans to protect groundwater, groundwater pumping will be reduced over time. SGMA requires that by 2040 all high and medium priority groundwater basins achieve sustainability. Groundwater pumping would become less of an option as the SGMA is implemented, and fallowing agricultural land more likely.

There is not sufficient evidence available to determine where within the CVC Contractors' water use service areas concentrated extraction may occur. There could be localized decline in groundwater levels and to a greater extent than under the No Project Alternative. The declines would be similar to the historic period before the importation of surface water to the area (Appendix G) and greater than the Proposed Project.

Although the incremental increase in groundwater pumping would not result in substantial or significant adverse impacts on groundwater levels or storage, the increased extraction would cumulatively contribute to the overdraft condition in the regional aquifer resulting in a greater impact to groundwater resources compared to the Proposed Project. The potential effects of increased groundwater pumping could be offset by the option for farmers to fallow fields to reduce the demand for surface water or groundwater supplies.

Land Use and Planning

No direct effects on land use and planning are expected under Alternative 4, as no new facilities would be constructed and no facilities removed. However, similar to the other action alternatives, Alternative 4 may indirectly reduce planned development in Fresno County, as reduced receipt of CVC Contract water from AEWSD compared to existing conditions may prevent planned development to occur in the CSA #34 area. While Alternative 4 may increase groundwater overdraft in the SJVB, it is expected to have a negligible effect on land subsidence in the region. However, it will cumulatively add to the overdraft and therefore the potential for land subsidence.

Alternative 4 would not result in: 1) the division of an established community, 2) conflict with applicable policies or regulations, 3) conflict with applicable conservation plans, or 4) conflict with general land use designations. However, Alternative 4 has the potential to create conflicts with planned development in the CSA #34 area. Therefore, Alternative 4 could result in increased land use impacts compared to the Proposed Project.

Socioeconomics

No direct effects of Alternative 4 on socioeconomics are expected, as no new facilities would be constructed and no facilities removed. Consequently, Alternative 4 would not result in the hiring of workers or the relocation of people. However, similar to the No Project Alternative, Alternative 4 would result in indirect socioeconomic impacts if, as described above under agricultural resources, costs to farmers rise and/or lands are fallowed. Increased costs results in reduced net income to farmers. Additionally, if farmers fallow lands, then total farm employment and farm labor income may decline in the region. Based on the data presented in Chapter 3 on total farm employment (137,600 employees) and total non-rangeland acres cultivated in the four-county region (5,194,970 acres), there is approximately one farm employee per 38 crop acres cultivated. If, in the maximum impact scenario, 16,000 acres are fallowed (see discussion under agricultural resources), then not only will on-farm income decline, but there may be a reduction of up to 420 farm jobs. This maximum impact scenario is unlikely, however, as farmers have historically used groundwater to irrigate a diverse array of crops, and it is expected at least in the short-term that they will either substitute groundwater for reduced surface water supplies or potentially find alternative surface water supplies or conveyance methods. Fallowing could occur, particularly in the long-term with implementation of SGMA, which requires all high and medium priority groundwater basins achieve sustainability by 2040. Fallowing could occur, if intensified groundwater pumping resulted in severe localized drops in groundwater levels and costs of groundwater pumping become too high or if well replacement becomes necessary and is too costly for farmers. Thus, while in the short-term Alternative 4 may not result in significant socioeconomic impacts, in the long-term there could be: 1) loss of agricultural production values or income, 2) reduction in regional economic activity due to land fallowing, or 3) loss in property revenues realized by local governments. Furthermore, if farmers increase groundwater pumping to offset potential reductions in surface water, then on-farm income would be reduced due to increased costs of irrigation water. Therefore, the potential socioeconomic impacts associated with Alternative 4 would be greater than the Proposed Project.

4.2.6 Environmentally Superior Alternative

Table 4.2-1 below provides a comparison of the impacts of the alternatives to the Proposed Project. The Proposed Project is considered the environmentally superior alternative because there would be no adverse environmental impacts associated with the continued conveyance of water to the individual exchanges. Unlike the alternatives, the Proposed Project would avoid the possibility of failing to secure water supplies, which would create indirect impacts on agricultural, groundwater and air resources, land use planning, and socioeconomics. Under the No Project Alternative, the failure to secure conveyance (because a long-term conveyance contract is not available) creates uncertainty in the water supply for CVC Contractors and may lead to increased reliance on groundwater supplies.

This in turn, represents a greater impact to the region's groundwater supply than with the Proposed Project and fails to meet most of the Proposed Project objectives listed in Section 2.3. In summary:

> No Project Alternative would have direct and indirect impacts related to all resource areas except biology, when compared to the Proposed Project, and would fail to meet most of the Proposed Project objectives.

> Alternatives 1, 2 and 4 have direct and indirect impacts similar to No Project, and both would also fail to meet most of the Proposed Project objectives.

> Alternative 3 has no direct impacts except to groundwater resources, but would have indirect impacts to agriculture, land use, and socioeconomics.

Finally, the Proposed Project establishes a conveyance mechanism for the term of the contract (20 years) and the provided certainty in water deliveries. This certainty allows the CVC Contractors to focus on changes within each district to improve water use efficiency and water conservation.

Table 4.2-1 Impacts from Implementation of each Alternative Compared to Proposed Project

Affected Resource	Proposed Project Long-term Conveyance Agreement		Alternatives									
			No Project		Alternative 1 Water Code Section 1810 Conveyance		Alternative 2 Article 55 Conveyance		Alternative 3 Short Term Conveyance Obligations		Alternative 4 Constrained Delta Exports	
Impacts	**Direct**	**Indirect**	**Direct**	**Indirect**	**Direct**	**Indirect**	**Direct**	**Indirect**	**Direct**	**Indirect**	**Direct**	**Indirect**
Agriculture	No Impact	No Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact
Air Quality	No Impact	No Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact
Biological	No Impact	No Impact	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
Greenhouse Gas Emissions	No Impact	No Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact
Hydrology and Water Quality												
> Surface Water	No Impact	No Impact	Increased Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	No Change	No Change	Increased Impact	No Change
> Groundwater	No Impact	No Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact	Increased Impact
Land Use & Planning	No Impact	No Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact
Socioeconomics	No Impact	No Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact	No Change	Increased Impact

Increased Impact = Impacts are expected to increase in severity when compared to the Proposed Project.

No Change = There would be no change in the level of impact significance when compared to the Proposed Project. Impacts would essentially be the same as those identified for the Proposed Project.

No Impact = There would be no significant impacts associated with the alternative if it were to be implemented.

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5 Cumulative Impacts

"Cumulative impacts" are defined as "two or more individual effects which, when considered together, are considerable or compound or increase other environmental impacts" (California Environmental Quality Act [CEQA] Guidelines Section 15355). Previously approved projects will be part of the baseline, and future projects that are not now known are speculative and need not be considered in the analysis. However, the analysis does need to consider the impacts of the proposed project in combination with any other reasonably foreseeable projects, and all of those impacts must be considered against the environmental baseline.

The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. However, only the less-than-significant impacts of implementation of the Proposed Project have the potential to add an incremental effect to a cumulatively significant impact because no potentially significant impacts on the physical environment would occur and economic impacts alone are not significant (but may be considered substantial in a local context).

The following discussion of cumulative impacts is for resources and environmental concerns with less-than-significant impacts from implementation of the Proposed Project and includes a discussion of economic impacts. Furthermore, the Proposed Project was determined to have no impacts, meaning there are no incremental impacts to evaluate. In summary, the Proposed Project has no potentially significant or any incremental impacts that would contribute to potential cumulative impacts.

5.1 Reasonably Foreseeable Projects

Reasonably foreseeable projects consist of future actions that are in the final planning stages or have completed environmental documentation and permits awaiting construction, or are under construction. Potential projects to consider cumulatively with respect to the Proposed Project consist of projects that could influence the water supply available to the Cross Valley Canal (CVC) Contractors for exchange or transfer, projects that affect the capacity in conveyance facilities, or influence conditions in the Delta or San Joaquin River. As such, the following actions were taken into consideration to assess potential cumulative impacts with implementation of the Proposed Project.

5.1.1 Delta Projects

- **Bay-Delta Conservation Plan (BDCP)/WaterFix.** The BDCP/WaterFix project is a water conveyance facility consisting of three new intakes on the Sacramento River and dual tunnels to convey water to existing state and federal pumping plants. The conveyance facility will be operated in conjunction with existing south Delta operations and will be coordinated with CVP operations.
- **South Delta Improvements Program (SDIP).** The SDIP is a series of proposed actions to improve water quality and protect salmon in the South Delta while allowing the SWP to operate more effectively. The proposed plan includes physical/structural improvements as well as operational changes. Together, these two components of the SDIP represent a balanced approach to meeting California's water needs.
- **South Delta Flood Bypass.** The South Delta Flood Bypass, also known as the Lower San Joaquin River Flood bypass, would route floodwaters out of a highly constrained urbanizing reach of the San Joaquin River system between Mossdale and Stockton, and away from densely developed communities in Manteca, Lathrop, and Stockton. Floodwaters would instead flow into larger channels through a rural area of the Delta Primary zone where urban development is prohibited.

- **Tracy Fish Collection Facility and Tracy Fish Facility Improvement Program.** The Tracy Fish Collection Facility (TFCF), located in the Central Valley near Stockton, was developed and built by Reclamation with interagency cooperation in the 1950's as part of the CVP. The purpose of the TFCF is to protect fish entering the Delta Mendota Canal (DMC) by way of the Tracy Pumping Plant (TPP). The TFCF implements new fish collection, holding, transport, and release technology that will improve fish protection at water diversions in the South Delta region.
- **Los Vaqueros Reservoir Expansion Project.** The Los Vaqueros Reservoir Project includes expanding the existing reservoir up to 275 thousand acre-feet to take full advantage of the existing state of the art fish screens currently in use in the Delta. These fish screens have proven effective at protecting Delta Smelt, Longfin Smelt, and other species of concern from the effects of water pumping from the Delta. DWR, Reclamation, and Contra Costa Water District (CCWD) are collaborating with local, State, and Federal agencies and stakeholders on the formulation and development of this project.
- **FloodSAFE California.** FloodSAFE is a long-term strategic initiative developed with the main goals to reduce flood risk in California, sustain economic growth, protect and enhance ecosystems and promote sustainability. FloodSAFE is also an important component of DWR's Integrated Water Management (IWM) Initiative, which is designed to achieve a sustainable and resilient flood and water management system.
- **North Delta Flood Control and Ecosystem Restoration Project.** The North Delta Flood Control and Ecosystem Restoration Project is intended to achieve flood control, ecosystem restoration, and recreational benefits in the North Delta area. The project objectives are to minimize the surge effect across the McCormack-Williamson Tract and provide additional capacity in the project area to minimize the potential for catastrophic flooding, while substantially increasing opportunities for habitat and ecological purposes. Components considered for flood control include setback levees and flood bypass areas that may be configured to create quality habitat for species of concern in the North Delta area.

5.1.2 Conveyance Projects

- **South Bay Aqueduct Improvement and Enlargement Project.** The South Bay Aqueduct (SBA) conveys water from the Sacramento – San Joaquin Delta through over 40 miles of pipelines and canals to the Zone 7, Alameda County, and Santa Clara Valley Water Districts, which in turn provide service to the cities of Livermore, Dublin, Pleasanton, San Ramon, Freemont, Newark, Union City, Milpitas, Santa Clara and San Jose. The purpose of the Project is to increase the capacity of the SBA from 300 cfs design capacity to 430 cfs to meet Zone 7 Water Agency's future needs and provide operational flexibility to reduce State Water Project peak power consumption.
- **Delta-Mendota Canal Recirculation Project.** The Delta-Mendota Canal (DMC) Recirculation Program is a federally authorized project that is studying the feasibility of recirculating water from the DMC into the San Joaquin River and back into the Delta. The project, if feasible, would utilize excess capacity in the DMC to improve flow and reduce salinity concentrations in the San Joaquin River while reducing reliance on New Melones Reservoir water supplies to meet water quality and flow requirements.
- **Delta-Mendota Canal/California Aqueduct Intertie.** The Intertie, a shared federal-state water system improvement, connects the DMC and the California Aqueduct via two 108-inch-diameter pipes and pumping capacity of 467 cubic feet per second (900 cfs gravity flow from CA to DMC. The Intertie connection is 500 linear feet. The Intertie addresses DMC conveyance conditions that had restricted use of the Jones Pumping Plant to less than its design capacity, potentially restoring as much as 35,000 acre-feet of average annual deliveries to the CVP.
- **Conveyance of Refuge Water Supply, South San Joaquin Valley Study Area, Mendota Wildlife Area.** Reclamation has responsibility under the Central Valley Project Improvement Act to provide reliable year-round water supplies for specific wildlife refuges, including the Mendota Wildlife Area. The project entails construction of a new dam in the San Joaquin River channel, replacing the existing

Mendota Dam which is owned and operated by the Central California Irrigation District (CCID). Currently, water delivered to the Mendota Wildlife Area via gravity flow and pumping from Mendota Pool is interrupted when the CCID dewaters the Mendota Pool for maintenance. The occasional reduction of water surface levels in Mendota Pool also restricts the delivery of water to the Mendota Wildlife Area.

5.1.3 San Joaquin River Projects

> **San Joaquin River Restoration Program.** The San Joaquin River Restoration Program (SJRRP) is a comprehensive long-term effort to restore flows to the San Joaquin River from Friant Dam to the confluence of Merced River and restore a self-sustaining Chinook salmon fishery in the river while reducing or avoiding adverse water supply impacts from restoration flows.

> **Lower San Joaquin River and Delta South Regional Flood Management Program.** The Lower San Joaquin River and Delta South Regional Flood Management Program is a flood management plan that describes the long-term, local vision for flood risk reduction. The plan will address, flood protection problems and opportunities, potential projects and priorities, and a financial plan. The plan will also connect to the State's separate but related effort to complete a flood management feasibility study for the lower San Joaquin River basin.

> **San Joaquin River Salinity Management Plan.** The San Joaquin River Salinity Management Plan focuses on reducing or mitigating salt loads transferred from the Delta to the San Joaquin River basin. Actions include providing flows to the system, projects designed to reduce salt load, such as the Grassland Bypass Project described below, and develop stakeholder interest in Real Time management and monitoring. Several other projects and studies are underway that will have the potential benefits of improving water quality of the San Joaquin River basin.

> **San Joaquin River Water Quality Improvement Project.** The San Joaquin River Water Quality Improvement Project (SJRIP) is designed to reduce the amount of salt and selenium delivered to the San Luis Drain and Mud Slough through the Grassland Bypass. The Grassland Bypass Project consolidates subsurface drainage flows on a regional basis and utilizes a portion of the San Luis Drain to convey flows around the habitat areas. Salt-tolerant crops and agricultural drainwater used for irrigation are some of the ways the SJRIP is being implemented.

> **San Joaquin River Parkway Master Plan.** The San Joaquin River Parkway Master Plan is a long-term, large-scale plan that would be implemented incrementally and in phases over many years. The Master Plan presents conceptual Parkway development projects, and goals and policies under which the development would be pursued and implemented. The Master Plan provides guidance for a wide range of agencies and organizations involved in developing and implementing the Parkway including, but not limited to, the Conservancy, the City of Fresno, the counties of Fresno and Madera, the San Joaquin River Parkway and Conservation Trust (the Parkway Trust), State Lands Commission, the California Department of Parks and Recreation, the California Wildlife Conservation Board, and the California Department of Fish and Wildlife.

> **Vernalis Adaptive Management Program.** The Vernalis Adaptive Management Program (VAMP) is a large-scale, long-term (12-year), experimental/management program designed to protect juvenile Chinook salmon migrating from the San Joaquin River through the Sacramento-San Joaquin Delta. VAMP is also a scientifically recognized experiment to determine how salmon survival rates change in response to alterations in San Joaquin River flows and SWP/ CVP exports with the installation of the Head of Old River Barrier. VAMP employs an adaptive management strategy to use current knowledge of hydrology and environmental conditions to protect Chinook salmon smolts, while gathering information to allow more efficient protection in the future.

> **New Friant River Outlet Powerhouse.** The New Friant River Outlet Powerhouse would increase the power-generating capacity at the Friant Dam River Outlet site to utilize flow releases required by the San Joaquin River Settlement Agreement to generate energy. The project expands the power generation capacity at the River Outlet site from 2 MW to approximately 9 MW.

> **Central Valley Joint Venture.** The Central Valley Joint Venture (CVJV) is a self-directed coalition consisting of 21 State and Federal agencies, private conservation organizations and one corporation. This partnership directs their efforts toward the common goal of providing for the habitat needs of migrating and resident birds in the Central Valley of California. The CVJV was established in 1988 as a regional partnership focused on the conservation of waterfowl and wetlands under the North American Waterfowl Management Plan. It has since broadened its focus to the conservation of habitats for other birds, consistent with major national and international bird conservation plans and the North American Bird Conservation Initiative.

5.1.4 Water Supply Projects

> **North-of-the-Delta Off-stream Storage Investigation (Sites Reservoir).** North-of-the-Delta Off-stream Storage (NODOS) would provide for water supply reliability for municipal and industrial uses, agriculture, and wildlife refuges; ecosystem enhancement actions to improve fish survival in major northern California rivers and the Delta; water quality improvements for Delta water users and estuarine species; flexible hydropower generation to support renewable energy sources such as wind and solar; recreation opportunities at the new reservoir and improved recreation at existing reservoirs; and local flood damage reduction below the new reservoir. Total water supply benefits of NODOS would be up to 500,000 af per year on average and over 600 af per year during dry and critical years.

> **Central Valley Project Improvement Act.** The Central Valley Project Improvement Act mandates changes in management of the CVP, particularly for the protection, restoration, and enhancement of fish and wildlife. Ten major areas of change include: 800,000 acre-feet of water dedicated to fish and wildlife annually; tiered water pricing applicable to new and renewed contracts; water transfers provision, including sale of water to users outside the CVP service area; special efforts to restore anadromous fish population; restoration fund financed by water and power users for habitat restoration and enhancement and water and land acquisitions; no new water contracts until fish and wildlife goals achieve; no contract renewals until completion of a Programmatic Environmental Impact Statement; terms of contracts reduced from 40 to 25 years with renewal at the discretion of the Secretary of the Interior; installation of the temperature control device at Shasta Dam; implementation of fish passage measures at Red Bluff Diversion Dam; firm water supplies for Central Valley wildlife refuges; and development of a plan to increase CVP yield.

> **CALFED Ecosystem Restoration Program.** CALFED's Ecosystem Restoration Program works to improve the ecological health of the Bay-Delta watershed through restoring and protecting habitats, ecosystem functions and native species. The **Watershed Program Element** specifically works in tandem with the **Ecosystem Restoration Program Element** to ensure that ecological health of the Delta is restored and that water management is improved by working with communities at the watershed level.

> **California Water Plan.** The California Water Plan Update 2013 planning horizon extends to the year 2050. There are 17 cross-cutting objectives and over 300 specific actions to reinforce the implementation of the Governor's Water Action Plan. The goals of that Plan are to make conservation a way of life, provide safe drinking water and expand water storage capacity, improve public safety, and secure wastewater systems for all communities, and foster environmental stewardship.

- **Long-Term CVP and SWP Operations.** The Long-Term CVP and SWP operations include the temporary barriers project in the south Delta and the 500 cfs increase in SWP Delta export limit July through September. In addition to current day operations, several other actions are included. These actions are: (1) an intertie between the CA and the DMC, (2) Freeport Regional Water Project (FRWP), (3) the operation of permanent gates, which will replace the temporary barriers in the South Delta, (4) changes in the operation of the Red Bluff Diversion Dam (RBDD), and (5) Alternative Intake Project for Contra Costa Water District.
- **Sacramento River Water Reliability Study.** The purpose of the Sacramento River Water Reliability Study is to develop a water supply plan that is consistent with the Water Forum objectives of pursuing a Sacramento River diversion to meet the water supply needs of the Placer-Sacramento region and promoting ecosystem preservation along the lower American River.
- **Upper San Joaquin River Basin Storage Investigation.** The Upper San Joaquin River Basin Storage Investigation is a feasibility study of new surface water storage facility that is being performed by Reclamation. The purpose of the investigation is to determine the type and extent of federal, state, and regional interests in a potential dam project in the upper San Joaquin River watershed to expand water storage capacity; improve water supply reliability and flexibility for agricultural, urban, and environmental uses; and enhance San Joaquin River water temperature and flow conditions to support anadromous fish restoration efforts
- **San Luis Reservoir Low Point Improvement Project.** The San Luis Reservoir Low Point Improvement project optimizes the water supply benefits of San Luis Reservoir while reducing additional risks to water users by avoiding supply interruptions when water is needed by increasing the certainty of meeting the requested delivery schedule throughout the year to south-of-Delta contractors dependent on San Luis Reservoir and increasing the reliability and quantity of yearly allocations to south-of-Delta contractors dependent on San Luis Reservoir
- **In-Delta Storage Program (Delta Wetlands Project).** The In-Delta Storage Project would provide capacity to store approximately 217,000 acre-feet of water in the south Delta for a wide array of water supply, water quality and ecosystem benefits. The project would include two storage islands (Webb Tract and Bacon Island) and two habitat islands (Holland Tract and Bouldin Island), similar to that proposed by Delta Wetlands over a decade ago. The Project would enhance water supply reliability and operational flexibility, contribute to ecosystem restoration, and provide water for the Environmental Water Account.

5.2 Cumulative Impact Analysis

5.2.1 Agriculture Resources

The cumulative effects of the Proposed Project on agricultural resources are considered in the context of other regional agricultural issues such as drought, environmental restrictions, and economic recession. Under the Proposed Project, no direct effects on agricultural resources are expected, as no new facilities would be constructed and no facilities removed. No indirect effects on prime farmland, unique farmland, or farmland of statewide importance are expected, while indirect effects on other agricultural lands are expected to be limited to the potential fallowing of some agricultural lands. As a result, the Proposed Project would not have a cumulative effect on agriculture in the region.

5.2.2 Air Quality

Under the Proposed Project, air quality impacts would be similar to those that currently occur, because it is anticipated that water would continue to be conveyed either via gravity flow or electric pumps served by CVP hydropower facilities. Thus, the incremental impacts on local air quality due to the Proposed Project would not be individually significant nor would they be cumulatively considerable. Therefore, cumulative impacts on air quality in the vicinity of the Proposed Project would be less than significant.

5.2.3 Biological Resources

Under the Proposed Project, the same contractual amount of water would be delivered to the same lands without the need for additional facility modifications or construction. Thus, no impacts to aquatic biological resources are expected from implementation of the Proposed Project, and together with reasonably foreseeable future actions would not incrementally contribute to any considerable effects to the aquatic biological resources within the Project Area. Because the Proposed Project is not expected to result in any direct or indirect effects to biological species, including special-status plant, wildlife, and aquatic species, and/or their habitat, the Proposed Project would not contribute cumulatively to any effects on these resources.

5.2.4 Greenhouse Gas Emissions

The generation of electricity to meet the groundwater pumping demand would produce GHG emissions. If all CVC Contractors received their maximum water allotments, end use GHG emissions are estimated to be about 9,400 MT CO_2e/yr. Since the Proposed Project provides for the continued conveyance of the CVC Contractors' existing CVP water supply, impacts related to GHGs (and potentially to climate change) would remain unchanged and no impact would occur. Cumulative impacts were assessed in a qualitative manner by determining if the Proposed Project, in conjunction with other projects throughout the CVC Contractors' water use service areas located on the eastern side of the San Joaquin Valley, would have the potential to contribute to a long-term cumulative impact on climate change. Given that GHG emissions and climate change are global issues, a statewide framework or cumulative approach for consideration of environmental impacts is generally used. Additionally, based on the analysis provided in the DWR GGERP (see section 3.6.4), GHG emissions associated with the use of SWP facilities for this project will not constitute a cumulatively considerable contribution to atmospheric levels of GHG emissions and are therefore, less than significant. The Proposed Project would generate some GHG emissions individually but there is no change in emissions over existing conditions and would not conflict with present regulations.

5.2.5 Hydrology and Water Quality (Surface Water Resources)

The issues for determination of a potential cumulative impact on surface water resources are those associated with water quality and quantity. Implementation of the Proposed Project would not result in any direct or indirect change in the quality or quantity of water delivered to the CVC Contractors. The water supply source(s) would remain the same as would the means of conveyance. Consequently, no cumulative impacts would occur to surface water resources of the CVC Contractors in the Project Area.

5.2.6 Hydrology and Water Quality (Groundwater Resources)

Much of the SJV is in a state of overdraft. A portion of the water applied on irrigated lands seeps into the groundwater; however, groundwater seepage is slow and would not lower the expense of pumping groundwater. The CVC Contractors strive to provide surface water at affordable prices to discourage groundwater pumping. The Proposed Project could provide short-term relief to groundwater quality and quantity. No new water supplies would be added to this region; therefore, the Proposed Project would have no impact on water resources as described previously. As such, no cumulative effects on groundwater resources in the Project Area are anticipated.

5.2.7 Land Use and Planning

No direct effects of the Proposed Project on agricultural land use are expected, as no new facilities would be constructed and no facilities removed. No indirect effects on prime farmland, unique farmland, or farmland of statewide importance are expected, while indirect effects on other agricultural lands are expected to be limited. In Fresno County, the County Service Area (CSA) #34 currently uses approximately 500 af per year for municipal and industrial (M&I) purposes, which is less than the full amount of 1,520 af available to CSA #34 under the long-term exchange agreement with Arvin-Edison Water Storage District (AEWSD). Receipt of CVC Contract water at increased levels (up to the exchange agreement amount of 1,520 af) from AEWSD would enable planned development to occur in the CSA

#34 area. This development would occur in areas already approved for development in the planned community of Millerton New Town, and would be in accordance with the general policies and goals in the Fresno County General Plan, as well as the specific land use designations and goals outlined in the Millerton Specific Plan for the area served by CSA #34. As described in this previous chapter, implementation of any of the action alternatives would result in relatively minor land use impacts, if at all. As a result, the Proposed Project would not have a cumulative effect on agricultural or other types of land uses in the region.

5.2.8 Socioeconomics

As described in Section 3.9.5, Proposed Project implementation would result in relatively minor economic impacts when considered in the context of the regional economy. The Proposed Project would enable conveyance to continue as under existing conditions, with conveyance and delivery subject to available capacity at the federal or state export pumps and in the Aqueduct or Delta-Mendota Canal (DMC). Compared to existing conditions, no indirect impact on the agricultural and municipal development economics within the CVC Contractors' water use service areas is expected to result from implementation of the Proposed Project. Furthermore, as there is no change in the cost, quality, or availability of water due to the Proposed Project implementation compared to existing conditions, there is no expected indirect impact on socioeconomic conditions.

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6 Other CEQA Considerations/Required Disclosures

This section addresses other potential effects as required by the California Environmental Quality Act (CEQA) Guidelines Section 15126.2: significant and unavoidable impacts, irreversible or irretrievable commitment of resources, growth-inducing impacts, energy requirements and conservation measures, and consistency with local plans.

6.1 Growth Inducement

CEQA Guidelines Section 21100(b)(5) requires that an Environmental Impact Report (EIR) discuss a project's growth-inducing impacts. This requirement is further explained in CEQA Guidelines Section 15126(g), which states that an EIR must address "the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly in the surrounding environment." Section 3.9 discusses potential Proposed Project effects on the regional economy and employment. The Proposed Project would not stimulate the economy to a level that would foster either economic or population growth. Therefore, the Proposed Project would not directly stimulate demand for housing and local services and would not induce additional jobs or population in the Cross Valley Canal (CVC) Contractors' water use service areas. In summary, renewing the conveyance contracts would continue the availability of a water supply to areas that have been using water attributable to this supply since the mid-1970s. The contract renewals will enable the economies of those areas to maintain their current activities.

6.2 Irreversible and Irretrievable Commitment of Resources

As required by CEQA Guidelines Section 15126.2c, an EIR must assess the significant *irreversible* and *irretrievable* commitments of resources associated with a project's implementation. A resource commitment is considered irreversible when direct and indirect impacts from its use limit future use options. Irreversible commitments apply primarily to nonrenewable resources, such as cultural resources, and also to those resources that are renewable only over long periods of time, such as soil productivity. A resource commitment is considered irretrievable when the use or consumption of the resource is neither renewable nor recoverable for future use. Irretrievable commitments apply to loss of production, harvest, or use of natural resources. None of the potential effects from implementation of the Proposed Project would result in the irreversible and/or irretrievable commitments of resources as compared to existing conditions. The consumption of electrical energy for pumping the CVC water at the Delta, at Dos Amigos Pumping Plant, and in the CVC could be seen as an irreversible consumption of electrical power. However, the power comes largely from CVC hydroelectric power plants, which provide a renewable source of electrical energy.

6.3 Significant and Unavoidable Impacts

Unavoidable adverse effects are environmental consequences of an action that cannot be avoided, either by changing the nature of the action or through mitigation if the action is undertaken. None of the potential effects from implementation of the Proposed Project are significant and unavoidable.

6.4 Energy Requirements

Energy usage associated with current activities in the CVC Contractors' water use service areas would continue under the Proposed Project and includes the operation of the conveyance facilities via gravity flow and/or pumping using electric motors. The amount of power needed to convey up to 128,300 af per year of water is small when compared to the overall water supplies and power used each year to move water to where it is needed, resulting in minimal effects to energy consumption within this region.

6.5 Consistency with Local Plans

The objectives of the Proposed Project do not conflict with existing agricultural zoning and general plan policies and does not involve the direct or indirect conversion of land to urban uses nor the construction or expansion of any water conveyance facilities. No significant impact would occur to local plans or policies within the Project Area, including the counties of Fresno, Kings, Tulare, and Kern.

7 Consultation and Coordination

7.1 Persons and Agencies Consulted

The following persons were contacted in the preparation of this document:

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Kern Tulare Water District
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7.2 Scoping

A scoping meeting was held on June 1, 2011, at the Lower-Tule River Irrigation District (LTRID) office in Tipton, California. The meeting was attended by some of the Cross Valley Canal (CVC) Contractors and the California Department of Water Resources (DWR), which has a direct connection with the Proposed Project. No public or non-project-related agency staff attended.

Issues raised during public scoping were:

> Compliance with state and federal statements relating to Native American historic properties of religious and cultural significance to American Indian tribes and interested Native American individuals as "consulting parties" under both state and federal law.

> Concern with discharges of CVC water into the Friant-Kern Canal (FKC) that could have potentially significant water quality impacts to Arvin-Edison Water Storage District's (AEWSD's) surface and groundwater supplies, water banking programs, and crops and land uses within the District.

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8 List of EIR Preparers

The following Cardno staff assisted in the preparation of this Draft EIR document:

Role	Preparer	Experience
Project Managers	**Paul Wisheropp** Senior Consultant / Water Resources Engineer/Restoration,	> M.S., Civil Engineering (Water Resources), Colorado State University, 1982 > B.S., Environmental Engineering, Humboldt State University, 1979 > 33 Years
	Kendra Ryan Senior Project Planner	> B.S., Landscape Architecture, University of California, Davis, 1990 > 25 Years
Deputy Project Manager	**Lisa Mash** Senior Project Scientist	> B.S., Marine Biology, University of South Carolina, 1995 > 15 Years
Senior Peer Review	**Susan Hootkins** Senior Consultant / Planning and Water Resources	> M.U.P., Urban & Regional Planning, San Jose State University; 1981 > B.A., Human Biology, Stanford University; 1973 > 38 Years
Project Description	**Katie Simpson** Project Scientist / Wildlife Biologist	> M.S., Primate Conservation, Oxford Brookes University, 2006 > B.A. Biological Anthropology, U.C. San Diego, 2001 > 11 Years
Surface Water and Groundwater Resources	**Kevin O'Dea** Senior Consultant	> B.S., Geology, University of Missouri-Columbia, 1978 > 20 Years
Aquatic Biological Resources	**Neil Lassettre** Senior Project Scientist / Aquatic Ecologist / Geomorphologist	> Ph.D., Environmental Planning, University of California, Berkeley, 2003 > M.S., Environmental Studies, San Jose State University, 1997 > B.A., Biology, University of California, Santa Cruz, 1993 > 16 Years
Wildlife Biological Resources	**Gretchen Lebednik** Senior Project Scientist / Vegetation Ecologist	> M.S., Botany, University of Washington, Seattle, 1974 > B.A. (with honors), Environmental Biology, University of California, Santa Barbara, 1971 > 43 Years

Role	Preparer	Experience
Land Use and Planning **Socioeconomics, Public Services, and Utilities**	**Barbara Wyse** Senior Project Economist	> M.S., Environmental and Natural Resource Economics, Oregon State University, 2004 > B.A., Environmental Sciences and Policy, Duke University, magna cum laude, 2000 > 10 Years
Land Use and Planning **Socioeconomics, Public Services, and Utilities**	**Olivia Welke** Assistant Staff Economist	> BA, Economics, Minor – Environmental Studies, University of Washington, 2009 > 3 Years
Climate Change, Greenhouse Gases, Energy Conservation	**Lorraine Woodman** Senior Consultant / Environmental Planning	> Ph.D., Anthropology, University of California, Santa Barbara, 1981 > M.A., Anthropology, University of California, Santa Barbara, 1978 > B.A., Anthropology, Pomona College, Claremont, California, 1975 > 28 Years
	Erin Kramer-Wilt Project Scientist	> M.S., Aquatic and Fishery Sciences, University of Washington, 2010 > B.A., Biology, Earlham College, 2003 > 7 Years
	Patrick Ritter Senior Consultant	> M.S., Civil Engineering, Stanford University, 1976 > B.S., Zoology, University of Wisconsin, 1974 > Registered Engineer > 30 Years
GIS Systems, Environmental Analysis, Physical Geography, Cartographic Research	**Anna Clare** GIS Specialist	> M.A., Geography, California State University, Chico, 2010 > B.S., Geographic Information System, Brigham Young University, 2002 > 10 Years
Production and Document Management	**Iris Eschen** Production Supervisor	> Certification. Heald Business College, San Francisco, 1979 > 33 Years
Production Support	**Karen Butler** Production Specialist	> CompTIA A+ Certification, New Horizons Computer Learning Center, 2004 > 23 Years

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