

RECLAMATION

Managing Water in the West

Draft Environmental Assessment

Central Valley Project Cross Valley Contractors Interim Renewal Contracts and Article 5 Exchanges, 2012-2014

EA-11-011



**U.S. Department of the Interior
Bureau of Reclamation
Mid Pacific Region
South-Central California Area Office
Fresno, California**

December 2011

Mission Statements

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

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

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List of Acronyms and Abbreviations

AEWSD	Arvin Edison Water Storage District
AF	acre-feet
AF/y	acre-feet per year
Aqueduct	California Aqueduct
APE	area of potential effects
BO	Biological Opinion
CAA	Clean Air Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CSCO	CVP/SWP Coordinated Operations
CV	Cross Valley
CVC	Cross Valley Canal
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVPIA PBO	CVPIA Programmatic Biological Opinion
Delta	Sacramento-San Joaquin River Delta
DWR	California State Department of Water Resources
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FKC	Friant-Kern Canal
FONSI	Finding of No Significant Impact
FWCA	Fish and Wildlife Coordination Act
GHG	Greenhouse gases
IRC	Interim Renewal Contracts
ITA	Indian Trust Assets
KCWA	Kern County Water Agency
KDWCD	Kaweah Delta Water Conservation District
LTCR Opinion	long-term contract renewal biological opinion

M&I	municipal and industrial
MBTA	Migratory Bird Treaty Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
O&M	operation and maintenance
PEIS	Programmatic Environmental Impact Statement
Reclamation	Bureau of Reclamation
RPA	Reasonable and Prudent Alternative
ROD	Record of Decision
SCCAO	South-Central California Area Office
SEA	Supplemental Environmental Assessment
Secretary	Secretary of the Interior
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SJV	San Joaquin Valley
SJVAB	San Joaquin Valley Air Basin
SLC	San Luis Canal
State	State of California
SWP	State Water Project
TLBWSD	Tulare Lake Basin Water Storage District
USFWS	U.S. Fish and Wildlife Service

Section 1 Purpose and Need for Action

1.1 Background

The Central Valley Project (CVP) is one of the largest water storage and conveyance systems in the world. For nearly three-quarters of the last century, California has depended on the CVP for a large part of its water needs, particularly for agriculture. In addition, because of consecutive years of drought followed by wet years often bringing floods, the state relies heavily on CVP dams and reservoirs to help balance and control its water resources. The CVP includes 20 dams and reservoirs capable of storing 11 million acre-feet of water, 11 power plants, 500 miles of major canals and aqueducts, three fish hatcheries, and various related facilities. The CVP conveys about 20 percent of the state's developed water from the Sacramento, Trinity, American, Stanislaus, and San Joaquin rivers to agricultural and municipal water users and wildlife refuges in the Sacramento and San Joaquin valleys and the San Francisco Bay Area. The CVP is operated and maintained by the Bureau of Reclamation (Reclamation).

Over the years, competition for water has escalated within the tributary area of the Sacramento-San Joaquin River Delta (Delta). Agricultural and municipal development, as well as construction and operation of water systems such as the CVP, the State Water Project (SWP), and local projects (see Figures 1-1 and 1-2) and levee systems have contributed to the reduction of water quality in the Delta and habitat that supports fish and wildlife resources in the Central Valley.

Similar to the CVP, the SWP also conveys water through the Delta. Operated and maintained by the Department of Water Resources (DWR), the SWP conveys water from the Feather River in Northern California to SWP agricultural and municipal water service contractors and water rights contractors in the Central Valley, the San Francisco Bay Area, and the Central and Southern California Coastal areas. The CVP and SWP are operated in coordination and in accordance with their respective water rights permits and licenses administered by the State Water Resources Control Board. Operations of the two projects are managed through the Coordinated Operating Agreement between DWR and Reclamation.

On October 30, 1992, President Bush signed into law the Reclamation Projects Authorization and Adjustment Act of 1992 (Public Law 102-575) that included Title XXXIV, the Central Valley Project Improvement Act (CVPIA). The CVPIA amends the previous authorizations of the CVP to include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority with irrigation and domestic uses and fish and wildlife enhancement as a project purpose equal to power generation. The CVPIA identifies a number of specific measures to meet these new purposes and directs the Secretary of the Interior (Secretary) to operate the CVP consistent with these purposes, to meet the Federal trust responsibilities to protect the fishery resources of federally recognized Indian tribes, and to achieve a reasonable balance among competing demands for use of the CVP water.

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Figure 1-1. Overview of California water systems (CVPIA PEIS Executive Summary, 1999)

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Figure 1-2. Overview of CVP and SWP systems in San Joaquin Valley (ESRP, 2011)

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Section 3409 of the CVPIA directs the Secretary to complete a Programmatic Environmental Impact Statement (PEIS) to analyze the direct and indirect impacts and benefits of implementing various provisions of the CVPIA in the Central Valley and coastal areas of California. Because it is a programmatic document, the Final PEIS presents a system-wide analysis, rather than presenting detailed analysis of specific projects and sites. The Final PEIS will be used as a basis for tiered environmental documentation to be completed prior to long-term implementation of some CVPIA provisions. The Final PEIS was completed in October 1999 and a subsequent Record of Decision (ROD) was signed in January 2001 (CVPIA PEIS, 1999).

Section 3404(c) of the CVPIA directs the Secretary to renew existing CVP water service and repayment contracts following completion of the PEIS and other environmental documentation, as may be needed. Conditions in the Delta related to water quality and effects to protected species have required the United States Fish and Wildlife Service (USFWS) and Reclamation to re-evaluate the impacts of pumping water from the Delta for CVP purposes, and for both agencies to complete appropriate environmental documentation before existing long-term CVP water service contracts can be renewed. As a result, Reclamation has entered into interim renewal contracts (IRC), which 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 with CVP contractors who receive water from the Delta.

The Cross Valley (CV) contractors are seven CVP contractors located on the eastside of the San Joaquin Valley (SJV) in Fresno, Kern, Tulare and Kings counties. These water districts are referred to as the CV contractors because of their use of the Cross Valley Canal (CVC) to obtain their water supplies from the Delta, some of which may be stored in San Luis Reservoir. The CVC is a locally-owned canal that was constructed in the mid-1970s through a collaborative effort of several local, state and federal water agencies. The CVC allows water to be conveyed between the California Aqueduct (Aqueduct) and the Friant-Kern Canal (FKC). Table 1-1 identifies the CV contractors, their subcontractors (if any), and whether or not they also have a Friant Division CVP contract. Figures 1-3 and 1-4 show the location of the CV contractors and depicts their juxtaposition to other CVP contractors and important features of the SWP, CVP, and the CVC.

Table 1-1. List of Cross Valley Contractors

CV Contractor
¹ County of Fresno
² County of Tulare
Hills Valley Irrigation District
³ Kern Tulare Water District
⁴ Lower Tule River Irrigation District
Pixley Irrigation District
Tri-Valley Water District
¹ County of Fresno includes Fresno County Service Area #34 ² County of Tulare subcontractors include Alpaugh Irrigation District, Atwell Water District, Hills Valley ID, Saucelito ID ⁴ , Fransinetti Farms, Stone Corral ID ⁴ , City of Lindsay ⁴ , Strathmore Public Utility District, Styrotek, Inc., and City of Visalia ³ Kern Tulare Water District and Rag Gulch Water District consolidated on January 1, 2009. 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.

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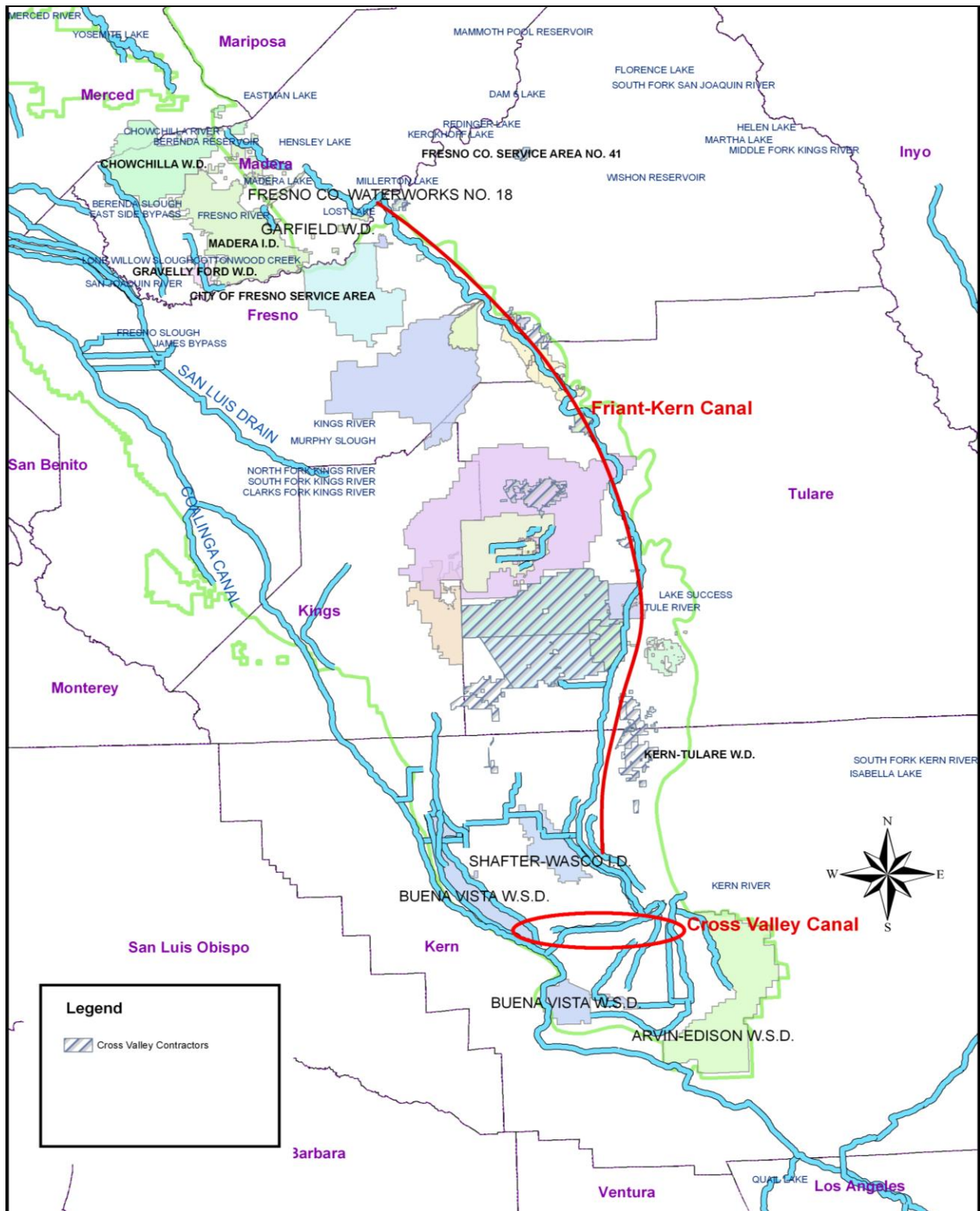


Figure 1-3. Project Overview Map with Friant Division CVP Contractors

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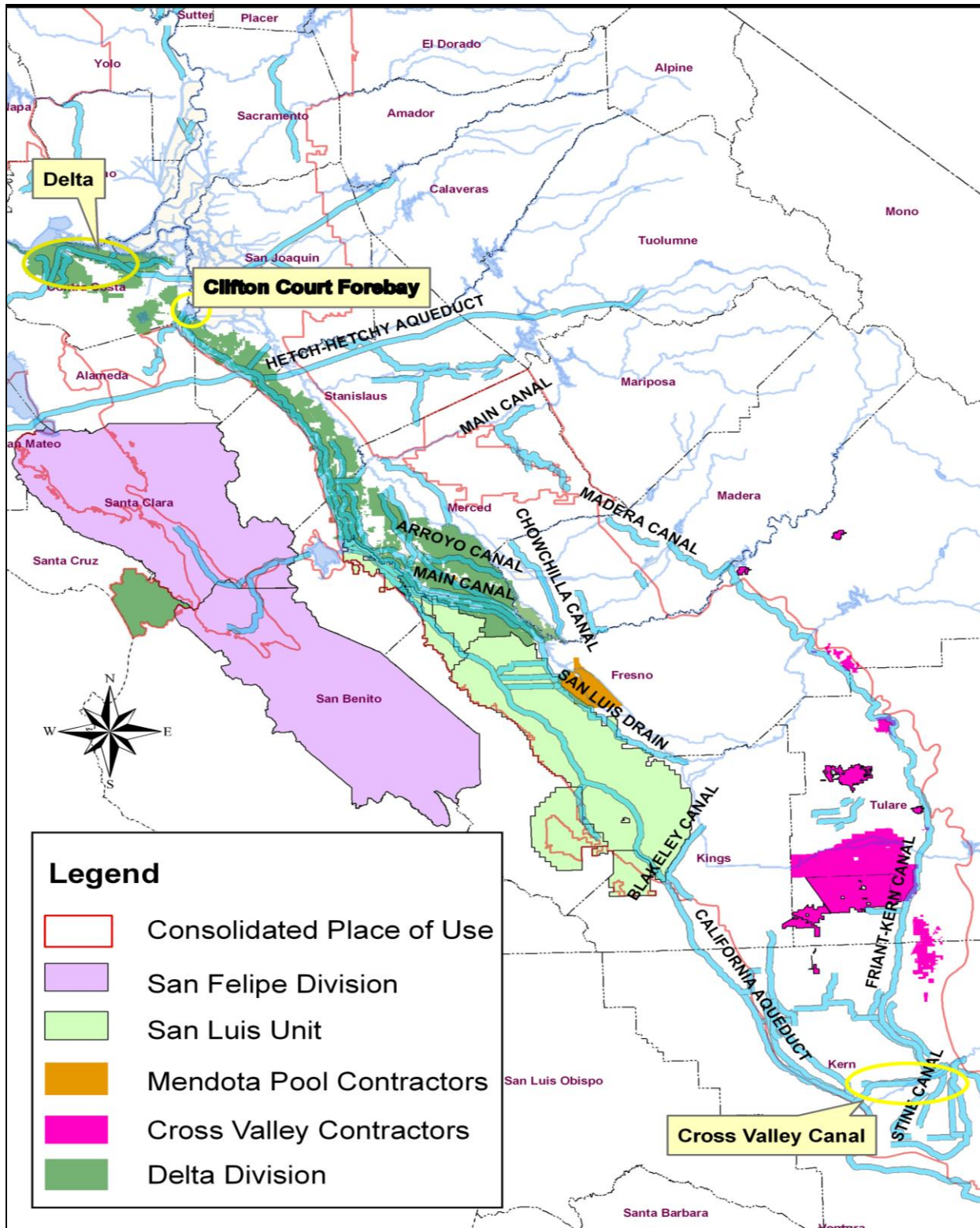


Figure 1-4. Project Overview Map with other CVP Divisions and Contractors

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Beginning in 1975, the first CV contractor(s) entered into three-party contracts with Reclamation and DWR. Pursuant to these contracts, Reclamation provided long-term water service and DWR provided conveyance for the CV contractors. Although the CV contractors are situated on the eastside of the SJV amongst the Friant Division CVP contractors (who receive their CVP supplies stored in Millerton Lake via the FKC), the CV contractors' CVP water is pumped from the Delta by the DWR and/or Reclamation. Reclamation may store the water in San Luis Reservoir and convey it in the San Luis Canal (SLC)/Aqueduct for delivery to the CV contractor(s). Due to direct conveyance hurdles, Reclamation envisioned that the CV contractors would obtain their CVP supplies via exchanges. The exchange arrangements are set forth in Article 5(a) of the CV contractor's water service contract, which 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 CVC and/or by exchange arrangements involving Arvin-Edison Water Storage District (AEWSD) or others. The parties further acknowledge that such arrangements are not transfers subject to Section 3405(a) of the CVPIA." Project Water as used in this Environmental Assessment (EA) is defined as water that is developed, diverted, stored, or delivered by the Secretary in accordance with the statutes authorizing the CVP and in accordance with all terms and conditions of water rights acquired pursuant to California law. Due to changing conditions, AEWSD has discontinued exchange relationships with some of the CV contractors.

1.2 Purpose and Need

The Proposed Action has two components: 1) execute eight IRC with the CV contractors and 2) approve the CV contractors' Article 5 exchange arrangements with individually proposed exchange partners.

The existing IRC for the CV contractors are set to expire on February 29, 2012 and need to be renewed until long-term water service contracts can be executed. As noted earlier, due to geographic differences between the CV contractors' water supplies and their respective service areas, the Article 5 exchange arrangements are needed in order for the CV contractors to ultimately receive their water supplies. If no approval is given for the Article 5 exchanges, Reclamation could still process the exchanges on an individual case-by-case basis; however, the timing for approval could exceed the window of opportunity to deliver and utilize the water.

The purpose of the IRC, as directed by the CVPIA, is to continue providing water service to the CV contractors who provide water service to their customers, which helps to sustain the regional economy, and in particular the agricultural sector of the economy. The purpose of the Article 5 exchanges is to continue providing a streamlined approval process and mechanism for water delivery to the CV contractors on a demand schedule where the contractors have the ability to take delivery of their supplies in large quantities and during short periods of time.

1.3 Scope

In accordance with section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 *et seq.*), this EA has been prepared to analyze the potential direct,

indirect, and cumulative impacts resulting from the Proposed Action. This EA has also been prepared to analyze the effects of the No Action Alternative.

The eight water service contracts proposed for interim renewal are listed in Table 2-1. These eight IRC would be renewed for a two-year period from March 1, 2012 through February 28, 2014. When a new long-term water service contract is executed for each CV contractor, the then-in-effect IRC would be superseded by the long-term water service contract and long-term conveyance agreement after appropriate environmental review is completed by Reclamation and DWR.

The Article 5 exchange arrangements would be approved for a two-year period to coincide with the IRC. Up to 128,300 acre-feet (AF) per year (AF/y) of the CV contractors' contractual CVP water supply from the Delta would be allowed to be exchanged with Friant Division CVP supplies and other sources (other sources of water include rivers, streams, creeks, groundwater, and SWP water). The CV contractors and potential exchange partners (other CVP contractors and non-CVP contractors) are all located within Fresno, Tulare, Kings, and Kern counties. This EA covers the broadest flexibility for Article 5 exchange arrangements known at this time. Proposals for new exchange arrangements not covered in this NEPA and Endangered Species Act (ESA) 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.

1.3.1 Contract Service Areas

No changes to any contractor's service area are part of the Proposed Action. Any request by a CVP contractor to change its existing service area would be a separate action. Separate appropriate environmental compliance and documentation would be completed before Reclamation approves a land inclusion or exclusion to any CVP contractor's service area.

1.3.2 Purpose of Water Use

Use of contract water for agricultural irrigation use or municipal and industrial (M&I) use under the proposed IRC would not change from the purpose of use specified in the existing contracts. However, consistent with current conditions the amount and types of crops planted would vary according to the annual water allocation and farming practices, and a small quantity of irrigation use may be changed to M&I purposes where the existing contract and governing laws and regulations allow.

1.3.3 Contract Assignments

Contract assignments between CVP contractors could occur; however, such an assignment is considered a separate action and would require appropriate environmental review and Reclamation approval. The Proposed Action includes renewing the existing IRC with the contract amount as they are currently stated.

As noted in Table 1-1 and 2-1, KTWD and Rag Gulch Water District have consolidated their two districts into one, under KTWD's name, through a contract assignment of Rag Gulch Water District's IRC to KTWD. As part of that assignment, KTWD has committed to maintain the effective separation of the two districts in terms of how much water would be delivered and applied where, until the long-term water service contracts are negotiated and appropriate environmental compliance is complete. That is, the water that would be delivered to KTWD

under the KTWD IRC would only be applied to lands within the historic KTWD contract service area boundaries, and water that would be delivered to KTWD under the Rag Gulch Water District IRC would only be applied to lands within the historic Rag Gulch Water District service area boundaries. No service area boundaries would be changed as a result of the Proposed Action.

1.4 Potential Resources Affected

Potentially affected resources include: water resources, land use, biological resources, cultural resources, Indian Trust Assets (ITA), Indian sacred sites, socioeconomics, environmental justice, air quality, and global climate.

1.5 Reclamation's Legal and Statutory Authorities, Jurisdiction, and Related Environmental Documents Relevant to the Proposed Federal Action

Several Federal laws, permits, licenses, policy requirements, and past environmental documents have directed, limited or guided the NEPA analysis and decision-making process of this EA and include the following (all of which are hereby incorporated by reference):

Reclamation Reform Act

The Reclamation Reform Act of 1982 applies to all irrigation land within an irrigation/water district, which has a water service contract with Reclamation and is subject to the acreage limitation and full-cost provisions of Reclamation law. Acquisition of irrigation water by exchange shall not subject the non-CVP users of such water to Federal Reclamation law and the associated rules and regulations.

Programmatic Environmental Impact Statement for the CVPIA

As discussed earlier in Section 1.1, the PEIS was prepared pursuant to regulations implementing the NEPA by Reclamation and the USFWS for the Department of the Interior to analyze the direct and indirect impacts and benefits of implementing various provisions of the CVPIA in the Central Valley and coastal areas of California over a 30-year study period. The PEIS was finalized in October 1999 and a Rod was signed in January 2001.

Programmatic Biological Opinion on Implementation of the CVPIA and Continued Operation and Maintenance of the CVP

The USFWS issued the Programmatic Biological Opinion on Implementation of the CVPIA and Continued Operation and Maintenance of the CVP (CVPIA PBO) (File Number 1-1-01-I-0311) in November 2000 (USFWS 2000).

Reclamation's program to implement the CVPIA included the renewal of all existing CVP contracts as a core program (CVPIA PBO, Pages 2-29 to 2-36). The CVPIA project description listed nine significant areas of commitment that provided the basis of the PBO no jeopardy finding (pages 2-50 to 2-71). These nine areas of commitment are listed below:

1. Commitments Associated with Implementation of the CVPIA.

- Anadromous Fisheries Restoration Activities (§3406(b)(1)).
 - Habitat Restoration Program (§3406(b)(1) other).
2. Commitments Associated with Long-term Renewal of CVP Water Contracts.
 3. Commitments for Activities Associated with CVP Water and/or Facilities.
 4. Commitments Associated with CVP Conveyance and Storage.
 5. Commitments Associated with Operations and Management Planning.
 6. Commitments Associated with Conservation Programs.
 - Wildlife Habitat Augmentation Program (Wetland Development Program).
 - CVP Conservation Program.
 - Comprehensive Mapping Program.
 7. Commitments Associated with Drainage.
 8. Commitments Associated with General Consultation Process.
 9. Commitments and Strategy to Ensure Compliance with the ESA.

In addition, pages 2-69 and 2-70, Section VI. I. 7 and 8 state:

“7. CVP or CVPIA actions or parts of actions, which may affect listed species or for which there is not enough information available to estimate take or make a not likely to adversely affect determination, will receive future tiered analysis and consultation. Reclamation or the [USFWS] will provide to the [USFWS]’s SFWO Endangered Species Division, dependent on lead agency status, clear descriptions of proposed CVP or CVPIA actions, specific areas that may be affected directly or indirectly by these actions, the manner in which the actions may affect any listed species or designated critical habitat, and other relevant reports and information. Reclamation and the [USFWS] will also identify any and all interrelated and interdependent actions and measures related to the proposed CVP or CVPIA action. In those situations where the lead agency or the [USFWS]’s SFWO Endangered Species Division, determines that an action may affect listed species or may adversely modify designated critical habitat, Reclamation and/or the [USFWS] will initiate informal or formal consultation as appropriate.

8. Reclamation and the [USFWS] will work together to develop means to more effectively facilitate ESA compliance through the coordination of activities and commitments discussed in this Project Description. This coordination will include establishment of a process within three months of this biological opinion that will provide necessary information to the [USFWS]’s SFWO Endangered Species Division in situations where a determination of no effect has been made, sufficiently in advance, to enable the USFWS’s review.”

Biological Opinions for the Continued Long-term Operation of the CVP and SWP

Reclamation and DWR coordinate long-term operation of the CVP and SWP. On July 30, 2004, the USFWS issued Biological Opinion (BO) 1-1-04-F-0140, which addressed the effects of operating the CVP/SWP and delivering CVP water for renewing water contracts and other actions on the threatened delta smelt (*Hypomesus transpacificus*) (USFWS 2004). On February 15, 2005, the USFWS issued BO 1-1-05-F-0055 in response to Reclamation’s November 3, 2004 request for initiation of formal consultation on the long-term operations of the CVP/SWP to further address effects on delta smelt critical habitat (USFWS 2005).

On April 7, 2006, NMFS listed the southern distinct population segment of North American green sturgeon as threatened under the ESA. Because this newly listed species had not been consulted under Section 7 of the ESA, Reclamation requested that NMFS consultation on the long-term operations of the CVP/SWP be re-initiated. Due to the potential for that consultation to affect species under the USFWS' jurisdiction and because of the Pelagic Organism Decline, which began in 2002, Reclamation requested that the USFWS also re-initiate consultation on delta smelt on July 6, 2006.

Subsequent BOs have been issued by NMFS in 2009 and USFWS in 2008 (File No. 08-F-1481-5, USFWS 2008) for the effects of the continued long-term operation of the CVP/SWP. The NMFS BO found that the proposed operations were likely to jeopardize several species and result in adverse modification of their critical habitat. The USFWS BO found that the proposed operations were likely to jeopardize the continued existence of delta smelt and adversely modify its critical habitat. NMFS provided a reasonable and prudent alternative (RPA) that Reclamation provisionally accepted. USFWS provide a RPA with five components. On December 15, 2008, Reclamation submitted a memo provisionally accepting the RPA developed by USFWS. The provisional acceptance of the USFWS' RPA was conditioned upon the further development and evaluation of two of the five components directed at habitat. Reclamation stated that the two RPA components, component 3 – the fall action, and component 4 – the tidal habitat restoration action, both needed additional review and refinement before Reclamation would be able to determine whether implementation of these actions by the CVP and SWP are reasonable and prudent.

Since that time, however, the Court remanded the BOs and Reclamation was ordered by the Court to comply with NEPA before accepting the RPAs from NMFS and USFWS, respectively. It is expected that once a new proposed action is selected through the NEPA process, Reclamation would provide a new Biological Assessment to the USFWS and NMFS and request consultation.

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

The Friant Division CVP contractors requested a formal consultation with the USFWS pursuant to Section 7 of the ESA, as amended, as part of renewal of 28 long-term water service contracts. Reclamation committed to initiating consultation on other aspects of the CVP so that interrelated and interdependent impacts and cumulative impacts on species outside the SJV could be fully addressed. With that in mind, the USFWS issued its BO on October 15, 1991 and Amendment of the BO on May 14, 1992 (USFWS 1991, 1992). In their BO, the USFWS stated that renewal of the 28 long-term contracts would not likely jeopardize the continued existence of 15 threatened and endangered species found within the Friant Division service area, provided Reclamation implement short and long-term endangered species conservation programs to mitigate the adverse impacts of continued CVP water delivery to the Friant Division. This program also committed the USFWS to participate by providing technical assistance and developing revised recovery plans for the SJV species needed for the timely resolution of listed species concerns. With contract renewal, the Friant Division CVP will continue to fulfill CVP purposes, while avoiding adverse impact to threatened and endangered species.

The BO, *U.S. Bureau of Reclamation Long-Term Contract Renewal of Friant Division and Cross Valley Unit Contractors*, January 19, 2001, File Number 1-1-01-F-0027 (LTCR Opinion), was prepared by the USFWS to address the proposed renewal by Reclamation of water service contract with the Friant Division and CV Units of the CVP in accordance with Section 7 of the ESA (USFWS, 2011). The USFWS concluded that the renewal for 25 years of CVP water service contracts is not likely to jeopardize 34 listed species. However, transfers and/or exchanges involving Friant Division or CV contractors were not addressed by the LTCR Opinion. In addition, the LTCR Opinion did not address some of the species and critical habitats covered in this EA, because their listings/designations occurred after the BO was issued. These species and critical habitats are: the vernal pool fairy shrimp, the vernal pool tadpole shrimp, all critical habitats for vernal pool species, and critical habitat for the California tiger salamander.

Biological Opinion on the Operations and Maintenance Program on Bureau of Reclamation Lands within the South-Central California Area Office (SCCAO)

The USFWS issued a BO (1-1-04-F-0368), dated February 17, 2005, for routine operations and maintenance (O&M) activities on SCCAO lands in San Joaquin, Stanislaus, Merced, Madera, Fresno, Santa Clara, San Benito and Contra Costa counties (USFWS, 2005). The 2005 BO addressed potential adverse effects on the California tiger salamander, vernal pool fairy shrimp, valley elderberry longhorn beetle, blunt-nosed leopard lizard, vernal pool tadpole shrimp, San Joaquin woolly-threads, California red-legged frog, giant garter snake, San Joaquin kit fox, and proposed critical habitat for California tiger salamander, and California red-legged frog. Additionally, the USFWS concurred that the Proposed Action was not likely to adversely affect the Conservancy fairy shrimp, longhorn fairy shrimp, succulent owl's-clover and its critical habitat, Hoover's spurge and its critical habitat, the giant kangaroo rat, California condor, bald eagle, delta smelt, San Joaquin adobe sunburst, California clapper rail, salt marsh harvest mouse, Greene's tuctoria and its critical habitat, SJV Orcutt grass and its critical habitat and critical habitat for the vernal pool fairy shrimp and vernal pool tadpole shrimp.

Cross Valley Unit Long-Term Contract Renewal Final EA

A Finding of No Significant Impact (FONSI) and Final EA, *Cross Valley Unit Long-Term Contract Renewal*, dated January 19, 2001 (Reclamation 2001a) was prepared by Reclamation to analyze the impacts associated with the renewal of a long-term (25 years) water service contract with the CV contractors. Reclamation determined that new information has become available since the signing of the 2001 EA and FONSI for the Long-Term Contract Renewal for the CV contractors, and prepared a Supplemental EA and FONSI (Reclamation 2001b). Once ESA compliance is completed on the continued long-term operation of the CVP and SWP, Reclamation will update the existing environmental documents in anticipation of renewing Cross Valley contractors' interim contracts.

Cross Valley Unit Interim Renewal Contracts

As noted earlier in Section 1.1, previous IRC were executed to provide a bridge between expiring IRC and a long-term water service contract per the CVPIA. Since ESA compliance is currently on-going in order to properly address the potential impacts from operating the CVP, Reclamation has historically executed IRC with the CV contractors, which were analyzed in the following EAs and supplemental EAs (SEAs):

- 2010 EA, which covered Contract Years 2010 and 2011 (Reclamation 2010);
- 2008 EA, which covered Contract Years 2008 and 2009 (Reclamation 2008);
- 2006 SEA, which covered Contract Years 2006 and 2007 (Reclamation 2006);
- 2004 SEA, which covered Contract Years 2004 and 2005 (Reclamation 2004);
- 2002 SEA, which covered Contract Years 2002 and 2003 (Reclamation,2003);
- 2001 SEA, which covered Contract Year 2001 (Reclamation 2001);
- 2000 SEA, which covered Contract Year 2000 (Reclamation 2000);
- 1998 SEA, which covered Contract Years 1998 and 1999 (Reclamation 1998); and
- 1994 EA, which covered Contract Years 1994 through 1997 (Reclamation 1994).

Article 5 Exchanges

As noted earlier in Section 1.1, the CV contractors have had to rely on exchanges with AEWSO and/or others in order to receive their CVP water supply from the Delta. These Article 5 exchanges are allowed under the CV contractors' CVP contract, and have been most recently approved in the following EAs:

- 2010 EA, which covered Contract Years 2010 and 2011 (Reclamation 2010a);
- 2009 EA, which covered Contract Year 2009;
- 2008 EA, which covered Contract Year 2008;
- 2007 EA, which covered Contract Year 2007;
- 2006 EA, which covered Contract Year 2006; and
- 2005 EA, which covered Contract Year 2005.

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Section 2 Alternatives Including the Proposed Action

For purposes of this EA, the following parameters are included as part of each alternative:

- Execution of each interim renewal contract is considered to be a separate action;
- A two-year interim renewal period is considered in the analysis, though contracts may be renewed for a shorter period;
- Each interim renewal contract would be superseded by long-term water service contracts if such contracts could be approved (after appropriate environmental review and Reclamation approval) during the interim renewal period;
- Each interim renewal contract would be renewed with existing contract quantities as reflected in Table 2-1 below;
- Reclamation would continue to comply with existing commitments made or requirements imposed by applicable environmental documents (see Section 1.5), such as existing BOs, including any obligations imposed on Reclamation resulting from re-consultations; and
- Reclamation would implement obligations resulting from current and future Court Orders issued in actions challenging applicable environmental documents that take effect during the interim renewal period.

Table 2-1. Interim Renewal Contracts Proposed for Renewal

Contractor	Contract Quantity (AF/y)	Purpose of Use	Water Shortage Reliability	Existing IRC #	Expiration Date
Fresno, County of	3,000	Agriculture and M&I	Agriculture	14-06-200-8292A-IR13	2/29/2012
Hills Valley Irrigation District	3,346	Agriculture and M&I	Agriculture	14-06-200-8466A-IR13	2/29/2012
Kern-Tulare Water District (KTWD)*	40,000	Agriculture and M&I	Agriculture	14-06-200-8601A-IR13	2/29/2012
Kern-Tulare Water District (Rag Gulch Water District)*	13,300	Agriculture and M&I	Agriculture	14-06-200-8367A-IR13	2/29/2012
Lower Tule River Irrigation District	31,102	Agriculture and M&I	Agriculture	14-06-200-8237A-IR13	2/29/2012
Pixley Irrigation District	31,102	Agriculture and M&I	Agriculture	14-06-200-8238A-IR13	2/29/2012
Tri-Valley Water District	1,142	Agriculture and M&I	Agriculture	14-06-200-8565A-IR13	2/29/2012
Tulare, County of	5,308	Agriculture and M&I	Agriculture	14-06-200-8293A-IR13	2/29/2012
Total	128,300				
<p>* KTWD and Rag Gulch Water District have consolidated their two districts into one district, under KTWD's name through a contract assignment of Rag Gulch Water District's IRC to KTWD. However, KTWD would be issued two IRC's – one as KTWD IRC (for 40,000 AF), and one as Rag Gulch Water District's assigned IRC (for 13,300 AF). As part of that assignment, KTWD has committed to maintain the effective separation of the two districts in terms of how much water is delivered and applied where, until the long-term water service contracts are negotiated and appropriate environmental compliance is completed.</p>					

2.1 No Action Alternative

2.1.1 Interim Renewal contract

The No Action Alternative evaluated in this EA is the execution of up to eight IRC between the United States (Reclamation), DWR, and the CV CVP contractors listed in Table 2-1 with terms and conditions modeled after the Preferred Alternative of the CVPIA Final PEIS adapted to apply for an interim period. Therefore, the No Action Alternative is the continued delivery of CVP water under the IRC which includes terms and conditions required by non-discretionary CVPIA provisions for long-term contracts.

The CVPIA PEIS Preferred Alternative assumed that most contract provisions would be similar to many of the provisions in the 1997 CVP IRC, which included contract terms and conditions consistent with applicable CVPIA requirements. The only CVPIA provision which was incorporated into the Preferred Alternative of the Final PEIS and included in the No Action Alternative but has not been incorporated into the previous IRC for the seven contractors is tiered water pricing.

The CVPIA required the implementation of a tiered water pricing component for contracts with terms longer than three years. The tiered pricing component is the incremental amount to be paid for each AF of water delivered, and includes charges for water that would be collected and paid into the Restoration Fund. The tiered pricing component for the amount of water delivered up to 80 percent of the contract total shall not be less than the established rates/charges determined annually by the Contracting Officer in accordance with the then-current applicable Reclamation water rate setting policies for the contractor. The tiered pricing component for the amount of water delivered in excess of 80 percent of the contract total, but less than or equal to 90 percent of the contract total, shall equal one-half of the difference between the rate/charges established for the contractor and the M&I full cost rate. The tiered pricing component for the amount of water that exceeds 90 percent of the contract total shall equal the difference between (1) the rates/charges and (2) the applicable cost water rate. This is described as the 80/10/10 pricing structure (80/10/10).

2.1.2 Article 5 Exchanges

Under the No Action Alternative, historical exchanges between AEWSD and the CV contractors to allow delivery of the CV contractors' contract supplies would continue as in the past. Some of the CV contractors who do not have an exchange agreement with AEWSD would have to transfer their water as in the past or develop new exchange arrangements, which may require separate Contracting Officer approval and environmental analysis on a case-by-case basis.

2.2 Proposed Action

The Proposed Action includes two components: 1) execution of up to eight IRC with the seven CV contractors for another two-year interim renewal period and 2) approving the CV contractors' Article 5 exchange arrangements with individually proposed exchange partners to coincide with the IRC.

2.2.1 Execution of Interim Renewal Contracts

The Proposed Action involves the execution of up to eight IRC between the United States (Reclamation) and the CVP contractors listed in Table 2-1. These contracts are the same eight included in the No Action Alternative. All seven of the CV contractors have existing IRC, which will expire on February 29, 2012, and all have had several IRC executed prior to their existing IRC. The CV contractors are currently in their thirteenth IRC and the proposed renewal would be the fourteenth. The Proposed Action would continue these existing IRC, with only minor, administrative changes to the contract provisions to update the previous IRC for the new contract period. In the event that a new long-term water contract is executed, that IRC would be superseded.

No changes to any of the CV contractor's respective service areas or water deliveries are part of the Proposed Action. CVP water deliveries under the eight proposed IRC can only be used within each designated contract service area. The proposed 2012 IRC quantities would remain the same as in the existing IRC. Water can be delivered under the IRC in quantities up to the contract total, although it is likely that deliveries would be less than the contract total.

2.2.1.1 Comparison of Proposed Action and No Action Alternative

The primary difference between the Proposed Action and the No Action Alternative is that the Proposed Action does not include tiered pricing. Section 3405(d) of the CVPIA does not require tiered pricing to be included in contracts of three years or less in duration. Therefore, if during the term of the IRCs at least 80 percent of the contract total is delivered in any year, no incremental charges for water will be collected and paid to the Restoration Fund that year as would have happened under tiered pricing.

Table 2-2 below provides a comparison of the differences between the No Action Alternative and the Proposed Action as they related to many of the construction clauses.

Table 2-2. Comparison of Contract Provisions for the Proposed Action and No Action Alternative

IRC Provision Definitions:	No Action Alternative Based on PEIS Preferred Alternative	Proposed Action – Negotiated Contract
Category 1 and Category 2	Tiered Pricing as in PEIS	No Tiered Pricing and No definition of Category 1 and Category 2
Contract Total	Contract Total described as Total Contract	Assumes maximum entitlement
M&I water	Not addressed as definition – Addressed within an article – Article assumes obtaining a rate for M&I when delivered	Assumes provision of water for irrigation of land in units less than or equal to five acres as M&I water unless Contracting Officer is satisfied use is irrigation
Terms of contract – right to use contract	Assumes that contracts may be renewed Assumes convertibility of contract to a 9(d) contract same as existing contracts	Assumes that contracts will be renewed if Contractor has been compliant with contract Similar to No Action Alternative but preserves positions re: convertibility to 9(d) contract
Water to be made available and delivered to the contractor	Assumes water availability in accordance with existing conditions Assumes compliance with BOs and other environmental documents for contracting	Similar to No Action Alternative but makes it more explicit that water to be made available is subject to operational constraints Similar to No Action Alternative; Requires contractor to be within legal authority to implement.

Rates and method of payment for water	Assumes Tiered Pricing is total water quantity; assumes advanced payment for rates for two months; payment only for water taken	Same as No Action Alternative in terms of payment and take or pay, however tiered pricing is not applicable to contracts less than 3 years
Application of payments and adjustments	Assumes credits or refunds	Similar to No Action Alternative except requires \$1,000 or greater overpayment for refund
Opinions and determinations	PEIS recognizes that CVP will operate in accordance with existing rules; opinions will not be arbitrary, capricious or unreasonable	Same as No Action Alternative with additional clarifications on the right to seek relief and legal effect of section
Coordination and cooperation	Not addressed	Assumes that communication, coordination and cooperation between CVP operations and users should participate in CVP operational decision making discussions; however, parties retain exclusive decision-making authority
Operation and maintenance by non-federal entity	Assumes that CVP will operate in accordance with existing rules and no additional changes to operation responsibilities	Similar to No Action Alternative; however, recognizes role of certain operating Non-Federal Entity/Entities
Resolution of disputes	Not addressed	Assumes a Dispute Resolution Process
Changes in contractor's service area	Assumes no change in CVP water service areas absent Contracting Officer consent	Assumes changes to limit rationale used for non-consent and sets time limit for assumed consent.
Confirmation of contract	Assumes Court confirmation of contract for assurance relating to validity of contract	No requirement for court confirmation of contract on contracts of short duration
Note: Table 2-2 contains a summary of many but not all of the terms and conditions of the referenced contracts. The above table is also generally descriptive of contract provisions within the predominantly irrigation contract forms; however, for the precise contract language and an exact comparison, the specific contracts should be referenced.		

The expiring 2010 IRC can be viewed online at: www.usbr.gov/mp/cvpia/3404c/lt_contracts/2010_int_cts/index.html. For comparison, the draft 2012 IRC can be viewed online at: http://www.usbr.gov/mp/cvpia/3404c/lt_contracts/2012_int_cts/index.html. The terms and conditions of the 2012 IRC are incorporated by reference into the Proposed Action.

2.2.2 Article 5 Exchange Arrangements

In addition, Reclamation proposes to approve the CV contractors' exchange arrangements with individually proposed exchange partners for the 2012 and 2013 contract years (March 1, 2012 through February 28, 2014) for up to the full CV contractors' CVP contract supply of 128,300 AF/y. The Proposed Action would also include the continued historical exchanges between the CV contractors and AEWS. Potential exchange partners are identified in Tables 3 through 10 in Section 3.

Due to varying hydrological conditions, loss due to evaporation and/or seepage, differences in the value of water, and/or timing, imbalanced exchanges could occur (Appendix B further explains the scenarios for imbalanced exchanges). Consistent with historical practices, under the Proposed Action, imbalanced exchange arrangements would be permitted but limited to a ratio of 2:1. Proposed exchange arrangements exceeding this amount are not within the scope of this analysis and subsequent environmental review(s) would be required. A 2:1 imbalanced

exchange occurs when the first component of the exchange, the CV contractors' annual allocation (not to exceed 128,300 AF/y), would be delivered to a participating entity. As the second component of the exchange, no less than 50 percent of the water that was delivered in the first component of the exchange to the participating entity would be delivered to the CV contractors. Possible exchange arrangements could be completed as follows, and is further described in Appendix B:

1. Historical exchanges with AEWS

- The CV contractors' CVP water is conveyed down the Aqueduct where it would be diverted by AEWS turnouts off the Aqueduct or CVC. In return, AEWS's Friant Division CVP water is diverted from the FKC into the CV contractors' service areas.

2. Exchanges with Friant Division CVP contractors

- The CV 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 CV contractors' respective turnouts.

3. Exchanges with SWP contractors

- The CV contractors' water is conveyed down the Aqueduct where it is diverted by a SWP contractor. In return, The SWP contractor's water is diverted from the Aqueduct into the CVC where the water is then pumped into the FKC and ultimately delivered to the CV contractors. In addition, SWP contractor previously banked water in Kern County could be extracted into the CVC and pumped into the FKC and delivered to the CV contractors.

4. Exchanges with Tulare Lake Basin Water Storage District (TLBWS) contractors

- The CV contractors' water is conveyed down the Aqueduct where it is diverted by TLBWS contractors. In return, TLBWS contractors deliver 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 CV contractors.

CVP water may be wheeled under Article 55 of a SWP contract as one component of the exchange. Article 55 of the SWP contracts allows for the SWP contractor to convey non-SWP water within available capacity in the Aqueduct. Under this scenario, a SWP contractor would request DWR to convey a CV contractor's CVP water, if capacity exists, in the Aqueduct. This option results in elevating the CV contractor's priority for DWR to convey the water.

CVP water is tracked from its origin to its final disposition (end use) and does not lose its Federal characteristics under the California water rights permits. Water supplies would be used in compliance with the applicable water rights permits and conform to the applicable purpose and place-of-use of the associated water rights permit. In addition, the following commitments are part of the Proposed Action:

- Commitments from Section 1.5;

- The water may be used for either Agricultural or M&I purposes;
- No native or untilled land (fallow for three consecutive years or more) may be cultivated with this water;
- No new construction or modification of existing facilities is to occur in order to complete the Proposed Action;
- No changes in the point of diversion or places-of-use without prior approvals from the State Water Resources Control Board, Reclamation, and/or DWR as applicable;
- No unmitigable impacts can be caused to a third party without discussion between the parties involved;
- Exchanges must not alter the quality of water, or the hydrological regime of natural waterways or natural watercourses such as rivers, streams, creeks, lakes, ponds, pools, or wetlands, etc., in a way that may have a detrimental effect on fish or wildlife or their habitats;
- All exchanges must comply with all applicable Federal, state and local laws, regulations, permits and policies; and
- Reclamation would review each exchange proposal for compliance with the above conditions prior to approval and execution of the action, and determination that the action is consistent with the criteria described within this NEPA analysis.

2.3 Alternatives Considered but Eliminated

2.3.1 Non-renewal of Interim Renewal Contracts

Non-renewal of existing contracts is considered infeasible based on Section 3404(c) of the CVPIA, which states that "...the Secretary shall, upon request, renew any existing long-term repayment of water service contract for the delivery of water from the CVP..." The non-renewal alternative was considered, but eliminated from analysis in this EA because Reclamation has no discretion not to renew existing water service contracts and because this alternative does not meet the Purpose and Need as stated in Section 1.2.

2.3.2 Reduction in Interim Renewal Contract Quantities

Reduction of contract water quantities due to the current delivery constraints on the CVP system was considered in certain cases, but rejected from the analysis of the eight interim renewal contracts for several reasons:

First, the Reclamation Project Act of 1956 and the Reclamation Project Act of 1963 mandated renewal of existing contract quantities when beneficially used. Irrigation and M&I uses are beneficial uses recognized under federal Reclamation and California law. Reclamation has determined that the contractors have complied with contract terms and the requirements of applicable law. It also has performed water needs assessments for all the CVP contractors to identify the amount of water that could be beneficially used by each water service contractor. In the case of each IRC contractor, the contractor's water needs equaled or exceeded the current total contract quantity.

Second, the analysis of the PEIS resulted in selection of a Preferred Alternative that required contract renewal for the full contract quantities and took into account the balancing requirements of CVPIA (p. 25, PEIS ROD). The PEIS ROD acknowledged that contract quantities would

remain the same while deliveries are expected to be reduced in order to implement the fish, wildlife, and habitat restoration goals of the Act, until actions under CVPIA 3408(j) to restore CVP yield are implemented (PEIS ROD, pages 26-27). Therefore, an alternative reducing contract quantities would not be consistent with the PEIS ROD and the balancing requirements of CVPIA.

Third, the shortage provision of the water service contract provides Reclamation with a mechanism for annual adjustments in contract supplies. The provision protects Reclamation from liability from the shortages in water allocations that exist due to drought, other physical constraints, and actions taken to meet legal or regulatory requirements. Reclamation has relied on the shortage provisions to reduce contract allocations to IRC contractors in most years in order to comply with Section 3406(b)(2) of the CVPIA. Further, CVP operations and contract implementation, including determination of water available for delivery, is subject to the requirements of BOs issued under the Federal ESA for those purposes. If contractual shortages result because of such requirements, the Contracting Officer has imposed them without liability under the contracts.

Fourth, retaining the full historic water quantities under contract provides the contractors with assurance the water will be made available in wetter years and is necessary to support investments for local storage, water conservation improvements and capital repairs.

Therefore, an alternative reducing contract quantities would not be consistent with Reclamation law or the PEIS ROD, would be unnecessary to achieve the balancing requirements of CVPIA or to implement actions or measure that benefit fish and wildlife, and could impede efficient water use planning in those years when full contract quantities can be delivered.

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Section 3 Affected Environment and Environmental Consequences

The context for this EA is the SJV within Fresno, Tulare, Kings, and Kern Counties. Water districts within these counties are characterized as either CVP contractors including the CV contractors, or other water districts (non-CVP contractors) who would participate as potential exchange partners. This section identifies the affected environment and potential environmental consequences resulting from the No Action Alternative and Proposed Action.

As noted in Section 1.5, previous IRC and Article 5 exchanges have been analyzed by Reclamation under several environmental documents. Since much of the affected environment is the same as has been previously analyzed in the past documents, and can also be found in Appendix C through E, the following section will not repeat some of the same information.

3.1 Water Resources

Central Valley Project Water Supply

CVP water is used for restoration of fisheries and aquatic habitat in waterways affected by water development, M&I uses, wildlife refuges, and other purposes – the largest use of CVP water is for agricultural irrigation. The greatest demand for irrigation water occurs in mid-to-late summer, as crops mature and crop water use increases. During the winter, farmers use water for frost control and pre-irrigation of fields to saturate the upper soil and for irrigation of permanent crops.

Reclamation makes CVP water available to contractors for reasonable and beneficial uses, but this water is generally insufficient to meet all of the contractors' needs. In the CV contractors' service areas, contractors without a sufficient CVP water supply may extract groundwater if pumping is feasible or negotiate water transfers with other contractors. Alternative supplies from groundwater pumping and/or transfers are accessed when CVP surface water deliveries become more expensive than pumping or doing water transfers.

Water Delivery Criteria

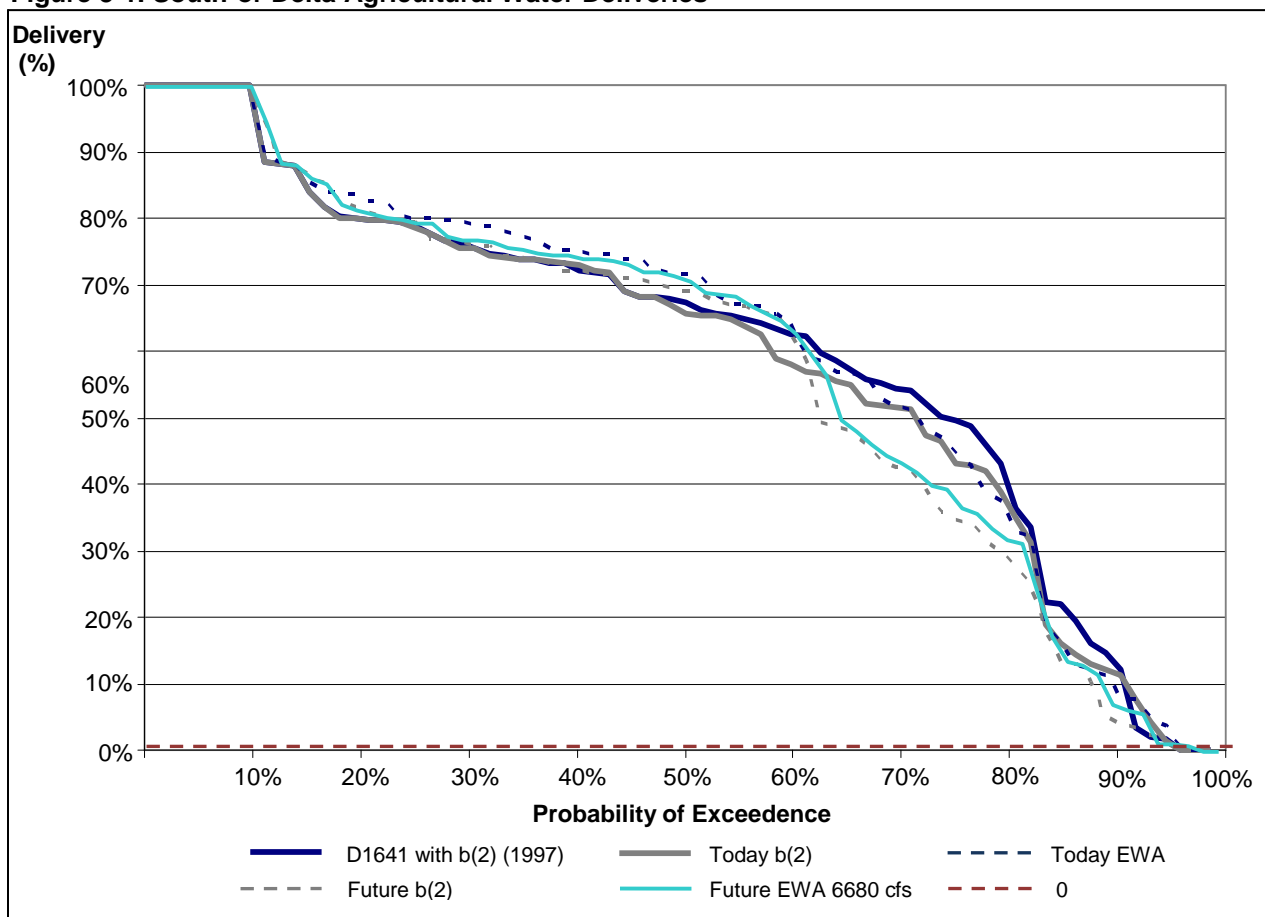
Reclamation's delivery of CVP water diverted from rivers is determined by state water right permits, judicial decisions, and state and federal obligations to maintain water quality, enhance environmental conditions, and prevent flooding. The CVPIA PEIS considered the effects of those obligations on CVP contractual water deliveries on a CVP-wide basis. Experience since completion of the CVPIA PEIS has indicated even more severe contractual shortages are applicable to south-of-Delta water deliveries than predicted (CVPIA PEIS, 1999), and this information has been incorporated into the modeling for the current CVP/SWP coordinated operations [CSCO] (Reclamation and DWR 2004).

With the implementation of the CVPIA PEIS Preferred Alternative and under conditions in the late 1990s, modeling predicts that CVP agricultural south-of-Delta water service contractors would receive an average of 59 percent of their current total contract amounts, based upon a hydrologic pattern similar to that of the last 70 years and described in the Technical Appendix,

Volume 2, of the Draft CVPIA PEIS (Reclamation 1997a). These conditions would result in the delivery of total contract amounts to agricultural water service contractors located south-of-Delta approximately 15 percent of the time. Minimum deliveries of zero would occur only in critically dry years.

Tables within the CSCO also show that deliveries of over 80 percent of the contract total for agricultural purposes would occur between 22 and 24 percent of the time (See Figure 3.1). Therefore, modeling predicts that tiered pricing, if it were required, would apply once every fourth or fifth year.

Figure 3-1. South-of-Delta Agricultural Water Deliveries



Contractor Water Needs Assessments

Demands were compared to available non-CVP water supplies to determine the need for CVP water. If the negative amount (unmet demand) is within 10 percent of their total supply for contracts of greater than 15,000 AF/y, or within 25 percent for contracts less than or equal to 15,000 AF/y, the test of full future need of the water supplies under the contract was deemed to be met. Because the CVP was initially established as a supplemental water supply for areas with inadequate supplies, the needs for most contractors were at least equal to the CVP water service contract and frequently exceeded the previous contract amount. Increased total contract amounts were not included in the needs assessment because the CVPIA stated that Reclamation cannot

increase contract supply quantities. The analysis for the Water Needs Assessment did not consider that the CVP's ability to deliver water has been constrained in recent years and may be constrained in the future because of many factors including hydrologic conditions and implementation of federal and state laws. The likelihood of contractors actually receiving the full contract amount in any given year is uncertain. No new water needs assessments are anticipated.

Table 3-1. Water Needs Assessment

Contractor	2025 Project Unmet Demand (AF)
County of Fresno	1,122
County of Tulare	Water Needs Assessment not required ¹
Hills Valley Irrigation District	3,092
Kern-Tulare Water District	7,517
Lower Tule River Irrigation District	23,318
Pixley Irrigation District	112,507
Tri-Valley Water District	Water Needs Assessment not required ²

¹The ten subcontractors that make up the county of Tulare each have less than the minimum irrigable acreage required for completion of a Water Needs Assessment.

²Tri-Valley Water District has less than the minimum irrigable acreage required for completion of a Water Needs Assessment.

3.1.1 Affected Environment

3.1.1.1 Cross Valley Contractors

CV contractors are CVP contractors that are geographically located within the Friant Division. A narrative description of the CV contractors can be found in Appendix C. In summary, there are seven CV contractors with a total CVP supply of 128,300 AF/y. One of the CV contractors, the County of Tulare, has 10 subcontractors which are identified in Table 3-2. The County of Tulare is in the process of assigning a portion of the contract to each of these subcontractors. Annual CV contractors' supply allocations are based on Reclamation's south-of-Delta CVP allocations, which are a percentage of each CVP contractors' respective contract total (Table 3-2). Allocations are based on available water supplies, meeting Delta water quality, environmental and flow requirements, and pumping capacity as well as other hydrologic and operational factors. Additionally, DWR pumps the CV contractors' Delta supplies after all other needs of the SWP have been met. The CVP water is subordinate in priorities for pumping by DWR. Water deliveries to the CV contractors are made available, by Reclamation, in the Delta and are diverted through the Banks Pumping Plant of the SWP or the Jones Pumping Plant of the CVP.

In 1975, the CVC was completed to bring water from the Aqueduct near Taft, California, through a series of six pump lifts to the east side of the SJV near the city of Bakersfield. Delta CV contractors CVP water supply was designed to be delivered to AEWS in exchange for a portion of their Friant Division CVP water supply available through Millerton Lake. Recently, Pixley Irrigation District and Lower Tule River Irrigation District have discontinued the exchange with AEWS and have transferred their CVP water to other CVP water districts and have purchased local supplies.

CV contractors have a limited capability to receive Delta water directly from the CVC. Due to the above, exchanges between the CV contractors and other water districts may include compensatory arrangements for water imbalances due to the hydrological conditions, the time of year the water is delivered, and value of such water. These exchange arrangements under Article 5(a) are not water transfers subject to Section 3405(a) of the CVPIA. (An example of the specific Article 5 language can found in Appendix A.)

Table 3-2. List of Cross Valley Contractors, Subcontractors, and their Related Water Resources

Agency	CVP Contract Supply (AF/y)	Other Water Supplies	Groundwater Safe Yield	Groundwater Recharge
County of Fresno County of Fresno Fresno County Service Area 34 (Brighton Crest)	3,000 Total 1,608 (M&I) 1,392 (M&I)	Unknown	*	Yes
County of Tulare Alpaugh Irrigation District Atwell Island Water District Hills Valley Irrigation District Saucelito Irrigation District Stone Corral Irrigation District City of Lindsay Fransinetta Farms Strathmore Public Utility District Styrotek, Inc. City of Visalia	5,308 Total 100 (Ag) 50 (Ag) 2,913 (Ag) 100 (Ag) 950 (Ag) 50 (M&I) 400 (Ag) 400 (M&I) 45 (M&I) 300 (M&I)	Groundwater	*	Yes
Hills Valley Irrigation District	3,346 (Ag)	Unknown	*	Yes
Kern-Tulare Water District	53,300 (Ag)	23,000 AF/y Kern River exchanged with ID4 for SWP water	*	Not within service area boundary
Lower Tule River Irrigation District	31,102 (Ag)		*	Yes
Pixley Irrigation District	31,102 (Ag)		*	Deer Creek
Tri-Valley Water District	1,142 (Ag)		*	No
Totals	128,300		-	-
*The safe groundwater yield is difficult to quantify. However, the safe yield of groundwater is generally considered to be 1 AF of water for every 1 acre of land. M&I – used for municipal and industrial purposes Ag – used for agricultural/irrigation purposes ID4 – Kern County Water Agency Improvement District 4				

3.1.1.2 Friant Division CVP Contractors and non-CVP Contractors

Friant CVP contractors are located on the eastern side of the SJV and are included in this EA as potential exchange partners under the Article 5 exchanges. CVP water for these contractors comes from Millerton Lake via the FKC or the Madera Canal. Water conveyed to these contractors is categorized as Friant Class 1 or Class 2 water depending on its reliability and allocation circumstances. A narrative description of Friant Division CVP contractors that are potential exchange partners can be found in Appendix D.

On March 1, 2010, Kaweah Delta Water Conservation District (KDWCD) received a partial assignment of 7,400 AF/y of Class 2 and 1,200 AF/y of Class 1 CVP water from Ivanhoe Irrigation District, and is now considered a Friant Division CVP contractor. KDWCD is located in the south-central portion of the San Joaquin Valley and lies in both Tulare and Kings counties with a total area of about 337,000 acres. KDWCD is comprised of four districts that are entirely

or partially within KDWCD boundary: Lakeside Irrigation Water District, Kings County Water District, Corcoran Irrigation District, and Tulare Irrigation District (Table 3-6). Nearly all of the lands within KDWCD served with Kaweah River water also use groundwater wells to supply irrigation water, primarily due to the erratic, relatively undependable, nature of flow on the Kaweah River. All M&I water uses within the KDWCD are supplied from groundwater. KDWCD can take delivery of CVP water from the FKC, which passes through the eastern portion of the district.

In summary, there are 29 Friant Division CVP contractors; however, only 20 have been identified as potential exchange partners for the purposes of this EA (Table 3-3).

Table 3-3. Potential Exchange Partners and Related Water Resources

Friant Division CVP Contractors	Class 1 (AF/y)	Class 2 (AF/y)	Other Surface Water Supplies	Groundwater Safe Yield	Groundwater Recharge
Arvin-Edison Water Storage District	40,000	311,675	Kern River	89,900	Yes
Delano-Earlimart Irrigation District	108,800	574,500	0	*	White River Channel
Exeter Irrigation District	11,500	19,000	0	*	Yokohl Creek
Fresno Irrigation District	0	75,000	Kings River 800,000	*	Yes
Garfield Water District	3,500	0	0	*	Unknown
Ivanhoe Irrigation District	6,500	500	Wutchumna Water Company Stock (3,950) St. Johns River, Cotton Creek	*	St. Johns River and Cotton Creek
Kaweah Delta Conservation District	1,200	7,400			
Lewis Creek Water District	1,450	0	0	*	Unknown
Lindmore Irrigation District	33,000	22,000	0	21,000	Yes
Lindsay-Strathmore Irrigation District	27,500	0	Wutchumna Water Company Stock 5-45,000	18,000	Unknown
Lower Tule River Irrigation District	61,200	238,000	Tule River 70,000; 31,102 CV	*	Unknown
Orange Cove Irrigation District	39,200	0	0	28,000	Only Small Amount in some Areas
Porterville Irrigation District	16,000	30,000	Tule River 12,900 Average, Porter Slough	0	No
Saucelito Irrigation District	21,200	32,800	0	*	Deer Creek only when CVP water is diverted from FKC
Shafter-Wasco Irrigation District	50,000	39,600	0	*	0
Southern San Joaquin Municipal Utility District	97,000	50,000	0	0	Poso Creek
Stone Corral Irrigation District	10,000	0	950 via exchanges with other CVP contractors	*	Unknown
Tea Pot Dome Water District	7,500	0	0	0	0
Terra Bella Irrigation District	29,000	0	0	0	Deer Creek
Tulare Irrigation District	30,000	141,000	0	0	0

Other Potential Exchange Partners: non-CVP Contractors	
Buena Vista Water Storage District	Kings County Water District
Cawelo Water District	Kings River Conservation District
Consolidated Irrigation District	Lakeside Irrigation District
Corcoran Irrigation District	Liberty Water District
Deer Creek & Tule River Authority	North Kern Water Storage District
Kern County Water Agency	Kern Water Bank Authority
Kern Delta Water District	Semitropic Water Storage District
*The safe groundwater yield is difficult to quantify. However, the safe yield of groundwater is generally considered to be 1 AF of water for every 1 acre of land.	

A narrative description of other CVP contractors and non-CVP contractors that are potential exchange partners can be found in Appendix E and Tables 3-4 through 3-9. Some of these districts have sub-entities which may include CVP and/or SWP contractors. In some cases, the diversions of non-CVP water from rivers, creeks and ditches, is based on the total runoff in any given hydrological season. The districts receive a percentage of the runoff and no specific limit exists to the total annual supply. The total amount of non-CVP water is difficult to quantify; therefore, average water supplies are depicted.

Table 3-4. Tulare Lake Basin Water Storage District Water Resources

Contractor/Subcontractor	Water Resources
Tulare Lake Basin Water Storage District	Kings, Tule, Kaweah, and Kern Rivers, Deer Creek, SWP supplies
Angiola Water District	605 AF/y SWP, if available 15,000 AF/y (5,145 average) Kings River 6,000 AF/y (975 average) Tule River and Deer Creek 60,000 AF/y (7,787 average) Tulare Lake Flooding 35,000 AF/y groundwater
Melga Water District	SWP supplies and Kings, Tule, Kaweah, and Kern Rivers

Table 3-5. Deer Creek & Tule River Authority Water Resources

Contractor/Subcontractor	CVP Supply (AF/y)		Other (AF/y)	Groundwater Safe Yield	Groundwater Recharge
	Friant	CV			
Lower Tule River Irrigation District	61,200 Class 1 238,000 Class 2	31,102	70,000 Tule River	*	Unknown
Pixley Irrigation District	0	31,102	Deer Creek	*	Deer Creek
Porterville Irrigation District	16,000 Class 1 30,000 Class 2	0	12,900 avg Tule River, Porter Slough	0	Yes
Saucelito Irrigation District	21,200 Class 1 and 32,800 Class 2	100		*	Deer Creek (when CVP water is available)
Stone Corral Irrigation District	10,000 Class 1	0	950 CVP exchanges with other CVP contractors	3,200 AF/y	Unknown
Terra Bella Irrigation District	29,000 Class 1	0	0	0	Deer Creek
*The safe groundwater yield is difficult to quantify. However, the safe yield of groundwater is generally considered to be 1 AF of water for every 1 acre of land.					

Table 3-6. Kaweah Delta Water Conservation District Water Resources

Contractor/Subcontractor	CVP Supply (AF/y)		Other	Groundwater Safe Yield	Groundwater Recharge
	Friant	CV			
Lakeside Irrigation Water District	0	0	Kaweah and Kern Rivers, Cottonwood and Cross Creeks	*	Cross Creek recharge basins
Corcoran Irrigation District	0	0	Kings River	*	Yes
Kings County Water District	0	0	Kaweah and Kings Rivers	*	Yes
Tulare Irrigation District	30,000 Class 1 141,000 Class 2	0	Kaweah River	10% natural and artificial recharge	Yes
*The safe groundwater yield is difficult to quantify. However, the safe yield of groundwater is generally considered to be 1 AF of water for every 1 acre of land.					

Table 3-7. Kern County Water Agency Water Resources

Member Unit	CVP ²	Other	Groundwater Safe Yield	Groundwater Recharge
Belridge Water Storage District ¹	No	SWP	n/a	None
Berrenda Mesa Water District ¹	No	SWP	n/a	None
Buena Vista Water Storage District	Yes	SWP, Kern River	0.3 AF	Yes
Cawelo Water District	Yes	45,000 AF/y SWP, Wet years only SWP, 27,000 AF/y Kern River, reclaimed oil field water	0.3 AF/acre	Limited Poso Creek, recharge basins
Henry Miller Water District ¹	Yes	SWP, Kern River	0.3 AF/acre	Limited
Improvement District #4	Yes	SWP, Kern River	0.3 AF/acre	Yes
Kern Delta Water District	Yes	Kings and Kaweah River	0.3 AF/acre	Yes
Lost Hills Water District ¹	No	SWP	n/a	None
North Kern Water Storage District	Yes	SWP, Kern River	0.3 AF/acre	Yes
Rosedale-Rio Bravo Water Storage District	Yes	SWP, Kern River	0.3 AF/acre	Yes
Semitropic Water Storage District	Yes	SWP, Poso Creek, Metropolitan Water District	0.3 AF/acre	Limited
Tehachapi-Cummings Company Water District ¹	No	SWP, local streams	*	Yes
Tejon-Castaic Water District ¹	No	SWP, local streams	n/a	None
West Kern Water District	No	SWP	n/a	None
Wheeler Ridge-Maricopa Water Storage District	No	SWP, local streams	*	Unknown
*The safe groundwater yield is difficult to quantify. However, the safe yield of groundwater is generally considered to be 1 AF of water for every 1 acre of land.				
¹ Outside the CVP authorized Place-of-Use and excluded from this EA and approval process.				
² Surplus CVP flood water (215 Water) when available.				

Table 3-8. Kern Water Bank Authority Water Resources

Contractor/Subcontractor	CVP ²	Other	Groundwater Safe Yield	Groundwater Recharge
Dudley Ridge Water District	No	SWP	*	Yes
Kern County Water Agency	Yes	SWP, Kern River	*	Yes
Semitropic Water Storage District	Yes	SWP, Poso Creek	*	Yes
Tejon-Castaic Water District ¹	No	SWP	*	Yes
Westside Mutual Water District	Yes	SWP	*	Yes
Wheeler Ridge-Maricopa Water Storage District	No	SWP, local streams	*	Yes
*The safe groundwater yield is difficult to quantify. However, the safe yield of groundwater is generally considered to be 1 AF of water for every 1 acre of land.				
¹ Outside the CVP authorized Place-of-Use and excluded from this EA and approval process.				
² Surplus CVP flood water (215 Water) when available.				

Table 3-9. Kings River Conservation District Water Resources

Contractor/Subcontractor	CVP	Other	Groundwater Safe Yield	Groundwater Recharge
Alta Irrigation District	No	Kings River	*	*
Clark's Fork Reclamation District No. 2069	No	Kings River	*	*
Consolidated Irrigation District	Yes ²	Kings River	*	Yes
Corcoran Irrigation District	No	Kings River	*	*
Empire West Side Irrigation District	No	Kings River, SWP	*	*
Fresno Irrigation District	Yes ^{2,3}	Kings River	*	*
James Irrigation District	Yes ^{2,3}	CVP via exchange for Kings River	*	*
Kings County Water District	Yes ²	SWP, Kings and Kaweah Rivers	*	*
Kings River Water District	Yes ²	Kings River	*	*
Laguna Irrigation District	Yes ²	Kings River	*	*
Lakeside Irrigation Water District	Yes ²	Kings and St. Johns Rivers, Cross Creek	*	Cross Creek, recharge basin
Liberty Water District	Yes ²	Kings River	*	Liberty Canal, recharge basin
Mid-Valley Water District	No	Kings River	*	*
Raisin City Water District	No	Kings River	*	*
Riverdale Irrigation District	No	Kings River	*	*
Salyer Water District	No	n/a	*	*
Stratford Irrigation District	No	Kings River	*	*
Tranquillity Irrigation District	Yes ^{2,3}	CVP via exchange for Kings River	*	*
Tulare Lake Reclamation District No. 761	No	Kings River, SWP	*	*
Burrell Ditch Company	No	Kings River	*	*
Crescent Canal Company	No	Kings River	*	*
John Heinlen Mutual Water Company	No	Kings River	*	*
Last Chance Water Ditch Company	No	Kings River	*	*
Lemoore Canal and Irrigation Company	No	Kings River	*	*
Liberty Mill Race Company	No	Kings River	*	*
Lovelace Water Corporation	No	Kings River	*	*
People's Ditch Company	No	Kings River	*	*
Reed Ditch Company	No	Kings River	*	*
Southeast Lake Water Company	No	Kings River	*	*
Stinson Canal and Irrigation Company	No	Kings River	*	*
Tulare Lake Canal Company	No	Kings River	*	*
Upper San Jose Water Company	No	Kings River	*	*
*The safe groundwater yield is difficult to quantify. However, the safe yield of groundwater is generally considered to be 1 AF of water for every 1 acre of land.				
¹ Outside the CVP authorized Place-of-Use and excluded from this EA and approval process.				
² Surplus CVP flood water (215 Water) when available.				

3.1.1.3 Groundwater Resources

The usable storage capacity has been estimated to be approximately 24 million AF for the San Joaquin River Hydrologic Region and 28 million AF for the Tulare Lake Hydrologic Region, which are the two hydrologic regions overlain by the CV contractors and most of the potential exchange partners. DWR estimated a level of groundwater extraction that would not lower groundwater levels over the long-term (perennial yield) to be approximately 3.3 million AF for the San Joaquin River Hydrologic Region. The perennial yield is 4.6 million AF for the Tulare Lake Hydrologic Region. This perennial yield is directly dependent upon the amount of recharge received by the groundwater basin. Recharge of the semi-confined aquifer in the regions is primarily derived from seepage from streams and canals, infiltration of applied water,

and subsurface inflow. Most of the districts listed previously in this section include recharge facilities and groundwater resources. Precipitation on the valley floor provides some recharge, but only in abnormally wet years. Seepage from streams and canals is highly variable depending upon annual hydrologic conditions.

Water districts and landowners located within suitable groundwater basins routinely balance irrigation demands with surface and groundwater through conjunctive use. In wet years the groundwater is recharged and in dry years groundwater is extracted. Water districts and landowners located in areas with little to no groundwater sources would seek surface water supplies to purchase if a deficit in water supplies occurs. In most cases, the water districts do not have authority over the groundwater usage. Groundwater is pumped from privately owned wells and is not under the control of the water district. The water districts strive to provide surface water, when available, at affordable prices to curb groundwater pumping. The groundwater levels, supplies and safe yield are difficult to quantify. This is due to the variances in soils types, proximity of the districts to the foothills, or water table gradients which results in groundwater flowing into and out of the aquifer underneath districts. Generally, the groundwater safe yield is approximately 1 AF per acre of land. In some years and due to the hydrogeology underlying a specific district the safe yield may be 0 AF. It is not uncommon for two water districts to enter into agreements for exchanges or transfers of surface water to off-set groundwater migration between the two districts. Water districts and landowners with suitable groundwater basins routinely balance irrigation demands with surface and groundwater through conjunctive use. In wet years the groundwater is recharged and in dry years groundwater is extracted.

The CVP was developed as a supplemental supply of surface water and to alleviate groundwater overdraft conditions. The overdraft of groundwater is a region-wide problem throughout the lower SJV and although ameliorated to some extent by the import of surface water, all hydrologic basins in the SJV continue to be overdrafted.

3.1.1.4 Conveyance Facilities and Waterways

Facilities and waterways involved with the exchanges include: the Banks and Jones Pumping Plants; FKC; SLC/Aqueduct; CVC; Kern Water Bank Canal; O'Neill Forebay; Kings, St. Johns, Tule, Kaweah and Kern Rivers; and small local creeks and streams. Since the exchanges would not involve any modifications to these existing facilities and waterways, and to the extent possible a change in normal operations, detailed background information for each of these facilities and waterways have been removed from this section and included in Appendix F.

In addition to the waterways listed above, the exchange partners have constructed extensive water conveyance systems to provide water throughout their service areas in order to provide water where it is needed.

3.1.2 Environmental Consequences

3.1.2.1 No Action Alternative

IRC No Action Alternative Contract provisions under the No Action Alternative stipulate that a tiered pricing structure would be applied. Tiered pricing is mandated under the water conservation section of the CVPIA for contracts of more than three years. Due to chronic

shortages in CVP contract deliveries in the IRC service areas, modeling predicts that the number of years when tiered pricing is applicable would be limited to approximately 22 or 24 percent of the time (or one year out of four or five) (See Figure 3-1). Based on modeling during the IRC period there is a relatively low chance that tiered pricing would be in effect. Water supplies do not typically meet demands for most IRC contractors and many IRC contractors are very active on the water market purchasing water supplies. Since much of the IRC contractors' service areas are planted in permanent crops and these contractors have paid more than tiered pricing rates in dry years on the water market to preserve their permanent crop planting investment, increasing water prices due to tiered pricing would not change water use trends.

For those areas where groundwater is of suitable quality and therefore available for irrigation, CVP water is considered to be a supplemental supply. Most agricultural contractors already rely on groundwater supplies and in some cases water transfers to meet on-farm needs. Alternate surface water supplies frequently are expensive. Thus, tiered pricing is unlikely to cause a grower to switch to alternate supplies. Most of the CV contractors have the option of switching to groundwater for a limited amount of time. This option would only be utilized (as stated above) if the cost/benefit ratio and the water quality were sufficient to warrant it. Due to continuing overdraft conditions, districts realize that when pumping groundwater above safe yield levels they are mining dry year supplies and that this supply cannot be relied on continually as it is not sustainable.

The CVP supplies for the CV contractors are unpredictable due to the constraints in deliveries from the Delta. The CV contractors swap Delta water for Friant water resulting in higher costs for the CV Contractors. In order for the CV contractors to obtain their Delta supplies through an exchange with the Friant Division Contractors, the runoff on the San Joaquin River must be sufficient to declare a full Class 1 and a minimum percent of Class 2 supply. If these conditions are not met, the CV contractors do not have the ability to exchange their CV supplies. These combined conditions result in higher overall costs of water for the CV contractors compared to neighboring Friant Division contractors. In dry years, the costs for CV contractors per AF may double. This is due to fixed contract costs and is independent of the runoff conditions and hydrology.

The CV contractors may switch from surface water to groundwater in certain years because of tiered water pricing. In certain years, the CV contractors may purchase additional water supplies. Purchased water by the CV Contractors would come from San Luis Reservoir, Delta, or Friant. This does not represent a new water supply, but rather, part of the water supply described in the PEIS. Overall, the diversion from the Delta or Friant would not change as the diversion would remain within the contract total. The total diversions from the Delta or Friant are not anticipated to change with the tiered pricing with no impact anticipated. The CV contractors receive water physically from Millerton Lake through exchanges (or occasionally via direct delivery). Changes in CVP water use because of this alternative would not affect this exchange.

In summary, the No Action Alternative would not likely result in the application of tiered pricing during the term of the contracts because of the short duration of IRC and the reasonable expectation that sufficient CVP allocation to trigger the tiers would occur in only every fourth or

fifth year. Further, even if tiered pricing were to apply, it is unlikely to result in a reduction in surface water use, a change in groundwater use, or other actions that could affect water resources. The contractors continue to have less water supply (surface water and groundwater) than demanded, conditions that exist notwithstanding their careful water management (e.g., installation and use of highly efficiency irrigation systems). For those reasons, and others discussed in this EA, implementation of the No Action Alternative is not likely to cause an impact to water resources.

Article 5 Exchanges No Action Alternative There may be negative impacts to water resources within the CV contractor's service areas under the No Action Alternative. No new supplies of water would be generated as the same amounts of water that have historically been pumped would continue and no additional water supplies would be diverted from reservoirs or rivers. The CVPIA PEIS and the corresponding BO for the continued long-term operation of the CVP and SWP assumed the 128,300 AF/y of water would be diverted, pumped from the Delta and conveyed every year; however, exchange volumes may be reduced. Contract deliveries and exchanges have been occurring annually since the mid 1970s. Therefore, the impacts to environmental resources have already been assessed for the O&M activities of the CVP and SWP and are part of the No Action Alternative.

Reclamation would prepare separate environmental documents each instance an Article 5 exchange is proposed to examine the impacts to environmental resources beyond the diversions, pumping and conveying of this water in CVP and SWP facilities. The timing for preparation of environmental and administrative review could exceed the window of opportunity for the exchange resulting in reduced flexibility in the management of the CV contractor's CVP water in order to compete with neighboring farmers. The No Action Alternative would likely result in increases of water transfers and higher prices for the CV contractors. The potential exchange partners may not receive the benefit of the additional water supplies for beneficial uses including growing higher value crops, groundwater recharge, groundwater banking or transfers. Less water may be available in the SJV if the exchange requests are not approved and CVP water is not conveyed under Article 55. However, the CV contractors could continue to exchange water with AEWS to the extent possible.

Groundwater The No Action Alternative is a continuation of exchanges between the CV contractors and AEWS, as in the past. AEWS is located in Kern County and exchange arrangements could result in temporary increases to the local groundwater as in the past.

Reclamation could still approve exchange arrangements between the CV contractors and other exchange partners but only after completing environmental and administrative review. The separate environmental reviews could exceed time frames for approvals for the exchanges since DWR has a short window of opportunity to pump and convey this water. Therefore, the exchange partners may not have the benefit of using this water for groundwater recharge or banking this water for later use during dry seasons to benefit the overdraft conditions in the SJV. The No Action Alternative could result in the CV contractors pumping groundwater or extracting groundwater from banking facilities if adequate surface water supplies are not available for purchase or exchange opportunities are limited. Continued groundwater pumping from areas of overdraft would exacerbate existing conditions.

Exchanges with AEWS D from multiple CV contractors are only feasible when there is a relatively large Class 2 declaration so that AEWS D has adequate supplies to exchange. AEWS D only has a Class 1 supply of 40,000 AF/y.

3.1.2.2 Proposed Action

IRC Proposed Action Impacts to water resources associated with the Proposed Action would be comparable to those described under No Action Alternative although tiered pricing provisions are not included in these contracts. Renewal of the IRC with only minor administrative changes to the contract provisions would not result in a change in contract water quantities or a change in water use. Water delivery during the IRC period would not exceed historic quantities. Therefore, there would be no effect on surface water supplies or quality.

The renewal of interim contracts delivering the same quantities of water that have historically been put to beneficial use would not result in any growth-inducing impacts. In addition, no substantial changes in growth are expected to occur during the short timeframe of this renewal. Therefore, the Proposed Action would have no adverse impacts on water resources.

Article 5 Exchanges Proposed Action The 128,300 AF/y of water involved in the exchanges are supplies already allocated and no additional water supplies would be diverted from rivers or lakes. No new construction or points of diversions would be required. However, changes in timing and locations of when and where water is diverted could occur. The rivers in the project area are managed for flood control and irrigation similar to canals.

Releases from the dams occur in response to high water flows or to meet irrigation demands and minimum flow requirements to benefit fish, wildlife and recreational uses. Typically, minimum flow requirements are maintained while the hydrological conditions dictate the amount of water diverted to meet irrigation demands. Telemetric systems are used to record flows and the watermasters coordinate with the water districts to open or close their gates for diversions of water on a real-time basis to ensure appropriate flows are maintained throughout the course of the rivers. The timing and locations of diversion vary from year-to-year due to hydrological conditions, fluctuating marketing conditions, transfers and/or exchanges of water with or without the proposed Article 5 exchanges. The Proposed Action would not result in adverse impacts to third parties, water quality, quantity, flows or temperature. In addition, the exchange arrangements would not interfere with deliveries to other water purveyors or meeting minimum flow requirements for both the SWP and CVP.

The Proposed Action would not result in deliveries of additional water supplies from new sources or origins of water. The maximum amount of water exchanged would be up to 128,300 AF/y and would be comingled in the conveyance facilities. Deliveries of water supplies in the conveyance facilities occur within the capacities and operations of the canals although the destination and label on the water may differ. Utilization of SWP and CVP facilities and the CVC would be scheduled and coordinated with the overseeing agency to ensure that the normal operations of said facilities would not be adversely impacted.

Changes in water flows or temperatures in the canals and Aqueduct would not result in significant impacts to water quality or quantity. The O&M of the CVP and SWP were addressed in the CVPIA PEIS and BO for the continued long-term operation of the CVP and SWP included the entire 128,300 AF/y of the CV contractor's water supplies. This water was assumed to be pumped and conveyed in each year for deliveries via exchanges to the CV contractors. The proposed Article 5 exchanges would not result in any impacts to diversion from the Delta or pumping and conveyance of this water beyond those already addressed in the CVPIA PEIS and the BO for the continued long-term operation of the CVP and SWP.

This EA addresses the conveyance of the CV contractor's CVP water under Article 55 of the SWP contracts when combined with Article 5(a) of the CVP contracts. The conveyance of CVP water under Article 55 could result in the CV contractors receiving a higher rank on the SWP hierarchy for pumping. Pumping and conveying water under Article 55 does not result in additional water conveyed. Reclamation policy limits the amount of CV contractors' south-of-Delta allocation to prohibit impact to the CVP as whole which has a lower joint-point-of-delivery priority than CV contractors have. DWR would pump this amount of water with or without the Proposed Action with others. The proposed exchanges, pumping, conveyance, and approvals are subject to applicable laws and policies including the Reclamation's policy that decisions made would not harm other CVP contractors. No adverse changes in water quantities, diversions, pumping or conveyance practices would occur.

Historically, the untimely delivery of CV contractor water has resulted in AEWS receiving the water when its value is low. This same amount of water is of much higher value at such time this water is exchanged back to the CV contractors due to timing and demands. The value and timing of the water is considered in exchange agreements between the parties. Therefore, the CV contractors are seeking to enter into exchange arrangements that will benefit AEWS and/or others in order to obtain water at a reasonable price for the CV contractors' landowners to compete with other agricultural growers. In lieu of paying a higher price for the water when it is exchanged to the CV contractors, the exchange arrangements commonly allow for an imbalanced exchange of the CV contractors' water supplies to compensate for the value of the water when it is delivered. Similar exchange arrangements are anticipated for the "other" exchange partners. The exchange arrangements are developed between willing buyers and sellers with mutually agreeable terms. A portion of the water (up to 50 percent) would be retained by the exchangee and 50 percent would be delivered to the CV contractor when it is needed.

Under the Proposed Action, the water management practices for the CV contractors would not change dramatically. CV contractors may receive between 100 and 50 percent of their CVP supply when it is needed. The CV contractors would receive the benefit of having lower priced water with deliveries on a demand schedule to allow for advanced planning and growing of crops on existing agricultural lands in order to compete with neighboring farmers. However, the availability of this water is contingent upon DWR having a window of opportunity to pump the water.

Under the Proposed Action, the exchange partners could potentially receive an increase of no more than 64,150 AF of water as a result of imbalanced exchanges. This water could be used to grow higher value crops, groundwater recharge, banking for later use in dry years, subsequent transfers within the Place-of-Use including selling to the Environmental Water Account and/or municipal and industrial uses. The increase of 64,150 AF is small (approximately 2 percent) compared to the over 3 million AF/y of the overall water supplies for the water purveyors and would not lead to significant impacts to surface water quality or quantity. The same amount of water would continue to be utilized within the lower SJV for beneficial uses. Subsequent transfers, recipients of the banked water, changes in the places or purpose of the use of the water would require environmental review, and compliance with the Reclamation Reform Act, water rights permits and applicable federal, state and local laws prior to approval. Reclamation does not have jurisdiction over non-CVP supplies.

Under the Proposed Action, the exchanger(s) could receive less water than their full contract supply and allocation. However, receiving a reduced amount of water versus supplies outside of the growing season would provide better use and management of this water. This reduction would not result in major impacts for the exchanger(s) since their water supplies are intermittent and unreliable.

Groundwater The SJV is in overdraft conditions. 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 water districts strive to provide surface water at affordable prices to discourage groundwater pumping. The Proposed Action could provide short-term relief to groundwater quality and quantity.

The Proposed Action would not result in noticeable reductions of water supplies in the CV contractors' service areas since this water has been delivered on an intermittent basis in the past. Kern Tulare Water District, Alpaugh Irrigation District and Atwell Water District are located in areas with inadequate groundwater supplies and unsuitable for groundwater recharge or in-district banking. Due to the availability of groundwater storage facilities in Kern County, it is likely that water districts located in the Kern County Basin would become exchange partners with the CV contractors. Therefore, it is likely groundwater quality and quantity would improve temporarily in Kern County. The groundwater is typically stored and extracted when surface water supplies are unavailable and distributed to the "owners" of the storage space in the groundwater banking facilities. The Proposed Action would provide an increase of water to areas suitable for groundwater recharge providing an improvement of managing available water supplies and overall benefit to the region-wide overdraft conditions until the water is extracted in

dry years. Therefore, the Proposed Action would not result adverse impacts to groundwater quality or quantity.

Cumulative Impacts No new water supplies would be added to the region. Renewal of the eight IRC would have no new impact on water resources as described previously and as such would not contribute to cumulative effects.

The Article 5 exchanges would not contribute to, or inhibit, the renewal of CVP long-term contract renewals for other CVP contractors. The CVPIA envisioned improved water management options and expanded the opportunities for transfers to occur to encourage efficient water management and conservation. Transfers of CVP water require approval by Reclamation's Contracting Officer. Transfers of CVP water undergo a rigorous checklist to determine whether there are any immitigable third party impacts, as well as a public review period under NEPA and Section 3405(a) of the CVPIA. CVP water transfers outside the respective places of use or changes in points of diversions require prior approval by the State Water Resources Control Board. Reclamation does not have approval authority over transfers of non-CVP water. Under State law, transfers are prohibited if they would result in unmitigated third party impacts regardless of the type of water rights held by the seller. SWP contractors are restricted under Table A and the Monterey Agreement to transfer SWP water. DWR manages a 'Turn Back Pool' for SWP contractors who do not need to deliver all of their SWP water supplies and DWR redistributes this water. Riparian water rights are restricted to use of the water that can be reasonably used on those lands appurtenant to stream courses and transfers are prohibited. Transfers out of the Kaweah Basin are not permitted without proper consent with the Kaweah Basin water interests. All "out of basin" transfers are reviewed for applicable laws prior to approvals.

The reservoirs, rivers and creeks in the lower SJV associated with the Proposed Action are managed for flood control and agricultural supplies. Diversions of water occur based on the hydrological and environmental conditions. During wet seasons and high water flows, surplus water supplies are released and, if possible, marketed to quickly disperse this water to avoid flooding and damage downstream in the rivers. The Proposed Action would not interfere with deliveries, operations or cause significant adverse changes to the rivers, creeks or conveyance facilities associated with the SWP or CVP. The conveyance facilities and river systems in the lower SJV are interconnected and allow for a myriad of transfers, exchanges, contract assignments, and conveyances of water via Warren Act contracts, Operational Contracts or Article 55 of the SWP. The conveyance of water under these water service options are subject to available capacity, meeting primary requirements, and environmental reviews.

It is recognized the exchange partners could take deliveries of their other water supplies in addition to receiving the 64,150 AF/y of CVP water. The use of CVP water within the exchange partners' service areas could result in other sources of water freed up, of which, Reclamation does not have approval authority. The freed up water supplies could be sold providing a financial benefit to the exchange partner. The U.S. Corps of Engineers has increased the capacity of Lake Kaweah, which is created by Terminus Dam on the Kaweah River. The dam enlargement project would raise the gross pool by 21 ft and add 42,600 AF of flood storage space in Lake Kaweah. The plan would increase the levels of flood protection to the 70-year event for downstream communities and the 3.2-year event for the Tulare lakebed. An additional

average annual irrigation water supply of 8,400 AF could be stored in the reservoir. (Kaweah River Basin Investigation and Draft Environmental Impact Statement, Corps 1999). The Proposed Action is unrelated to the project modifications and would not contribute to or hinder decisions to the enlargement project. The spillway modification project increases water supplies for agricultural or marketing purposes. Transfers of Kaweah River water supplies outside of the Kaweah Basin are currently prohibited with the exception of high flood flows. The Proposed Action, when added to the modification to the lake enlargement project, would not increase or decrease water allocations and would not contribute to cumulative effects to rivers or reservoirs. The Proposed Action would not contribute to or interfere with flood control management and operations. The Proposed Action and imbalanced exchanges would not increase or decrease the availability of flood water nor inhibit or contribute to decisions to accept or reject this source of water.

In recent years, other exchanges between CV contractors and CVP contractors or other water entities have undergone environmental reviews and short-term approvals. It is anticipated these other exchanges would occur over the term of the CV contractors' future water service contracts. In past interim contracts, Reclamation allowed for exchange arrangements to be pursued with others as well as with AEWS.

3.2 Land Use

3.2.1 Affected Environment

A narrative of the land uses in the water districts involved with the exchanges are contained in the incorporated documents and in Appendices C thru E. Generally, the land use is mainly comprised of irrigated agriculture. Cities along the Highway 99 corridor are expected to expand over the next years. These cities include Fresno, Visalia, Delano, and Bakersfield.

3.2.2 Environmental Consequences

3.2.2.1 No Action

Under the No Action Alternative, available water supplies would be applied to existing agricultural lands. Decisions to fallow lands would be based on available water supplies, hydrological conditions, constraints of water deliveries, and fluctuating agricultural marketing strategies. Due to reduced water supplies if exchange arrangements were not in place, there may be a small reduction in farmed acres.

3.2.2.2 Proposed Action

Land use would not change under the Proposed Action. The CV contractors have managed their water supplies to meet demands in the past when DWR has not had the opportunity to pump the water. Receiving a reduced supply of water when DWR has the opportunity would not result in adverse changes in cropland production since an increment of this water would be provided by the exchange partner to the CV contractor during the irrigation season.

Although it is possible the exchange partners could potentially receive an increase of no more than 64,150 AF of water, this would occur only in years when DWR has a window of opportunity to pump this water or when Article 55 conveyance arrangements are utilized. The conveyance of water under Article 55 is subject to capacity in the Aqueduct and meeting all

SWP requirements. Due to the unreliability and unavailability of this water, the Proposed Action would not lead to long-term land use changes. The water supplies are variable and do not provide a reliable or consistent amount for landowners to make long-term land use changes. No native grasslands or shrub land would be tilled or cultivated. Water would be delivered to established croplands and used for irrigation purposes on lands irrigated within the last three years or for existing M&I uses. Exchange arrangements that result in short-term imbalanced exchanges could result in short-term fallowing of lands until such time the water is delivered. Imbalanced exchanges may involve monetary compensation to allow purchases of other supplies.

The exchanges would occur within existing facilities. Exchanges requiring additional construction to convey this water are not within the scope of this EA and would undergo separate environmental review.

Cumulative Impacts The home prices in the lower SJV and project area are lower compared to other regions in California. This and other economical forces are driving factors for land use changes from agricultural to urban uses. These changes are long-term and require approvals from the Local Area Formation Committee, changes in City or County General Plans and undergo environmental reviews. Changes in the CVP contractors' boundaries and service areas undergo environmental review under NEPA and approval by Reclamation. Boundary change requests from the CVP contractors for Reclamation's approval are often misconstrued. Reclamation does not have land use change approval authority. However, Reclamation must determine whether boundary change requests would result in inconsistency with the Reclamation Reform Act, water rights permits or other laws and regulations. During this determination and approval process, Reclamation evaluates any proposals for boundary changes as it relates to the use of the water and prepares environmental documents in accordance with NEPA prior to Reclamation's approval.

As stated earlier, a myriad of water service transactions routinely occur within the project area. The temporary fallowing of lands could occur especially during dry and drought seasons. The various water service transactions are for the efficient management of water resources and do not contribute to long-term or reliable water supplies that would result in land use changes. Providing affordable surface water to farmers could curtail urban sprawl. The population in California is expected to grow over the next couple decades. Land values are anticipated to increase as housing becomes scarce. These trends are expected to continue and could entice farmers to sell their lands. These conditions are likely to occur with or without the proposed exchanges.

3.3 Biological Resources

3.3.1 Affected Environment

A list of endangered, threatened and sensitive species that may occur within Fresno, Kings, Tulare and Kern (San Joaquin Valley portion) counties which underlie the action area, was obtained from the USFWS's Endangered Species Lists website at: http://www.fws.gov/sacramento/y_old_site/es/spp_lists/auto_list_form.cfm on September 21, 2011 (document number: 110920015616). Additional data was obtained from the California

Department of Fish and Game's California Natural Diversity Database (CNDDDB). The CNDDDB data is from September 2011.

The documents incorporated by reference contain a more detailed description of biological resources in the districts' service areas and boundaries. The CVP contractors have already undergone consultation with the USFWS and NMFS and are implementing measures in the applicable BOs. Kern County has existing Habitat Conservation Plans for portions of its service area, more specifically for the Kern Water Bank and the Metropolitan Bakersfield area.

Table 3-1 below contains common and scientific names, current Federal listing status and a column for critical habitat. The species are from the USFWS's list, but the list also includes the riparian brush rabbit and riparian woodrat, because they were addressed in the LTCR Opinion. Critical habitat exists in the affected environment for the following species: Buena Vista Lake shrew, California condor, California tiger salamander, Hoover's spurge, San Joaquin Valley Orcutt grass, succulent owl's-clover, vernal pool fairy shrimp and vernal pool tadpole shrimp.

Most of the lands in the affected environment are agricultural lands. These lands are only usable by a few Federally listed species, which are discussed in this section. Agricultural lands are generally not suitable for long-term occupation by kit foxes, although lands adjacent to natural habitats may be used for occasional foraging (Warrick et al. 2007). It may be possible for Tipton kangaroo rats to colonize fallowed lands within as little as eight months when they occur on adjacent habitat. The Fresno kangaroo rat has been reported as being able to colonize fallowed agricultural lands (Culbertson 1946) and Stephens' kangaroo rats have been observed to recolonize land after discing was stopped (Thomas 1975), even within as little as eight months (Moore-Craig 1984). Ornate shrews may reside on actively farmed ground, and/or may have a relatively good ability to disperse (Williams and Harpster 2001). There are two instances in which San Joaquin woolly-threads were found in low densities in areas that had been previously disced, which were adjacent to undisturbed populations (Lewis 1993); the species' primary dispersal method is probably by wind. The Kern mallow has been known to occasionally reinvade disturbed sites, when the species is found on adjacent land (Mitchell 1989 as cited in Service 1998). Kern mallow seeds may be carried by dust devils, which do not seem to necessarily move in the direction of the prevailing wind (E. Cypher, pers. comm.). In 2005, the species was seen at the edges of fallow ag fields at the northern edge of Lokern, approximately a meter into the fields, north of occupied habitat; the interiors of the fields were not surveyed (E. Cypher, pers. comm.).

The critical habitat consists of undeveloped lands within these areas. Reclamation has determined that no delivery of CVP water to these lands would be allowed unless and until the landowner can demonstrate compliance with the ESA, including consultation with the Service for critical habitat.

Table 3-1. Federally Threatened and Endangered Species and Critical Habitat that may occur within the Affected Environment

Common Name	Scientific Name	Federal Status	Critical Habitat
Bakersfield cactus	<i>Opuntia treleasei</i> (= <i>Opuntia basilaris treleasei</i>)	Endangered	None
blunt-nosed leopard lizard	<i>Gambelia sila</i>	Endangered	None
Buena Vista Lake shrew	<i>Sorex ornatus relictus</i>	Endangered	Designated
California condor	<i>Gymnogyps californianus</i>	Endangered	Designated
California jewelflower	<i>Caulanthus californicus</i>	Endangered	None
California red-legged frog	<i>Rana aurora draytonii</i>	Threatened	Designated
California tiger salamander	<i>Ambystoma californiense</i>	Threatened	Designated
Central Valley steelhead (National Marine Fisheries Service)	<i>Oncorhynchus mykiss</i>	Threatened	Designated
Conservancy fairy shrimp	<i>Branchinecta conservatio</i>	Endangered	Designated
fisher	<i>Martes pennant</i>	Candidate	N/A
Fresno kangaroo rat	<i>Dipodomys nitratoide exilis</i>	Endangered	Designated
giant garter snake	<i>Thamnophis gigas</i>	Threatened	None
giant kangaroo rat	<i>Dipodomys ingens</i>	Endangered	None
hairy Orcutt grass	<i>Orcuttia pilosa</i>	Endangered	Designated
Hartweg's golden sunburst	<i>Pseudobahia bahiifolia</i>	Endangered	None
Hoover's spurge	<i>Chamaesyce hooveri</i>	Threatened	Designated
Keck's checker-mallow (=checkerbloom)	<i>Sidalcea keckii</i>	Endangered	Designated
Kern mallow	<i>Eremalche kernensis</i>	Endangered	None
Kern primrose sphinx moth	<i>Euproserpinus euterpe</i>	Threatened	None
Lahontan cutthroat trout	<i>Oncorhynchus clarki henshawi</i>	Threatened	None
least Bell's vireo	<i>Vireo belli pusillus</i>	Endangered	Designated
Little Kern golden trout	<i>Oncorhynchus mykiss</i> (=aguabonita) <i>whitei</i>	Threatened	Designated
longhorn fairy shrimp	<i>Branchinecta longiantenna</i>	Endangered	Designated
Mariposa pussy-paws	<i>Calyptidium pulchellum</i>	Threatened	None

Common Name	Scientific Name	Federal Status	Critical Habitat
mountain yellow-legged frog	<i>Rana muscosa</i>	Candidate	N/A
Paiute cutthroat trout	<i>Oncorhynchus clarki seleniris</i>	Threatened	None
palmate-bracted bird's-beak	<i>Cordylanthus palmatus</i>	Endangered	None
Ramshaw sand-verbena	<i>Abronia alpine</i>	Candidate	None
riparian brush rabbit	<i>Sylvilagus bachmani riparius</i>	Endangered	None
riparian woodrat (San Joaquin Valley woodrat)	<i>Neotoma fuscipes riparia</i>	Endangered	None
San Benito evening-primrose	<i>Camissonia benitensis</i>	Threatened	None
San Joaquin adobe sunburst	<i>Pseudobahia peirsonii</i>	Threatened	None
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	Endangered	None
San Joaquin Valley Orcutt grass	<i>Orcuttia inaequalis</i>	Endangered	Designated
San Joaquin woolly-threads	<i>Monolopia congdonii</i>	Endangered	None
Sierra Nevada bighorn sheep	<i>Ovis canadensis californiana</i>	Endangered	Designated
southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered	Designated
Springville clarkia	<i>Clarkia springvillensis</i>	Threatened	None
succulent owl's-clover	<i>Castilleja campestris</i> ssp. <i>succulenta</i>	Threatened	Designated
Tipton kangaroo rat	<i>Dipodomys nitratoides nitratoides</i>	Endangered	None
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	Threatened	Designated
vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	Threatened	Designated
vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	Endangered	Designated
western snowy plover	<i>Charadrius alexandrinus nivosus</i>	Threatened	Designated
western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	Candidate	N/A
Yosemite toad	<i>Bufo canorus</i>	Candidate	N/A

3.3.2 Environmental Consequences

3.3.2.1 No Action

The No Action Alternative is similar to the Proposed Action. The same amounts of water would be diverted from rivers and reservoirs based on hydrological conditions. Deliveries would occur in existing facilities. The operations of the CVP and SWP would continue as in the past within constraints and limitations. Croplands would remain the same. Decisions to fallow or not fallow lands would be based on hydrological and agricultural marketing conditions. Reclamation could prepare separate EA reviews for each proposed exchange request. However, the time required for environmental reviews could extend beyond the time constraints to implement an exchange arrangement.

3.3.2.2 Proposed Action

With the IRCs, the CV contractors remain subject to the previous commitments in the CVPIA PBO and the LTRC Opinion, as noted in Section 1.5. Due to their compliance with those commitments and the short-term nature of the action, this part of the Proposed Action may affect, but is not likely to adversely affect Federally listed species and critical habitat under the USFWS's jurisdiction.

The aspect of the Proposed Action that has the greatest environmental concern is the potentially unbalanced nature of the Article 5 exchanges, which could result in either a temporary or permanent net amount of water being delivered to the participating Friant CVP or non-CVP contractors. The non-CVP contractors are not covered by the CVPIA PBO or the LTRC Opinion. However, all exchangees other than AEWS, including the non-CVP contractors, would be required to sign off on all the environmental commitments for the Proposed Action in order for the Contracting Officer to approve any individual proposed exchange. The 128,300 AF/y of water that would be involved in the exchanges are supplies already allocated to the CV Contractors and no additional water supplies would be diverted from rivers or lakes. No new construction or points of diversions would be required. However, slight changes in timing and locations of when and where water is diverted could occur. The rivers in the project area are managed for flood control and irrigation, so their use in the Proposed Action to convey water supplies would not be a change from current conditions. The Proposed Action would not result in any increase in the water level of Lake Isabella, because each entity that has storage in the reservoir cannot exceed their allowed AF amount. Any water not taken from Lake Isabella as a result of a district receiving water under the Proposed Action would have to be released if it would cause the allowed amount to be exceeded. Therefore, the least Bell's vireo and southwestern willow flycatcher would not be affected by any flooding of nests or habitat.

Reclamation's authority to review inclusions (annexations) would be effective in preventing the annexation and conversion of listed species' habitats or designated critical habitat without separate Section 7 review. The CVPIA PBO specifically requires Reclamation to notify the USFWS of all proposed inclusions and exclusions into/from service areas for CVP water.

The conveyance of CVP water under Article 55 could result in the exchangee(s) receiving a higher rank on the SWP hierarchy. Conveying water under Article 55 does not result in additional water conveyed. DWR would pump this amount of water although the label on the water and recipients may differ. Article 55 conveyance can only be authorized if there is no adverse impact to the SWP and/or SWP contractors. Therefore, Article 55 of the SWP contracts

would not affect federally listed species or critical habitats (i.e. there would be no effects other than those of long-term CVP/SWP operations, which is subject to its own ESA compliance).

Due to the criteria for the Proposed Action, districts would not be able to expand their service areas, bring native or fallowed lands (fallowed for three years or more) into cultivation, or alter current environmental conditions without further environmental review and approval. Most of the species addressed in this EA are not adapted to highly disturbed conditions and are poor colonizers; mostly for that reason, they have declined to the point of becoming threatened or endangered. Typically, they would not become established on land that had been fallowed for two years or less and would not occur on land that is being cultivated or is highly disturbed.

The few species that could occupy these lands are: the Buena Vista Lake shrew, San Joaquin kit fox, Tipton kangaroo rat, blunt-nosed leopard lizard, Kern mallow, and San Joaquin woolly-threads. As a result of the commitments made by all of the contractors involved in the Proposed Action, which include those from the LTRC Opinion, effects on these species would be extremely unlikely. Critical habitat would not be affected as a result of the Proposed Action.

Cumulative Impacts Habitat loss and degradation affecting animals and plants occurs within the action area and is projected to continue to affect special-status species in the southern San Joaquin Valley. However, actions taken by Reclamation, in concert with protections afforded by regional conservation plans such as the Metropolitan Bakersfield Habitat Conservation Plan and the Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan, ameliorate such adverse effects and play a key role in achieving the goal of maintaining and preserving special-status species and their habitats.

3.4 Cultural Resources

Cultural resources is a broad term that includes prehistoric, historic, architectural, and traditional cultural properties. The National Historic Preservation Act (NHPA) of 1966 is the primary Federal legislation that outlines the Federal Government's responsibility to cultural resources. Section 106 of the NHPA requires the Federal Government to take into consideration the effects of an undertaking on cultural resources listed on or eligible for inclusion in the National Register of Historic Places (NRHP). Those resources that are on or eligible for inclusion in the NRHP are referred to as historic properties.

The Section 106 process is outlined in the Federal regulations at 36 Code of Federal Regulations (CFR) Part 800. These regulations describe the process that the Federal agency (Reclamation) takes to identify cultural resources and the level of effect that the proposed undertaking will have on historic properties. In summary, Reclamation must first determine if the action is the type of action that has the potential to affect historic properties. If the action is the type of action to affect historic properties, Reclamation must identify the area of potential effects (APE), determine if historic properties are present within that APE, determine the effect that the undertaking will have on historic properties, and consult with the State Historic Preservation Office (SHPO), to seek concurrence on Reclamation's findings. In addition, Reclamation is required through the Section 106 process to consult with Indian Tribes concerning the

identification of sites of religious or cultural significance, and consult with individuals or groups who are entitled to be consulting parties or have requested to be consulting parties.

3.4.1 Affected Environment

The San Joaquin Valley is rich in historical and prehistoric cultural resources. Cultural resources in this area are generally prehistoric in nature and include remnants of native human populations that existed before European settlement. Prior to the 18th Century, many Native American tribes inhabited the Central Valley. It is possible that many cultural resources lie undiscovered across the valley. The San Joaquin Valley supported extensive populations of Native Americans, principally the Northern Valley Yokuts, in the prehistoric period. Cultural studies in the San Joaquin Valley have been limited. The conversion of land and intensive farming practices over the last century may have destroyed many Native American cultural sites.

The CVP is being evaluated for the National Register. Facilities include the Friant Dam and the FKC. Friant Dam is located on the San Joaquin River, northeast of Fresno, California. Completed in 1942, the dam is a concrete gravity structure, 319 feet high, with a crest length of 3,488 feet. The FKC carries water over 151.8 miles in a southerly direction from Millerton Lake to the Kern River, four miles west of Bakersfield. The water is used for supplemental and new irrigation supplies in Fresno, Tulare, and Kern Counties. Construction of the FKC began in 1945 and was complete in 1951.

3.4.2 Environmental Consequences

3.4.2.1 No Action

Under the No Action Alternative, there would be no impacts to cultural resources since there would be no modifications to existing conveyance systems and no new construction that would result in any ground disturbance. Conditions related to cultural resources would remain the same as existing conditions.

3.4.2.2 Proposed Action

The Proposed Action would allow for the delivery of water through existing conveyance to CV contractors who have previously received water. Similarly, actions carried out under Article 5 exchanges would utilize existing facilities. There would be no modifications to existing facilities and construction of new facilities. Land use changes and/or conversions are not a part of the Proposed Action. As a result, there would be no potential to affect historic properties pursuant to 36 CFR Part 800.3(a)(1). Since no historic properties would be affected, the Proposed Action would not impact cultural resources.

Cumulative Impacts The Proposed Action is not ground disturbing, would not involve land use changes, and would not require new facilities or infrastructure to be built; therefore, it would not contribute to cumulative impacts to archaeological or historical resources.

3.5 Indian Trust Assets

3.5.1 Affected Environment

ITA are legal interests in assets that are held in trust by the U.S. Government for federally recognized Indian tribes or individuals. The trust relationship usually stems from a treaty,

executive order, or act of Congress. The Secretary of the Interior is the trustee for the United States on behalf of federally recognized Indian tribes. “Assets” are anything owned that holds monetary value. “Legal interests” means there is a property interest for which there is a legal remedy, such a compensation or injunction, if there is improper interference. ITA cannot be sold, leased or otherwise alienated without the United States’ approval. Assets can be real property, physical assets, or intangible property rights, such as a lease, or right to use something; which may include lands, minerals and natural resources in addition to hunting, fishing, and water rights. Indian reservations, rancherias, and public domain allotments are examples of lands that are often considered trust assets. In some cases, ITA may be located off trust land. Reclamation shares the Indian trust responsibility with all other agencies of the Executive Branch to protect and maintain ITA reserved by or granted to Indian tribes, or Indian individuals by treaty, statute, or Executive Order.

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

The No Action Alternative is similar to the Proposed Action. Historical diversions and water deliveries would continue as in the past. Therefore no impacts to ITA would occur.

3.5.2.2 Proposed Action

The Proposed Action involves existing facilities to convey water and would not include modifications or new construction of facilities. Therefore, the Proposed Action does not have the potential to affect ITA.

Cumulative Impacts The Proposed Action would have no impacts to ITA; therefore, there would subsequently be no cumulative impacts to ITA.

3.6 Indian Sacred Sites

3.6.1 Affected Environment

Executive Order 13007 provides that in managing Federal lands, each Federal agency with statutory or administrative responsibility for management of Federal lands will, to the extent practicable and as permitted by law, accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, and avoid adversely affecting the physical integrity of such sacred sites.

3.6.2 Environmental Consequences

3.6.2.1 No Action

Under the No Action Alternative, there would be no impacts to Indian sacred sites since conditions would remain the same as existing conditions.

3.6.2.2 Proposed Action

The Proposed Action involves conveying water within existing facilities to established agricultural lands. No construction or modifications of facilities would be required. As a result, the Proposed Action is not expected to affect Indian sacred sites and/or prohibit access to and ceremonial use of this resource.

Cumulative Impacts The Proposed Action would have no impacts to Indian sacred sites; therefore, there would subsequently be no cumulative impacts to this resource.

3.7 Socioeconomic Resources

3.7.1 Affected Environment

The human population in the southern SJV increased substantially in the 1980's, led by 50 to 60 percent growth in the Fresno, Bakersfield and Visalia-Tulare urban areas (DWR 1998). This trend is expected to continue and the region's population is projected to more than double over the next 30 years. Most of the future growth within the southern SJV is expected in Fresno, the Visalia-Tulare area and Bakersfield (DWR 1998). Between 1996 and 1998, the counties of Fresno, Kern, Tulare and Kings were in the top seven urbanizing counties within California and the top eight with the most irrigated farmland converted to urban land during the same period.

The socioeconomical conditions in the SJV are described in more detail in the incorporated by reference documents. In summary, the agricultural industry contributes to the economic vitality of the SJV. One in three jobs is related to the agricultural industry. Agriculture is the leading industry within the Tulare Lake Basin, as reflected by the majority of the private land being used for irrigated agriculture. Three million acres of irrigated agriculture occurs between the southern limit of the San Joaquin River watershed and the crest of the Tehachapi Mountains, versus 176,300 acres of urban areas (DWR 1998).

3.7.2 Environmental Consequences

3.7.2.1 No Action

Under the No Action Alternative, Reclamation may not have a streamlined environmental review process resulting in redundancy and inefficiency and increased administrative costs. Exchange requests may not be approved in a timely manner and implemented when water is available. Water prices may increase slightly for the local area.

3.7.2.2 Proposed Action

The Proposed Action involves similar amounts of water delivered and applied to lands in the SJV as in the past. The Proposed Action would allow for improved water deliveries to the CV contractors when it is needed during the growing season and maintain the stability of the agricultural market and economical vitality for the SJV. The Proposed Action would result in improved water management and could reduce purchases of water supplies by the CV contractors. The Proposed Action could maintain costs for water through the imbalanced exchange scenario. The amount of water is small and would not contribute to changes in water prices.

Cumulative Impacts The Proposed Action when added to other actions does not contribute to significant increases or decreases in socio-economical conditions. The multiple water service actions have occurred historically and are not precedent setting. The Proposed Action would not increase or decrease long-term water supplies that would result in decisions by landowners to permanently change existing land uses.

Water districts strive to provide affordable surface water to the farmers to curtail groundwater overdraft and to maintain the economic stability and agricultural related jobs and economic base within their communities and service areas. In addition, water service actions are sought to convey water over shortest distances to lower pumping costs and energy usage. The saved money is used to hire staff, pay overhead costs, maintain and improve facilities. These water districts are non-profit and maintain financial records that are accessible to the public.

3.8 Environmental Justice

3.8.1 Affected Environment

Executive Order 12898, dated February 11, 1994, requires Federal agencies to ensure that their actions do not disproportionately impact minority and disadvantaged populations. Many agricultural jobs require unskilled labor and the pay tends to be low. The employment opportunities for agricultural jobs draw low income and minority populations. The farm workers reside in surrounding communities.

3.8.2 Environmental Consequences

3.8.2.1 No Action

The No Action Alternative may result in less water delivered for irrigated agriculture within the CV contractor's service areas. Less water could translate into less acres planted and less jobs for farm workers who are typically from minority and disadvantaged populations. The No Action Alternative would have a small negative impact on minority and disadvantaged populations.

3.8.2.2 Proposed Action

The Proposed Action would result in the preservation of jobs for minority or disadvantaged populations within the CV contractors' service areas. The same amount of water would be made available for croplands within the SJV as has historically occurred. Managing existing water supplies would continue as in the past including decisions to purchase other supplies, pumping groundwater, planting or growing less water intensive types of crops or fallowing lands. No lands would be permanently taken out of agricultural production. Any actions that maintain seasonal jobs within the CV contractors' service areas should be considered beneficial; therefore, a small positive impact would benefit minority and disadvantaged populations.

Cumulative Impacts The Proposed Action does not contribute to adverse cumulative effects to low or disadvantaged populations. The Proposed Action, when added to other water service actions improve water management to grow crops that sustain job agricultural job opportunities providing a benefit for minority or disadvantaged populations. No lands would be taken out of long-term agricultural production. No increase of cultivated lands would occur as a result of conveying and deliveries of this water.

3.9 Air Quality

Section 176 (c) of the Clean Air Act (CAA) (42 U.S.C. 7506 (c)) requires that any entity of the Federal government that engages in, supports, or in any way provided financial support for, licenses or permits, or approves any activity to demonstrate that the action conforms to the applicable State Implementation Plan (SIP) required under Section 110 (a) of the CAA (42

U.S.C. 7401 (a)) before the action is otherwise approved. In this context, conformity means that such federal actions must be consistent with a SIP's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards and achieving expeditious attainment of those standards. Each federal agency must determine that any action that is proposed by the agency and that is subject to the regulations implementing the conformity requirements will, in fact conform to the applicable SIP before the action is taken.

On November 30, 1993, the Environmental Protection Agency (EPA) promulgated final general conformity regulations at 40 CFR 93 Subpart B for all Federal activities except those covered under transportation conformity. The general conformity regulations apply to a proposed Federal action in a non-attainment or maintenance area if the total of direct and indirect emissions of the relevant criteria pollutants and precursor pollutant caused by the Proposed Action equal or exceed certain threshold amounts, thus requiring the Federal agency to make a determination of general conformity.

3.9.1 Affected Environment

The project area is mostly located within the San Joaquin Valley Air Basin (SJVAB) which is the second largest air basin in California. Despite years of improvements, the SJVAB does not meet all State and Federal health-based air quality standards. The governing body over the SJVAB, the San Joaquin Valley Air Pollution Control District, has adopted stringent control measures to reduce emissions and improve overall air quality within the SJVAB.

3.9.2 Environmental Consequences

3.9.2.1 No Action

Under the No Action Alternative, there would be no impacts to air quality since conditions would remain the same as the existing conditions.

3.9.2.2 Proposed Action

Under the Proposed Action, the movement of water would be done via gravity flow and/or pumped using electric motors which have no emissions. The air quality emissions from electrical power have been considered in environmental documentation for the generating power plant. There are no emissions from electrical motors and therefore a conformity analysis is not required under the CAA and there would be no impact on air quality.

Cumulative Impacts The Proposed Action would utilize gravity and/or pumped using electric motors which have no emissions. Therefore, when taking into consideration other similar actions, no adverse cumulative impacts to air quality are expected.

3.10 Global Climate

Climate change refers to significant change in measures of climate that last for decades or longer. Burning of fossil fuels is considered a major contributor to perceived global climate change. Carbon dioxide, which is produced when fossil fuels are burned, is a greenhouse gas (GHG) that effectively traps heat in the lower atmosphere. Some carbon dioxide is liberated naturally, but this may be augmented greatly through human activities. Increases in air temperature may lead to changes in precipitation patterns, runoff timing and volume, sea level rise, and changes in the

amount of irrigation water needed due to modified evapotranspiration rates. These changes may lead to impacts to California's water resources and project operations. While there is general consensus in their trend, the magnitudes and onset-timing of impacts are uncertain and are scenario-dependent (Anderson et al. 2008).

3.10.1 Affected Environment

Climate change is an environmental trend and for the purpose of this EA refers to changes in global or regional climate over time and is expected to have some effect on the snow pack of the Sierra Nevada and the run-off regime. Current data are not yet clear on the hydrologic changes and how they will affect the CVP as well as other federal, state and local river operations within the action area. Water allocations are made dependent on hydrologic conditions and environmental requirements. Since operations and allocations are flexible, any changes in hydrologic conditions due to climate change would be within the respective operations' flexibility and therefore water resource changes due to climate change would be the same with or without the Proposed Action.

3.10.2 Environmental Consequences

3.10.2.1 No Action Alternative

Implementation of the No Action Alternative would involve no change on the composition of GHG in the atmosphere and therefore would not contribute to global climate change.

3.10.2.2 Proposed Action

It is likely the CV contractors would seek the least costly exchanges by conveying water shorter distances resulting in less power usage. The amount of power needed to convey 128,300 AF/y of water is small when compared to the overall water supplies and power used each year to move water where it is needed. CVP power is currently not used for exchanges occurring under Article 55 of the SWP. GHG generated by the Proposed Action is expected to be extremely small compared to other sources contributing to potential climate change since the delivery of water would be conveyed mostly via gravity and little, if any, additional pumping from electric motors would be required. While any increase in GHG emissions would add to the global inventory of gases that would contribute to global climate change, the Proposed Action would result in potentially minimal increases in GHG emissions and a net increase in GHG emissions among the pool of GHG would not be detectable.

It is possible that climate change would affect the Proposed Action rather than vice versa; however, it would be difficult measure/define the impact(s), if any. As noted in the affected environment, operations of the CVP are flexible to coincide with hydrologic conditions. Therefore, effects related to changes in the global climate would not result in adverse impacts to the Proposed Action.

Cumulative Impacts GHG impacts are considered to be cumulative impacts. The Proposed Action, when added to other existing and proposed actions, would not contribute to cumulative impacts to global climate change owing to the EPA threshold (25,000 tons/year) magnitude of GHG emissions requirement for reporting.

Section 4 Consultation and Coordination

4.1 Public Review Period

Reclamation intends to provide the public with an opportunity to comment on the Draft EA and Draft FONSI during a 30-day public review period.

4.2 Fish and Wildlife Coordination Act (16 USC § 661 et seq.)

The Fish and Wildlife Coordination Act (FWCA) requires that Reclamation consult with fish and wildlife agencies (federal and state) on all water development projects that could affect biological resources. The Proposed Action does not involve federal water development projects. Therefore, the FWCA does not apply.

4.3 Endangered Species Act (16 USC § 1531 et seq.)

Section 7 of the ESA requires Federal agencies, in consultation with the Secretary (of the Interior or Commerce, as appropriate), to ensure that their actions do not jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of these species.

The Proposed Action would support existing uses and conditions. No native lands would be converted or cultivated with CVP water. The water would be delivered to farmlands, through existing facilities, as has been done under existing contracts, and would not be used for land conversion.

Effects to Delta species and critical habitats, such as the delta smelt, salmonids, and green sturgeon which are the result of CVP operations, are addressed in the CVP/SWP Coordinated Operations consultation. As such, Reclamation has determined that there would be no effects to species and critical habitats for the Proposed Action under the jurisdiction of NMFS.

Reclamation has initiated Section 7 consultation with the USFWS for the Proposed Action. This EA would not be finalized until consultation is complete. Reclamation is in the process of preparing a biological evaluation which would be sent to the USFWS to initiate consultation.

4.4 National Historic Preservation Act (16 USC § 470 et seq.)

The NHPA of 1966, as amended (16 USC 470 *et seq*), requires that federal agencies give the Advisory Council on Historic Preservation an opportunity to comment on the effects of an undertaking on historic properties, properties that are eligible for inclusion in the NRHP. The 36 CFR Part 800 regulations implement Section 106 of the NHPA.

Section 106 of the NHPA requires federal agencies to consider the effects of federal undertakings on historic properties, properties determined eligible for inclusion in the NRHP. Compliance with Section 106 follows a series of steps that are designed to identify interested

parties, determine the APE, conduct cultural resource inventories, determine if historic properties are present within the APE, and assess effects on any identified historic properties. The activities associated with the Proposed Action would include no new ground disturbance, no change in land use, and the use of existing conveyance features to move and store water. Reclamation has determined that there would be no potential to affect historic properties by the Proposed Action pursuant to 36 CFR 800.3(a)(1). Since the Proposed Action would have no potential to affect historic properties, consultation with SHPO was not required.

4.5 Migratory Bird Treaty Act (16 USC § 703 et seq.)

The Migratory Bird Treaty Act implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Unless permitted by regulations, the Act provides that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. Subject to limitations in the Act, the Secretary of the Interior may adopt regulations determining the extent to which, if at all, hunting, taking, capturing, killing, possessing, selling, purchasing, shipping, transporting or exporting of any migratory bird, part, nest or egg will be allowed, having regard for temperature zones, distribution, abundance, economic value, breeding habits and migratory flight patterns.

The Proposed Action would be in compliance with the Migratory Bird Treaty Act.

4.6 Executive Order 11988 – Floodplain Management and Executive Order 11990 – Protection of Wetlands

Executive Order 11988 requires Federal agencies to prepare floodplain assessments for actions located within or affecting flood plains, and similarly, Executive Order 11990 places similar requirements for actions in wetlands. The Proposed Action would not adversely affect floodplains or wetlands.

Section 5 List of Preparers and Reviewers

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Appendix A – Article 5 Language

13 POINT OF DIVERSION AND RESPONSIBILITY FOR DISTRIBUTION OF WATER

14 5. (a) The Project Water to be furnished to the Contractor by the Contracting Officer
15 pursuant to this interim renewal contract shall be made available to the Contractor at a point or
16 points of delivery mutually agreed to in writing by the Contracting Officer, DWR and the Contractor
17 either on Project and/or State Facilities or another location or locations. The parties acknowledge
18 that Project Water to be furnished to the Contractor pursuant to this interim renewal contract shall
19 be delivered to the Contractor by direct delivery via the Cross Valley Canal and/or by exchange
20 arrangements involving Arvin-Edison Water Storage District or others. The parties further
21 acknowledge that such exchange arrangements are not transfers subject to Section 3405(a) of
22 CVPIA. Notwithstanding Article 9, such exchange arrangements, other than the previously approved
23 exchange arrangements with Arvin-Edison Water Storage District, shall be submitted to the
24 Contracting Officer for approval in accordance with the same criteria historically applied by the

1 Contracting Officer or with the then existing Project-wide criteria. DWR shall have no obligation
2 to make such exchange arrangements or be responsible for water transported in facilities that are not
3 a part of the SWP.

4 (b) When Project Water is made available by the Contracting Officer at Clifton
5 Court Forebay, DWR shall provide to the Contractor, subject to the availability of capacity as
6 determined by DWR, conveyance from the Delta and storage in DWR's share of storage at San Luis
7 Reservoir, if necessary, of such Project Water consistent with the following provisions and the
8 Operations Manual;

9 (1) The United States shall deliver or cause to be delivered into the State's
10 Clifton Court Forebay, Project Water in such quantities and of such quality as shall be sufficient to
11 perform the United State's and DWR's obligation to furnish water to the Contractor as set forth in
12 this interim renewal contract. Such deliveries into Clifton Court Forebay shall be made at such times
13 and rates of flow as the Contracting Officer and DWR shall agree.

14 (2) DWR, in accordance with an approved Project Water delivery
15 schedule, shall convey the amount of water delivered into DWR's Clifton Court Forebay by the
16 Contracting Officer directly: (i) to the Cross Valley Canal turnout in Reach 12E of the California
17 Aqueduct or to other points of diversion mutually agreed to in writing by DWR and the Contractor,
18 or (ii) to DWR or federal share of storage in San Luis Reservoir for later release and delivery to the
19 Contractor or (iii) to replace water delivered to the Contractor from DWR's share of San Luis
20 Reservoir prior to DWR receiving Project Water from the United States, to the extent DWR
21 determines that capacity (and water in the event of an exchange) is available for such conveyance,
22 storage, or exchange (if any). Such deliveries of Project Water shall be required to be made in a
23 manner which will not increase the cost of or adversely affect SWP operations and the quantity or
24 quality of water deliveries to SWP Contractors.

1 (3) If DWR delivers water to the Contractor from DWR's share of storage
2 in San Luis Reservoir prior to the United States providing Project Water at DWR's Clifton Court
3 Forebay, the United States shall return a like amount of water to DWR pursuant to the procedures
4 set forth in the Operations Manual.

5 (4) The total amount of Project Water delivered at Clifton Court Forebay
6 to DWR by the United States shall include water to compensate DWR for water conveyance and
7 storage losses incurred in the delivery of Project Water to the Contractor. The amount of such
8 conveyance and storage losses will be determined pursuant to procedures set forth in the Operations
9 Manual.

10 (5) Project Water received by DWR at Clifton Court Forebay for
11 conveyance and/or storage for delivery to the Contractor will be commingled with waters of DWR
12 which are pumped through facilities of the California Aqueduct and with other waters of both the
13 United States and DWR in the joint use facilities of the San Luis Unit.

14 (6) Priorities for use of DWR's share of storage at San Luis Reservoir for
15 storage of Project Water shall be subject to all DWR obligations to the SWP operations and SWP
16 Contractors and to the criteria specified in the Operations Manual.

17 (7) Subject to the necessary arrangements, the United States shall transmit
18 or cause to be transmitted, by exchange or otherwise, such quantities of power as shall be required
19 by DWR to pump through its Delta Pumping Plant and its share of Dos Amigos Pumping Plant, the
20 quantities of Project Water transported into Clifton Court Forebay pursuant to (1) of this subsection.

21 (8) DWR shall furnish the Contracting Officer with such information as
22 the Contracting Officer and DWR agree is needed regarding the timing and quantities of power
23 required by DWR to pump Project Water. Such information shall be exchanged between the United
24 States and DWR in accordance with provisions set forth in the Operations Manual.

1 (9) The United States and DWR may, under terms and conditions
2 satisfactory to both, and in accordance with applicable law, exchange water and/or power necessary
3 for delivery of Project Water to the Contractor under terms of this interim renewal contract. Such
4 exchange shall be in accordance with the provisions set forth in the Operations Manual.

5 (c) To the extent that Friant Division Project Water exceeds Contract demand and
6 other Project purposes, as determined by the Contracting Officer, and if the Contractor so requests,
7 the Contracting Officer, subject to Article 3(d), shall make Project Water provided for in Article 3
8 (a) of this interim renewal contract available from such Friant Division supplies.

9 (d) Project Water may be provided by the Contracting Officer to the Contractor,
10 at the Contractor's request, through federal delta diversion and conveyance facilities and/or stored
11 in the federal share of storage at San Luis Reservoir for reregulation for later delivery to the
12 Contractor to the extent such diversion, conveyance and/or storage does not diminish the ability of
13 the Project to deliver Project Water to users in the Delta Division, San Luis Unit and San Felipe
14 Division service areas or to meet other legal obligations of the Project. The Contractor asserts that
15 it has rights to utilize Project facilities, including, but not limited to, those constructed pursuant to
16 the Act of June 3, 1960 (Public Law 86-488). The Contracting Officer disagrees with this assertion.
17 The parties agree that this interim renewal contract preserves the rights and positions of the parties
18 with respect to use of Project facilities arising pursuant to Contract No. 14-06-200-8292A, and the
19 inclusion or omission of language in this interim renewal contract is not intended to be, nor shall it
20 be interpreted as, a waiver of any such rights should they later be determined to exist by a court of
21 competent jurisdiction or by mutual agreement of the parties.

22 (e) Irrigation Water furnished to the Contractor pursuant to this interim renewal
23 contract shall be delivered by the Contractor in accordance with any applicable land classification
24 provisions of Federal Reclamation law and the associated regulations. Project Water shall not be

1 delivered to land outside the Contractor's boundaries or, if applicable, Subcontractor's boundaries
2 unless approved in advance by the Contracting Officer.

3 (f) All Project Water delivered to the Contractor pursuant to this interim renewal
4 contract shall be measured and recorded with equipment furnished, installed, operated and
5 maintained by the United States or the responsible Operating Non-Federal Entity or DWR at the
6 point or points of delivery established pursuant to subdivisions (a) and (b) of this Article. Upon the
7 request of any party to this interim renewal contract, the Contracting Officer or DWR shall
8 investigate the accuracy of such measurements and shall take any necessary steps to adjust any errors
9 appearing therein. The Contractor shall advise the Contracting Officer on or before the tenth (10th)
10 calendar day of each month of the quantity of M&I Water taken during the preceding month.

11 (g) Neither the United States nor any Operating Non-Federal Entity nor DWR
12 shall be responsible for the control, carriage, handling, use, disposal, or distribution of Project Water
13 made available to the Contractor pursuant to this interim renewal contract beyond the delivery points
14 specified in subdivisions (a) and (b) of this Article. The Contractor shall indemnify the United States
15 and DWR and their respective officers, employees, agents and assigns on account of damage or
16 claim of damage of any nature whatsoever for which there is legal responsibility, including property
17 damage, personal injury or death arising out of or connected with the control, carriage, handling, use,
18 disposal, or distribution of such Project Water beyond such delivery points, except for any damage
19 or claim arising out of (i) acts performed by the United States, DWR or any of their officers,
20 employees, agents or assigns, including any responsible Operating Non-Federal Entity, with the
21 intent of creating the situation resulting in any damage or claim, (ii) willful misconduct of the United
22 States or DWR or any of their officers, employees, agents, or assigns, including any responsible
23 Operating Non-Federal Entity, or (iii) negligence of the United States or DWR or any of their
24 officers, employees, agents or assigns including any responsible Operating Non-Federal Entity. In

1 the event any such claim or liability, referenced in this Article or otherwise arising from this
2 Agreement, is made against DWR, its officers or its employees, the Contractor agrees to defend,
3 indemnify and hold each of them harmless from such claim to the extent such claim does not arise
4 from an error or omission of DWR related to the control, carriage, handling, use, disposal, or
5 distribution of Project Water made available to the Contractor by the United States.

Appendix B – Potential Imbalanced Exchange Scenarios and Exchange Mechanisms

SCENARIOS WHEREBY IMBALANCES COULD OCCUR

Scenario 1 – Evaporation and Conveyance Losses

In some cases the exchange parties are miles apart or the exchange water is temporarily stored resulting in losses of water due to evaporation and/or seepage. Consequently, one (or more) recipient does not receive the entire amount of water. The parties would enter into mutually agreeable terms to compensate for such losses.

Scenario 2 – Differing Hydrological Conditions

The hydrological conditions in the State of California are sporadic. Northern California could receive higher precipitation and snow-pack to fill reservoirs compared to Southern California. Annual allocations are based on snowmelt and runoff for the Friant and Delta CVP contractors. These varying conditions could result in less water available to complete the exchanges. The exchange arrangements between the parties typically include mutually agreeable terms for compensation if such conditions occur.

Scenario 3 – Timing of Water Deliveries

As stated in the Background Section above, the CV's CVP water is delivered to SWP facilities when an opportunity exists for DWR to convey this water. This opportunity is often outside of the growing season when the water is not needed for crops in the CV's districts. In these cases, the CVs could enter into agreements with an exchangee that is able to take this water at the time it is available. Later during the growing season, an amount of water would be returned to the CV. The amount returned to the CV would be less than the amount delivered to the exchangee to compensate the exchangee for the service of providing this water to the CVC at a time it is needed.

Scenario 4 – Differing Values of Water During the Year

Scenario 4 is similar to Scenario 3. However the imbalanced exchange is due to other timing issues other than restrictions by DWR to convey the CV Contractor's water. The value of water is typically much higher between June and September. Exchange agreements could include an imbalanced exchange of water based on unpredictable timing constraints to offset the difference in the value of the water when it is delivered.

Potential Cross Valley Contractors Exchange Mechanisms

1. Historical exchanges with AEWS

- Reclamation provides CVP water to CV contractor from the Delta
- Delivery from CV contractor to AEWS
 - i. If capacity is available at Jones Pumping Plant

- The San Luis and Delta-Mendota Water Authority (SLDMWA) conveys CV contractor water in CVP facilities
 - a. Point-of-delivery from SLDMWA to CV contractor is O'Neill Forebay
 - b. Reclamation provides Federal power at Jones Pumping Plant
 - DWR wheels CV contractor water in SWP facilities from O'Neill Forebay
 - a. Point-of-delivery is AEWS D turnouts off of the Aqueduct or the CVC turnout off of the Aqueduct
 - b. If CVC is used, then the Kern County Water Agency (KCWA) conveys CV contractor water in the CVC to AEWS D's turnout off of the CVC
 - c. Reclamation provides Federal power at Dos Amigo Pumping Plant
 - ii. If capacity is available at Banks Pumping Plant
 - DWR conveys CV contractor water in SWP facilities
 - a. Point-of-delivery is AEWS D's turnouts off of the Aqueduct or the CVC turnout off of the Aqueduct
 - b. If the CVC is used, then KCWA conveys CV contractor water in the CVC to AEWS D's turnout off of the CVC
 - c. Reclamation provides Federal power at Banks and Dos Amigo Pumping Plants
 - Return from AEWS D to CV contractor
 - i. Point-of-delivery to CV contractor is CV contractor turnouts off of the FKC
 - ii. Source of water is Friant Division CVP water
 - Exchange may be unbalanced (up to 2:1 average exchange ratio over a 10-year period)
2. Exchange with Friant Division CVP contractor
- Reclamation provides CVP water to CV contractor from the Delta
 - Delivery from CV contractor to Friant Division CVP contractor
 - i. If capacity is available at Jones Pumping Plant
 - SLDMWA conveys CV contractor water in CVP facilities
 - a. Point-of-delivery from SLDMWA to CV contractor is O'Neill Forebay
 - b. Reclamation provides Federal power at Jones Pumping Plant
 - DWR conveys CV contractor CVP water in SWP facilities from O'Neill Forebay
 - a. Point-of-delivery is the CVC turnout off of the Aqueduct
 - b. Reclamation provides Federal power at Dos Amigo Pumping Plant
 - KCWA conveys CV contractor water in CVC through the CVC/FKC Intertie into FKC
 - CV contractor water enters FKC as "Project Water" subject to Reclamation Law with no requirement for a Warren Act contract
 - FWA delivers water to Friant Division contractor
 - ii. If capacity is available at Banks Pumping Plant

- DWR wheels CV contractor CVP water in SWP facilities
 - a. Point-of-delivery is the CVC turnout off of the Aqueduct
 - b. Reclamation provides Federal power at Banks and Dos Amigo Pumping Plants
 - KCWA conveys CV contractor CVP water in CVC through the CVC/FKC Intertie into FKC
 - Water enters FKC as “Project Water” subject to Reclamation Law with no requirement for a Warren Act contract
 - The Friant Water Authority (FWA) delivers water to Friant Division CVP contractor
 - Return from Friant Division CVP contractor to CV contractor
 - i. Point-of-delivery to CV contractor is CV contractor turnouts off of the FKC
 - ii. Source of water is Friant Division CVP water
 - Exchange may be unbalanced (up to 2:1 average exchange ratio over a 10-year period)
3. Exchange with SWP contractor
- Reclamation provides CVP water to CV contractor from the Delta
 - Delivery from CV contractor to SWP contractor
 - i. Point-of-delivery of CV contractor water to SWP contractor is in the Delta
 - ii. SWP contractor conveys CV contractor water under Article 55 of its SWP contract for delivery to SWP contractor
 - iii. Reclamation provides Federal power at Banks and Dos Amigo Pumping Plants
 - SWP contractor returns water to CV contractor
 - i. If source of delivery to CV contractor is SWP contract supplies
 - SWP contractor wheels CV contractor water in SWP facilities to the CVC turnout off of the Aqueduct
 - KCWA wheels water in CVC through the CVC/FKC Intertie into FKC
 - Water enters FKC as “Project Water” subject to Reclamation Law with no requirement for a Warren Act contract
 - FWA delivers water to CV contractor
 - ii. If source of delivery to CV contractor is from previously banked CVP, SWP, Kern River, 215, or abandoned water
 - SWP contractor delivers recovered groundwater to CVC
 - KCWA wheels water in CVC through the CVC/FKC Intertie into FKC
 - Water enters FKC as “Project Water” subject to Reclamation Law with no requirement for a Warren Act contract
 - FWA delivers water to CV contractor
 - Exchange may be unbalanced (up to 2:1 average exchange ratio over a 10-year period)
4. Exchange with Tulare Lake Basin Water Storage District (TLBWSD)
- Reclamation provides CVP water to CV contractor from the Delta
 - Delivery from CV contractor to TLBWSD
 - i. Point-of-delivery to SWP contractor is in the Delta

- ii. SWP contractor conveys CV contractor CVP water supplies under Article 55 of its SWP contract for delivery to SWP contractor
 - iii. Reclamation provides Federal power at Banks and Dos Amigo Pumping Plants
- Exchange for Friant Division CVP Water Supplies
 - i. TLBWSD delivers CV contractor water to TLBWSD points-of-diversion off the Aqueduct
 - ii. TLBWSD delivers non-project water from Pine Flat, Kaweah or Success Reservoirs to Friant Division CVP contractors on the same local system
 - iii. Friant Division CVP contractors deliver CVP water via the FKC to the CV contractors
 - iv. Water is delivered to the CV contractor as "Project Water" subject to Reclamation law with no requirement for a Warren Act contract
 - v. Water is delivered to the TLBWSD as non-project water not subject to Reclamation law with no requirement for a Warren Act contract
- Exchange may be unbalanced (up to 2:1 average exchange ratio over a 10-year period)

Appendix C – Cross Valley CVP Contractors

CV Contractors

There are seven (7) CV Contractors as previously stated (See Table 1). However, some CV contractors are comprised of subcontractors. Altogether, there are sixteen (15) water suppliers within the group known as the CV contractors. The following description characterizes each water supplier:

County of Fresno

Pursuant to the County of Fresno's water service contract CVP water is delivered to Fresno County Service Area #34 that receives approximately 500 af/y.

County of Tulare

Tulare County is comprised of ten subcontractors. In certain years, only a portion or none of the CV water is pumped and conveyed, therefore, they purchase water on the open market to make up the deficits. The ten subcontractors are described below:

Alpaugh Irrigation District Alpaugh Irrigation District (AID) was formed in 1915 and is located in Tulare County approximately 15 miles south of Corcoran and 15 miles northwesterly of Delano, California. AID is comprised of approximately 10,500 acres, of which 5,400 are irrigated. Groundwater provides the primary water supply to AID. AID also operates 18 wells. Two of the deep wells, provide approximately 300 af/y of potable water supply to the Community of Alpaugh. The population in Alpaugh is approximately 1,150. AID maintains 60 miles of domestic water pipelines.

In 1975, AID entered into a contract with the County of Tulare as a subcontractor for CVP water. Historically, AID has entered into exchange arrangements with AEWSA under Article 5 of the water service contract. AID receives 100 af/y of CVP water through its contract with County of Tulare. Through the exchange arrangements, AEWSA takes delivery of this water and AID takes delivery of the CVP water that would have been delivered to AEWSA from the Friant facilities. AID receives its CVP water supplies via Deer Creek. Water from the FKC is diverted into Deer Creek and flows approximately 12 miles to the Deer Creek check structure located on the westerly side of Highway 43 at the northeasterly corner. AID has approximately 45 miles of unlined canals and approximately 25 miles of pipeline. AID has three regulating reservoirs. Reservoir No.1 is the primary regulatory reservoir is used year round to provide timing and flexibility in water deliveries. Reservoirs 2 and 3 are used to provide additional storage to meet the peak demand flows during the summer months. Collectively, the reservoirs cover approximately 800 acres and have a maximum capacity of 4,000 af.

AID does not have any other contracts or water rights to surface water supplies. However, during wet years AID has been able to utilize excess waters available in the Homeland Canal located on the westerly side, which if not used, would flow into the historic Tulare Lake. The main crops grown in AID are cotton, alfalfa, barley, and wheat.

Atwell Island Water District Atwell Island Water District (AIWD) was established in 1977 and is located in Kings and Tulare Counties approximately 1 ½ miles south of the Community of Alpaugh. AIWD is comprised of 7,136 acres, of which, 4,645 are irrigated. In 1978, AIWD entered into a long-term contract with Reclamation for 1,055 af/y of CVP water to be transported by DWR through SWP facilities to the CV and delivered to AEWSD. The CVP water from the Friant facilities that would have flowed to AEWSD are diverted at MP 102.67R via Deer Creek through Alpaugh Irrigation District's facilities to Atwell Island Water District. The contract for 1,055 af/y was terminated.

In 1993, AIWD and Hills Valley Irrigation District entered into a contract for CV Contractors CVP water with the County of Tulare. Both AIWD and Hills Valley Irrigation District receive 954 af/y of CVP water. In recent years, Hills Valley Irrigation District has obtained 904 af/y of AIWD's supply under this agreement resulting in a reduction to 50 af/y for AIWD. AIWD also is a participant in the Mid-Valley Water Authority. This Authority was organized to develop the Mid-Valley Canal.

The distribution of AIWD's water is performed by Alpaugh Irrigation District through a wheeling agreement. Alpaugh Irrigation District owns and operates the approximately 36 miles of unlined canals and laterals. AIWD does not operate or maintain groundwater recharge or extraction facilities. Landowners must provide privately owned wells to sustain irrigation during periods when the AIWD does not have surface water available. AIWD serves only agricultural users. The main crops are cotton, alfalfa, barley, and wheat.

AIWD provides an in lieu conjunctive use program. In wet years, AIWD purchases supplies for use in lieu of pumping groundwater. AIWD uses primarily surface water supplies when it is available and relies on groundwater only when surface water is unavailable.

Hills Valley Irrigation District Hills Valley Irrigation District (HVID) is located in Fresno County about 20 miles east of Fresno and 5 miles north of Orange Cove. A small portion of the HVID is located in Tulare County. HVID does not maintain a central office or full time staff. The operations and maintenance of the facilities are conducted through a contractual agreement with a private contractor.

as a separate subcontractor. In 1995, the contract amount was amended to 3,346 af/y. HVID entered into a contract for Cross Valley CVP water through County of Tulare for 954 af/y and an additional 1,100 af/y. Subsequently HVID acquired 904 af/y from AIWD's subcontract with County of Tulare. The total amount of CVP water is 6,304 af/y.

Four intermittent streams flow into HVID. Wahtoke and Wooten Creeks flow through HVID. Hills Valley and Navelencia Creeks are both natural channels which have been destroyed by land leveling operations. An artificial channel has been constructed through the area that is adequate to prevent flooding from Hills Valley Creek, while no channel appears to be necessary to control any flooding from Navelencia Creek waters.

HVID is comprised of approximately 4,319 acres, of which, 3,602 are irrigated acres. HVID is divided into three areas. Improvement Districts Nos. 1 and 2 and the non-improved district.

Improvement District No. 1 covers 1,276 acres, Improvement District No. 2 is 1,990 acres and the remaining 795 acres are outside any improvement district but are within HVID's boundaries. HVID's distribution system is comprised of approximately 11 miles of pipeline. HVID does not have any groundwater extraction facilities, therefore, landowners must provide their own wells to sustain irrigation during periods when surface water supplies are inadequate. HVID constructed a 15 af regulating reservoir within Improvement District No. 1 and two regulating reservoirs in Improvement District No. 2.

The low yielding wells within HVID are useful as a supplemental irrigation supply and in controlling the buildup of a perched water table in some areas. Therefore, HVID has limited conjunctive use capability. HVID is located near the foothills of the Sierra Nevada Mountains and has relatively low aquifer storage capacity, shallow depth of sediments prevail and in some locations restricted lateral drainage out of HVID occurs. Landowners located in isolated areas do not have wells. For those landowners who do have wells maintain a balance between recharge and withdrawal to prevent insufficient water supplies from occurring while avoiding waterlogging other areas. Typically, the landowners with wells extract groundwater in the spring when the groundwater levels are at their highest. The main crops are oranges, prunes/plums and grapes.

Saucelito Irrigation District See description elsewhere in this document. SID receives up to 100 af/y of CVP water under its contract with County of Tulare.

Fransinetto Farms Fransinetto Farms receives up to 255 af/y of CVP water under its contract with County of Tulare.

Stone Corral Irrigation District See description earlier in this document. SCID receives up to 950 af/y of CVP water under its contract with County of Tulare.

City of Lindsay Lindsay is located on the east side of the San Joaquin Valley in Tulare County near the base of the Sierra foothills and has falling grade from east to west. Lindsay is traversed by State Highway 65 running north and south along the west side of the City. Lindsay is located approximately 12 miles east of Tulare and State Highway 99, approximately 11 miles north of Porterville and 15 miles southeast of Visalia. The first census of Lindsay in 1910 indicated 1,814 residents. The latest population estimates in January 1999 showed 9,015 residents. During the 1990's, yearly population growth was at or less than 1% per year. This rate of growth is slower than the rate of Tulare County. The 2000 census indicates the population in Lindsay at 10,297. Lindsay is an agricultural service center. The agricultural industry is built around citrus (oranges), and twelve orange packing houses, providing the major component of the economic base.

The City of Lindsay entered into a long-term water service contract with Reclamation for 2,500 acre feet per year (af/y) of Class 1 Friant water under contract number 5-07-20-W0428. The City of Lindsay receives up to 50 af/y of CVP water under its contract with County of Tulare. Lindsay obtains their CVP water from the Friant-Kern Canal at the Honolulu Street turnout. The water treatment plant is at the same location and provides filtration, chemical additions and chlorination.

Strathmore Public Utility District SPUD provides wastewater treatment for a population of approximately 1,900 in the city of Strathmore. SPUD receives up to 400 af/y of CVP water through its contract with the County of Tulare. The CVP water is diverted from SPUD's turnout on the FKC and injected into a well to be used for blending with the wastewater before it reaches the headworks of the wastewater treatment plant. SPUD coordinates its diversions in a manner to minimize impacts to agricultural users along the FKC. The CVP water is typically diverted by SPUD during times of wet seasons and high flows when water turbidity is increased allowing for less chemicals used to coagulate and treat the wastewater. The treated water is temporarily stored in an onsite storage facility and is distributed to M&I customers.

Styrotek, Inc. Styrotek, Inc. is located near the city of Delano and manufactures shipping containers. The company receives up to 45 af/y of CVP water under its contract with the County of Tulare. The CVP water is used in the cooling process after the container molds are heated and formed. A portion of the water evaporates or is reclaimed for use in boilers.

City of Visalia The city of Visalia is located in Tulare County and is approximately 28.58 square miles with a population of approximately 102,000. Visalia receives up to 400 af/y of CVP water under its contract with County of Tulare.

Visalia exchanges up to 400 af/y of CV Project water with HVID's Wutchumna Water rights from the Kaweah River. HVID takes physical possession of the CVP water. However, this water is considered non-Project water and is applied to *ineligible* lands. Visalia takes physical possession of the Kaweah (Wutchumna) River water which is characterized as Project water. This water is conveyed through the Persian Ditch Company facilities and is applied to golf courses.

Kern-Tulare and Rag Gulch Water Districts

The Kern-Tulare Water District and Rag Gulch Water District (KTRG) provide irrigation water to over 19,000 acres of high-value permanent crops in Kern and Tulare counties. The annual irrigation demand is approximately 54,000 acre-feet, of which (KTRG) currently provide approximately 40,000 acre-feet of imported water. The remaining 14,000 acre-feet per year are from groundwater pumped by water users.

KTRG are located on the eastern side of the San Joaquin Valley in Kern and Tulare counties, approximately 8 miles east of Delano and 27 miles north of Bakersfield. KTRG are approximately 4 miles in width generally located west of State Highway 65, and extend approximately 14 miles in length from Sherwood Avenue to Avenue 48.

The summer climate is hot and dry while winters are cooler with somewhat more rainfall than adjacent valley areas. KTRG are located within a thermal zone with favorable air movement where citrus, deciduous trees, and other frost sensitive crops are successfully grown. The average length of the growing season in the area is from 250 to 300 days per year. Soils in both water districts are of excellent quality for irrigation.

KTRG currently comprise a gross area of approximately 24,000 acres, of which almost 19,000 acres are developed in irrigated agriculture. There are very few residences located within KTRG. At the present time, 99 percent of irrigated lands are permanent plantings. A summary of land use in 2000 is presented in the matrix below.

	Kern-Tulare	Rag Gulch	Total
Alfalfa	0	276	276
Almonds	480	100	580
Pistachios	1,111	0	1,111
Other Deciduous	355	15	370
Citrus	6,945	1,097	8,042
Subtropical	201	0	201
Grapes	<u>4,301</u>	<u>3,815</u>	<u>8,116</u>
Total Irrigated	13,393	5,303	18,696
Non-irrigated	<u>4,792</u>	<u>650</u>	<u>5,442</u>
Total	18,185	5,953	24,138

It is estimated that 1 percent of the cropped land in the Kern-Tulare Water District is irrigated by the sprinkler method, 8 percent is irrigated by the furrow method, and 91 percent is irrigated using the drip or micro-sprinkler irrigation method. This high percentage of low volume irrigation practices results in a very high irrigation efficiency.

Kern-Tulare Water District has a contract with the Bureau of Reclamation for 40,000 acre-feet of entitlement from the Central Valley Project (CVP) and Rag Gulch Water District has a CVP contract for 13,300 acre-feet. The California Department of Water Resources conveys water under this contract through the California Aqueduct to Tupman. Water is then conveyed through the Cross Valley Canal from Tupman to the Friant-Kern Canal, where it is either delivered directly to the KTRG or exchanged with Arvin-Edison for water available in the Friant-Kern Canal.

Kern-Tulare Water District has a contract with the City of Bakersfield for an average of 20,000 acre-feet per year of Kern River water and Rag Gulch Water District has a similar contract for an average of 3,000 acre-feet per year. Water under these contracts is delivered to Kern County Water Agency Improvement District No. 4 in exchange for State Water Project Water. The State Water Project water is conveyed through the Cross Valley Canal to the Friant-Kern Canal, where it is either delivered directly to the KTRG or exchanged with Arvin-Edison for water available in the Friant-Kern Canal. The Basic Term of these contracts is scheduled to expire December 31, 2011 followed immediately by the Extension Term which the parties are discussing. Additionally, the City of Bakersfield is obligated to provide Kern-Tulare Water District during the Extension Term approximately 70,000 acre-feet of Kern River supply purchased but not delivered previously.

KTRG share common distribution systems and staff. The distribution system of KTRG delivers water from the Friant-Kern Canal to lands within KTRG. The distribution system consists of 4 pumping plants located along the Friant-Kern Canal, 4 regulating reservoirs, 7 re-lift pumping plants, and approximately 70 miles of buried pipelines. In addition, KTRG operate 2 pumping plants located in Delano Earlimart Irrigation District (DEID) reservoirs and 1 pumping plant located in a Southern San Joaquin Municipal Water District (SSJMUD) reservoir.

The depth to groundwater varies from about 200 feet to over 600 feet throughout KTRG and averages approximately 450 feet. There are static groundwater levels taken in the spring and do not include the temporary drawdown of 50 to 100 feet caused by pumping. Wells drilled on the west side of KTRG tap into an unconfined aquifer that is classified as suitable for irrigation. Groundwater in this area contains between 250 and 400 parts per million (ppm) total dissolved solids and is of a calcium bicarbonate or sodium bicarbonate chemical type. Wells drilled on the east side of KTRG tap into confined aquifers that also contain useable groundwater. This groundwater is characterized as sodium chloride with total dissolved solids concentrations between 300 and 500 ppm and is classed as having medium to high salinity hazard and high to very high sodium hazard.

Lower Tule River Irrigation District

LTRID was formed in 1950. LTRID is currently comprised of 93,502 of agricultural lands, 7,671 of native or natural lands and approximately 1,917 acres of urban land uses. LTRID is located in Tulare County on the east side of the San Joaquin Valley. State Highway 99 bisects LTRID in a north-south direction, and the Tule River flows westerly through the entire length of the LTRID. The FKC is located five miles to the east of LTRID's northeast boundary and adjoins the southeast portion of LTRID between Avenues 136 and 128. The towns of Woodville, Popular and Tipton lie within LTRID's boundaries but are not serviced by LTRID. LTRID's entire distribution system is unlined earth canals. Collectively, LTRID owns or controls approximately 163 miles of canals and approximately 47 miles of river channel. LTRID maintains and operates 12 recharge and regulating basins, covering approximately 3,000 acres. In wetter years, LTRID uses these facilities to recharge the groundwater reservoir. LTRID does not own or control groundwater extraction facilities. Therefore, each landowner must provide privately owned wells to sustain irrigation during periods when LTRID does not have surface water available. The main crops in LTRID are alfalfa, grain/hay and cotton.

Currently, the water supplies in LTRID are groundwater, water rights on the Tule River, and CVP water under two separate contracts. The Tule River water supply is approximately 70,000 af/y. Tule River flows approximately 22 miles through the central part of the LTRID. Porter Slough follows a parallel course north of the Tule River. In 1951, LTRID entered into a long-term contract with Reclamation for 61,200 af/y of Class 1 and 238,000 af/y of Class 2 Friant water. In 1975, LTRID entered into a three-way contract with Reclamation and the California Department of Water Resources (DWR) to provide an additional 31,102 af/y of CVP water supply. Under this three-way contract, the CVP water is diverted from the Delta, conveyed through State Water Project (SWP) facilities via the California Aqueduct to the Cross Valley Canal to AEWS. Through the Cross Valley Canal Exchange Program, AEWS and LTRID 'swap' CVP water supplies from the Delta and Friant facilities. Recently, the exchange agreement between AEWS and LTRID has been terminated. LTRID may enter into similar exchange arrangements with other water districts to obtain their CVP water supplies from the Delta. Currently, LTRID sells their CVP contract supplies from the Delta and uses the money to purchase other supplies.

Pixley Irrigation District

PXID is located in Tulare County and bisected by State Highway 99. The City of Pixley is located within the PXID's boundaries. However, PXID does not serve the City of Pixley. PXID was formed in 1958 and currently comprises 69,550 acres, of which 48,302 are irrigated. Deer Creek flows westerly through the entire length of PXID. The FKC is located between one to five miles east of PXID's boundary.

PXID's water supply is derived from the use of groundwater, diversions from Deer Creek and CVP water. PXID entered into a long-term contract with Reclamation in 1975 for 31,102 af/y. PXID operates a conjunctive use program by supplying a portion of the irrigated lands and a portion for direct groundwater recharge through Deer Creek, the existing canal system and sinking basins owned or leased by PXID. PXID obtains their CVP supplies through four turnouts on the FKC into Deer Creek to PXID diversions or Deer Creek. PXID has 45 miles of unlined canals that convey water and provide groundwater recharge. An estimated 30% of the CVP supplies are "lost" through the unlined canals. However, the recharge to the groundwater is considered a beneficial use of this water. PXID maintains and operated nine recharge and regulating basins covering approximately 330 acres.

PXID owns or has access to approximately 330 acres of sinking/re-regulating basins. These basins, along with the Deer Creek channel and the PXID's canals, are used for direct groundwater recharge when surface water supplies are available. It is estimated that a third of the water imported by PXID has been directly recharged into the underground reservoir by PXID operations since PXID's inception.

PXID does not own or operate and groundwater extraction facilities. However, groundwater is the primary water supply available to lands within PXID. Privately owned wells currently provide water to all irrigated lands within the PXID. Approximately 31,957 acres of lands rely totally on groundwater pumping for irrigation. In addition, PXID may enter into an agreement with the Pixley Wildlife Refuge to recharge the groundwater. The refuge is approximately 960 acres.

Tri-Valley Water District

TVWD is comprised of 4,481 acres, of which, 1,812 are irrigable acres. The nearest town is Orange Cove. TVWD only serves agricultural water to seven growers and approximately 880 acres. TVWD does not provide groundwater. However all landowners have wells. Due to the proximity of TVWD to the Sierra foothills, groundwater supplies are typically inadequate. Wells tend to produce groundwater early in the growing season but produce very little in mid and late summer. The water distribution system is comprised of approximately seven miles of pipeline which is shared with Orange Cove Irrigation District landowners and operated by Orange Cove Irrigation District personnel. TVWD does not own or operate any canals, recharge basins, or regulating reservoirs. The main crops are oranges, lemons and tangerines.

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Appendix D – Friant Division CVP Contractors

Arvin-Edison Water Storage District

(AEWSD) is located in Kern County in the southeasterly portion of the San Joaquin Valley. AEWSD was formed in 1942 and its original size was 129,988 acres. Currently, AEWSD comprises 132,000 acres, of which, 109,230 acres are irrigated. Urbanization has changed approximately 2,500 acres of agricultural lands to M&I. AEWSD entered into its first long-term contract with Reclamation in 1986 for 40,000 af of Class 1 and 311,675 af of Class 2 water. The main crops in AEWSD are grapes, potatoes, oranges and cotton.

The CVP water supplies for AEWSD are variable and regulates this water by use of the groundwater reservoir underlying AEWSD. In addition, AEWSD engages in Article 5 exchanges of CVP water with the CV Contractors. Up to 128,300 af/y of CV Contractor's CVP water is delivered to AEWSD. This water is diverted from the Delta through the Aqueduct and to the CVC. In exchange, the Friant CVP water that would have flowed down the FKC to AEWSD is diverted by the CV Contractors in the FKC. Due to the variances in allocations of Friant CVP water, these exchanges may not even out each year. However, over the long-term the amounts of water would be equal. Two of the CV Contractors have terminated their exchange arrangements with AEWSD resulting in approximately 70,984 af/y maximum delivered to the remaining six CV Contractors and approximately 66,096 af/y of water returned to AEWSD.

AEWSD takes Friant CVP water from a turnout located at the terminus of the FKC. AEWSD has 45 miles of lined canals and 170 miles of pipeline. AEWSD maintains three spreading basins to percolate water into the aquifer for storage. Gravity and pressure fed ponds are filled from surface water supplies in "wet" years, while groundwater wells are used to extract stored water in "dry" years. The safe yield of the groundwater supply is 89,900 af.

In 1997, AEWSD entered into a 25-year agreement with the Metropolitan Water District of Southern California (MWD), in which AEWSD agreed to bank approximately 250,000 af/y of MWD State Water Project Supply for later extraction in drought years. AEWSD has completed construction of an Intertie pipeline connecting the terminus of its canal to the California Aqueduct to enhance the water banking and exchange program. The Intertie pipeline does not create new or additional contractual supplies.

AEWSD has historically delivered an average of less than 2,000 af/y of non-CVP to two urban customers, East Niles Community Service District and Sycamore Canyon Golf Course.

Delano-Earlimart Irrigation District

(DEID) is located in Tulare and Kern Counties on the eastern side of the San Joaquin Valley, approximately 10 miles from the Sierra foothills. DEID is comprised of 56,474 acres, of which 46,581 are irrigated. DEID serves agricultural water supplies only. In DEID entered into a long-term contact with Reclamation for 108,800 af/y of Class 1 and 574,500 af/y of Class 2 water. The main crops in DEID are grapes, almonds, deciduous and subtropical orchards. DEID obtains

its CVP water from its turnout on the FKC and delivers the water to its customers through 172 miles of pipeline.

DEID recharges the groundwater during surplus “wet” years through operations with the White River channel, as well as, a small 5 acre recharge basin. In 1993, the DEID purchased and developed an 80 acre parcel specifically for development into a groundwater recharge basin. This basin has five separate cells and dual methods for introducing water to each cell from either DEID’s distribution system or from direct diversions out of White River. The FKC flows north-south through DEID and Lake Woollomes is located adjacent to DEID. Lake Woollomes is a feature of the FKC and CVP facilities. DEID does not obtain supplies or recreational opportunities from Lake Woollomes.

Exeter Irrigation District

(EID) is located in Tulare County on the east side of the San Joaquin Valley, nine miles east of the City of Visalia. EID was formed in 1937 and in 1950 entered into a long-term contract with Reclamation for 10,000 af/y of Class 1 and 19,000 af/y of Class 2 water. In 1953, the Class 1 water supply was increased to 11,500 by an amendment to the contract. EID is comprised of approximately 15,184 acres and 12,700 are irrigated. The City of Exeter is located within EID. However, EID serves only agricultural water. EID obtains its CVP water from seven turnouts on the FKC located between MP 74.6 and MP 81.4. EID’s distribution system is comprised of approximately 60 miles of pipeline. EID maintains two small balancing or regulating reservoirs with a capacity of less than one af each. Yokohl Creek is an intermittent stream which traverses through the northern portion of EID in a northwesterly direction for approximately 2 miles. The main crops grown in EID are citrus, grapes, plums and olives.

Fresno Irrigation District

(FID) was formed in 1920 under the California Irrigation Districts Act, as the successor to the privately owned Fresno Canal and Land Company. FID purchased all of the rights and property of the company for the sum of \$1,750,000. The assets of the company consisted of over 600 miles of canals and distribution works which were constructed between the years 1850 and 1880, as well as the extensive water rights on Kings River.

FID, which now comprises some 245,000 acres, lies entirely within Fresno County and includes the rapidly growing Fresno-Clovis metropolitan area. FID now operates approximately 800 miles of canals and pipelines. Total irrigated area exceeds 150,000 acres, although this number has been decreasing in recent years as a result of urban expansion. The main crops in FID are grapes, citrus, and cotton.

A significant improvement in the control and management of the waters of Kings River occurred with the completion of the Pine Flat Dam project by the USACOE in 1954. Although built primarily as a flood control project, Pine Flat Dam provides significant water conservation stemming from the storage and regulation of irrigation water to the 28 water right entities on Kings River including FID. FID is contracted for 11.9% of the 1,000,000 af capacity of Pine Flat Reservoir. While FID is entitled to approximately 26% of the average runoff of Kings River, much of its entitlement occurs at times when it can be used directly for irrigation of crops without the need for regulation at Pine Flat.

In a normal year, FID diverts approximately 500,000 af of water and delivers most of that to agricultural users, although an increasing share of FID's water supply is used for groundwater recharge in the urban area. Depending upon hydrological conditions and Kings River flows, FID diverts water and allocates a proportional share of the water to its customers including the City of Fresno and Clovis. In addition to its entitlement from Kings River, FID and the City of Fresno have signed contracts to purchase up to 135,000 af annually from the Friant Division of the CVP. Historically, excess water applied by the farmers has percolated beyond the root zone and recharged the extensive aquifer underlying FID. Between 85% and 90% of the groundwater supply can be attributed to water imported and distributed by FID.

However, the conversion of agricultural lands to high-density urban uses in the expanding Fresno-Clovis metropolitan area has reduced the capacity to utilize surface water because all municipal and industrial water is obtained by pumping groundwater. A local overdraft has developed in and around the urban area, and this situation has been exacerbated by the drought of the late 1980s and early 1990s.

FID has combined forces with the City of Fresno, the City of Clovis, the County of Fresno, and the Fresno Metropolitan Flood Control District in a cooperative effort to develop and implement a comprehensive surface and groundwater management program. The main goal of the program involves using flood control basins for recharge during the summer when the basins are not needed to control urban storm runoff. This program also contains elements designed to protect the quality of groundwater in the area.

Garfield Water District

(GWD) is located in Fresno County on the east side of the San Joaquin Valley near the foothills of the Sierra Mountains. GWD is comprised of 1,750 acres, of which, 1,300 are irrigated acres. The main crops are grapes, almonds, olives, stone fruit, citrus and pasture. The distribution system is approximately 8 miles of pipeline. GWD is a CVP contractor with 3,500 af/y of Class 1 Friant water. GWD has no other sources of surface water. GWD is near the foothills and groundwater supply is limited.

Ivanhoe Irrigation District

(IID) is located in Tulare County on the east side of the San Joaquin Valley approximately 50 miles southeast of Fresno and 8 miles northeast of Visalia. IID is generally located between the St. Johns River on the south and Cottonwood Creek on the north. As early as 1915 the lands began to be developed for agricultural uses. Irrigation was from groundwater pumping, precipitation and surface diversions from runoff on the Kaweah River. IID was formed in 1948 and has acquired private surface water rights through the Wutchumna Water Company. IID's owns 7.9 shares of Wutchumna Water stock equaling approximately 3,950 af of water. In 1949, IID entered into a long-term contract with Reclamation for 7,700 af/y of Class 1 and 7,900 af/y of Class 2 water. The non-CVP water supplies are diverted from the Kaweah River through the Wutchumna Ditch to IID's diversion facility and is co-mingled with the CVP supply. IID obtains its CVP water supplies through two turnouts on the FKC. IID's distribution system comprises approximately 48 miles of pipeline and three groundwater recharge areas. The three groundwater recharge areas cover approximately 15 acres and are used when surplus water is available. Approximately three miles of a portion of Cottonwood Creek is also used for recharge purposes.

IID does not own or operate groundwater extraction facilities. Therefore, landowners must provide their own wells to sustain irrigation during periods when IID does not have surface water supplies available. IID comprises of 11,202 acres, of which 10,648 are irrigated. The main crops in IID are grapes, citrus, deciduous fruits, and olives.

Kaweah Delta Water Conservation District

Discussed in Appendix E.

Lewis Creek Water District

(LCWD) is located on the east side of the San Joaquin Valley in Tulare County near the base of the Sierra foothills and has falling grade from east to west. LCWD is traversed by State Highway 65 running north and south along the west side of the City. LCWD is located approximately 12 miles east of Tulare and State Highway 99, approximately 11 miles north of Porterville and 15 miles southeast of Visalia. The first census of LCWD in 1910 indicated 1,814 residents. The latest population estimates in January 1999 showed 9,015 residents. During the 1990's, yearly population growth was at or less than 1% per year. This rate of growth is slower than the rate of Tulare County. The 2000 census indicates the population in LCWD at 10,297. LCWD is an agricultural service center. The agricultural industry is built around citrus (oranges), and twelve orange packing houses, providing the major component of the economic base. LCWD has a water service contract with Reclamation for 1,450 acre feet per year (af/y) of Class 1 Friant water.

LCWD obtains their CVP water from the Friant-Kern Canal at the Honolulu Street turnout. The water treatment plant is at the same location and provides filtration, chemical additions and chlorination.

Lindmore Irrigation District

(LID) is located in Tulare County at the base of the Sierra foothills. LID's northern boundary extends approximately 2 miles from Lindsay and extends approximately 1 ½ miles south of Strathmore. LID is approximately 9 miles long and 10 miles wide and comprises 27,255 acres, of which 25,700 are irrigated. LID was formed in 1937 and in 1948 entered into a long-term contract with Reclamation for 33,000 af/y of Class 1 and 22,000 af/y of Class 2 water. LID lies over the Kaweah Basin. The safe groundwater yield for LID was calculated in 1987 to be 21,000 af/y. LID operates a conjunctive use program to manage surface and groundwater supplies. LID uses groundwater at the beginning of the growing season to warm the CVP water while filling LID's pipeline system. This reduces maintenance costs and leaks in the concrete irrigation pipes due to contraction of cold water. The main crops grown in LID are oranges, olives, cotton, and alfalfa. LID obtains their CVP supplies from four turnouts on the FKC between MP 88.4 and 93.2. LID's conveyance system comprises of 123 miles of pipeline and five reservoirs. The Noel reservoir is 3 af, earthen-clay lined reservoir used for balancing (overflow). The Montgomery reservoir is 4.5 af, earthen-clay lined and is used for balancing (overflow). The Brewer reservoir is 6.5 af, earthen-clay lined and is used for balancing (overflow). The 93.2E N. reservoir is 5.5 af, concrete lined and is used for balancing (equalizing). The 93.2-0.1S S. reservoir is 2.5 af, concrete lined and is used for balancing (equalizing).

Lindsay-Strathmore Irrigation District

(LSID) was formed in 1915 and is located in Tulare County on the east side of the San Joaquin Valley. LSID comprises 15,700 acres, of which 12,700 acres are irrigated to permanent crops. LSID's original imported water supply was from the Kaweah River through LSID's ownership of Wutchumna Water Company stock and 39 deep wells. The supplies from the Wutchumna Water Company range from 5,000 to 14,000 af/y. LSID enters into Warren Act Contracts with Reclamation to transport this water within LSID using CVP facilities. The groundwater supply is limited to 18,000 af/y. In 1948, LSID entered into a long-term contract with Reclamation for 3,900 af/y of Class 1 water. In 1985, the contract amount was amended to 27,500 af/y. The main crops in LSID are oranges and olives. LSID serves only agricultural water.

LSID obtains their CVP water supplies from its turnout at MP 85.56 of the FKC. LSID's distribution system is approximately 115 miles of pipeline and three balancing reservoirs. The Main reservoir is 80 af and concrete lined. The High-Level reservoir is 5 af and concrete lined and the El Mirado reservoir is a 200,000 gallon steel tank. LSID operates 5 groundwater wells with a normal production of 1,750 GPM. These wells are not utilized if surface water is available due to the high cost of pumping. No usable groundwater basin underlies LSID. LSID lies too far east against the foothills to be influenced by either the Kaweah or Tule Rivers. LSID does not operate recharge areas or a conjunctive use program. LSID contractually uses the conjunctive use capacity of the Tulare Irrigation District, a common stockholder in the Wutchumna Water Company, by delivering LSID's Kaweah River water through the Wutchumna Ditch to the Tulare Irrigation District turnout. Tulare Irrigation District either uses this water for irrigation (in lieu recharge) or direct sinking in their groundwater recharge basins. During "dry" years, Tulare Irrigation District's farmers utilize the groundwater delivered by LSID. Tulare Irrigation District returns surface water to LSID through either the FKC or through the Kaweah River system. LSID regularly transfers water to Lindmore Irrigation District, which borders LSID on the west. Approximately 2,500 af/y is transferred to Lindmore during normal water supply years.

Lower Tule River Irrigation District

See description under Cross Valley Contractors.

Orange Cove Irrigation District

(OCID) is located in Fresno and Tulare Counties and was formed in 1937. OCID is about 30 miles southeast of Fresno and 20 miles north of Visalia. OCID is 14 miles long and 3 miles wide and has 28,000 acres, of which approximately 26,788 are irrigated. In 1949, OCID entered into a long-term contract with Reclamation for 31,800 af and in 1989, the contract amount was amended to 39,200 af/y of Class 1 water. OCID obtains their CVP water supplies from fifteen diversion points on the FKC between MP 35.87 to 53.32. OCID's distribution system is 105 miles of pipeline and one regulating reservoir with a capacity of 8 af. OCID does not supply any M&I water. A groundwater basin is almost non-existing under OCID. The area immediately east of Smith Mountain and the area in the vicinity of Navelencia contain basin water. The majority of wells are located in this area. The safe yield does not exceed 28,000 af/y. OCID does not operate any groundwater wells or recharge facilities due to the existing groundwater conditions. OCID provides approximately 1.4 af per acre. Therefore, the balance of crop needs are made up from precipitation and groundwater pumping. The landowners in OCID manage the groundwater supplies through conjunctive use practices. OCID transfers unused water supplies out to other

districts for storage and banking. OCID is pursuing partners for a long-term transfer program or groundwater banking program to balance water in wet and dry years. The main crops in OCID are citrus, grapes, deciduous and subtropical orchards, olives, and nuts.

Porterville Irrigation District

(PID) is located in Tulare County and is comprised of 17,400 acres, of which 13,061 are irrigated. PID was formed in 1949. PID entered into a long-term contract with Reclamation for 16,000 af/y of Class 1 and 30,000 af/y of Class 2 water. PID has an average annual entitlement of 12,900 af/y of water supply from the Tule River.

The FKC enters PID at the northeast corner and exists in the south central portion. The Tule River passes through PID in a northwesterly direction. PID owns the facilities of two improvement districts. Improvement District No. 1 consists of approximately four miles of pipeline and serves 854 acres. Improvement District No. 2 consists of 3.3 miles of open ditch and serves 1,266 acres. PID obtains their CVP supplies from six diversion points on the FKC. In addition to its owned facilities, PID has entered into agreements with Lower Tule River Irrigation District and other entities to utilize non-District owned facilities to convey PID's Water. Through an agreement between PID and Lower Tule River Irrigation District, CVP water deliveries are conveyed through facilities owned or operated by Lower Tule River Irrigation District within PID. These facilities consist of 13 miles of unlined canals.

PID also conveys both CVP supplies and Tule River water through facilities owned by the Porter Slough Ditch Company, the Hubbs-Miner Ditch Company, the Rhodes-Fine Ditch Company and the Gilliam-McGee Ditch Company. These facilities consist of approximately 13 miles of unlined ditch within PID. The facilities belonging to these companies are operated by PID under long-term agreements with the entities. PID operates two percolation basins. PID owns no storage facilities. It does, however, own a portion of the water conservation storage space within Success Reservoir. This storage space is used to store water rights water owned by ditch companies with which PID has operating agreements. PID serves agricultural water only. The main crops in PID are walnuts, cotton, grapes, alfalfa, prunes, corn and citrus.

Saucelito Irrigation District

SID was formed in 1941 and is located in Tulare County, approximately ten miles southwest of Porterville, two miles south of Poplar, eight miles east of Tipton and five miles west of Terra Bella. Deer Creek crosses SID, for about 5 miles, near its southerly boundary and runs during wet years. SID takes no diversions off Deer Creek. The FKC is located on the eastern boundary of SID.

SID entered into a long-term contract with Reclamation in 1959 for the construction of facilities. Water deliveries began in 1961 for 21,200 af/y Class 1 and 32,800 af/y of Class 2 water. Currently, SID comprises of 19,453 acres, of which 19,057 are irrigated. SID has five individual water users that are Riparian Water rights holders totaling 9.5 shares at 55 acre feet per share from Mole Ditch. SID engages in exchanges with the Cross Valley Contractors. SID obtains its CVP water supplies from 4 diversion points on the FKC between MP 11.64 and 107.35 and Deer Creek diversion at MP 102.69. SID's distribution system is 55 miles of pipeline with one recharge pond that covers approximately ½ acre. Deer Creek also provides groundwater recharge in wet years. The main crops in SID are milo, wheat, cotton, grapes and almonds.

Shafter-Wasco Irrigation District

(SWID) was formed in 1937 and is located in Kern County about 20 miles northwest of Bakersfield. Currently, SWID is comprised of 38,766 acres, of which 32,000 are irrigated. Included within its boundaries are the cities of Shafter and Wasco covering approximately 2,400 acres. SWID entered into a long-term contract with Reclamation in 1955 for 50,000 af/y of Class 1 and 39,600 af/y of Class 2 water. SWID does not have any other long-term surface water supplies. SWID provides water for agricultural use only.

SWID obtains its CVP water supplies from two turnouts on the FKC at MP 134.4 and 137.2. The distribution system is .3 miles of lined canals and 117 miles of pipeline. SWID does not own or operate any water storage facilities or groundwater extraction facilities. Landowners must provide wells to meet irrigation demands when SWID does not have adequate surface water supplies available. The main crops in SWID are almonds, cotton, alfalfa, nursery stock, grains, grapes, blackeye peas and carrots. SWID has a history of transferring small amounts of water to neighboring districts.

Southern San Joaquin Municipal Utility District

(SSJMUD) was formed in 1935 and is located in Kern County, approximately 75 miles southeast of Fresno and 30 miles northwest of Bakersfield. The Delano and McFarland are within its boundaries but are not serviced by SSJMUD. Currently, SSJMUD is comprised of approximately 61,000 acres, of which 47,000 are irrigated. SSJMUD entered into a long-term contract with Reclamation in 1945 for 97,000 af/y of Class 1 and 50,000 af/y of Class 2 water and does not have other long-term surface water supplies.

SSJMUD obtains its CVP water supplies from nine diversion points on the FKC between MP 119.6 and 130.4. The distribution system is 158 miles of pipeline. SSJMUD operates eleven regulating reservoirs that provide groundwater recharge. Poso Creek and other smaller foothill drainages provide recharge to the groundwater. SSJMUD does not own and operate groundwater production facilities. Landowners must provide well to irrigate during times when SSJMUD does not have surface water supplies available to meet irrigation demands. The main crops in SSJMUD are alfalfa, citrus, grapes, cotton, nuts and barley. SSJMUD does not typically transfer water in or out.

Stone Corral Irrigation District

(SCID) was formed in 1948. SCID is located in Tulare County, approximately 30 miles southeast of Fresno and 10 miles north-northeast of Visalia. SCID's longest portion, north to south, is 3 ¼ miles and its greatest width, east to west, is 3 miles. SCID is comprised of 6,488 acres, of which 5,470 acres are irrigated. SCID entered into a long-term contract with Reclamation for 7,700 af/y of Class 1 water in 1950. In 1991, the contract was amended to 10,000 af/y of Class 1 water. SCID receives a small amount of water through exchange arrangements with CVC Contractors. This amount is 950 af/y of CVP water. The safe yield for the groundwater supply in SCID is approximately 3,200 af.

The FKC runs approximately along the north and east boundaries. SCID obtains the CVP water from the FKC at MP 57.90, 59.33, 60.90 and 62.68. The conveyance system is 27 miles of

pipeline. SCID serves only agricultural water. The main crops are citrus, cotton, deciduous and subtropical fruit.

Tea Pot Dome Water District

(TPDWD) was formed in 1954 and is located in southeastern Tulare County, approximately three miles south of Porterville. TPWD is comprised of 3,282 acres, and all are irrigated. TPDWD relies mostly on their CVP contract water supplies.

In 1958, TPDWD entered into a long-term contract with Reclamation for 7,500 af/y of Class 1 water. TPDWD does not have any other long-term surface water supplies. TPDWD does not own or operate groundwater recharge or extraction facilities. Landowners pump small amounts of groundwater. TPDWD receives its CVP water supplies from its turnout on the FKC. The distribution system is 20 miles of pipeline. The main crops are citrus and olives.

Terra Bella Irrigation District

(TBID) was formed in 1915 and is located in Tulare County about 75 miles southeast of Fresno and about eight miles south of Porterville. Deer Creek flows westerly and passes through the northern portion. Fountain Spring Gulch flows in a northwest direction, traversing a portion of TBID. TBID is comprised of 13,962 acres, of which, 11,165 are irrigated. The town of Terra Bella is located within TBID's boundaries with an estimated population of 3,870. TBID provides CVP and groundwater CVP for domestic purposes and to the town of Terra Bella.

Approximately 850 af/y of CVP water is delivered for domestic, municipal and industrial uses within TBID.

TBID entered into a long-term contract with Reclamation in 1950 for 29,000 af/y of Class 1 water. TBID receives its CVP water supplies from the FKC at MP 103.64, MP 102.69 and Deer Creek to a percolation pond. The distribution system is 152 miles of pipeline. TBID does not have any other long-term surface water supplies.

TBID's deep well system is barely adequate to support small winter demands. Historically, there were a total of 83 wells drilled over the years in TBID. Currently, TBID owns and operates 10 wells. Recently, TBID has lost the use of three wells due to chemical contamination. TBID is losing its groundwater supply. There are no significant grower or landowner wells. TBID uses three regulating reservoirs during the irrigation season and are also used for storage in the winter. Station 1 has a capacity of 0.185 million gallons, Station 2 has 0.212 million gallons and Station 3 has a 1.880 million gallon capacity.

TBID has developed groundwater banking arrangements with other districts. Groundwater banking arrangements have enabled TBID, a groundwater deficient district, to produce crops during drought years. In years when surplus amounts of water are available, TBID transfers water to other districts for direct use, resale, or percolation through recharge basins. TBID and Lower Tule River Irrigation District have a long history of water exchanges. TBID transfers water to Lower Tule River Irrigation District and, in turn, transfers water to TBID in dry years. TBID provides agricultural water, in addition to, municipal and industrial water for domestic use. The main crops are nuts, deciduous fruit orchards, and citrus.

Tulare Irrigation District

(TID) was formed in 1889 and is located in western Tulare County on the eastside of the San Joaquin Valley. TID currently comprises of 70,000 acres, of which, approximately 62,000 are irrigated. The city of Tulare lies on the eastern portion at the intersection of the Southern Pacific and Santa Fe Railroads and on U.S. Highway 99. TID provides only agricultural water supplies and does not service the city of Tulare. Water for Tulare is extracted from the ground and furnished through City owned facilities.

TID entered into a long-term contract with Reclamation in 1952 for 30,000 af/y of Class 1 and 141,000 af/y of Class 2 water. TID has pre-1914 water rights on the Kaweah River for approximately 50,000 af/y of water. TID's owned Kaweah River water rights are 1) Crocker Cut on the Lower Kaweah Branch, 2) St. Johns Canal (TID) on the St. Johns Branch and 3) Crossmore cut Packwood Creek) on the St. Johns Branch. Water is also made available through share holdings in the following Kaweah River agencies: 1) Tulare Irrigation Company on both the Lower Kaweah Branch and the St. Johns Branch, Wutchumna Water Company on the Kaweah River, 4) Persian Ditch Company, and 5) Consolidated Peoples Ditch Company. Groundwater recharge occurs from percolation in the canals and natural channels, recharge basins, and treated municipal and industrial effluent. TID has 12 groundwater recharge areas covering a total of 1,110 acres. TID does not operate extraction wells.

TID obtains their CVP water supplies from its turnout which is located approximately 14 miles northeast of the District Service Area. The water is conveyed in TID's Main Canal. Diversions into this Main Canal include water from the Kaweah and St. Johns River Branch. The Packwood Creek diversion system begins at the terminus of the Lower Kaweah River approximately 10 miles northeast of TID. The distribution system includes 300 miles of unlined canals, ¼ mile of lined canal and 30 miles of pipeline. The main crops in TID are alfalfa, field corn, wheat and cotton.

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Appendix E – Other CVP Contractors, SWP Contractors, and non-CVP Contractors

Buena Vista Water Storage District

Buena Vista Water Storage District (BVWSD) lies in the trough of the southern San Joaquin Valley in Kern County. The District lands are within a portion of the lower Kern River watershed, where historic runoff created the heavy clay soils from former swamp and overflow lands north of Buena Vista Lake. The area lies on the west side of the valley floor, about 16 miles west of the city of Bakersfield. The unincorporated town site of Buttonwillow (population 1,500) is situated in the geographical center, however BVWSD does not supply any M&I water. The water service area contains 48,443 acres of agricultural land. Approximately 45,500 acres have been built-out, and about 40,000 acres almost entirely field and row crops.

BVWSD service area is agricultural, with cotton, grain, sugar beets, and alfalfa as the principal crops. Cotton is the dominant crop, comprising about 85% of the annual cropping pattern. Total crop consumptive use peaked in the 1970s, averaging about 113,000 acre-feet. In the past 10 years consumptive use has declined to about 105,000 acre-feet.

In addition to Kern River water supplies BVWSD contracted with DWR via the Kern County Water Agency for an additional surface water supply in 1973. This contract provided for an annual firm supply of 21,300 af and surplus supply of 3,750 af. BVWSD has also been a historic user of surplus FKC flows to serve irrigation demands and for groundwater recharge programs. BVWSD is geographically located adjacent to the California Aqueduct and low in elevation on the Kern River Fan. BVWSD's Kern River supply is thus delivered by gravity from its origin in the Sierra-Nevada Mountains north east of Lake Isabella. BVWSD is a member unit under KCWA. Other members of KCWA in the Bakersfield area also have contracted for SWP water but must pump their supplies to their service areas upslope and to the east of the San Joaquin Valley via the CVC. These circumstances lend themselves to an exchange of BVWSD Kern River water for east side member units SWP water, thus avoiding or reducing energy use and resultant pumping costs. This process also frees up CVC capacity that would otherwise be necessary for transportation of east side member units of SWP water. In order to allow maximum benefit from these exchanges, BVWSD has increased its SWP capacity by construction of a three pipe siphon Aqueduct Turnout (BV-7) having a capacity of 300 cfs. BVWSD Aqueduct capacity can now provide approximately 85-90% of peak system demand with a total flow capacity from the California Aqueduct of approximately 800 cfs. Although the exchange programs have provided benefits to BVWSD, salt loading is an issue since SWP water supplies carry more salinity than Kern River water. This would influence the degree of exchange volume in particular years when salinity levels are greater.

BVWSD engages in water banking programs. These banking programs generally fall under two categories. The first category would be a program designed to return water to BVWSD during a dry year when supplies are restricted. The second category would be a program where BVWSD is providing a banking and extraction service for monetary payment or similar benefits. BVWSD wet year supplies have afforded it the ability to enter into both categories of banking programs

which in turn allow BVWSD to stretch its wet year supplies into dry year payback deliveries and thus help to balance required groundwater pumping. These programs also allow BVWSD to make more efficient use of its Kern River water supplies over the long term which in turn minimizes the loss of water from the critically overdrafted groundwater basin. BVWSD also engages in direct groundwater recharge programs. BVWSD Kern River supply is dependent on the hydrologic cycles as they occur regardless of crops demands. During dry years, landowners must provide the difference between crop demands and BVWSD allocated surface deliveries via groundwater pumping from individual wells. During wet years BVWSD is able to satisfy maximum crop demands that eliminates the use of landowner wells. Excess wet years are stored to maximize surface carryover use and followed by direct recharge, to the maximum extent possible to replenish the groundwater supply. The efficiency of managing this difference between crop demands and available water supplies ensures that BVWSD, as a whole, is in positive balance with the groundwater basin. The main recharge areas used by BVWSD below the Enos Lane are the Kern River Bypass Area, the Kern River channel, the Main Canal, the Outlet Canal, the Tule Elk Reserve area near Tupman, and the upper reach of the Kern River Flood Channel. Recharge capacity has nearly doubled in the Kern River Bypass Area due to improvements in the West Kern/Buena Vista banking program, and in the Tule Elk Reserve area via additional distribution facilities in sloughs and other low lying areas. In addition, BVWSD is a recharge participant in the KCWA Pioneer Project and shares a first priority access to the total recharge capacity for overdraft correction.

Historically, BVWSD stored its spring runoff flows within Buena Vista Lake until the lake bottom lands were freed from the storage right in exchange for conservation storage space in Lake Isabella. This storage space was purchased by the Kern River Interests upon construction of Isabella Dam by the USACOE. BVWSD owns 31.6% of the conservation storage space within the reservoir with flood control being the only overriding purpose. This affords a maximum storage increment of 172,000 af of regulation space with a maximum winter carryover capability of 68,800 af. BVWSD also retained storage rights within the cells of Buena Vista Lake with a yield, after losses, of approximately 25,000 af. Pursuant to the Kern River Storage and Use of Water Agreement, BVWSD is afforded use of this facility for wet year storage of excess Kern River supplies. In addition, BVWSD, via agreement with Kern County maintains regulation storage use of 1,800 af of space within Buena Vista Aquatic Recreation Area Lakes. Therefore, BVWSD has approximately 96,000 af of surface storage space for regulation of its surface water supplies from one year to the next. These surface storage rights are very important to the efficient management of BVWSD's Kern River water rights since the April-July runoff period does not coincide with the crop irrigation requirement which occur in the January through March pre-irrigation and the June through September summer irrigation periods. The carryover capability with Isabella reservoir and BVWSD's SWP supply allow BVWSD to provide a surface water supply for the early pre-irrigation period even though BVWSD's Kern River supply normally does not begin until the Mar-August supply period. The reservoir also provides peaking capability and facilitates other management practices such as the previously mentioned exchange, banking, and recharge activities

The Buena Vista Aquatic Recreational Area lakes provide the BVWSD with a very useful tool in the operational storage for regulation of both Kern River and SWP flows to the BVWSD as well as some valuable surface storage. This facility receives the BVWSD's Kern River flow via the

Alejandro Canal and SWP flow via turnout BV-3 while directing flows in the BVWSD's Outlet canal for use in the Buttonwillow service area. The lakes are also used to serve the Maples area and Henry Miller Water District per agreement with Kern County and upon arrangement with BVWSD.

During wet years the BVWSD authorizes the sale of surplus water to reduce or avoid groundwater pumping and generate revenue to offset BVWSD operating costs. Generally, surplus water is offered to landowners within the BVWSD (for use above surface allocation), to landowners adjacent to the BVWSD who rely primarily on groundwater supplies, and other non-adjacent parties. Such deliveries are beneficial since they correct overdraft, raise pumping levels, and generate revenues.

Historically there have been threatened and endangered species present within the bounds of BVWSD. The giant kangaroo rat (*Dipodomys ingens*) was known to exist in the southernmost portion of BVWSD, but has not been sighted in recent times. The giant garter snake (*Thamnophis gigas*) was located in BVWSD in a 1999 survey. The western yellow billed cuckoo (*Coccyzus americanus occidentalis*) was last reported in BVWSD in 1973. Two accounts of the buena vista lake shrew (*Sorex ornatus relictus*) were made in BVWSD in 1991. The blunt-nosed leopard lizard (*Gambelia sila*) was last observed in BVWSD in 1987. The western snowy-plover (*Charadrius alexandrinus nivosus*) was last seen in BVWSD in 1978.

Cawelo Water District

Cawelo Water District (CWD) is located in the North-Central portion of Kern County and encompasses an area of nearly 45,000 acres. The CWD lies between State Highway 99 on the west and State Highway 65 on the east, the community of McFarland on the north and Oildale on the south. The city of Bakersfield is approximately six miles southeast of CWD.

As of 2000, the total area of CWD was 45,079 acres including a service area of 33,320 acres. Land use in 2000 in the service area consisted of 29,657 acres of irrigated agriculture, 3313 acres of fallow and 350 acres devoted to other uses including waterways, residential, commercial and agriculture-related businesses.

Approximately 85% of the irrigated lands served by CWD are planted to trees and vines (principally grapes, citrus, deciduous fruit, and nuts).

CWD surface water supply is obtained primarily under two long-term contracts: a contract with the Kern County Water Agency for SWP water and a contract with the city of Bakersfield for Kern River water. Water from these two sources has accounted for 90% of CWD's surface water supplies. CWD also purchases water from many other sources under short-term agreements as available. The imported surface water serves as a supplemental supply for irrigation within CWD. Approximately 65% of the irrigation demands within CWD have been satisfied with imported surface water deliveries. CWD does not serve M&I water. Individual landowner wells have contributed to the remainder of the water required to irrigate crops. CWD obtains surface water from other sources including diversions from Poso Creek when available, oil-field produced water, and CVP water through one-year temporary water service contracts when available.

Within the bounds of CWD, the only threatened or endangered species that has been sighted in recent times is the San Joaquin kit fox (*vulpes macrotis mutica*). This species was last observed in CWD in 1986.

St. Johns Water District

Encompasses in part or in total of the Kaweah River water rights of Jennings Ditch Company, Modoc Ditch Company, Goshen Ditch Company, and St. Johns Ditch Company.

Kaweah Delta Water Conservation District

The Kaweah Delta Water Conservation District (KDWCD) was formed in 1927, under the provisions of California state law known as the Water Conservation District Act of 1927, for the purpose of conserving and storing waters of the Kaweah River and for conserving and protecting the underground waters of the Kaweah Delta. Later the Water Conservation District Act, as well as the purpose of KDWCD, was expanded to include power generation.

KDWCD is located in the south central portion of the San Joaquin Valley and lies in both Tulare and Kings Counties. It fully encompasses the growing cities of Visalia, Farmersville and Tulare. The population of the KDWCD is currently estimated to be in excess of 150,000 people. The total area of KDWCD is about 337,000 acres with approximately 255,000 acres located in western portion of Tulare County and the balance, or about 82,000 acres, in the northeastern portion of Kings County. KDWCD is comprised of four districts that are entirely or partially within KDWCD boundary and are listed below:

Lakeside Irrigation Water District

Discussed elsewhere within the Appendices.

Kings County Water District

Discussed elsewhere within the Appendices.

Corcoran Irrigation District

Corcoran Irrigation District encompasses the area around the town of Corcoran, at the eastern edge of Kings County and receives CVP water via the Kings River where it is diverted out of the FKC. Corcoran Irrigation District diverts the CVP water out of the Kings River into the Lakeland/Highline Canal that enters at Kansas Avenue. In addition, water can enter the Kaweah/St. John River system and can be diverted into Cross Creek which will enter at Kansas Avenue. There are no recorded occurrences of threatened or endangered species in Corcoran Irrigation District.

Tulare Irrigation District

Discussed elsewhere in the Appendices.

Kaweah Delta Water Conservation Water District

KDWCWD lands are primarily agricultural, although the cities of Visalia and Tulare constitute significant areas of urbanization. Farmersville is the other incorporated area. Smaller unincorporated rural communities include Goshen, Ivanhoe, Waukena, and Guernsey.

A high degree of agricultural development exists in the KDWCD, with approximately 266,000 acres presently devoted to the production of a variety of irrigated crops, 3,200 acres idle or fallow (including roads and canals), 13,000 acres in farmsteads, 23,300 acres undeveloped and approximately 31,500 acres of urbanized land. The principal crops are cotton, miscellaneous field crops, deciduous fruit and nut trees and alfalfa.

KCWCD encompasses the alluvial fan of the Kaweah River, extending about 40 miles in a southwesterly direction from the foothills of the Sierra Nevada Mountains on the east to the center of the San Joaquin Valley in the vicinity of the Tulare Lake bed on the west. KDWCD is generally bounded on the north and west by the service area of the Kings River and on the south by the service area of the Tule River.

Numerous public and private entities within KDWCD's boundaries divert water from the Kaweah River and its distributaries. Nearly all of the lands served with Kaweah River water also use groundwater wells to supply irrigation water, primarily due to the erratic, relatively undependable, nature of flow on the Kaweah River. All municipal and industrial water uses within KDWCD are supplied from groundwater.

Terminus Dam and Lake Kaweah, located on the Kaweah River about 3.5 miles to the east of KDWCD, was completed in 1961 by the USACOE. This project was constructed for flood control purposes on the Kaweah River and to provide river control and water conservation for irrigation purposes. KDWCD has a contract with the United States for repayment for the project costs allocated to water conservation. The reservoir currently holds about 143,000 acre-feet, with construction underway to expand capacity to 183,300 acre-feet.

KDWCD and its sub-entities have historically received substantial quantities of water surplus to the needs of CVP Contractors. Over the past 50 years, an excess of 5 million acre-feet of CVP water has been imported into KDWCD. KDWCD and the Kaweah River groundwater basin have experienced long-term groundwater overdraft estimated in 1972 to be 89,000 acre-feet per year. KDWCD is currently undergoing new studies of groundwater data to determine the extent and volume of groundwater overdraft within its boundaries. There are currently 40 recharge basins within KDWCD covering approximately 5,000 acres. While KDWCD owns and operates many of the groundwater recharge basins, it does not provide water-banking services for others. Conversion of land from agricultural uses to urban/commercial uses has occurred, is occurring and is expected to continue to occur in these communities consistent with the general plans and zoning for these communities as may be amended. While KDWCD owns and operates numerous groundwater recharge basins within its boundaries, it does not provide water banking for others.

Kern County Water Agency

Kern County Water Agency (KCWA) comprises all of Kern County in the Southern San Joaquin Valley. KCWA currently has approximately 861,000 irrigated acres. This is in contrast to its peak to the KCWA's peak irrigation acres, 973,000 acres in 1984 and its lowest recent level of irrigation acres, 729,400 acres in 1991 due to a severe drought. There are about 110,000 to 120,000 acres per year that are idled for various reasons. In an extreme case, if all of this land was cropped in a single year, irrigated acreage could return to its peak without the conversion of

any native lands. In 1991 there were about 266,200 acres of permanent crops and in 1998 permanent crops amounted to about 316,500 acres. This trend is expected to continue. KCWA was created by a special act of the State Legislature in 1961. It holds the master contract with the State of California for delivery of a maximum yearly supply of 1,000,949 acre-feet of SWP water supplies to 21 subcontracting water agencies (“Member Units”) within Kern County listed below:

Agency	Surface Water Rights/ Contract Rights	Irrigated Acreage	Percent in Permanent Plantings
Belridge Water Storage District	SWP	--	--
Berrenda Mesa WD	SWP	--	--
Buena Vista WSD	SWP, KR	38,411	1%
Cawelo WD	SWP, KR,	34,300	97%
MS, Oilfield waste			
Henry Miller WD	SWP, KR	18,100	0%
Kern County Water Agency Improvement District No. 4	SWP, KR	4,900	0%
Kern Delta WD	SWP, KR, MWD	93,100	7%
Lost Hills WD	SWP	57,600	29%
Rosedale-Rio Bravo WSD	SWP, KR	33,400	17%
Semitropic WSD	SWP, MS MWD	129,100	23%
Tehachapi-Cummings CWD	SWP, local streams	--	--
Tejon-Castaic WD	SWP, local streams	--	--
West Kern WD	SWP	--	--
Wheeler Ridge-Maricopa WSD	SWP, MS	93,600	37%
Arvin-Edison WSD (LTRC)	CVP, KR, MS	99,000	48%
Southern San Joaquin MUD (LTRC)	CVP	50,500	56%
Shafter-Wasco ID (LTRC)	CVP, MS	30,900	48%
Delano-Earlimart ID (LTRC)	CVP, MS	51,000	80%
Kern Tulare WD (LTRC)	CVP, KR	20,202	100%
Rag Gulch WD (LTRC)	CVP, KR	5138	100%

KCWA Member Unit SWP Supplies

Member Unit	Supply	Allocation (60%)	Water Shortage
Belridge WSD	121,508	72,905	48,603
Berrenda Mesa WD	108,600	65,160	43,440
Buena Vista WSD	21,300	12,780	8,520
Cawelo WD	45,000	22,920	15,280
Henry Miller WD	35,500	21,300	14,200
Improvement District No. 4	82,946	49,768	33,178
KCWA	8,000	4,800	3,200
Kern Delta WD	25,500	15,300	10,200
Lost Hills WD	119,110	71,466	47,644
Semitropic WSD	155,000	93,000	62,000
Rosedale Rio-Bravo WSD	29,900	17,940	11,960
Tehachapi-Cummings CWD	19,300	11,580	7,720
Tejon-Castac WD	5,278	3,167	2,111
West Kern WD	25,000	15,000	10,000
Wheeler Ridge-Maricopa WSD	197,088	118,253	78,835
Total	998,730	559,238	339,492

Arvin-Edison WSD, Southern San Joaquin MUD, Shafter-Wasco ID, Delano-Earlimart ID, Kern Tulare WD and Rag Gulch WD are LTRC CVP contractors and are within the focus of this EA. Belridge WSD, Berrenda Mesa WD, Tehachapi-Cummings CWD and Tejon-Castac WD are not within the Place of Use under Reclamation's water rights permits for this action, therefore are not included in this Environmental Assessment or Proposed Action. Henry Miller WD and West Kern WD have small portions within the CVP Place of Use. Approvals of exchanges with these two districts could occur only after considering the amounts and deliveries involved.

As stated earlier, each proposal would be reviewed individually for compliance with this EA, related biological assessments, applicable laws and policies including Reclamation's water rights permits prior to approval. KCWA Improvement District #4 supplies are M&I water and the remaining districts are agricultural. The KCWA was established to make water available for any beneficial use or uses of lands or inhabitants; provide flood control; drain and reclaim lands; acquire, appropriate, store, conserve and import water; prevent contamination of water; develop and sell at wholesale hydroelectric energy to aid in financing water projects.

KCWA is the largest agricultural water contractor on the SWP and the second largest overall with 1,000,949 acre-feet of annual supply. Kern County ranks in the top four California counties in agricultural production, behind Fresno, Tulare and Monterey Counties. For the year 2000, the last year for which statistics are available, Kern County agricultural production was valued at \$2.2 billion. Grapes were the biggest crop with a value of \$438 million, followed by citrus at \$291 million and cotton at \$226 million.

Kern County leads the state in production of several crops including almonds, pistachios, carrots, watermelons, sheep and wool. Agriculture has been Kern County's number one industry for many years. Approximately one out of every four jobs in Kern County is related to agriculture. Kern County has a total population of 662,000 people. Bakersfield, the largest incorporated city in the county has a population of 247,000 people.

City Population

McFarland 9,600

Delano 38,800

Shafter 12,700

Wasco 21,200

Buena Vista WSD, Cawelo WD, Kern Delta WD, North Kern WSD, Rosedale-Rio Brave WSD, and Semitropic may enter into exchange arrangements with the Cross Valley Contractors under separate agreements and are described elsewhere in this Section.

Improvement District No. 4

In the late 1960's KCWA formed it Improvement District No. 4 to import state project water to the urban Bakersfield area for municipal purposes. Today, more than 80,000 af/y of SWP water is reserved for importation into the area. Fifty-thousand af/y is set aside to replenish ground water basins, while 34,000 af is treated and distributed through KCWA's Henry C. Garnett Water Purification Plant. The treated water is delivered to four domestic water systems that serve parts of northern and eastern Metropolitan Bakersfield through the following entities:

Within the boundaries of the Kern County Water Agency ID #4 are San Joaquin woollythreads (*Monolopia congdonii*), Bakersfield cactus (*Opuntia basilaris* var. *treleasei*), San Joaquin kit fox (*Vulpes macrotis mutica*) and valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). These species were last reported in 1992, 1995, 1986 and 1991 respectively.

Wheeler Ridge-Maricopa Water Storage District

Wheeler Ridge-Maricopa Water Storage District (WR-MWSD) is a public agency whose jurisdiction encompasses about 147,000 acres of land in Kern County at the extreme southern end of the San Joaquin Valley twenty miles south of Bakersfield. A large portion of the WR-MWSD is within the designated Places of Use as defined in Reclamation's Water Rights Permits. WR-MWSD provides irrigation water supplies to about 90,000 acres of farmland within its boundaries. A small percentage of the water is supplied on a temporary basis for industrial, groundwater recharge, and in-lieu of groundwater pumping purposes. WR-MWSD provides no water treatment or M&I service. Except for a few locations along Interstate 5, WR-MWSD is exclusively rural. There are no cities or towns within MR- MWSD boundaries. No significant new water distribution facilities have been constructed since 1986, and none are planned.

WR-MWSD is a member unit of the KCWA and has contracted with KCWA for a water supply from the SWP. Water from the SWP is delivered to WR-MWSD through the California Aqueduct which transects WR-MWSD from west to east. Water from the SWP is the primary source of supplemental water utilized by WR-MWSD. Other sources have included banked water from the various banking programs in Kern County in which WR-MWSD participates including the Kern Water Bank, the Pioneer Project, and the Berrenda-Mesa Project. Direct delivery of water from the CVP is accomplished by releases from the terminus of the FKC into

the Kern River channel. Water released to the Kern River can either be conveyed directly to the Kern Water Bank Canal or diverted into the River Canal and delivered downstream to the Kern Water Bank Canal. From the Kern Water Bank Canal the water is conveyed to the California Aqueduct and thence into WR-MWSD turnout and pipeline facilities located along the California Aqueduct.

Most of the WR-MWSD water supply is distributed to 72,074 acres of farmlands within its Surface Water Service Area under the terms of recorded long-term agricultural water service contracts. Current facilities can also provide temporary water service to about 18,000 acres of farmlands. An additional 20,000 acres of farmlands and 10,000 acres of other developed lands rely primarily on groundwater supplies. Another 27,000 acres are undeveloped and used primarily for grazing. The primary use of the CVP water by WR-MWSD would be for delivery into the various banking programs for later recovery and use.

KCWA WATER SUPPLY

SWP - KCWA is the second largest participant in the SWP, a water storage and delivery system of reservoirs, aqueducts, power plants and pumping plants. The project, which extends for more than 600 miles (two-thirds the length of California), was planned, built, and is operated by the California Department of Water Resources. About \$4 billion have been spent on project construction.

The project's main purpose is to store water during wet periods and distribute it to areas of need in Northern California, the San Francisco Bay area, the San Joaquin Valley, and Southern California. The State has contracts to supply up to 4.2 million acre-feet annually of SWP water to 29 public agencies. Other project functions include flood control, power generation, recreation, and fish and wildlife enhancement.

The first deliveries of water from the project to Kern County began in 1968. KCWA has contracted to receive a maximum yearly supply of 1,000,949 acre-feet of water. Of that amount, 134,000 acre-feet is allocated to municipal and industrial use, and 866,949 acre-feet is used for agricultural use. Water from the SWP reaches Kern County through the California Aqueduct which passes through the west side of Kern County before crossing the Tehachapi Mountains into Southern California. A portion of that water is brought to Bakersfield and other eastern portions of the San Joaquin Valley through a series of seven pumping stations in the 22-mile long Cross Valley Canal operated by the KCWA.

CVP - The FKC is an essential part of the Kern County agricultural water supply system. It delivers more than 400,000 acre-feet per year to DEID, SJMUD, SWID, AEWSD, KTWD and RGWD.

Kern River - The Kern River supplies water for agriculture, municipal use, industrial use and hydroelectric power. Flows average 700,000 acre-feet yearly or about 22% of the water for Kern County users. The Kern River originates in two forks near Mt. Whitney in the southern Sierra Nevada Mountains and flows south. A large dam has been constructed to form Lake Isabella. The Kern River is the largest local source of surface water in Kern County. Districts that have water rights include, KDWD, City of Bakersfield, BVWSD, Henry Miller Water District, Olcese Water District, and La Hacienda Inc. Kern River water is also delivered to Rosedale Rio-Bravo

Water Storage District, Cawelo Water District, Kern-Tulare Water District, Rag Gulch Water District and the KCWA's Improvement District No. 4.

Agricultural Use

Kern County is the fourth most productive agricultural county in the nation. A semiarid region, it must rely on adequate imported water supply. A vast underground water basin supplies 43% of the water used for domestic and agricultural purposes. Other sources of supply include the Kern River (22%), the SWP (23%), and the FKC (11%). With years of flood and years of drought spaced among periods of normal supply, careful management practices have been developed and applied. Kern County farmers are among the most efficient water managers in the state. It is estimated that 75% of the water applied to local crops goes to satisfying actual crop requirements. Significant improvement in efficient irrigation has been made through the utilization of drip and low volume application methods, as well as careful management of row and border systems. Laser leveling helps achieve uniform distribution. Researchers have determined that irrigation practices in Kern County are among the most efficient in the nation. With national and worldwide demands for food and fiber increasing, the water and agricultural industries of Kern County will continue to develop efficient technologies to meet future irrigation requirements.

Groundwater

Sediments that comprise Kern County's main groundwater basin are unconsolidated deposits of Tertiary and Quaternary age, including alluvium, lacustrine, deltaic and flood basin deposits of sand and gravel. Thin lenses of silt and clay are scattered throughout the basin at various depths, but are most pronounced in the southwestern and northwestern portions of the Tulare Lake Basin. This basin is located within the Tulare Lake hydrologic region and is bounded on the north by the Kern County line, on the east by the Sierra Nevada foothills, on the south by the Tehachapi and San Emigdio Mountains and on the west by the coast ranges. The Kern River is the principal watershed drainage. The main groundwater basin in the San Joaquin Valley portion of Kern County covers about 963,000 acres. KCWA estimates total storage capacity of the top 500 feet is about 50 million acre-feet. Total groundwater in storage within this space is estimated at 40 million acre-feet, with about 10 million acre-feet of dewatered storage space.

The main San Joaquin Valley basin has two primary water bearing zones; an unconfined zone generally above the Corcoran Clay and a confined zone generally below the Corcoran Clay. There are multiple confined zones in some parts of the valley. The southeastern corner of the Valley contains the White Wolf basin, which is separated from the main Kern County basin by the White Wolf Fault. In the northeastern portion of the basin some groundwater production occurs in the Santa Margarita and Olcese formations. These deep, confined aquifers are on the edge of the Valley with limited yields and marginal to poor groundwater quality.

Natural recharge of the groundwater basin is estimated to be about 180,000 acre-feet annually. Annual groundwater pumping exceeds the natural recharge of the basin. The conjunctive use of surface and groundwater supplies has increased the operational yield of the groundwater basin to about 2 million acre-feet annually. There are about 5,500 to 6,000 active groundwater wells in the Kern County groundwater basin. Basin yield varies across the valley. The lowest pump yields are in the northeastern portion of the valley, and the highest yields are typically in the Kern Fan area. Typical yields may vary from about 700 gallons per minute to over 3,000 gallons per minute (Management Plan, October 2001).

KCWA has an allocated Aqueduct capacity of 3,277 cfs. Along both sides of the Aqueduct within the Kern County portion of the DWR San Joaquin Field Division are a number of Member Unit turnouts used to convey water from the Aqueduct into each district delivery system. Following is a list of the Member Units and number of turnouts: Semitropic WSD - 2; Buena Vista WSD - 6; Cawelo - 11; Rosedale Rio-Bravo WSD - 12; Henry Miller WD- 23; Wheeler Ridge-Maricopa WSD - 17. The Aqueduct is used to convey water including the transfer and exchange water, to Kern Tulare Rag Gulch.

Recovered groundwater that is conveyed to the California Aqueduct, can be delivered to districts or exchanged with the DWR. Exchanges with the DWR can be simultaneous, or delayed exchanges. In a simultaneous exchange water delivered from the Aqueduct to an upstream district at the same time the recovered groundwater is transported to the Aqueduct. With a delayed exchange, water might be delivered by the DWR to the receiving district from storage before or after the recovered groundwater is received.

¹ Cawelo WD takes delivery of SWP water via the CVC.

² Rosedale-Rio Bravo WSD takes delivery of their SWP water via the CVC.

³ Henry Miller WD takes their SWP water via Buena Vista turnouts.

Recovery

The CVC is also used to convey banked groundwater after it is recovered. Once in the CVC, recovered water can be delivered to CVC participants in exchange for water in the California Aqueduct. During periods when water is not available for exchange, the CVC can be operated in reverse flow. When operated in reverse flow, water flows from the CVC directly into the California Aqueduct. In 1991, water levels in the Aqueduct were low enough for the flow to be by gravity. When water levels in the California Aqueduct are too high for gravity flow, the water must be pumped into the Aqueduct. In 1992, the DWR constructed a temporary pump station to lift 80 cfs from the CVC into the California Aqueduct. A similar station may be reconstructed in the future if reverse flows into the California Aqueduct are needed when levels in the California Aqueduct are too high for gravity flow. In addition, raising the lining in the CVC reach adjacent to the California Aqueduct would allow reverse flow without a pump station.

It should be noted that depending on groundwater pumping operations, water in the Buena Vista Aquatic Lake may contain high concentrations of arsenic. These high concentrations are caused when groundwater from nearby wells is pumped into the Buena Vista Aquatic lakes for agricultural use and to make up evaporation losses.

Potential Sources of Exchange Water

The KCWA member units have access to the following potential sources of water that could be exchanged for CVP water supplies:

1. SWP water – Accessed from turnouts along the California Aqueduct and subsequently from public and privately owned canals and pipelines that transport the water for use within Kern County.

2. Kern River water – Accessed from existing turnouts and diversion points along the Kern River and related public and privately owned canals and pipelines that transport the water for use within Kern County, or through additional exchange to CVP surface water supplies.
3. Poso Creek, Caliente Creek or other minor streams within Kern County – Existing points of diversion are within Cawelo WD, Semitropic WSD, Kern Delta WD, Henry Miller WD, Arvin-Edison WSD and portions of Wheeler Ridge-Maricopa WSD.
4. Kaweah, Tule, St. Johns and Kings River water – Historically has been available to Kern County NLTC via diversion of flows at established points of diversion into the FKC and into the Kern River.
5. Groundwater – Exchanges involving groundwater could occur virtually anywhere within the Kern NLTC area, including groundwater recharge and recovery facilities, which have access directly or through additional exchange to CVP surface water supplies. Groundwater banking is not included in this analysis and separate NEPA review would be needed.

Potential Scope of Exchange Water Deliveries

The distribution systems in Kern County are heavily interconnected. The Cross Valley Canal interconnects the SWP, Kern River and Friant-Kern systems. The SWP is further interconnected with the Friant-Kern system via Arvin-Edison WSD's turn-in/out to the California Aqueduct. Also, most of the KCWA member units have distribution systems which are interconnected with the distribution systems of neighboring districts. As an example, Semitropic Water Storage District and Shafter Wasco Irrigation District have a pipeline interconnection which can move water directly from the California Aqueduct through Semitropic's distribution system and into Shafter-Wasco, a Friant long-term contracting district. In reverse, water from the FKC can be moved through Shafter-Wasco directly to Semitropic, a non-long-term CVP district and a SWP contractor.

Natural streams also provide conveyance capability to facilitate exchanges. As an example, Poso Creek, itself a source of potential exchange supplies, traverses a couple of districts (and the Kern National Wildlife Refuge) and has served as a conveyance vehicle of CVP supplies in the past. All of these interconnections can be used to directly or indirectly deliver exchange water. This illustrates the potential for exchanges between various entities within Kern County and those elsewhere within the CVP or the SWP. As an important aside, several facilities exist which can be used to deliver water to the Kern National Wildlife Refuge. While CVP supplies or purchased non-CVP supplies available to the KNWR are not typically available to water districts, exchanges have historically been done with the KNWR to provide water to the refuge on their preferred demand pattern. Additional exchanges have been offered and considered with the KNWR where refuge supplies could be delivered and stored in the groundwater of KCWA districts and subsequently returned from groundwater or other surface supplies back to the KNWR on its preferred demand schedule. There may be monetary or water resource gains associated with facilitating such exchanges. CVP water from the Friant Division cannot be used for wildlife habitat since the water rights permits do not include fish and wildlife or their habitat as a purpose of use. This EA does not cover exchanges to refuges and separate NEPA analysis would be required.

Kern Delta Water District

Kern Delta Water District (KDWD) is located in the southern portion of the CVP Service Area, directly south of City of Bakersfield, and west of Arvin-Edison. Two major highways, Interstate 5 on the west and State Highway 99 on the east, join at KDWD southern boundary. To the west, KDWD's border roughly follows the Buena Vista Canal, while its eastern border is located west of the City of Arvin (population approximately 13,000 in 2000). KDWD encompasses the historic Kern Lakebed. KDWD comprises of 129,000 acres which are primarily agricultural but also encompassing about 5,000 acres of residential and commercial land uses. Most urban areas are found in the north portion of Kern Delta, where the City of Bakersfield is slowly growing to the south. In addition, there is sparse urban development along the two major east-to-west roads (Panama Land and Taft Highway). Land use south of the City of Bakersfield is mainly agricultural (87%), but there are about 8,000 acres dedicated to petroleum extraction. Planned suburban and commercial development is generally focused on the areas immediately south of Bakersfield.

Major infrastructure in Kern Delta consists of two oil fields: the Ten-Section Oil Field on the west, south of Panama Lane, and a much smaller oil field just south of Panama Lane near the town Lamont at the eastern edge of Kern Delta. There are a number of oil and gas pipelines running through KDWD and several major power line easements. The Arvin-Edison Canal runs through portions of the northern end of Kern Delta, connecting to five existing irrigation canals that serve Kern Delta growers. From west to east, these existing earth-lined canals are the Buena Vista, Stine, Farmers, Kern Island Main, Kern Island Central, and Eastside Canals. All but the Kern Island Main and Eastside Canals generally follow the alignment of historic streams. Lands north of Bear Mountain Blvd, within KDWD, are covered in the Metropolitan Bakersfield Habitat Conservation Plan which has been completed. Kern County is currently developing a HCP which encompasses the remaining lands in KDWD.

Kern Water Bank Authority

The Kern Water Bank Authority (KWBA) located in the southwestern San Joaquin Valley, occupies approximately 30 square miles (20,000 acres) of land in Kern County.

The primary purpose of the KWBA is to recharge, store and recover water (water banking) in order to improve the water supply for its participants during periods of water shortages. It also conducts other activities that include farming and habitat management.

The KWBA is a Joint Powers Authority comprised of six subcontracting water agencies, as listed below. All members of the KWBA have a contract, either directly or indirectly, for water from the SWP. KWBA provides the mechanism to help mitigate the various reliability problems inherent in the SWP. The following are Kern Water Bank Authority Member Units:

Dudley Ridge Water District	Tejon-Castac Water District
Kern County Water Agency	Westside Mutual Water Company
Semitropic Water Storage District	Wheeler Ridge-Maricopa Water Storage District

The KWBA operates by recharging surplus water for direct groundwater recharge within recharge basins when it is plentiful. KWBA does not own any of the water recharged onto the property. All water is owned by the participants purchasing and recharging the water to maintain balance of water supplies. As such, KWBA does not use its banked water for growing crops, although its member districts do use the water for farming within their districts. The majority of KWBA land, 17,000 of the 20,000 acres were farmed intensively prior to 1991. Currently, the water conservation activities of the water bank are allowing re-establishment of intermittent wetland and upland habitat. The CVP water, if approved, would be delivered for recharge of the aquifer. KWBA receives FKC water via the CVC or the Kern River. Both the CVC and Kern River will then convey the water to the Kern Water Bank facilities for groundwater storage until needed by the Kern Water Bank participants. When the stored water is requested by the KWBA participants, the water can be pumped from the ground and delivered through the Kern Water Bank canal, CVC and the California Aqueduct directly or by exchange to the participant's service areas so long as they are within the Place of Use boundaries as defined in Reclamation's water rights permits.

Kings County Water District

The Kings County Water District (KCWD) was formed in 1954 under the County Water District Act to provide a legal entity for water management in the northeast portion of Kings County. The basic missions of KCWD are:

- 1) Protection, conservation, and stabilization of groundwater.
- 2) Negotiating and contracting for supplemental water.
- 3) Maintaining facilities for surface water distribution for irrigation and groundwater recharge.
- 4) Preserving the existing surface water rights held by mutual water companies through a program of water stock acquisition and retention.

KCWD encompasses the northeastern portion of Kings County, from the Kings River on the north to approximately six miles south of Hanford. To the east, KCWD extends to the County's east boundary, and to the west it extends approximately 5 miles west of Hanford to the eastern edge of the City of Lemoore. KCWD is located in the east central part of the Kings River service area, and is entirely within Kings County. The City of Hanford, with a population of 38,000, lies near the center of KCWD. The total area of KCWD is 143,000 acres, of which 51,150 acres are also within the boundaries of Division 5 of the Kings River Conservation District; 82,610 acres are also within the boundaries of Kaweah Delta Water Conservation District; and 9,240 acres are within the area where the two districts overlap. KCWD's population excluding City of Hanford is 25,000. Although, KCWD boundaries encompass the Cities of Hanford and a portion of Lemoore, KCWD does not supply any M&I water.

KCWD includes portions of the service areas of three major mutual ditch companies. Peoples Ditch Company and Last Chance Water Ditch Company both possess water rights on the Kings River, and Lakeside Ditch Company holds water rights on the Kaweah River. KCWD boundary completely encompasses the area of the Lakeside Irrigation Water District, a California water district formed to administer the water rights and distribution system of the Lakeside Ditch Company stockholders, and acquire additional surface water supplies. KCWD also operates and maintains the Riverside Ditch, a conveyance system used to distribute KCWD and People's Ditch Company water.

KCWD has recharge basins that are located near the conveyance systems of the ditch companies in which they own stock. KCWD also uses Old Slough and river channels, and has a continuing program of purchasing and leasing property for groundwater recharge. KCWD currently has over 1,100 acres of artificial recharge area and also uses some 230 miles of unlined canals owned by the ditch companies that contributes to incidental recharge. Maintenance of these recharge basins is performed by KCWD and consists mainly of weed control and efforts to maintain permeability.

The quantity of water used in the recharge program has only recently been totally measured. Critically dry years such as 1976-77 resulted in zero recharge while wet years such as 1982-83 can yield 125,000 af/y recharged in KCWD. The results of the program are monitored by semiannual measurements of the groundwater level in 230 wells through a cooperative effort. The average of the measurements are taken in these wells each autumn. These measurements depict an erratic decline in groundwater levels. Since KCWD formation in 1954, the average depth to groundwater has gone from 37 feet to 74 feet measured in the autumn of 1997. The average yearly decline in groundwater levels is .86 feet per year since 1954. This equates to an annual average overdraft of 12,300 af/y. To counteract this overdraft, KCWD has practiced a conjunctive use of both surface and groundwater, plus the planned artificial recharge of the groundwater by importing available surplus water and flood release water from reservoirs on the San Joaquin, Kings, and Kaweah Rivers and placing it in recharge basins. KCWD practices appear to be producing positive results because the rate of decline in groundwater levels is less after 1954 than in years preceding formation of KCWD. KCWD efforts are enhanced by the cooperation of Last Chance, Peoples, Settlers, and Lakeside Ditch Companies that provide the conveyance system to these basins and help regulate the rate of recharge. Furthermore, they help distribute surface water purchased by KCWD to local farmers who would otherwise pump groundwater. Approximately 135,000 acres (nearly 95 percent) in KCWD is irrigated agriculture. Surface water supplies for irrigation come from diversions of the Kings and Kaweah Rivers, and from exchanges and purchases of CVP and SWP water. The supply of surface water is inconsistent, and ranges from a low of 30,000 af in 1997 to a high of 327,000 af in 1983. The estimated average surface supply is 150,000 af. Due to inadequate surface water supplies, even in wet years, to meet the total demands for water within KCWD, groundwater is pumped through private wells owned by landowners to meet their individual needs. In addition, all the water requirements to meet M&I users is pumped. Approximately 282,500 af of groundwater is pumped annually resulting in overdraft. This condition is expected to worsen as the urban population grows.

KCWD 1996 Crop Map, showing land use information from DWR 1996 Land Use Survey, indicated that approximately one-half of KCWD's area is field crops, with high proportions of the remaining land used to grow grain and hay, deciduous fruits and nuts. There is a smaller amount of land planted in vineyards as well as citrus, plus truck, nursery and berry crops. The City of Hanford (population approximately 40,000), the County seat of Kings County, is situated in the geographical center of the KCWD. The 1996 map indicated that approximately 25 percent of KCWD's area is semi-agricultural or non-agricultural. According to KCWD, there is a slow but steady development trend change in land uses from agriculture to urban as the City expands and small county acreages are converted to home sites. The lands that are served by KCWD have been in cultivation for several decades or longer, with some of the People's Ditch

Company ditches dating back to the 1870-1890 period. KCWD has purchased varying amounts of CVP water since 1956. Water purchases have ranged from a low of 1,639 af in 1997-98 to a high of 28,969 af in 1998-99.

Lakeside Irrigation Water District

Lakeside Irrigation Water District (LIWD) is located east of the city of Hanford and the northern portion is crossed by State Hwy 198. LWD is situated within Kings County Water District, Kaweah Delta Water Conservation District and a portion within Kings River Conservation District. LIWD is not represented by the above listed umbrella agencies. LIWD is a member of the Mid-Valley Water Authority; however, Mid Valley Water Authority is not included as a participant in this Proposed Action and environmental analysis LIWD has a total of 31,917 acres. In LIWD's 1998 Annual Report, approximately 27,155 acres were irrigated agricultural land, 1,817 acres were non-agricultural land and 2,945 acres were idle/fallow land that could be irrigated. LIWD has maintained a crop survey since its formation in 1962. In 2000 the four largest crops were cotton (9,879 ac), corn (7,697 ac), silage grains (6,521 ac), and alfalfa (5,133 ac). Portions of these crops were single or double cropped for a total of 33,643 acres planted. The balance of agricultural land was planted to various tree crops, grasses, vegetables and sugar beets.

There have been no sightings of Federally listed threatened or endangered species within the bounds of LIWD.

Liberty Water District

Liberty Water District (LWD) is located in Fresno County south of the city of Caruthers and northerly of the cities of Riverdale and Laton and is bisected by Hwy 41. LWD comprises 21,189 acres and all are irrigated agriculture. LWD has historically grown row crops, alfalfa, grains which have been planted to tree crops, and vines with little or no change in the annual crop water demand. LWD would utilize CVP water exclusively for agricultural use or recharge of groundwater and would not transfer the CVP water. LWD has no M&I use within LWD.

North Kern Water Storage District

The North Kern Water Storage District is situated in the San Joaquin Valley portion of Kern County and encompasses about 70,000 acres divided into two project areas. The 1950 North Kern Water Storage District project of about 60,000 acres (North Kern hereinafter) and the 1979 Rosedale Ranch Improvement District project of about 10,000 acres. Both are fully developed to irrigated agriculture, with almonds and grapes accounting for about 50% of the cropped area and stone fruit and other permanent and annual crops comprising the remaining amount. North Kern is comprised of approximately 64,813 irrigated acres and about 74% is planted to permanent crops. Water supplies include Kern River, Poso Creek, oilfield waste water, and other smaller creeks.

1950 North Kern Project

The historical surface water supplies of North Kern have ranged from 6,000 acre-feet in a dry year to nearly 394,000 acre-feet in a wet year. Owing to the highly variable Kern River supply, North Kern has been forced to regulate available surface water supplies from times of surplus (wet years) to times of need (dry years). This regulation has been accomplished, to a large extent,

through use of the underlying groundwater reservoir. During wet years on the Kern River, significant deliveries of surface water are made to irrigation and spreading (for groundwater recharge). For the purpose of groundwater recharge, North Kern makes use of about 1,500 acres of recharge basins (water spreading areas); the dry channel of Poso Creek and several other controlled-flow facilities. In wet years, more than 200,000 acre-feet of water have been directed into recharge basins for replenishment of the groundwater aquifer. During dry years, deliveries of surface water to irrigation are greatly reduced and groundwater pumping is significant. Extraction of groundwater by means of North Kern wells has ranged from zero to more than 80,000 acre-feet in one year. North Kern has successfully operated its conjunctive use project for 50 years. The underlying groundwater is part of the larger groundwater basin which underlies the southern San Joaquin Valley. While North Kern is in balance respecting water supplies and uses within its boundaries, groundwater levels are tied to the larger basin, which is in a condition of overdraft.

1979 Rosedale Ranch Improve District Project

After the above 1950 project was implemented lands were annexed to North Kern with the specific requirement that the newly annexed lands would not share in the water supplies of the original project. The lands thus developed a distinct and separate project with the purchase of water supplies during wet years from Kern River rights of the City of Bakersfield. The Rosedale Ranch project has approximately 14 miles of unlined canals for the direct delivery of water or irrigation. The focus of the project was groundwater recharge through a combination of in-lieu-pumping deliveries and canal losses which has totaled up to 31,000 af. North Kern does not supply M&I water service.

The FKC bisects North Kern with less than 50% uphill of the FKC. There is a turnout on the North side of Poso Creek on the FKC. North Kern has a weir across Poso Creek on the Calloway Canal approximately 1-1/2 miles below the FKC. NKWSD, in a program with Kern-Tulare and Rag Gulch Water districts recently constructed a turnout off 1 mile north of 7th Standard Road. In addition, North Kern has a pump station on the Calloway Canal at Kimberlina Road that is used to deliver water supplies to Shafter-Wasco Irrigation District (SWID) via SWID's North Pipeline. The pump station can also allow water to flow into the Calloway Canal at this location. NKWSD also has a gravity outlet on the Calloway Canal near the intersection of Cherry and Fresno Avenues that is used to deliver water supplies from the Shafter-Wasco Irrigation District South Pipeline into the Calloway Canal. Finally, water supplies delivered at the end of the FKC can be exchanged for Kern River supplies being delivered at lower elevations. The Kern River supplies intended for lower elevations are diverted into the District's higher elevation Beardsley Canal to be delivered to lands uphill of the FKC.

Rosedale-Rio Bravo Water Storage District

Rosedale-Rio Bravo Water Storage District (R-RBWSD) is located west of Bakersfield in Kern County. R-RBWSD has a gross area of approximately 43,000 acres with a net estimate of 33,400 irrigated agricultural acres. Approximately 3,900 acres are fallow lands, 2,500 acres undeveloped lands and 1,100 acres of canals and recharge basins. R-RBWSD is primarily planted to alfalfa hay, almonds, grain, cotton and corn. All water coming into R-RBWSD has been used for groundwater recharge and overdraft correction. R-RBWSD does not serve M&I water.

Water was historically supplied from landowner wells pumping from the groundwater basin, with a small amount (an average about 15,000 af/y) of irrigation diversions to lands adjacent to the R-RBWSD's groundwater recharge project. Prior to operation of its groundwater recharge project, pumping extractions exceeded the safe yield of the local groundwater supply, and a substantial overdraft in the range of 40,000 to 50,000 af/y occurred annually. As a result of this overdraft, groundwater levels were declining at a rate of 8 to 10 feet per year. In 1959, the R-RBWSD was formed to develop a groundwater recharge project to offset the overdraft. Construction of the recharge project was completed in 1962. The physical features of the project include facilities to divert waters from the Kern River and the joint use Cross Valley Canal into the Goose Lake Slough Channel, the channel itself and recharge basins. R-RBWSD has completed construction of additional recharge basins and now has a wetted area of approximately 840 acres available for groundwater recharge. R-RBWSD is also a recharge participant in the Pioneer Project, and as such, has first priority to 25% of the total recharge capacity. This provides an additional 50 cfs of recharge capacity. R-RBWSD acquires water for recharge purposes from the Kern River through a water service agreement with the city of Bakersfield, from the FKC of the CVP, as available, and from the SWP through a water supply contract with the KCWA. Water supplies from these three sources have averaged about 62,000 af/y for the years 1962 through 1999 or about 79% of the cumulative consumptive use during those years.

The SWP contract was originally to provide an average (firm and surplus) of about 29,900 af/y. However, R-RBWSD is now expected to receive only about 76% of its firm supply or about 22,700 af/y. R-RBWSD has also been unable to renew its short-term contract with Reclamation and is now only able to obtain CVP water through transfers or surplus (flood water) supplies.

Semitropic Water Storage District

Semitropic Water Storage District (SWSD) is located in north-central Kern County in the San Joaquin Valley, about 20 miles northwest of the City of Bakersfield. Semitropic was organized in 1958 to supply supplemental water within its boundaries. The total land area within Semitropic is approximately 221,000 acres (345 square miles), with about 143,000 acres (223 square miles) irrigated area. Geographically, SWDS is located at the South End of the San Joaquin Valley, which is generally hotter and drier than other parts of the Valley.

During the 1960's, Semitropic developed plans for main conveyance and distribution system facilities to extend from the Governor Edmund G. Brown California Aqueduct (California Aqueduct) to farm delivery locations. Prior to construction of the facilities, irrigated crops within Semitropic were totally dependent on groundwater pumping.

Semitropic initially contracted with the Kern County Water Agency (KCWA), for an annual firm supply of 158,000 acre-feet of State Water Project (SWP) water and 25,100 acre-feet per year of surplus water. Semitropic gave up 3,000 acre-feet of supply to buy into Kern Water Bank (KWB) and now has 155,000 acre-feet annual firm supply of SWP water. This is used to irrigate approximately 42,300 acres in its Contract Water Service Area (CWSA). Other water is available from the KCWA on an interruptible basis to deliver to other service areas totaling about 58,000 acres (consisting of a Conjunctive Surface Water/Groundwater Surface Area (CSWGSA) of about 28,500 acres and an In-Lieu Service Area (ILSA) of about 29,500 acres). Farmers in all the

service areas maintain wells to supplement Semitropic Supplies and protect against shortages. Nearly 42,700 acres rely exclusively on groundwater. Landowners within SWSD apply approximately 480,000 acre-feet of water of which, in a very good year 350,000 acre-feet can be imported surface water with the remaining 130,000 acre-feet applied in the groundwater service area. Approximately 72% of the land area in SWSD is included in the Buttonwillow and Pond Poso Improvement Districts leaving 28% in the "unorganized area". The "unorganized area" is a large, contiguous area in the northwest quarter of SWSD. This area is mostly not irrigated and does not benefit from the Proposed Action nor is it envisioned to be developed to irrigated agriculture.

SWSD provides water banking and owns a portion of the Kern Water Bank. It should be noted that water banking for later (beyond one-year) is not included in this analysis and review process. SWSD also provides banking for conjunctive use for in-lieu storage to alleviate groundwater pumping. The Proposed Action could result in providing CVP water to SWSD for the purpose of groundwater recharge or conjunctive use.

Tulare Lake Basin Water Storage District

Tulare Lake Basin Water Storage District (TLBWSD) has a service area of 185,800 acres and its boundaries include nearly the entire Tulare Lake Bed. TLBWSD is located southwest of the city of Corcoran in Kings County. TLBWSD was formed in 1926 at which time all the lands in TLBWSD were fully developed. All deliveries from TLBWSD are for agricultural purposes. TLBWSD manages Kings River South Fork water deliveries at Empire No. 2 Weir near Stratford (immediately below State Route 41) in Kings County. Empire No. 2 Weir diverts Kings River water into the Tulare Lake, Kings River-South Fork and Blakeley canals which serve the Tulare Lake Bed. TLBWSD is a SWP contractor and is connected to the California Aqueduct by Lateral A and B. Despite its state contract, the Tulare Lake Bed units rely most heavily on Kings River water for irrigation purposes.

CVP water is conveyed to TLBWSD via the California Aqueduct or released into the Kings River, Kaweah River or Tule River from the FKC. While TLBWSD has no formal water banking facilities, it does practice conjunctive use.

The area served by TLBWSD remain vulnerable to occasional flooding and drought-caused water supply shortages. The result, economically and physically, is that the Tulare Lake Bed is farmed in large tracts upon which annual field crops are produced. Small farmers cannot endure the financial burdens of Tulare Lake Bed agricultural operations. Main crops are cotton, seed alfalfa and grain.

Kings River Conservation District

The Kings River Conservation District (KCRD) is a water resources and energy management agency located in the central San Joaquin Valley. KCRD is a public agency created in 1951 through special legislation by the State of California. Its boundaries include the entire service area of the Kings River – an area of approximately 1,100,000 acres, plus an additional area of approximately 140,000 acres outside of the Kings River service area. KCRD's mission is to provide flood protection, achieve a balanced and high quality water supply, and develop power

resources within its boundaries. KRCD works with and coordinates the common interests of the following thirty-five (35) entities:

Alta Irrigation District	Tulare Lake Basin Water Storage District
Clark's Fork Reclamation District No. 2069	Tulare Lake Reclamation District No. 761
Consolidated Irrigation District	Burrel Ditch Company
Corcoran Irrigation District	Corcoran Irrigation Company
Empire West Side Irrigation District	Crescent Canal Company
Fresno Irrigation District	John Heinlen Mutual Water Company
James Irrigation District	Last Chance Water Ditch Company
Kings County Water District	Lemoore Canal and Irrigation Company
Kings River Water District	Liberty Canal Company
Laguna Irrigation District	Liberty Mill Race Company
Lakeside Irrigation Water District	Lovelace Water Corporation
Liberty Water District	Peoples Ditch Company
Mid-Valley Water District	Reed Ditch Company
Raisin City Water District	Southeast Lake Water Company
Riverdale Irrigation District	Stinson Canal and Irrigation Company
Salyer Water District	Tulare Lake Canal Company
Stratford Irrigation District	Upper San Jose Water Company
Tranquility Irrigation District	

Alta Irrigation District

Alta Irrigation District is located east and south of the Kings River and was California's first public irrigation district formed (in 1888) to actually deliver water to its users. The District's Alta Canal transports water into a system which serves the area from Reedley to an area west of Orange Cove in eastern Fresno County, and the Dinuba, Orosi, and Traver areas of northern Tulare County. The District's total area is 130,000 acres of which irrigated ag is 90,000 and M&I is 40,000 acres. Main crops are peaches, nectarines, plums, citrus, and grapes.

Clark's Fork Reclamation District No. 2069

Clark's Fork Reclamation District No. 2069 delivers a limited amount of water to the Kings County "island" formed by the Kings River's Clark's Fork and South Fork channels northwest of Lemoore. The District has no District owned distribution system. Diversions are all by pumping through 30 individual pumping facilities along the Clark's Fork and South Fork channels. The service area is 1,920 acres. Irrigated acres are 1,800 and 120 acres are fallow. Main crops are cotton, alfalfa and wheat.

Consolidated Irrigation District

Consolidated Irrigation District (CID) has a service area of 155,000 acres serving a large portion

of southeastern Fresno County and smaller areas in northeastern Kings County. CID extends from northeast of Sanger to south of Kingsburg and west of Caruthers. Communities served by CID include Sanger, Del Rey, Parlier, Fowler, Selma, Kingsburg and Caruthers. CID was a pioneer in developing groundwater recharge basins, storing water in the underground reservoirs in wet years for use (by pumping) in dry years and by those lacking access to surface water supplies in the San Joaquin Valley. CID also administers the Lone Tree Channel, a separate water delivery system. Lone Tree rights are held by approximately 80,000 acres within CID's boundaries.

Corcoran Irrigation District

Corcoran Irrigation District is described earlier in this document.

Empire West Side Irrigation District

Empire West Side Irrigation District serves a narrow territory which stretches more than seven miles along the South Fork's right (west) bank from above Empire No. 1 Weir, an area running northwest to southwest of Stratford in Kings County. Empire West Side Irrigation District also is a SWP contractor with deliveries made through TLBWSD Lateral A, which leaves the California Aqueduct at Kettleman City. Empire West Side Irrigation District serves agricultural water to its service area comprising 6,400 acres.

Fresno Irrigation District

Fresno Irrigation District (FID) is a member of KRCD and is also a CVP Long-Term Contract. FID takes delivery of the City of Fresno's Class 1 water amounting to 60,000 af/y and 75,000 af/y of Class 2 water from the Friant Division. The FID supply under the complex Kings River water diversion schedules is the largest in KRCD. Surface water transported by FID to groundwater recharge basins sustains the groundwater which is presently the only source of municipal and industrial water for the metropolitan Fresno-Clovis area. Surface water used for agricultural irrigation is also a major groundwater recharge contributor. FID stretches from the base of the Sierra foothills to west and south of Kerman. FID's internal water distribution system is extensive and complex. FID provides water (through the Fresno supply) to the Freewater County Water District north of Sanger.

FID's territory encompasses much of the northern valley floor portion of Fresno County and embraces the cities of Fresno and Clovis. Other communities within FID's service area include Kerman and Biola. FID's service area is the largest of any member unit. The service area is 245,246 acres. Irrigated agriculture is 152,694 and M&I is 92,552 acres.

James Irrigation District

James Irrigation District (JID) formerly served its agricultural users with Kings River water diverted through the James Main and Beta Main canals. JID's mission is to deliver agricultural water and has a service area of 25,800 irrigated acres. Since 1963, its primary surface water supply (under water exchange agreements with both JID and Tranquillity Irrigation Districts (TRID) and the lower Kings River units) has been CVP water pumped from the Mendota Pool. JID diverts Kings River water only when flood release flows are available. Water enters JID by diversions of Kings River water at the James Weir; Diversions of CVP water pumped from Mendota Pool into the James Bypass; diversions of San Joaquin River water from Mendota Pool through the James Bypass; delivery from a well field through lined canals and pipelines along

Lassen Avenue and McMullin Grade Road; and spill from Fresno Irrigation District into a lined canal along McMullin Grade Road (not a supply). No water leaves JID.

JID and TRID are the two most northwesterly units and have an exchange agreement resulting in water being imported into the Kings River service area on a regular basis. JID and TRID are also CVP Contractors. The two Districts leased their average annual Kings River supply to other lower Kings River units at a price equal to that paid by JID and TRID to purchase a like amount of CVP water delivered at Mendota Pool through the Delta-Mendota Canal under their CVP Long-Term contracts. Up to 26,600 acre feet of JID and TRID supply in any one year is credited by the lower Kings River units to help facilitate minimum Pine Flat releases for fish and wildlife, channel conveyance losses and other administrative purposes. JID and TRID benefit by avoiding enormous Kings River channel losses in exchange for 100% water deliveries from Mendota Pool while assisting other Kings River units in resolving their own channel loss problems.

Kings County Water District

Kings County Water District is described earlier in this Section as a separate individual entity.

Kings River Water District

Kings River Water District (KRWD) serves much of the Centerville Bottoms area northeast, east and southeast of Sanger. The Centerville Bottoms is a rich and beautiful delta containing many wooded areas and complex, secluded sloughs which, supplied by the Kings River, ultimately flow back into the main stream. KRWD's senior water rights and small delivery system capacity combine to enable KRWD to deliver water much of the year. KRWD's service area is 25,800 acres of which 10,000 acres are irrigated agriculture. KRWD does not provide M&I water. Water enters by diversions from the Kings River. No water leaves KRWD.

Laguna Irrigation District

Laguna Irrigation District (LGID) serves an area of southern Fresno County and northern Kings County west of Laton and south, southeast and southwest of Riverdale. The total service area is 35,000 acres with a substantial portion that includes the historic Rancho Laguna de Tache grant. This grant was a 48,800 acre Mexican land grant which included a 26 mile stretch along the original Kings River channel's right bank (below the modern site of Kingsburg. LGID southerly boundary is generally along the Kings River. The grant was complex but played a pivotal role in the eventual settlement of Kings River water rights and supplies through its 1892 purchase by the Fresno Canal and Irrigation Company, and gained control of the grant's riparian water claims. In 1897, the manager of the Fresno canal system and the Laguna ranch owner negotiated the first partial Kings River water supply schedules. This ultimately led to later agreements that resolved all Kings River water rights and supply issues. LGID has a total area of 35,000 acres of which 20,700 are agricultural. LGID does not provide M&I water.

Lakeside Irrigation Water District

Lakeside Irrigation Water District is discussed earlier in this section.

Liberty Water District

Liberty Water District is discussed earlier in this section.

Mid Valley Water District

Mid Valley Water District is comprised of 13,406 agricultural acres. Water is delivered by pumping from the James Bypass. Mid Valley Water District does not provide M&I water.

Raisin City Water District

Raisin City Water District (RCWD) has a total of 53,500 acres, of which, 43,500 are agricultural, 5,000 are M&I and 5,000 are fallow. RCWD does not provide M&I water.

Riverdale Irrigation District

Riverdale Irrigation District (RID) serves rural portions of the Riverdale community between Murphy Slough and the King River's North Fork. RID's Kings River supply is combined with the Reed Ditch Company and Liberty Mill Race Company under the Murphy Slough Association. RID's total area is 15,000 acres, of which, 14,000 acres are ag, 700 are M&I and 300 are fallow. Water is diverted from the Kings River near the town of Laton. No water is returned to the river.

Salzer Water District

Salzer Water District still exists but is no longer functioning and will not be a participant or receiving CVP water.

Stratford Irrigation District

Stratford Irrigation District service area is 9,750 agricultural acres and serves the left (east) bank of the South Fork, below Empire No. 1 Pool. Stratford Irrigation District serves the Stratford area of Kings County and does not provide M&I water. Water is diverted from the Kings River at Lemoore Weir into the Lemoore Canal, or from the Kings River at Empire Weir No. 1 or Empire Weir No. 2.

Tranquillity Irrigation District

Tranquillity Irrigation District (TRID) is a CVP Contractor and has already undergone extensive environmental review and is not the focus of this EA. TRID has a service area of 10,700 agricultural acres and is a CVP Long-Term contractor. TRID is the northwesterly unit in KRCD. TRID's surface water supply (under the Tranquillity exchange agreement) is pumped from the Mendota Pool. TRID's former Kings River diversion facilities, the Lone Willow Channel and Beta Main Canal, were last used in 1958 and are abandoned.

Tulare Lake Basin Water Storage District

Tulare Lake Basin Water Storage District is described elsewhere in this section

Tulare Lake Reclamation No. 761

Tulare Lake Reclamation District No. 761 receives most of its water supplies through the Blakeley Canal, originating at Empire Weir No. 2, and Lateral A from the SWP. Tulare Lake Reclamation No. 761 delivers water to lands on the western and southwestern sides of the Tulare Lake Bed in Kings County. Its service area is 37,000 acres, of which, 16,000 acres are agricultural and none are M&I. The remaining acres are fallow/idle and portions serve as wetlands. Main crops are wheat and alfalfa.

Burrel Ditch Company

Burrel Ditch Company has a service area of 4,500 agricultural acres and is a mutual water company. The company delivers water from Murphy Slough into the company's small service area in the Burrel area, east of Fresno Slough. Main crops are wine grapes, almonds, alfalfa and silage corn.

Corcoran Irrigation Company

Corcoran Irrigation Company has no designated service area and is a mutual water company serving the Corcoran area of eastern Kings County with water transported 25 miles through the Lakelands Canal system from People's Wier, south of Kingsburg. The Peoples Weir is the largest of all such Kings River structures and spans the main channel a mile south of the Fresno County of Kingsburg just inside the northeastern corner of Kings County. It creates a large pool from which water may be diverted into the Lakelands Canal, which flows from the left bank 25 miles to the Corcoran area, or into the People's Ditch. Those privately owned canals deliver water to users in a substantial portion of eastern Kings County, all the way south to the Tulare Lake Bed.

Crescent Canal Company

Crescent Canal Company has a service area of 13,100 agricultural acres and is a mutual water company serving an area west of the Kings River North Fork and Fresno Slough, several miles of west of Riverdale. Deliveries are through the company's Crescent Canal. The Crescent Weir is located a few miles southwest of Riverdale and four miles below State Route 41 where North Fork flood release quantities are typically measure and confirmed. Beginning here is the Crescent Canal Company's ditch. Main crops are cotton, seed alfalfa and safflower.

John Heinlen Mutual Water Company

John Heinlen Mutual Water Company has a service area of 13,100 agricultural acres and serves stockholders in a Kings County area north and northwest of Lemoore. Main crops are cotton and alfalfa.

Last Chance Water Ditch Company

Last Chance Water Ditch Company is a mutual water company which serves stockholders within a large portion of Kings County, southwest of Laton and north and west of Hanford, as well as, portions of the Tulare Lake Bed. The company has a service area of 39,000 agricultural acres. Main crops are stone fruit and walnuts.

Lemoore Canal and Irrigation Company

Lemoore Canal and Irrigation Company is a mutual water company serving stockholders in the Lemoore area of Kings County. The company's large service area has one of the most substantial lower river water supplies. The company's service area is 52,300 agricultural acres. Main crops are cotton, wheat and safflower.

Liberty Canal Company

Liberty Canal Company is a mutual water company and delivers water through the Liberty Canal which flows northwesterly from Laton to the company's service area of 5,300 irrigated acres north of Riverdale. Main crops are orchards, vines and row crops.

Liberty Mill Race Company

Liberty Mill Race Company is a mutual water company receiving water through Murphy Slough and serves an area, approximately 8,100 irrigated acres, north and northwest of Riverdale and near Burrel.

Lovelace Water Corporation

Lovelace Water Corporation, a private water company, serves the northern portion of the Tulare Lake Bed with deliveries made through the Kings River South Fork Canal and the Tulare Lake Canal. Lovelace Water Corporation has no designated service area.

People's Ditch Company

People's Ditch Company is a mutual water company providing water service over an extensive portion of northeastern Kings County (including the Hanford area), as well as, making deliveries to stockholders in the Tulare Lake Bed. The company operates People's Weir which was discussed in this section under Corcoran Irrigation Company. In wet years, surplus water deliveries through the People's Ditch is ponded in the Kings County Water District's extensive system of groundwater recharge basins and channels. The People's Ditch Company has no designated service area.

Reed Ditch Company

Reed Ditch Company is a mutual water company serving a small area northwest of Riverdale with water delivered through Murphy Slough. The company's service area is 3,500 irrigated agricultural acres. Main crops are trees, row crops and vines.

Southeast Lake Water Company

Southeast Lake Water Company is a mutual water company with no designated service area. The company delivers water to stockholders in portions of the Tulare Lake Bed.

Stinson Canal and Irrigation Company

Stinson Canal and Irrigation Company is a mutual water company and has a service area of 15,500 irrigated agricultural acres serving an area west of the left bank of the North Fork and Fresno Slough, west and northwest of Burrel. Deliveries are through the company's Stinson Canal. Main crops are row crops.

Tulare Lake Canal Company

Tulare Lake Canal Company is a mutual water company and has no designated service area. The company provides water to stockholders in portions of the Tulare Lake Bed.

Upper San Jose Water Company

Upper San Jose Water Company serves a narrow area about seven miles along the western sides of the South Fork, Clark's Fork and the Crescent Bypass, just east of Lemoore Naval Air Station in Kings County. The company has no designated service area.

Ditch companies are entities that do not have specific geographic boundaries. However, they own canals and ditches that provide the mechanism to deliver water to the stock holders.

Besides groundwater potential water supplies are Kings River and streams tributary thereto, such as Mill Creek, Sand Creek, Wahtoke Creek and other minor streams flowing into KRCD, Kaweah, St. Johns and Tule Rivers, SWP, and CVP (Friant Division or Cross Valley Canal Divisions supplies).

Appendix F – Conveyance Facilities and Waterways

Jones Pumping Plant and Banks Pumping Plant

Located in the Sacramento-San Joaquin Delta, Banks lifts water 244 feet from the Clifton Court Forebay into the beginning of the Aqueduct. DWR has a priority system for pumping SWP and CVP water supplies at Banks. CVP water supplies have a lower priority compared to SWP uses. Prior to pumping CVP supplies at Banks (Joint Point of Diversion {JPOD}) there are environmental and water quality plans that must be submitted and approved and criteria that must be met. Under certain conditions, DWR does not have an opportunity to pump and convey the annual allocation of water supplies to the CV contractors or pumping and conveyance may occur at a time that is outside of the growing season.

Jones consists of an inlet channel, pumping plant, and discharge pipes. Water in the Delta is lifted 197 feet into the DMC. Each of the six pumps at Tracy is powered by a 22,500 horsepower motor and is capable of pumping 767 cfs. Power to run the huge pumps is supplied by CVP powerplants. The water is pumped through three 15-foot-diameter discharge pipes and carried about 1 mile up to the DMC. The intake canal includes the Jones Fish Screen, which was built to intercept downstream migrant fish so they may be returned to the main channel to resume their journey to the ocean. Although CV contractor supplies are predominantly pumped at Banks, infrequently, if pumping capacity exists after all other CVP needs have been met (typically in the spring), CV contractor water supplies have been pumped at Jones and moved over the SWP at O'Neill Forebay for conveyance to the CVC.

Delta-Mendota Canal

The DMC carries water southeasterly from the Jones along the west side of the SJV for irrigation supply, for use in the San Luis Unit, and to replace San Joaquin River water stored at Friant Dam and used in the Friant-Kern and Madera systems. The canal is about 117 miles long and terminates at the Mendota Pool, about 30 miles west of Fresno. The initial diversion capacity is 4,600 cfs, which is gradually decreased to 3,211 cfs at the terminus. It also connects with O'Neill Forebay near San Luis Reservoir where water can be pumped from the DMC into either San Luis Joint Use Facilities a part of which is a shared canal named the San Luis Canal for the CVP and the Aqueduct for the SWP.

O'Neill Forebay

These joint Federal/State facilities are located on San Luis Creek, 2.5 miles downstream from San Luis Dam. O'Neill Dam, completed in 1967, is a zoned earthfill structure with a height of 87 feet and a crest length of 14,300 feet. The forebay, with a capacity of 56,400 AF, is used as a hydraulic junction point for Federal and State waters. The top 20,000 AF acts to re-regulate storage necessary to permit off-peak pumping and on-peak generation by the main San Luis Pumping-Generating Plant. The O'Neill Forebay Inlet Channel extends 2,200 feet from the DMC to deliver water to the O'Neill Forebay. Six pumping units of the O'Neill Pumping-Generating Plant lift water 45 to 53 feet into the forebay.

Friant-Kern Canal

The FKC carries water over 151.8 miles in a southerly direction from Friant Dam to its terminus at the Kern River, four miles west of Bakersfield. The FKC has an initial capacity of 5,000 cfs that gradually decreases to 2,000 cfs at its terminus in the Kern River (Reclamation, 2009). The water conveyed in the FKC is from the San Joaquin River and is considered to be of good quality because it originates from snow melt from the Sierra Nevada. The water is used for municipal and industrial, and agricultural purposes in Fresno, Tulare, and Kern Counties. The FKC is a part of the CVP, which annually delivers about seven million AF of water for agricultural, urban, and wildlife use.

California Aqueduct

The State of California constructed the Aqueduct as part of the SWP. Waters from the Aqueduct flow out of the Delta near the City of Tracy to San Bernadino and Riverside into Lake Perris. SWP contractors take delivery from the CVC and/or direct diversion from the Aqueduct. The SWP typically delivers approximately 1.36 million AF to the SJV per year. Contracts executed in the early 1960s established the maximum annual water amount (supply) that each SWP long-term contractor may request from the SWP.

Recovered groundwater that is discharged into the Aqueduct, can be delivered to water districts or exchanged with the DWR. Exchanges with the DWR can be simultaneous, or delayed exchanges. In a simultaneous exchange water delivered from the Aqueduct to an upstream district at the same time the recovered groundwater is transported to the Aqueduct. With a delayed exchange, water might be delivered by the DWR to the receiving district from storage before or after the recovered groundwater is received.

Joint-Use Facility – San Luis Canal/California Aqueduct

The SLC is the Federally-built and operated section of the California Aqueduct and extends 102.5 miles from O'Neill Forebay, near Los Banos, in a southeasterly direction to a point west of Kettleman City. The SLC is a part of the CVP, while the California Aqueduct is a part of the State Water Project (operated by the DWR). The principle purpose of the CVP portion of the facility is to furnish approximately 1.25 million AF of water as a supplemental irrigation supply to roughly 600,000 acres located in the western portion of Fresno, Kings, and Merced counties. Beyond Kettleman City, the State Water Project delivers water to southern California mainly for M&I purposes. This is almost half of the water supply for the Los Angeles region. The SLC/California Aqueduct is a concrete-lined canal with a capacity ranging from 8,350 to 13,100 cfs.

Cross Valley Canal

The CVC extends from the Aqueduct near Tupman to Bakersfield. It consists of four reaches which have capacities ranging from 890 cfs through the first two pumping plants to 342 cfs in the unlined extension near Bakersfield. The canal is a joint-use facility operated by the Kern County Water Agency for the CVC participants. Water can be conveyed through the CVC to the Kern Water Bank, the City of Bakersfield, the Berrenda Mesa Property, the Kern River channel, Pioneer Banking project and the various member units recharge sites.

The CVC is also used to convey banked groundwater after it is recovered. Once in the CVC, recovered water can be delivered to CVC participants in exchange for water in the Aqueduct.

During periods when water is not available for exchange, the CVC can be operated in reverse flow. When operated in reverse flow, water flows from the CVC directly into the Aqueduct. In 1991, water levels in the Aqueduct were low enough for the flow to be by gravity. When water levels in the Aqueduct are too high for gravity flow, the water must be pumped into the Aqueduct. Due to this bi-lateral flow flexibility, the operations on the CVC require coordination among the users. The CVC provides flexibility in the conveyance of water supplies in the central and southern SJV. CVP or State Water Project (SWP) water supplies originating from the Delta are the predominant supplies conveyed through the CVC, although groundwater or previously banked water is also conveyed in this canal.

Kern River/Alejandro/Outlet Canals

Water from the FKC, the CVC, or from the Kern River can be conveyed in the Kern River channel or in the Kern River Canal to the Pioneer Banking project or other recharge areas. Conveyance of water in the Kern River Canal requires an agreement with the City of Bakersfield. Conveyance of water in the Alejandro Canal requires an agreement with the Buena Vista Water Storage District. It should be noted that depending on groundwater pumping operations, water in the Buena Vista Aquatic Lake may contain high concentrations of arsenic. These high concentrations are caused when groundwater from nearby wells is pumped into the Buena Vista Aquatic lakes for agricultural use and to make up evaporation losses.

The Kern River is about 165 miles long and is the southernmost river in the San Joaquin Valley. The river originates from the Sierra Nevada mountains on the eastern side of Tulare County and terminates on the west side of Kern County where it is mainly diverted for local water supplies. When the Kern River enters Kern County, it deposits into Lake Isabella created as a result of Isabella Dam. Below the dam, the river is highly diverted through a series of canals to irrigate farms in the southern San Joaquin Valley and provide municipal water supplies to the City of Bakersfield and surrounding areas. The Kern River is one of the few rivers in the Central Valley which does not contribute water to the CVP; however, the FKC joins the river approximately four miles west of downtown Bakersfield. Kern River water quality is generally similar to that in the FKC since its origin is also from snow melt in the Sierra Nevada. The Kern River Canal can also be used to convey water from the Kern River to the California Aqueduct directly via the Alejandro Canal, the Buena Vista Aquatic Lakes and Outlet Canal and a pumping plant, or indirectly via an exchange.

Kern Water Bank Canal

The Kern Water Bank Canal is a bi-directional canal constructed by the Kern Water Bank Authority. The canal has a single pumping plant for delivering water for recharge. The forward flow capacity is 950 cfs. Reverse flow capacity is approximately 650 cfs. The canal is used to convey SWP water and other waters from the Aqueduct to the local banking projects for groundwater recharge. The canal is also used to convey pumped groundwater during a surface water short year, back to the Aqueduct, either directly or by exchange, to water districts for a supplemental water supply.

Kings River

The Corps is the operator of Pine Flat Dam and releases water for flood control. During the irrigation season, (normally June through August) water is released from behind Pine Flat Dam and the Kings River is controlled by the Kings River Water Association. In wet years the Kings

River may flow to the Tulare Lake Basin. Only in very wet seasons does the Kings River flow north into Fresno Slough and into the San Joaquin River. The average annual runoff for the Kings River is approximately 1.7 million AF. The Kings River is managed similarly to a canal system providing water for irrigation and to meet flow requirements for fish and wildlife purposes.

Kaweah and St. Johns Rivers

The Corps also operates Terminus Dam on the Kaweah River for flood control and water supply. Downstream of Terminus Dam, the St. Johns River and Lower Kaweah River divides from the Kaweah River at McKay Point. The St. Johns River becomes Cross Creek north of Goshen. A few tributaries such as Dry Creek and Yokohl Creek, flow into the Kaweah and St. Johns Rivers. The Kaweah River ceases to be an identifiable stream south of Highway 245, and the river branches into Mill Creek and other major and minor streams creating a delta. During the irrigation season (June through August) the Kaweah Delta Water Conservation District manages the Kaweah River irrigation flows similarly to a canal facility to meet demands and on behalf of the watermaster for the Kaweah and St. Johns Rivers Association. The average annual runoff of the Kaweah River is 430,000 AF, and does not include various smaller creeks. The St. Johns River was permanently established during the fresher of 1861-62 and branches off the Kaweah River. The Lower Kaweah River, St. Johns River and smaller creeks are used for conveyance of irrigation water to ditch companies and water districts.

Tule River

The Tule River watershed above Success Dam is a fan shaped area containing 245,000 acres, ranging in elevation of 550 feet at Success Dam to a maximum of 10,000 feet, with less than 10 percent of the watershed above elevation 7,500 feet. The Tule River above Success Reservoir is composed of three channels, the North Fork and the Middle Fork that join just above the community of Springville, and the South Fork that passes through the Tule River Indian Reservation before entering Success Reservoir at State Route 190. The main channel of the Tule River below Success Dam traverses about 50 miles to the pocket of the Tulare Lake Basin where the river joins the terminus of the South Fork of the Kings River. The Tule River bifurcates at Road 192 and a South Fork channel traverses 12 miles along with a third Middle Fork channel of 3 miles, all northerly of the community of Woodville.

Success Dam, a Corps project currently has a storage capacity of 82,300 AF, of which 75,000 AF is reserved for flood control and irrigation water storage. The remaining storage, 7,300 AF, was set aside for a silt and recreation pool. The Tule River runoff at Success Reservoir is extremely variable subject to precipitation in the watershed. Records of the Tule River runoff for the past 101 years are available from water year 1904 through water year 2004. The average annual runoff of the Tule River is 141,630 AF. Of the past 101 years, 1977 was the driest year with a runoff of 15,810 AF, and 1983 was the wettest year with 615,090 AF.

The Tule River Association, made up of all water rights holders at and below Success Reservoir, administers the water and storage rights at and below Success Dam. The Corps controls storage in Success Reservoir through a Flood Control Diagram that limits irrigation storage during the period November 15th to May 1st of the following year. Irrigation water storage operations during the remainder of the year are controlled by the Tule River Association Watermaster.

The Tule River gross service area below Success Dam covers about 320,000 acres, of which 140,000 acres are within Tulare County, and 180,000 acres are within the Tulare Lake Basin of Kings County. Of the gross service area, approximately 240,000 acres are developed in irrigated agriculture with the remainder in urban and non-agriculture uses.

Dos Amigos Pumping Plant

This joint Federal/State facility, 17 miles south of O'Neill Forebay, is a relift plant in the San Luis Canal. The plant contains six pumping units, each capable of delivering 2,200 cfs at 125 feet of head.

Appendix G – ITA and Cultural Resources Concurrence

[Will be included in the Final EA]