RECLAMATION

Managing Water in the West

DRAFT

Central Valley Project
Long-Term Service Contract Renewals
American River Division

Environmental Impact Statement

U.S Department of the Interior
Bureau of Reclamation
Mid-Pacific Region

January 2005

CENTRAL VALLEY PROJECT LONG-TERM WATER SERVICE CONTRACT RENEWALS - AMERICAN RIVER DIVISION

Draft Environmental Impact Statement

January 2005

Table of Contents

Items **Page**

Items **Page**

Items Page

Items **Page**

Items **Page**

Items **Page**

CHAPTER 5 CONSULTATION AND COORDINATION

LIST OF ATTACHMENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

Executive Summary

INTRODUCTION

This Environmental Impact Statement (EIS) evaluates the potential impacts and benefits for the U.S. Bureau of Reclamation (Reclamation) to renew the long-term water service contracts to deliver water from the Central Valley Project (CVP) for agricultural and municipal and industrial uses to the American River Division CVP water service contractors.

PURPOSE AND NEED FOR THE ACTION

Reclamation is responsible for operational control of the CVP including securing payment for the cost of water facilities and operations and maintenance established in the water service contract with the Federal government. In addition, as a duly authorized representative, Reclamation administers all actions pertaining to the establishment of water service contracts on behalf of the Secretary of the Interior.

The purpose of this action is to renew the American River Division long-term water service contracts, consistent with Reclamation authority and all applicable state and federal laws, including the Central Valley Project Improvement Act (CVPIA) (H.R. 429, Public Law 102-575). The project alternatives will include the terms and conditions of the long-term contracts and tiered water pricing.

Long-term contract renewal (LTCR) is needed to:

- Continue beneficial use of water, developed and managed as part of the CVP, with a reasonable balance among competing demands, including the needs of irrigation and domestic uses; fish and wildlife protection, restoration, and mitigation; fish and wildlife enhancement; power generation; recreation; and other uses consistent with requirements imposed by the State Water Resources Control Board (State Board) and the CVPIA;

- Incorporate certain administrative conditions into the renewed contract to ensure CVP continued compliance with current federal reclamation law and other applicable statues; and

- Allow the continued reimbursement to the federal government for costs related to CVP construction and operation.

DEVELOPMENT OF ALTERNATIVES

Three alternatives were identified for the renewal of long-term contracts between Reclamation and contractors in the American River Division. The alternatives present a range of water service agreement provisions that could be implemented for long-term contract renewals. The No Action Alternative consists of renewing existing water service contracts. Alternative 1 is based upon the April 2000 Proposal presented by the CVP water service contractors to Reclamation. Alternative 2 is based upon the November 1999 Proposal presented by Reclamation to the CVP water service contractors.

The primary differences in the alternatives relate to methods addressing tiered water pricing, definition of M&I users, water measurement, and water conservation.

No Action Alternative

The No Action Alternative assumes renewal of long-term CVP water service contracts in accordance with implementation of CVPIA. Contract assumptions in the No Action Alternative are defined by the current water service contract documents for American River Division contractors, including contracts under Public Law 101-514 for Sacramento County Water Agency and San Juan Water District, amendatory contracts for Placer County Water Agency and East Bay Municipal Utility District, and interim contracts for San Juan Water District and El Dorado Irrigation District, as shown in Table 2-3.

The No Action Alternative assumes maximum delivery of contract amounts to be equal to full contract amounts for Sacramento County Water Agency (Zone 40 and City of Folsom), San Juan Water District, Sacramento Municipal Utility District, Roseville, Placer County Water Agency, El Dorado Irrigation District contract for El Dorado Hills and Lake Hills Estates, and East Bay Municipal Utility District.

Alternative 1

Alternative 1 is based upon the proposal presented by CVP water service contractors to Reclamation in April 2000. The April 2000 proposal did include several provisions that were different than the assumptions for No Action Alternative, including the Definition of Municipal Users.

Alternative 2

Alternative 2 is based upon the proposal presented by Reclamation to CVP water service contractors in November 1999. The November 1999 proposal did include several provisions that were different than the assumptions for No Action Alternative including differences related to tiered pricing and the definition of M&I users.

SELECTION OF THE PREFERRED ALTERNATIVE

It is anticipated that the final contract language and the long-term contract renewal Preferred Alternative will represent a negotiated position between Alternatives 1 and 2. Therefore, it is anticipated that the impacts will be either equal to or less than those identified for Alternatives1 through 2 or the No Action Alternative.

SUMMARY OF THE IMPACT ASSESSMENT

The alternatives considered in this EIS were analyzed to determine the potential for adverse and beneficial impacts associated with their implementation as compared to continuation of the No Action Alternative conditions.

None of the alternatives include construction of facilities or changes in water service areas. Population projections and land use projections would be the same for all alternatives. General plans for the areas within the American River water service contractors service areas include protections for biological resources, land use, cultural resources, air quality, soils, visual resources, and recreational opportunities.

The long-term contract renewal process that occurs under the alternatives is not the sole factor driving growth and land use change. Demographic, economic, political, and other factors, independent of the long-term contract renewal process, are causing changes with direct and indirect effects to land use that are beyond the range of Reclamation's responsibilities. Virtually all of the long-term contract renewal actions are within the range of existing conditions. In most instances the responsibility to address affects to land uses will be with the local government as part of their California Environmental Quality Act compliance for actions of the municipalities. For example, Reclamation is not responsible for the development of housing tracts or industrial development in a community. Such actions are approved locally and at the state level. Further, if a farmer changes from one irrigated crop to another because of economic reasons, Reclamation does not control the farmer's decision.

A major difference between the alternatives is due to tiered water pricing assumptions and the responses to the pricing method. The tiered water pricing assumptions are identical under No Action Alternative and Alternative 1. The tiered water pricing assumptions under Alternative 2 would increase CVP water rates as compared to the No Action Alternative.

If tiered pricing makes CVP water unaffordable to some of the existing users, those users may increase groundwater use to replace more expensive CVP water. This could cause localized overdraft conditions in all of the water service contractors service areas. The actual response to the increased water rates is not know at this time. Because CVP water is only part of the total water supplies for the American River Division contractors, it is difficult to predict how the increases in water costs would affect actual retail water rates. However, the higher cost of CVP water may result in loss of existing or future manufacturing or agricultural activities.

The alternatives considered in this EIS were analyzed to determine the potential for adverse and beneficial impacts associated with their implementation as compared to continuation of the No Action Alternative conditions, as summarized in Table ES-1.

TABLE ES-1

IMPACT ASSESSMENT RESULTS

	No Action Alternative	Alternative 1	Alternative 2
Surface Water Resources, Quality, and Facilities	CVP operations would be similar to future conditions described in the American River Pump Station EIR/EIS Flows in American River and storage volumes in Folsom Lake are provided to support steelhead in accordance with recent biological opinions	Same as No Action Alternative	If CVP water users continue to use CVP water, conditions will be the same as No Action Alternative If CVP water users determine that CVP water is too expensive, CVP water use may decrease.
Groundwater Resources and Groundwater Quality	The CVP water supplies would continue to be used and groundwater conjunctive use programs would be implemented	Same as No Action Alternative	Conditions under this alternative would be identical to those under the No Action Alternative If CVP water users determine that CVP water is too expensive, groundwater use may increase.
Land Use, Demographics, and Sociological Resources	Growth would continue in Sacramento, Placer, El Dorado, Contra Costa, and Alameda counties, as described in the county general plans and associated environmental documentation.	Same as No Action Alternative	Same as No Action Alternative
Central Valley Project Water Supply Costs, Agricultural Economics, and Regional Economics	CVP water supply costs for this alternative were based upon the Tiered Water Pricing concept in the CVPIA PEIS Preferred Alternative.	Same as No Action Alternative	Higher CVP water costs would have adverse impacts on users unless the CVP water supplies were replaced by less expensive water supplies.

TABLE ES-1
IMPACT ASSESSMENT RESULTS

	No Action Alternative	Alternative 1	Alternative 2
Fishery and Wildlife Resources	Growth would continue in American River Division service area, as described in the county general plans and associated environmental documentation. The general plans include protection measures for biological resources.	Same as No Action Alternative	Same as No Action Alternative
Recreation	Recreational opportunities would continue as described in the county general plans and associated environmental documentation and CVP water service contractor plans	Same as No Action Alternative	Same as No Action Alternative
Cultural Resources	Sacramento, Placer, El Dorado, Contra Costa, and Alameda counties are responsible for protection of cultural and historical resources under the current land use plans, as described in the county general plans and associated environmental documentation. The general plans have protection measures for cultural and historic resources.	Same as No Action Alternative	Same as No Action Alternative
Indian Trust Assets	The American River Division does not include Indian Trust Assets that rely upon CVP water.	Same as No Action Alternative	Same as No Action Alternative
Air Quality	Growth would continue in Sacramento, Placer, El Dorado, Contra Costa, and Alameda counties, as described in the county general plans and associated environmental documentation. The general plans include air quality improvement and protection measures.	Same as No Action Alternative	Same as No Action Alternative

TABLE ES-1

IMPACT ASSESSMENT RESULTS

	No Action Alternative	Alternative 1	Alternative 2
Soils	Sacramento, Placer, El Dorado, Contra Costa, and Alameda counties have adopted land use plans and erosion control plans to protect soil resources in the general plans.	Same as No Action Alternative	Same as No Action Alternative
Visual Resources	Visual resources would continue to change in the No Action Alternative as growth continues in Sacramento, Placer, El Dorado, Contra Costa, and Alameda counties. The general plans include protection measures for visual resources.	Same as No Action Alternative	Same as No Action Alternative
Environmental Justice	The economies of Sacramento, Placer, El Dorado, Contra Costa, and Alameda counties are extremely vibrant and growing. It is assumed that the high employment and the high cost of living would continue into the future.	Same as No Action Alternative	If the higher cost of CVP water results in loss of existing or future jobs, the impact would probably affect the less educated, low income workers who would not be able to easily find replacement jobs
Secondary Growth Impacts	Growth would continue in Sacramento, Placer, El Dorado, Contra Costa, and Alameda counties, as described in the county general plans and associated environmental documentation.	Same as No Action Alternative	Same as No Action Alternative

CHAPTER 1
PURPOSE AND NEED

CHAPTER 1
Purpose and Need

INTRODUCTION

The U.S. Bureau of Reclamation (Reclamation) proposes to renew long-term water service contracts for delivering Central Valley Project (CVP) water to be used for irrigation and municipal and industrial (M&I) purposes in the American River Division. The CVP water service contractors include Sacramento County Water Agency which provides water to an area within Sacramento County designated as Zone 40 and to the City of Folsom (Folsom) through a subcontract, San Juan Water District, Sacramento Municipal Utility District for use at Rancho Seco, City of Roseville (Roseville), Placer County Water Agency, El Dorado Irrigation District for use in El Dorado Hills and Lake Hills Estates, and East Bay Municipal Utility District. These water service contractors currently have CVP water contracts that will expire at various dates prior to 2029. The long-term water service contracts proposed in this Environmental Impact Statement (EIS) would continue to deliver the same amount of CVP water as the existing contracts, for a period of 40 years as Municipal and Industrial (M&I) contracts.

This EIS has been prepared pursuant to and in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 USC § 4321-4370d) and the Council on Environmental Quality (CEQ) regulations on implementing NEPA (40 CFR Parts 1500-1508).

The American River Division also includes the El Dorado County Water Agency, in accordance with the provisions of Public Law 101-514. Currently, the El Dorado County Water Agency is preparing environmental documentation to evaluate potential impacts and benefits that may occur if a water service contract is implemented. Due to the incomplete nature of the environmental documentation, El Dorado County Water Agency is not included in the contract renewal alternatives considered in this EIS. However, the potential contract is included in the analysis of cumulative impacts in this EIS.

PURPOSE AND NEED FOR THE ACTION

Reclamation is responsible for operational control of the CVP including securing payment for the cost of water facilities and operations and maintenance established in the water service contract with Reclamation. In addition, as a duly authorized representative, Reclamation administers all actions pertaining to the establishment of water service contracts on behalf of the Secretary of the Interior (Secretary).

The purpose of this action is to renew the American River Division long-term water service contracts, consistent with Reclamation authority and all applicable state and federal laws, including the Central Valley Project Improvement Act (CVPIA) (H.R. 429, Public Law 102-575).

Long-term contract renewal (LTCR) is needed to:

- Continue beneficial use of water, developed and managed as part of the CVP, with a reasonable balance among competing demands, including the needs of irrigation and M&I uses; fish and wildlife protection, restoration, and mitigation; fish and wildlife enhancement; power generation; recreation; and other uses consistent with requirements imposed by the State Water Resources Control Board (State Board) and the CVPIA;

- Incorporate certain administrative conditions into the renewed contract to ensure CVP continued compliance with current federal reclamation law and other applicable statues; and

- Allow the continued reimbursement to the federal government for costs related to CVP construction and operation.

BASIS TO RENEW CENTRAL VALLEY PROJECT WATER SERVICE CONTRACTS

The River and Harbors Act of 1935 included the initial authorization for the CVP. The Central Valley Project Authorization Act of 1937 re-authorized the CVP and allowed the Secretary to enter into repayment contracts and other necessary contracts with "all agencies with which contracts are authorized under reclamation law."

Public Law 88-44, the Reclamation Project Act of 1939, provided for repayment of construction charges and authorized sale of CVP water to municipalities and other public corporations and agencies, plant investment, and certain irrigation water deliveries to leased lands. This act required the Secretary to comply with laws of the State relating to the control, appropriation, use, or distribution of water used in irrigation or vested rights acquired there under. This act also provided that the Secretary include provision for contract renewal, upon request of the other party to any long-term contract for municipal, domestic, or industrial water supply. The contract renewal would be subject to renegotiation of: (1) the charges set forth in the contract in the light of circumstances prevailing at the time of renewal; and (2) any other matters with respect to which the right to renegotiate is reserved in the contract. The act also states that the Secretary shall, upon request, provide in any such long-term contract that the other party to the contract shall, during the term of the contract and of any renewal (subject to fulfillment of other obligations), have a first right to a stated share or quantity of the CVP water supply available for municipal, domestic, industrial, or irrigation use.

Sections 9(c) of the Reclamation Project Act of 1939 authorized the Secretary to enter into contracts to furnish water for municipal water supply or miscellaneous purposes, provided that such contracts require repayment to the United States over a period not to exceed forty years. Section 9(e) of the Reclamation Project Act of 1939 allowed the Secretary to enter into either short- or long-term contracts to furnish water for irrigation purposes, with each such contract to be for a period not to exceed forty years.

The Water Service Contracts Act of 1944 provided for delivery of specific quantities of irrigation and M&I water to contractors.

The Reclamation Project Act of 1956 provided the right of renewal of long-term repayment or water service contracts for agricultural contractors for a term not to exceed 40 years. The Reclamation Project Act of June 21, 1963, Renewal of Water Supply Contracts, extended the right of renewal of long-term repayment or water service contracts for M&I contractors.

On October 30, 1992, the President signed into law the Reclamation Projects Authorization and Adjustment Act of 1992 (Public Law 102-575) that included Title XXXIV, the Central Valley Project Improvement Act (CVPIA). The CVPIA amended 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 by including fish and wildlife enhancement as a project purpose equal to power generation. Section 3409 of the CVPIA required the Secretary to prepare a Programmatic Environmental Impact Statement (PEIS) pursuant to NEPA to evaluate the direct and indirect impacts and

benefits of implementing CVPIA. That PEIS was prepared by Reclamation and U.S. Fish and Wildlife Service (Service). Reclamation released a Draft PEIS on November 7, 1997. An extended comment period closed on April 17, 1998. Reclamation and the Service released the final CVPIA PEIS in October 1999 and the joint Record of Decision in January 2001

Section 3404(c) of the CVPIA directs the Secretary of the Interior (Secretary) to renew existing CVP water service and repayment contracts following completion of the PEIS and other needed environmental documentation by stating that:

> "...the Secretary shall, upon request, renew any existing long-term repayment or water service contract for the delivery of water for a period of 25 years and may renew such contracts for successive periods of up to 25 years each....(after) appropriate environmental review, including preparation of the environmental impact statement required in section 3409 (i.e., the PEIS)..."

Section 3404(c) of the CVPIA clearly indicates that 25 years will be the upper limit for long-term irrigation repayment and water service contracts within the CVP. However, Section 3404(c) did not amend the provisions of Section (9(c) of the Reclamation Project Act of 1939 and the Act of June 21, 1963 which authorized renewal of M&I water contract terms for up to 40 years. These 1939 and 1963 authorizations remain in place as guidance for establishing the terms of M&I contracts.

BASIS TO RENEW AMERICAN RIVER DIVISION WATER SERVICE CONTRACTS

The Central Valley Project Authorization Act of 1937 authorized construction of the initial CVP project features for navigation, flood-control, waste storage, construction of distribution systems, and hydropower generation. The River and Harbors Act of 1940 further authorized construction of CVP facilities and mandated that dams and reservoirs be used first for river regulation, improvement of navigation, and flood control; second for irrigation and domestic users; and third for power. This authorization was amended by the American River Division Authorization Act of 1949, Trinity River Act of 1955, San Luis Authorization Act of 1960, River and Harbors Act of 1962, Auburn-Folsom South Unit Authorization Act of 1967, and San Felipe Division Authorization Act of 1967.

The CVP facilities include major reservoirs on the Trinity, Sacramento, American, Stanislaus, and San Joaquin rivers and conveyance facilities. Water service contractors in the American River Division are served by the American River and associated conveyance facilities. The contractors are briefly described below by county location.

Sacramento County

The CVP American River Division water service contractors in Sacramento County include Sacramento County Water Agency, San Juan Water District, and Sacramento Municipal Utility District.

Sacramento County Water Agency. Sacramento County Water Agency was formed in 1952 to provide water, including groundwater, to areas within Sacramento County. The legislation that provided for the formation of the agency allowed for contracting with the federal government under Reclamation Law in the same manner as irrigation districts and with other federal and state governments for the purchase, sale, and acquisition of water and the construction and operation of facilities.

Section 206 of Public Law 101-514 provided up to 50,000 acre-feet/year of water in the American River Division of the CVP for use by Sacramento County Water Agency, San Juan Water District, and El

Dorado County Water Agency. Sacramento County Water Agency, San Juan Water District, and Reclamation prepared a joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR) that evaluated the use of the water by San Juan Water District and Sacramento County Water Agency. Following completion of the EIS/EIR, Sacramento County Water Agency entered into a contract in April 1999 with Reclamation for the delivery of 22,000 acre-feet of water to meet the needs of Sacramento County with 7,000 acre-feet for delivery to Folsom under a subcontract.

Zone 40. Sacramento County Water Agency formed Zone 40 in 1985 for the purpose of constructing facilities for the production, conservation, transmittal, distribution and sale of surface water and groundwater for conjunctive use. In 1999, Sacramento County Water Agency expanded Zone 40 to include wholesale service areas of Elk Grove Water Service (previously Elk Grove Water Works) and community areas throughout Zone 40 that are projected for development under the County of Sacramento General Plan.

The CVP water service contract under Public Law 101-514 provides for the delivery of up to 15,000 acre-feet for M&I purposes within Zone 40. New facilities are required for diversion, treatment, and conveyance of the CVP water. Therefore, at this time, most of Zone 40 is served by groundwater. Sacramento County Water Agency does have a wheeling agreement with the City of Sacramento to provide treatment and conveyance of water through the City of Sacramento existing treatment and distribution system. The Laguna/Vineyard area is currently receiving treated surface water pursuant to the Sacramento County Water Agency contract with the CVP.

In addition to the Public Law 101-514 contract, this EIS also considers an assignment of 30,000 acre-feet of CVP water under the CVP water service contract with Sacramento Municipal Utility District to Sacramento County Water Agency for use within Zone 40. CVP water assigned to Sacramento County Water Agency will be delivered through the proposed Freeport Regional Water Project.

Currently, Sacramento County Water Agency is participating with East Bay Municipal Utility District in the development of a diversion facility near Freeport on the Sacramento River downstream of the confluence with the American River. The project will include an intake facility and pumping plant, conveyance facilities between the river and a treatment plant, and a treatment plant located in central Sacramento County. The facilities will be operated to serve Zone 40. As described below, the conveyance will be extended further eastward to provide water to facilities owned by East Bay Municipal Utility District.

City of Folsom. The City of Folsom entered into a subcontract with Sacramento County Water Agency to receive delivery of 7,000 acre-feet for M&I uses in accordance with Public Law 101-514. This water can only be used for service in a portion of Folsom located in the southeastern quadrant of the City (north of U.S. Highway 50).

San Juan Water District. The San Juan Water District provides CVP water and water rights water to Citrus Heights Water District, Fair Oaks Water District, Orange Vale Water Company, the Ashland area of Folsom, and neighboring portions of Placer County. San Juan Water District also provides water under contract with Placer County Water Agency to portions of Placer County that cannot be easily served by Placer County Water Agency facilities.

San Juan Water District entered a contract in 1960 with Reclamation to obtain CVP water from Folsom Lake for up to 11,200 acre-feet/year for irrigation and municipal/industrial uses. The contract also provides for delivery of up to 33,000 acre-feet/year of water rights held by San Juan Water District through Reclamation diversion facilities in Folsom Lake. The water rights are defined as the first 149

acre-feet/day delivered to San Juan Water District. The contract was renewed on an interim basis until the long-term contract renewals considered in this EIS are completed.

In 1999, San Juan Water District also entered a contract with the Reclamation for the delivery of up to 13,000 acre-feet for M&I uses in accordance with Section 206 of Public Law 101-514.

Sacramento Municipal Utility District. Sacramento Municipal Utility District entered into a contract with Reclamation in February 1970 for the delivery of up to 60,000 acre-feet/year of CVP water for M&I uses and for the delivery of up to 15,000 acre-feet of water rights water made available to Sacramento Municipal Utility District by the City of Sacramento, as a result of a previous assignment of water by Sacramento Municipal Utility District to the City of Sacramento. The CVP water under the contract was to be used Sacramento Municipal Utility District in its power generation operations, and actually was used for more than 15 years for the Rancho Seco nuclear power plant operations. In the 1980s, the nuclear power plant operations ceased. Since that time, water has been used for continued operation of the site including temperature controls for the nuclear fuels stored at the site. Sacramento Municipal Utility District has recently received California Energy Commission approval for two gas-powered generators at the Rancho Seco site known as the Cosumnes Power Plant. The Cosumnes Power Plant will consist of a nominal 1000-megawatt combined-cycle natural gas fired plant. The plant will be constructed in two phases, each consisting of 500 megawatts. The first phase of the Cosumnes Power Plant is under construction with on-line service scheduled for the fall of 2005.

Both the CVP water and the water rights water flows are currently diverted from the American River at Nimbus Reservoir and delivered to the Ranch Seco site through the Folsom South Canal. The existing contract specifically requires Sacramento Municipal Utility District to be responsible for conveyance, handling, disposal, and/or distribution of water beyond the point of facilities operated by the United States.

Placer County

The CVP American River Division water service contractors in Placer County include Roseville and Placer County Water Agency. San Juan Water District also serves portions of Placer County, as described above.

City of Roseville. Roseville entered a contract with Reclamation to obtain CVP water from Folsom Lake in 1967 for up to 32,000 acre-feet/year for irrigation and municipal/industrial uses. The Roseville service area includes the incorporated area. A portion of southeastern Roseville is served by San Juan Water District. Roseville has exercised an option with Placer County Water Agency for 10,000 acre-feet of water and has an option with Placer County Water Agency for an additional 20,000 acre-feet of water.

Placer County Water Agency. Placer County Water Agency entered into a contract with Reclamation in 1970 for up to 117,000 acre-feet of CVP water for irrigation and municipal/industrial uses. The contract was amended in 2002 and reduced the amount of CVP water to 35,000 acre-feet prior to the construction of Auburn Dam.

Placer County Water Agency also has the right to divert for consumptive uses up to 120,000 acre-feet/year of water rights on the Middle Fork American River. Placer County Water Agency contracts with San Juan Water District and Roseville to deliver up to 25,000 and 30,000 acre-feet, respectively, for service to areas within Placer County that would be difficult for Placer County Water Agency to serve with existing facilities. In addition, in order to protect the groundwater aquifer within Placer County, Placer County Water Agency contracts with Sacramento Suburban Water District to provide up to 29,000 acre-feet in years when the March through November unimpaired flow into Folsom Reservoir is greater

than 1,600,000 acre-feet and the Placer County Water Agency's total supply is determined to be in "surplus conditions." In accordance with agreements with the Sacramento Water Forum, Placer County Water Agency has agreed to limit its water right diversions from the American River to 35,000 acre-feet, which is assumed in this analysis to be diverted upstream of Folsom Dam through a pump station on the American River.

El Dorado County

The only CVP American River Division water service contractor in El Dorado County is El Dorado Irrigation District. As described above, El Dorado County Water Agency is currently preparing separate environmental documents to evaluate contracting with Reclamation under Section 206 of Public Law 101-514. That document will serve as the environmental document for the long-term contract for El Dorado County Water Agency.

Foresthill Public Utility District also had a CVP water service contract for water delivered from Sugar Pine Reservoir. In 2003, the water rights and facilities that provided water to this area were transferred to the utility district and the contract was eliminated.

El Dorado Irrigation District. El Dorado Irrigation District has entered into two contracts with Reclamation to obtain CVP water from Folsom Lake. One of the contracts is for Lake Hills Estates (located north of El Dorado Hills) and was initially signed in 1958 for up to 50 acre-feet/year for M&I purposes. The other contract is for El Dorado Hills and was initially signed in 1963 for up to 7,500 acre-feet/year for M&I purposes. Both contracts have been renewed on an interim basis until the long-term contract renewals considered in this EIS are completed. Water under both contracts is diverted from Folsom Lake and treated at the same El Dorado Irrigation District treatment plant.

El Dorado Irrigation District also had a CVP water service contract for water delivered from Sly Park Reservoir. In 2004, the Sly Park water rights and facilities were transferred to El Dorado Irrigation District and the contract was eliminated.

Alameda and Contra Costa Counties

Water is diverted from American River Division to serve users within the East Bay Municipal Utility District service area located in Alameda and Contra Costa Counties.

East Bay Municipal Utility District. East Bay Municipal Utility District is a large municipal and industrial water service provider that serves over 1.3 million customers in portions of Alameda and Contra Costa counties. The district also provides wastewater treatment services for Oakland, Piedmont Alameda, Berkeley, Emeryville, Albany, and portions of the City of Richmond.

The East Bay Municipal Utility District primary source of water is the Mokelumne River and several minor local surface waters. At present, the current East Bay Municipal Utility District water supply is insufficient to meet customer demand in multiple-year droughts even with aggressive water conservation and recycling programs. To provide water to meet demands in drier years, East Bay Municipal Utility District is pursuing development of additional water supply projects, including utilization of a contract with Reclamation to obtain CVP water from the Folsom South Canal that was signed in 1970. The contract provided for delivery of up to 150,000 acre-feet/year for municipal/industrial uses. In 1972, the Environmental Defense with Sacramento County legally challenged the delivery of the CVP water from the Folsom South Canal as "unreasonable" use of American River water. In 1988, the SWRCB adopted findings that the CVP contract for East Bay Municipal Utility District is a reasonable use of American River water. In 1990, Alameda County Superior Court Judge Hodge affirmed the contractual rights

subject to a set of specific conditions known as "Hodge Decision." Due to these issues, East Bay Municipal Utility District has not been able to take delivery of this contract water except a small portion under an emergency provision during the 1977-78 drought.

In 2001, the CVP contract was amended to provide for delivery of water from three possible diversion points with defined water amounts for each location. The preferred diversion point is located at Freeport on the Sacramento River (downstream of the confluence with the American River). At Freeport, East Bay Municipal Utility District will be able to divert up to 133,000 acre-feet of American River water each year with a not-to-exceed total of 165,000 acre-feet in three consecutive years. This diversion can only occur in drought years when East Bay Municipal Utility District's total system storage is forecasted to be less than 500,000 acre-feet. The other diversion locations include "Site 5" on the American River upstream of the Interstate 5 bridge and from the Folsom South Canal as under the initial contract.

The Final EIS was published in April 2004. Reclamation plans to issue a Record of Decision following consultation under Section 7 of the Endangered Species Act. The Freeport Regional Water Authority certified the Final EIR in April 2004.

RELATIONSHIP OF THIS DOCUMENT TO THE 1999 CVPIA PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

The PEIS provided a programmatic evaluation of the impacts of implementing the CVPIA. Four alternatives, 17 supplemental analyses, Preferred Alternative, and No-Action Alternative were evaluated in the PEIS. The impact analysis in the PEIS was completed at a subregional level but presented within the PEIS on a regional basis for the Sacramento Valley, San Joaquin Valley, and Tulare Lake regions. The PEIS No-Action Alternative assumed that existing water service contracts would be renewed under the same terms as expiring contracts. The Final PEIS included a Preferred Alternative that addressed the regional impacts and benefits of the anticipated general method that Reclamation would use for implementation of the CVPIA, including long-term contract renewal, as described in Chapter 3 of this document.

The PEIS evaluated the impacts and benefits of long-term contract renewals under CVPIA. Following completion of the PEIS, more specific information related to contract renewal proposals has been developed by Reclamation and the contractors. This EIS includes the CVPIA provisions as defined in the Preferred Alternative of the PEIS as the No Action Alternative and evaluates the impacts and benefits of differences between the contract assumptions in the No Action Alternative and two other alternatives, as described in Chapter 2. The PEIS and the Biological Opinion prepared for the operation and maintenance of the CVP and implementation of CVPIA considered and addressed impacts caused to date by CVP actions. Therefore this EIS does not need to address operations of the CVP.

OTHER RELATED DOCUMENTS OR ACTIVITIES

There are several activities being implemented by Reclamation as part of the obligation to manage and operate the CVP. The following discussion identifies these activities and describes their relation to the renewal of the American River Division water service contracts. Related studies and projects that have been conducted recently or are currently being completed are summarized in Table 1-1.

STUDY PERIOD

The analysis period for this EIS is the term of the proposed long-term contracts included in this EIS: 40 years for M&I water service contracts.

PUBLIC INVOLVEMENT PROCESS

On October 15, 1998, Reclamation published a notice of intent (NOI) in the Federal Register to announce the preparation of environmental documents for long-term renewal of CVP water service contracts. Scoping meeting were held at eight locations throughout the CVP service area.

Reclamation completed a scoping report in April 1999. Scoping served as a fact-finding process that helped identify public concerns and recommendations about the NEPA process, issues that would be addressed in this document, and the scope and level of detail for analyses.

The proposed long-term contract renewals were considered in a public process. Throughout the contract renewal process, meetings were held with the contractors, other agencies, interest groups, and the public. Issues raised during the public involvement process were addressed in the negotiations process and were used in the preparation of this EIS.

TABLE 1-1
RELATED ACTIVITIES

Project or Study and Lead Agency	Summary
Long-Term Contract Renewal of Existing CVP Water Service Contracts - Reclamation	Reclamation is in negotiation with other CVP water contractors for renewal of long-term contracts, including contractors for the American River Division, Feather Water District, Shasta-Trinity Divisions, Sacramento Canals Unit, San Luis Unit, Contra Costa Unit, San Felipe Unit, Delta Mendota Canal Unit, the San Joaquin National Veterans Cemetery, the City of Lindsay, City of Fresno, Cross Valley , and Mercy Spring Water District.
Implementation of CVPIA - Reclamation	Reclamation and the Service are proceeding with implementation of other provisions of CVPIA, including stream restoration, refuge water supplies, and further analysis of yield replacement.
CALFED Bay-Delta Program - CALFED	Established in May 1995, the consortium of federal and state agencies is charged with the development of a long-term solution to the Delta water concerns. CALFED completed an Environmental Impact Report (EIR) and Environmental Impact Statement (EIS) as part of this process. Renewal of Long-Term CVP Contracts is assumed within the CALFED EIR/EIS and Record of Decision.
Coordinated Operating Agreement (COA) and Operations Criteria and Plan (OCAP) Update - Reclamation and California Department of Water Resources	Provisions and requirements of the CVPIA, State Water Resources Control Board Order 1641, the CALFED Bay-Delta Program, and other agency mandates require that the existing operational roles and responsibilities of the SWP and CVP be reviewed and updated to provide appropriate long-term operating criteria and procedures for the two primary water storage and delivery projects affecting waterways of the Central Valley.
Trinity River Mainstem Fishery Restoration Environmental Impact Statement/Report - Reclamation and Trinity County	Fish and Wildlife Service (Service) completed a Final EIS/EIR and Record of Decision. Based upon subsequent litigation, Service is preparing responses to court's comments. Service and Reclamation also are implementing a portion of the recommendations for restoration activities along the Trinity River.
Vernalis Adaptive Management Plan - Reclamation	The Vernalis Adaptive Management Plan (VAMP) provides protective measures for fall-run chinook salmon and gathers scientific information on survival of salmon smolts through the Delta. The VAMP will be implemented through experimental flows on the San Joaquin River and export pumping rates with a temporary fish barrier on Old River during the 1-month period each year, from approximately April 15 to May 15. Additional attraction flows are targeted for October. The VAMP includes water acquisition for a pulse flow at Vernalis during the April and May period, and other flows identified to meet anadromous fish flow objectives. The San Joaquin River Group Authority, Reclamation, and the Service prepared a Final EIS/EIR for the water acquisition component of VAMP, in January 1999.

CHAPTER 2
DESCRIPTION OF ALTERNATIVES

CHAPTER 2
Description of Alternatives

INTRODUCTION

This chapter summarizes the long-term water service contract negotiations process and descriptions of the alternatives considered in this EIS.

LONG-TERM WATER SERVICE CONTRACT NEGOTIATIONS PROCESS

Section 3404 (c) of the CVPIA states that “the Secretary shall, upon request, renew any existing long-term repayment or water service contract for the delivery of CVP water...” Consistent with the 1963 Act, M&I contracts shall be renewed for successive periods up to 40 years each under terms and conditions that are mutually agreeable. The CVPIA also states that no renewals shall be authorized until appropriate environmental review, including the PEIS, has been completed. The PEIS provided a programmatic environmental analysis and identified the need for site-specific environmental documents for the long-term contract renewal process. This EIS is the site-specific environmental document for the Long-Term Contract Renewal of water service contracts in the American River Division.

The CVPIA states that contracts which expire prior to the completion of the PEIS may be renewed for interim periods. The interim renewal contracts reflect existing Reclamation law, including modifications due to Reclamation Reform Act and applicable CVPIA requirements. The initial interim contract renewals were negotiated in 1994 with subsequent renewals for periods of two years or less to provide for continued water service until Long-Term Contract Renewal environmental documentation is completed. Many of the provisions negotiated as part of the interim contracts were assumed to be part of the contract renewal provisions in the description of the PEIS Preferred Alternative.

In 1998, the long-term contract renewal process was initiated. Reclamation reviewed the interim contract provisions comments on the Draft PEIS, and comments on the environmental documents for the interim renewal contracts. Reclamation proposed to negotiate the general provisions of the long-term contract with representatives of all CVP water service contractors. Following the acceptance of the CVP-wide provisions, Reclamation proposed that division-specific provisions and, finally, contractor-specific provisions be negotiated.

Reclamation published the initial proposed contract in November 1999. There were several negotiations sessions throughout the next six months. The CVP water service contractors published a counter-proposal in April 2000. The November 1999 proposal represents one "bookend" for negotiations and the April 2000 proposal represents the other "bookend." The results of the negotiations are reflected in the subsequent proposals, as described later in this chapter. The final negotiated provisions are defined within these bookends.

ISSUES CONSIDERED AS PART OF LONG-TERM CONTRACT RENEWALS

The long-term contract renewal process included a Needs Assessment to define existing and future water demands within the water service contractors service area, consideration of changes in the water service contractor service area boundaries, and consideration for future water transfers involving CVP water that

would potentially change the water service contract amounts. The results of the Needs Assessment and the consideration for changes in the water service contract definitions are described below.

Needs Assessments

The water rights granted to the CVP by the State Water Resources Control Board (SWRCB) requires the federal government to determine that CVP water is being used in a beneficial manner. To this end, an needs assessment methodology was developed, specifically as part of the long-term contract renewal process, to determine if the contractors have a need for their full contract amount by the Year 2029. This assessment was computed for each CVP water service contractor using a multiple-step approach. First, the existing water demand for each contractor was calculated based on historic water uses. Crop acreage, crop water needs, precipitation, and conveyance loss information provided by each contractor were reviewed for agricultural water use. Residential, commercial, industrial, institutional, recreational, and environmental uses, including landscape irrigation, system losses, and landscape acreage information provided by each contractor were reviewed for M&I water use. Future changes in water demands based upon crop acreage, M&I expansion, and changes in efficiencies were reviewed. Third, existing and future water supplies were identified for each contractor, including groundwater, other surface water supplies, water assignments, and water transfers and sales. The calculation of CVP water needs assumed that other (non-federal) water supplies would be used first, and groundwater pumping would not exceed the safe yield of the aquifer. Reclamation did not include any incidental recharge due to application of irrigation water. In addition, the actual water needs were calculated at each division or unit level to allow for annual intra-regional transfers.

Future water demands were identified for each contractor based upon assumptions for water conservation and best management practices. The demands were then 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 greater than 15,000 acre-feet/year, or within 25 percent for contracts less than or equal to 15,000 acre-feet/year, the full future need of the water supplies under the contract was deemed to be beneficially used. 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 states that Reclamation cannot increase contract supply quantities until all provisions of CVPIA are met.

Water Needs Assessments were completed for the contractors within the American River Division. Table 2-1 shows the quantities of available supplies and demands used in determining the needs of each contractor under existing conditions. Included in this table are the contractor's total water supplies including any assignments, transfers, or exchanges into or out of the contractor's service areas, the total water demands, and the amount of the surplus or unmet demand. Projected Water Needs Assessment values for the American River Division contractors are presented in Table 2-2. Water supply, demand, and delivery information in Tables 2-1 and 2-2 are based on a normal hydrologic year unless noted.

The water needs assessment did not consider that Reclamation's ability to deliver CVP water as has been constrained in recent years and may be constrained in the future due to many factors including hydrologic conditions as well as implementation of federal and state laws. The future water needs were calculated for the Year 2025. Although the term of the long-term renewal contracts extends beyond this date, this EIS uses these values to be representative of future conditions because all CVP supplies will be fully utilized prior to the end of the contract period.

TABLE 2-1

CONTRACTOR'S WATER NEEDS ASSESSMENT FOR EXISTING CONDITIONS (IN ACRE-FEET AND BASED ON A NORMAL HYDROLOGIC YEAR UNLESS NOTED, IN ACRE-FEET)

	Sacramento County Water Agency	San Juan Water District	Sacramento Municipal Utility District	City of Roseville	Placer County Water Agency	El Dorado Irrigation District	East Bay Municipal Utility District	
Data for Year:	1996	1995	1995	1995	1999	1995	1993 (normal)	1995 (critical)
Total CVP Delivery	0	5083	2,959	19,800	0	23,959 (including Sly Park)		
Other Surface Water Supply	13,605	33,000	17,008		114,400	19,055	371,000	129,000
Groundwater (a)	13,583							
Transfers and Exchanges In	1,146	10.014						
Transfers and Exchanges Out	49				10,000			
Total Supply	28,285	48,097	19,967	19,800	104,400	43,014	371,000	129,000
Agricultural Demand					79,112	15,889		
M&I Demand	28,441	50,888	19,967	19,800	23,997	27,125	224,750	168,563
Total Demand (b)	28,441	50,888	19,967	19,800	103,109	43,014	224,750	168,563
Unmet Demand (c)	156	2,791	0	0	-1,291	0	-146,250	39,563

(a) The amount of groundwater recharge is subtracted from the groundwater withdrawn. Negative numbers occur recharge is greater than the amount withdrawn.

(b) Agricultural plus M&I demand

(c) Total demand minus total supply

Information based upon Reclamation Water Needs Assessment, 2004

TABLE 2-2

CONTRACTOR'S WATER NEEDS ASSESSMENT PROJECTED FOR 2025/2029
(BASED ON A NORMAL HYDROLOGIC YEAR UNLESS NOTED, IN ACRE-FEET)

	Sacramento County Water Agency	San Juan Water District	Sacramento Municipal Utility District	City of Roseville	Placer County Water Agency	El Dorado Irrigation District	East Bay Municipal Utility District	
Total CVP Delivery	22,000	24,200	60,000	32,000	35,000	15,050 (only 7,550 for El Dorado Hills) (d)	150,000 (normal year)	112,500 (critical year)
Other Surface Water Supply	27,000	33,000	18,024		220,400	59,134	364,000	80,000
Groundwater (a)	34,792 minus 14,893 recharge	5,700 recharge		6,500				
Transfers and Exchanges In	30,000	25,000		13,000		1,800		
Transfers and Exchanges Out	5,600		30,000		64,000			
Total Supply	93,299	76,500	48,024	51,500	191,400	75,984	514,000	192,500
Agricultural Demand					81,687	24,466		
M&I Demand	93,554	76,632	33,942 (46,186 in 2040)	54,900	74,500 (116,376 in 2040)	49,257	257,700	193,200
Total Demand (b)	93,554	76,632	33,942 (46,186 in 2040)	54,900	156,187 (198,064 in 2040)	73,723	257,700	193,200
Unmet Demand (c)	255	132	918 (-1,838 in 2040)	3,400	-35,213 (6,664 in 2040)	-2,261	-256,300	700

a) The amount of groundwater recharge is subtracted from the groundwater minus. Negative numbers occur if recharge is greater than the amount withdrawn.

(b) Agricultural plus M&I demand

(c) Total demand minus total supply

(d) Water under PL 101-514 for El Dorado County Water Agency and El Dorado Irrigation District not included in this EIS

Information based upon Reclamation Water Needs Assessment, 2004

Changes in Water Service Areas

This environmental analysis does not consider any changes in water service area boundaries for use of CVP water. Any change to water service area boundaries for use of CVP water requires Reclamation approval and separate technical and environmental analyses.

Water Transfers

The use of water transfers between willing sellers and willing buyers is expected by many experts to be used increasingly in the future. CVPIA Section 3405(a) authorizes transfers of CVP water, subject to the conditions set out in the statute. Reclamation policy on transfers provides guidance on the conditions under which transfer of CVP water will be evaluated and approved. Water transfers provide an opportunity to supplement or replace water supplies to support existing and future demands.

Existing long-term water service contracts authorize transfers outside a contractor's service area only with the consent of a Reclamation Contracting Officer. Several different types of transfers are possible. Intra-CVP contract transfers have occurred regularly throughout the CVP and are frequently limited to scheduling changes between adjoining districts. These types of transfers occur between CVP contractors within the same division, typically occur within a single year, and are from irrigation use to irrigation use or M&I use to M&I use. Such transfers assist in the efficient management of CVP water by offsetting the impacts of shortages imposed under drought or regulatory conditions. Transfers from CVP contractors to others outside of the CVP place of use are also possible. These types of transfers require prior approval by the State Water Resources Control Board.

Transfers not involving CVP water supplies may require use of CVP facilities to convey and sometimes store non-project water purchased by the CVP contractor. Contractors are required to enter into separate Warren Act contracts with Reclamation and comply with all Federal and State law including approval of the transfer by the State Water Resources Control Board.

Reclamation policy requires environmental review under NEPA and ESA compliance for all water transfers and Warren Act contracts.

DEVELOPMENT OF ALTERNATIVES

Three alternatives were identified for the renewal of long-term contracts between Reclamation and contractors in the American River Division.

In November 1999, Reclamation published a proposed long-term water service contract. In April 2000, the CVP contractors presented an alternative long-term water service contract. Reclamation and the CVP contractors continued to negotiate the CVP-wide terms and conditions with these proposals serving as "bookends." This EIS considers these proposals with the No Action Alternative as bookends to be considered for the environmental documentation to evaluate the impacts and benefits of the renewing long-term water service contracts.

The alternatives present a range of water service agreement provisions that could be implemented for long-term contract renewals. The No Action Alternative consists of renewing existing water service contracts. Alternative 1 is based upon the April 2000 Proposal presented by the CVP water service contractors to Reclamation. Alternative 2 is based upon the November 1999 Proposal presented by Reclamation to the CVP water service contractors.

The primary differences in the alternatives relate to methods addressing tiered water pricing, definition of M&I users, water measurement, and water conservation, as summarized in Table 2-1. The following detailed descriptions focus on these issues.

No Action Alternative

The No Action Alternative assumes renewal of long-term CVP water service contracts in accordance with implementation of CVPIA. The No Action Alternative is based upon the PEIS Preferred Alternative and results of environmental documents completed by Reclamation after the PEIS Record of Decision. The PEIS Preferred Alternative included conditions described in the PEIS No Action Alternative as modified by implementation of CVPIA. The PEIS No Action Alternative included assumptions for water service contract deliveries in Year 2025 based upon existing general plans and existing water supply facilities. To avoid being too speculative, the PEIS No Action Alternative acknowledged existing water service contracts but limited the amount of water delivered to areas based upon historical deliveries, completed local planning and environmental documentation, and existing conveyance facilities. Therefore, the PEIS No Action Alternative did not include deliveries of CVP water under PL 101-514 to Sacramento County Water Agency and San Juan Water District because the environmental documentation was not completed during development of the PEIS. The PEIS No Action Alternative also did not include deliveries of CVP water to Placer County Water Agency and East Bay Municipal Utility District due to the lack of conveyance facilities or completed environmental documentation. Finally, the PEIS No Action Alternative did not include full deliveries to Sacramento Municipal Utility District because of the lack of environmental documentation for use of the contract total. None of these assumptions were modified by the PEIS Alternatives, therefore, the PEIS Preferred Alternative also included these limitations to deliveries. However, the PEIS acknowledged that efforts were on-going to prepare the appropriate documentation, and that the actual contract deliveries and totals would be evaluated in the environmental documentation for long-term contract renewals, including this EIS.

Since that time, Reclamation has completed environmental documentation and participated in implementation plans to provide delivery of full contract totals to these agencies, including preparation of "EIS/EIR for Central Valley Project Water supply Contracts under Public Law 101-514 (Section 206)" (Sacramento County Water Agency), "EIS/EIR for East Bay Municipal Utility District Supplemental Water Supply Project Amendatory Central Valley Project" (East Bay Municipal Utility District) "EIS/EIR for Freeport Regional Water Project" (East Bay Municipal Utility District and Sacramento County Water Agency), and "EIS/EIR for American River Pump Station Project for Placer County Water Agency."

Therefore, the assumptions for CVP contract amounts and maximum deliveries have been modified for this EIS to reflect studies that have been completed following the development of the PEIS alternatives. These assumptions, summarized in Table 2-3, reflect the existing conditions, and in accordance with discussions in the PEIS, and the results of the Needs Assessment.

TABLE 2-3

CENTRAL VALLEY PROJECT CONTRACTS IN AMERICAN RIVER DIVISION

CVP Contractor	Contract Total Assumptions for No Action Alternative and Alternatives 1 and 2
Sacramento County Water Agency	22,000 acre-feet under PL 101-514 contract (7,000 acre-feet subcontract with Folsom) 30,000 acre-feet assigned from Sacramento Municipal Utility District
San Juan Water District	11,200 acre-feet under 1960 contract 13,000 acre-feet under PL 101-514 contract
Sacramento Municipal Utility District	30,000 acre-feet 30,000 acre-feet assigned to Sacramento County Water Agency
Placer County Water Agency	35,000 acre-feet
Roseville	32,000 acre-feet
El Dorado Irrigation District	7,550 acre-feet
East Bay Municipal Utility District	Up to 133,000 acre-feet/year and 165,000 acre-feet over three consecutive dry years per the Amendatory Contract

Assumptions related to contract provisions in the No Action Alternative are defined by the current water service contract documents for CVP water service contractors, as shown in Table 2-4. Specific discussions related to tiered water pricing, definition of municipal and industrial users, water measurement, and water conservation are described in more detail in the following subsections.

Tiered Water Pricing. The No Action Alternative includes tiered water pricing based on use of a "80/10/10 Tiered Water Pricing from Contract Rate to Full Cost" including Ability-to-Pay limitations. Under this approach, the first 80 percent of the maximum contract total would be priced at the applicable Contract Rate. The next 10 percent of the contract total would be priced at a rate equal to the average of the Contract Rate and Full Cost Rate. The final 10 percent of the contract total would be priced at Full Cost Rate. The terms "Contract Rate" and "Full Cost Rate" are defined by the CVP ratesetting policies and P.L 99-546 and Reclamation Reform Act, respectively. The Contract Rate for irrigation and M&I water includes the contractor's allocated share of CVP main project operation and maintenance costs; operation and maintenance deficit, if any; and capital cost. The contract rate for irrigation water does not include interest on capital. The contract rate for M&I water includes interest on capital computed at the CVP M&I interest rate. The Full Cost Rate for irrigation and M&I water includes interest at the Reclamation Reform Act interest rate.

In addition to the CVP water rate, contractors are required to pay a Restoration Payment on all deliveries of CVP water. Reclamation law and policy provides full or partial relief to irrigation contractors on Restoration Payments and the capital rate component of the water rate. Ability-to-pay relief, relative to the irrigation water rate, is fully applicable only to the first 80 percent of the contract total. Ability-to-pay relief is not applicable to the third tier water rate. The second tier may reflect partial Ability-to-pay relief, as it is equal to the average of the first and third tiers. The relief could be up to 100 percent of the capital cost repayment and is based upon local farm budgets. The Ability-to-Pay law and policy do not apply to CVP operation and maintenance costs, municipal or industrial water rates, CVP distribution facilities, or non-CVP water costs.

TABLE 2-4

COMPARISON OF CONTRACT PROVISIONS CONSIDERED IN ALTERNATIVES

Provision	No-Action Alternative	Alternative 1	Alternative 2
Explanatory Recitals	Assumes water rights held by CVP from the State Water Resources Control Board for use by water service contractors under CVP policies	Assumes CVP Water Right as being held in trust for project beneficiaries that may become the owners of the perpetual right	Same as No-Action Alternative
	Assumes that CVP is a significant part of the urban and agricultural water supply of users	Assumes that CVP is a significant, essential, and irreplaceable part of the urban and agricultural water supply of users	Same as No-Action Alternative
	Assumes increased use of water rights, need to meet water quality standards and fish protection measures, and other measures constrained use of CVP	Assumes that CVPIA impaired ability of CVP to deliver water	Same as No-Action Alternative
	Assumes the identification of measures to replace/increase CVP yield pursuant to CVPIA §3408(j)	Assumes implementation of yield increase projects per §3408(j) study	Same as No-Action Alternative
	Assumes that loss of water supply reliability would have impact on socioeconomic conditions and change land use	Assumes that loss of water supply reliability would have significant adverse socioeconomic and environmental impacts in CVP service area	Same as No-Action Alternative
Definitions			
Charges	Charges defined as payments required in addition to Rates	Assumes rewording of definition of Charges to exclude both Rates and Tiered Pricing Increments	Same as No-Action Alternative
Category 1 and Category 2	Tiered Pricing as in PEIS	Not included	Tiered Pricing for Categories 1 and 2
Contract Total	Contract Total described as Total Contract	Same as No-Action Alternative	Described as basis for Category 1 to calculate Tiered Pricing
Landholder	Landholder described in existing Reclamation Law	Assumes rewording to specifically define Landholder with respect to ownership, leases, and operations	Assumes rewording to specifically define Landholder with respect to ownership and leases
M&I water	Assumes rewording to provide 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	M&I water described for irrigation of land in units less than or equal to two acres	Same as No-Action Alternative

TABLE 2-4

COMPARISON OF CONTRACT PROVISIONS CONSIDERED IN ALTERNATIVES

Provision	No-Action Alternative	Alternative 1	Alternative 2
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	States that contract shall be renewed Includes conditions that are related to negotiations of the terms and costs associated with conversion to a 9(d) contract	Same as No-Action Alternative
Water to be made available and delivered to the contractor	Assumes water availability in accordance with existing conditions	Similar to No-Action Alternative	Actual water availability in a year is unaffected by Categories 1 and 2
	Assumes compliance with Biological Opinions and other environmental documents for contracting	Same as No-Action Alternative	Same as No-Action Alternative
	Assumes that current operating policies strive to minimize impacts to CVP water users	Assumes that CVP operations will be conducted in a manner to minimize shortages and studies to increase yield shall be completed with necessary authorizations	Same as No-Action Alternative
Time for delivery of water	Assumes methods for determining timing of deliveries as in existing contracts	Assumes minor changes related to timing of submittal of schedule	Same as No-Action Alternative
Point of diversion and responsibility for distribution of water	Assumes methods for determining point of diversion as in existing contracts	Assumes minor changes related to reporting	Same as No-Action Alternative
Measurement of water within district	Assumes measurement for each turnout or connection for facilities that are used to deliver CVP water as well as other water supplies	Assumes measurement at delivery points	Assumes similar actions in No-Action Alternative but applies to all water supplies
Rates and method of payment for water	Assumes Tiered Pricing is total water quantity; assumes advanced payment for rates for two months	Assumes Tiered Pricing is total water quantity; assumes advanced payment for rates for two months	Assumes Tiered Pricing is total water quantity; assumes advanced payment for rates for six months
Non-interest-bearing operation and maintenance deficits	Assumes language from existing contracts	Same as No-Action Alternative	Same as No-Action Alternative
Sales, transfers, or exchanges of water	Assumes continuation of transfers with the rate for transferred water being the higher of the seller's or purchaser's CVP cost-of-service rate	Assumes continuation of transfers with the rate for transferred water being the purchaser's CVP cost-of-service rate plus incremental fees	Same as No-Action Alternative
Application of payments and adjustments	Assumes payments will be applied as in existing contracts	Assumes minor changes associated with methods described for overpayment	Same as No-Action Alternative

TABLE 2-4

COMPARISON OF CONTRACT PROVISIONS CONSIDERED IN ALTERNATIVES

Provision	No-Action Alternative	Alternative 1	Alternative 2
Temporary reduction—return flows	Assumes that current operating policies strive to minimize impacts to CVP water users	Same as No-Action Alternative	Same as No-Action Alternative
Constraints on availability of project water	Assumes that current operating policies strive to minimize impacts to CVP water users	Assumes Contractors do not consent to future Congressional enactments which may impact water supply reliability	Same as No-Action Alternative
Unavoidable groundwater percolation	Assumes that some of applied CVP water will percolate to groundwater	Same as No-Action Alternative	Same as No-Action Alternative
Rules and regulations	Assumes that CVP will operate in accordance with then-existing rules	Assumes minor changes with right to not concur with future enactments retained by Contractors	Same as No-Action Alternative
Water and air pollution control	Assumes that CVP will operate in accordance with then-existing rules	Same as No-Action Alternative	Same as No-Action Alternative
Quality of water	Assumes that CVP will operate in accordance with existing rules without obligation to operate toward water quality goals	Same as No-Action Alternative	Same as No-Action Alternative
Water acquired by the contractor other than from the United States	Assumes that CVP will operate in accordance with existing rules	Assumes changes associated with payment following repayment of funds	Same as No-Action Alternative
Opinions and determinations	PEIS recognizes that CVP will operate in accordance with existing rules	Assumes minor changes with respect to references to the right to seek relief	Same as No-Action Alternative
Coordination and cooperation	Not included	Assumes that coordination and cooperation between CVP operations and users should be implemented and CVP users should participate in CVP operational decisions as a partnership	Not included
Charges for delinquent payments	Assumes that CVP will operate in accordance with existing rules	Same as No-Action Alternative	Same as No-Action Alternative
Equal opportunity	Assumes that CVP will operate in accordance with existing rules	Same as No-Action Alternative	Same as No-Action Alternative
General obligation	Assumes that CVP will operate in accordance with existing rules	Similar to No-Action Alternative	Same as No-Action Alternative
Compliance with civil rights laws and regulations	Assumes that CVP will operate in accordance with existing rules	Same as No-Action Alternative	Same as No-Action Alternative

TABLE 2-4

COMPARISON OF CONTRACT PROVISIONS CONSIDERED IN ALTERNATIVES

Provision	No-Action Alternative	Alternative 1	Alternative 2
Privacy act compliance	Assumes that CVP will operate in accordance with existing rules	Same as No-Action Alternative	Same as No-Action Alternative
Contractor to pay certain miscellaneous costs	Assumes that CVP will operate in accordance with existing rules	Similar to No-Action Alternative	Same as No-Action Alternative
Water conservation	Assumes compliance with conservation programs established by Reclamation and the State of California	Assumes conditions similar to No-Action Alternative with the ability to use State of California standards, which may or may not be identical to Reclamation's requirements	Same as No-Action Alternative
Existing or acquired water or water rights	Assumes that CVP will operate in accordance with existing rules	Same as No-Action Alternative	Same as No-Action Alternative
Operation and maintenance by non-federal entity	Assumes that CVP will operate in accordance with existing rules and no additional changes to operation responsibilities under this alternative	Assumes minor changes to language that would allow subsequent modification of operational responsibilities	Assumes minor changes to language that would allow subsequent modification of operational responsibilities
Contingent on appropriation or allotment of funds	Assumes that CVP will operate in accordance with existing rules	Assumes minor changes to language	Same as No-Action Alternative
Books, records, and reports	Assumes that CVP will operate in accordance with existing rules	Assumes changes for record keeping for both CVP operations and CVP users	Same as No-Action Alternative
Assignment limited	Assumes that CVP will operate in accordance with existing rules	Assumes changes to facilitate assignments	Same as No-Action Alternative
Severability	Assumes that CVP will operate in accordance with existing rules	Same as No-Action Alternative	Same as No-Action Alternative
Resolution of disputes	Not included	Assumes a Dispute Resolution Process	Not included
Officials not to benefit	Assumes that CVP will operate in accordance with existing rules	Same as No-Action Alternative	Same as No-Action Alternative
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.	Same as No-Action Alternative
Notices	Assumes that CVP will operate in accordance with existing rules	Same as No-Action Alternative	Same as No-Action Alternative
Confirmation of contract	Assumes Court confirmation of contract	Same as No-Action Alternative	Same as No-Action Alternative

Definition of Municipal and Industrial Users. The definition of M&I users was established in portions of a 1982 Reclamation policy memorandum. In addition to more traditional urban and industrial uses, the 1982 memorandum identified agricultural water as water served to tracts that can support $5,000 gross income for a commercial farm operation. The memorandum indicates that parcels greater than two acres can meet this criteria. However, Reclamation has generally applied a definition of five acres or less for M&I uses in the CVP for many years. This definition is used in the No Action Alternative. The CVP contractors can seek a modification from the Contraction Officer for a demonstrated need of agricultural use on parcels between two and five acres in size.

Water Measurement. The No Action Alternative includes water measurement at every turnout or connection to measure CVP water deliveries. It is assumed that if other sources are commingled with the CVP water, including groundwater or other surface waters, that the measurement devices would report gross water deliveries. Additional calculations would be required to determine the exact quantity of CVP water. However, if groundwater or other surface waters are delivered by other means to the users, the No Action Alternative did not include additional measurement devices except as required by individual users' water conservation plans.

Water Conservation. The water conservation assumptions in the No Action Alternative include water conservation actions for municipal and on-farm uses assumed in the DWR Bulletin 160-93; and conservation plans completed under the 1982 Reclamation Reform Act consistent with the criteria and requirements of the CVPIA. Such criteria address cost-effective Best Management Practices that are economical and appropriate, including measurement devices, pricing structures, demand management, public information; and financial incentives.

Alternative 1

Alternative 1 is based upon the proposal presented by CVP water service contractors to Reclamation in April 2000. There were several issues included in the April 2000 proposal that could not be included in Alternative 1 because they are not consistent with existing Federal or state requirements or would require a separate Federal action, as described below.

- The April 2000 proposal includes Terms and Conditions to provide a highly reliable water supply and provisions improve the water supply capabilities of the CVP facilities and operations to meet this goal - *These issues were not included in Alternative 1 because these issues would require additional Federal actions with separate environmental documentation and also limit the Secretary's obligation to achieve a reasonable balance among competing demands as required by the CVPIA. Currently Reclamation is completing the least cost plan to restore project yield in accordance with Section 3408(j) of CVPIA and under the CALFED program.*

- The April 2000 proposal includes language to require renewal of contracts after 25 years upon request of the contractor - *The study period for this EIS is 25 years for irrigation contracts and irrigation/M&I contracts and 40 years for M&I contracts. Renewal after 25 years for 25-year contracts would be a new Federal Action and would require new environmental documentation.*

- The April 2000 proposal did not include provisions for compliance with biological opinions - *Biological consultations are required by the Consultation and Coordination requirements established by Executive Order for all*

Reclamation activities. These are binding on Reclamation and provisions are needed to address this requirement.

- The April 2000 proposal included provisions for water transfers - *It is recognized that water transfers will continue and that the CVP long-term contracts will provide the mechanisms for the transfers. However, it would be difficult to identify all of the water transfer programs that could occur with CVP water in the next 25 years. Reclamation would continue with separate environmental documents for transfers, and will establish criteria for rapid technical and environmental review of proposed transfers.*

- The April 2000 proposal includes provisions for transfer of operations and maintenance requirements - *It is recognized that transfers of operation and maintenance to the group of contractors will continue and that the CVP long-term contracts will provide the mechanisms for such transfers. However, it would be difficult to identify all of the operation and maintenance transfer programs that could occur with CVP water in the next 25 years. Reclamation would require separate environmental documents for such transfers.*

- The April 2000 proposal includes provisions for resolution of disputes - *Assumptions for resolution of disputes were not included in Alternative 1 and at this time would not appear to affect environmental conditions.*

- The April 2000 proposal includes provisions for expansion of the CVP service areas by the existing CVP water contractors - *The study area for the long-term contract renewal process is defined by the existing service area boundaries. Expansion of the service area boundaries would be a new Federal Action and would require separate environmental documentation.*

The April 2000 proposal was similar to the No Action Alternative assumptions except for four issues (Tiered Water Pricing, Definition of Municipal Users, Water Measurement, and Water Conservation). These issues are described below for Alternative 1 and summarized in Table 2-3.

Alternative 1 includes the same water delivery and CVP system-wide operations assumptions as the No Action Alternative, as shown in Table 2-4.

Tiered Water Pricing. Tiered water pricing in Alternative 1 is the same as under the No Action Alternative.

Definition of Municipal and Industrial Users. The definition of Municipal and Industrial users in Alternative 1 is similar to the provisions under the No Action Alternative. However, Alternative 1 assumes that users with greater than two acres could be considered as Irrigation water service contractors.

Water Measurement. The definition of Water Measurement in Alternative 1 is similar to the provisions under the No Action Alternative. However, the measurement would occur at delivery locations to the agency not each turnout or connection.

Water Conservation. The definition of Water Conservation in Alternative 1 is similar to the provisions under the No Action Alternative. However, Alternative 1 assumes that actions completed in accordance

with water conservation programs for the State of California would be accepted by Reclamation to meet water conservation requirements.

Alternative 2

Alternative 2 is based upon the proposal presented by Reclamation to CVP water service contractors in November 1999. There were several provisions included in the November 1999 proposal that could not be included in Alternative 2. These provisions would constitute a separate Federal action, as described below.

- The November 1999 proposal includes provisions for the contractor to request approval from Reclamation of proposed water transfers - *Water transfers were not included in Alternative 2 because such actions cannot now be definitely described and essentially constitute a separate Federal action and require separate environmental documentation.*

- The November 1999 proposal includes provisions for transfer of operations and maintenance to third parties - *Transfer of operations and maintenance responsibility was not included in Alternative 2 because these actions would be a separate Federal action and require separate environmental documentation.*

The November 1999 proposal did include several provisions that were different than the assumptions for No Action Alternative and included in Alternative 2, as summarized below and in Table 2-3. The primary differences are related to tiered pricing and the definition of M&I users.

Alternative 2 includes the same water delivery and CVP system-wide operations assumptions as the No Action Alternative, as shown in Table 2-4.

Tiered Water Pricing. Tiered water pricing in Alternative 2 is based upon a definition of a "Category 1" and "Category 2" water supplies. "Category 1" is defined as the quantity of CVP water that is reasonably likely to be available for delivery to a contractor and is calculated on an annual basis as the average quantity of delivered water during the most recent five year period. For the purpose of this Alternative, the "Category 1" water supply is defined as the "contract total." "Category 2" is defined as that additional quantity of CVP water in excess of Category 1 water that may be delivered to a contractor in some years. Under Alternative 2, the first 80 percent of Category 1 volume would be priced at the applicable Contract Rate for the CVP. The next 10 percent of the Category 1 volume would be priced at a rate equal to the average between the Contract Rate and Full Cost Rate as defined by Reclamation law and policy. The final 10 percent of the Category 1 volume would be priced at the Full Cost Rate as defined by the CVPIA. All Category 2 water, when available, would be priced at Full Cost Rate. It should be noted that Category 1 and Category 2 volumes would change every year based upon the average deliveries for the "most recent five years," with limited exception, based upon the findings of the water needs assessment. Alternative 2 assumes the sum of Category 1 and Category 2 water is equal to the maximum quantity included in the contractor's existing water service contract. The terms "Contract Rate" and "Full Cost Rate" are discussed under Tiered Pricing for the No Action Alternative. The same Ability-to-Pay adjustments would be applicable to the Restoration Payments and tiered water rates as described in the No Action Alternative.

Definition of Municipal and Industrial Users. The definition of Municipal and Industrial users in Alternative 2 is the same as under the No Action Alternative.

Water Measurement. The definition of Water Measurement in Alternative 2 is the same as under the No Action Alternative.

Water Conservation. The definition of Water Conservation in Alternative 2 is the same as under the No Action Alternative.

ALTERNATIVES CONSIDERED BUT ELIMINATED

An alternative including reduction of contract amounts was proposed during the scoping process, but rejected from detailed analysis. The reason for eliminating this alternative was twofold. Water needs analyses have been completed for all contracts and in almost all cases the needs exceed or equal the current total contract amount. Secondly, in order to implement good water management, the contractors need to be able to store or immediately use water available in wetter years when more water is available. By quantifying contract amounts in terms of the needs analyses and the CVP delivery capability, the contractors can make their own economic decisions. Allowing the contractors to retain the full water quantity gives the contractors assurance that the water would be available to them to justify making investments in storage facilities. In addition, reduction in contract quantities is not necessary to meet the objevtives of CVPIA. The CVPIA, in and of itself, achieves a balance between environmental goals and water supply objectives, in part through its dedication of significant amounts of CVP water, as well as actions to acquire water for environmental purposes.

SELECTION OF THE PREFERRED ALTERNATIVE

It is anticipated that the final contract language and the long-term contract renewal Preferred Alternative will represent a negotiated position between the alternatives. Therefore, it is anticipated that the impacts will be either equal to or less than those identified for Alternatives 1, 2, or No Action Alternative.

SUMMARY OF IMPACT ASSESSMENT

The alternatives considered in this EIS were analyzed to determine the potential for adverse and beneficial impacts associated with their implementation as compared to continuation of the No Action Alternative conditions. The results of this analysis are summarized in Table 2-5 and presented in Chapter 4 of this EIS.

TABLE 2-5
IMPACT ASSESSMENT RESULTS

	No Action Alternative	Alternative 1	Alternative 2
Surface Water Resources, Quality, and Facilities	CVP operations would be similar to future conditions described in the American River Pump Station EIR/EIS Flows in American River and storage volumes in Folsom Lake are provided to support steelhead in accordance with recent biological opinions	Same as No Action Alternative	If CVP water users continue to use CVP water, conditions will be the same as No Action Alternative Because CVP water costs would be higher than under the No Action Alternative, CVP water users may determine that CVP water is too expensive and use less CVP water. Then, surface water conditions may change, however, it is difficult to project the extent of this change based upon the determination by individual users concerning water costs.
Groundwater Resources and Groundwater Quality	The CVP water supplies would continue to be used and groundwater conjunctive use programs would be implemented	Same as No Action Alternative	Conditions under this alternative would be identical to those under the No Action Alternative if CVP water users continue to use CVP water as in the No Action Alternative. If CVP water users determine that CVP water is too expensive, groundwater use may increase as CVP surface water use decreases.
Land Use, Demographics, and Sociological Resources	Growth would continue in Sacramento, Placer, El Dorado, Contra Costa, and Alameda counties, as described in the county general plans and associated environmental documentation.	Same as No Action Alternative	Same as No Action Alternative

TABLE 2-5
IMPACT ASSESSMENT RESULTS

	No Action Alternative	Alternative 1	Alternative 2
Central Valley Project Water Supply Costs, Agricultural Economics, and Regional Economics	CVP water supply costs for this alternative were based upon the Tiered Water Pricing concept in the CVPIA PEIS Preferred Alternative.	Same as No Action Alternative	Higher CVP water costs would have adverse impacts on users unless the CVP water supplies were replaced by less expensive water supplies.
Fishery and Wildlife Resources	Growth would continue in American River Division service area, as described in the county general plans and associated environmental documentation. The general plans include protection measures for biological resources.	Same as No Action Alternative	Same as No Action Alternative
Recreation	Recreational opportunities would continue as described in the county general plans and associated environmental documentation and CVP water service contractor plans	Same as No Action Alternative	Same as No Action Alternative
Cultural Resources	Sacramento, Placer, El Dorado, Contra Costa, and Alameda counties are responsible for protection of cultural and historical resources under the current land use plans, as described in the county general plans and associated environmental documentation. The general plans have protection measures for cultural and historic resources.	Same as No Action Alternative	Same as No Action Alternative
Indian Trust Assets	The American River Division does not include Indian Trust Assets that rely upon CVP water.	Same as No Action Alternative	Same as No Action Alternative

TABLE 2-5
IMPACT ASSESSMENT RESULTS

	No Action Alternative	Alternative 1	Alternative 2
Air Quality	Growth would continue in Sacramento, Placer, El Dorado, Contra Costa, and Alameda counties, as described in the county general plans and associated environmental documentation. The general plans include air quality improvement and protection measures.	Same as No Action Alternative	Same as No Action Alternative
Soils	Sacramento, Placer, El Dorado, Contra Costa, and Alameda counties have adopted land use plans and erosion control plans to protect soil resources in the general plans.	Same as No Action Alternative	Same as No Action Alternative
Visual Resources	Visual resources would continue to change in the No Action Alternative as growth continues in Sacramento, Placer, El Dorado, Contra Costa, and Alameda counties. The general plans include protection measures for visual resources.	Same as No Action Alternative	Same as No Action Alternative
Environmental Justice	The economies of Sacramento, Placer, El Dorado, Contra Costa, and Alameda counties are extremely vibrant and growing. It is assumed that the high employment and the high cost of living would continue into the future.	Same as No Action Alternative	If the higher cost of CVP water results in loss of existing or future jobs, the impact would probably affect the less educated, low income workers who would not be able to easily find replacement jobs
Secondary Growth Impacts	Growth would continue in Sacramento, Placer, El Dorado, Contra Costa, and Alameda counties, as described in the county general plans and associated environmental documentation.	Same as No Action Alternative	Same as No Action Alternative

CHAPTER 3
SUMMARY OF PREVIOUS ENVIRONMENTAL DOCUMENTATION

CHAPTER 3
Summary of Previous Environmental Documentation

INTRODUCTION

The purpose of this chapter is to summarize the results of the NEPA and CEQA documents recently completed or being prepared that address delivery and use of CVP water within the American River Division. These documents include the PEIS for the CVPIA and the associated Biological Opinion; EIS/EIR for Central Valley Project Water Supply Contracts under Public Law 101-514 (Section 206); EIR/EIS for East Bay Municipal Utility District Supplemental Water Supply Project; Environmental Impact Reports for the City of Folsom General Plan, City of Roseville General Plan, Sacramento County General Plan, Placer County General Plan, EIR for the El Dorado County General Plan; EIR for the Water Forum Proposal; EIR/Environmental Assessment for a Warren Act Contract between Roseville and Reclamation; and EIR/EIS for a pump station project between Placer County Water Agency and Reclamation.

It should be recognized that under each of the descriptions presented in this chapter, references to "No-Action Alternative" and other alternatives are specific to the reference documents not to the alternatives described in the remaining chapters of this EIS.

It also shoul be recognized that these summaries represent information presented in the referenced reports at the time of publication of each report. Some of the information, including locations of proposed facilities and numerical values have changed since that time. However, these summaries are primarily presented to indicate the range of alternatives considered and types of mitigation measures adopted to minimize impacts of proposed actions that can be related to use of CVP water in the American River Division.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

The CVPIA amended 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. Pursuant to CVPIA, Interior is developing policies and programs to improve environmental conditions that were affected by operations, management, and physical facilities of the CVP. The CVPIA also includes tools to facilitate larger efforts in California to improve environmental conditions in the Central Valley and the San Francisco Bay-Delta system. The PEIS addressed potential impacts and benefits implementing provisions of the CVPIA. The PEIS was prepared by Reclamation and the U.S. Fish and Wildlife Service (Service).

The analysis in the PEIS was intended to disclose the probable region-wide effects of implementing the CVPIA and provide a basis for selecting a decision among the alternatives. The PEIS was developed to allow subsequent environmental documents to incorporate PEIS analysis by reference and limit the need to re-evaluate the region-wide and cumulative impacts of CVPIA. In some cases, worst-case assumptions were used to maximize the utility of the analysis for tiering within the scope of the impacts analyzed in the PEIS.

As the project-specific actions are considered, the lead agencies must determine if the specific impacts were adequately analyzed in the PEIS. If the actions under consideration were previously evaluated and the impacts of such actions would not be greater than those analyzed in the PEIS or would not require additional mitigation measures, the actions could be considered part of the overall program approved in

the PEIS Record of Decision (ROD). In such a case, an administrative decision could be made that no further environmental documentation would be necessary. If a tiered document is appropriate, the tiered document may be an EIS or an EA. The tiered documents can use the PEIS by reference to avoid duplication and focus more narrowly on the new alternatives or more detailed site-specific effects. Therefore, only changes from the alternatives considered in the PEIS would be addressed in detail in the tiered documents.

Localized Impacts of PEIS on Preferred Alternative

The primary impact to CVP water service contractors, as described in the PEIS, is not due to contract provisions, but rather to the implementation of CVPIA. The re-allocation of CVP water to fish and wildlife purposes under CVPIA reduced average annual CVP water deliveries to water service contractors from 2,270,000 acre-feet/year under the PEIS No-Action Alternative to 1,933,000 acre-feet/year under all of the PEIS alternatives, including the PEIS Preferred Alternative. The impacts in the American River Division are summarized below.

- Average Annual CVP Water Deliveries for Agricultural water service contractors located in the American River Division decreased 22 percent from pre-CVPIA Affected Environment conditions.

- Average Annual CVP Water Deliveries for Municipal water service contractors located American River Division decreased four percent from pre-CVPIA Affected Environment conditions.

There was no change in deliveries to water rights holders, Sacramento River Settlement Contractors, or Delta Mendota Exchange Contractors under CVPIA implementation.

ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT FOR CENTRAL VALLEY PROJECT WATER SUPPLY CONTRACTS UNDER PUBLIC LAW 101-514 (SECTION 206)

The 1998 "Central Valley Project Water Supply Contracts Under Public Law 101-514 (Section 206): Contract Between the U.S. Bureau of Reclamation and the Sacramento County Water Agency, Subcontract between Sacramento County Water Agency and Folsom, and Contract Between the U.S. Bureau of Reclamation and the San Juan Water District Environmental Impact Statement/Environmental Impact Report" addressed the following proposed actions to implement portions of Public Law 101-514.

- Reclamation entering into water service contracts with the Sacramento County Water Agency and the San Juan Water District

- Sacramento County Water Agency and Folsom entering into a subcontract for the use of 7,000 acre-feet of water within the City of Folsom.

- The State Water Resources Control Board (SWRCB) amending Reclamation's water rights permit to expand the place of use within Sacramento County, add points of diversion on the American and Sacramento rivers, and allow Reclamation installing and operating a temperature control device on the water supply intake at Folsom Dam

Sacramento County Water Agency, in conjunction with Folsom, and San Juan Water District have negotiated with Reclamation to secure water supply contracts from the American River Division of the

Central Valley Project. The contracts have been authorized and directed by the U.S. Congress as part of Public Law 101-514. Section 206(b)(1) of Public Law 101-514 directs the U.S. Secretary of Interior to enter into long-term M&I water supply contracts to meet immediate water needs of Sacramento County. The law directs the Secretary to enter into contracts for up to 22,000 acre-feet annually with Sacramento County Water Agency and 13,000 acre-feet annually with San Juan Water District. These contracts are intended as the first phase of a contracting program to meet the long-term water supply needs of Sacramento County. From its allocation, Sacramento County Water Agency intends to deliver up to 7,000 acre-feet annually to Folsom.

The EIS/EIR addressed the environmental effects of diverting and delivering contract water from Folsom Lake from the confluence of the American River and Sacramento River, and from the Sacramento River at Freeport. The EIS/EIR evaluated impacts to American River fisheries, endangered species, CVP water and power customers, and biological resources in the service areas.

The purpose of the proposed actions(s) was to provide reliable M&I water supplies for the local agencies through CVP water supply contracts to Sacramento County Water Agency and San Juan Water District.

Current users of water within Zone 40 depend on groundwater that is in an overdraft condition. In addition, water demand projections indicate that additional water will be required to supplement the current groundwater supply. The CVP water service contract will provide supplemental water supply to reduce groundwater depletion and facilitate a conjunctive use program.

The City of Folsom water supplies also were not sufficient to serve up to 10,000 acre-feet/year to the new East Area. The additional supply under Public Law 101-514 was to be used specifically within the East Area.

Availability of current San Juan Water District CVP contracts and water rights for surface waters from Folsom Lake can vary from 35,800 acre-feet to 44,200 acre-feet/year depending upon hydrology. The uncertainty about availability of water supplies means that unmet water needs can vary from zero in some years to more than 6,000 acre-feet in other years. The new CVP contract would improve water supply reliability in this area that does not have useable groundwater resources.

The EIS/EIR stated that impacts on fisheries and aquatic habitat were determined to not occur or be less than significant, except for identified significant impacts on the Lower American River from altering habitat suitability and alterations to Nimbus hatchery operations. Specifically, there would be adverse impacts to steelhead from increased Lower American River water temperatures during the summer and early fall months. Mitigation for these two impacts consisted of the development and use of improved methods for managing the coldwater pool in Folsom Lake.

For terrestrial habitats and wildlife and water supply and hydrology, environmental impacts were determined to be less than significant or to not occur. For recreation, aesthetics/visual resources, flood control, water quality, cultural resources, urban development, agricultural/prime and unique farmlands, air quality, and noise, no significant impacts were identified. Potential impacts (1) from a reduction in available CVP energy and (2) on the potential to increase average annual pumping requirements and costs were determined to be significant, with no recommended mitigation. These two impacts were determined to be significant unavoidable adverse impacts.

Potentially significant cumulative impacts were determined to occur to: (1) CVP and State Water Project (SWP) water supply deliveries; (2) lower Sacramento River, upper Sacramento River, Shasta and Trinity reservoir, and Delta fisheries, and warmwater fisheries in Folsom Reservoir; (3) riparian resources in Folsom Reservoir, lower American and Sacramento rivers; (4) recreational resources and activities in

Folsom Reservoir, lower American, and Sacramento rivers; (5) aesthetic quality in all CVP waterbodies; and (6) cultural resources in Folsom Reservoir. Basin-wide efforts such as CALFED, CVPIA implementation, specific watershed efforts, and actions resulting from the ESA consultations for the P.L. 101-514 water supply contracts are expected to reduce these cumulative effects.

Sacramento County Water Agency, San Juan Water District, Folsom, and Reclamation, participated in consultations with the Service and National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) on the proposed water service contracts in Sacramento County authorized under P.L. 101-514 in accordance with Section 7 of the Endangered Species Act of 1973 (as amended). These consultations resulted in a final Biological Opinion from NOAA Fisheries and a Biological Opinion from the Service which conclude that delivery of water under the proposed contracts is not likely to adversely affect or jeopardize the continued existence of the various threatened or endangered species within the areas and waterbodies that could be affected. The Service Biological Opinion included a list of measures to be implemented by Reclamation, the County of Sacramento, Sacramento County Water Agency, and Folsom.

ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT FOR EAST BAY MUNICIPAL UTILITY DISTRICT SUPPLEMENTAL WATER SUPPLY PROJECT

Following completion of the 1970 contract between Reclamation and East Bay Municipal Utility District, Environmental Defense and Sacramento County legally challenged the delivery of the CVP water from the Folsom South Canal as "unreasonable" use of American River water in 1972. In 1988, the SWRCB adopted findings that the CVP contract for East Bay Municipal Utility District is a reasonable use of American River water. In 1990, Alameda County Superior Court Judge Hodge affirmed the contractual rights subject to a set of specific conditions known as "Hodge Decision."

East Bay Municipal Utility District proposed the Supplemental Water Supply Project to identify the methods to allow delivery of the CVP water under the Hodge Decision. The CVP water would be used to reduce existing and future deficiencies during drought conditions and to provide an alternative water supply if an emergency outage occurs on the Mokelumne River supply facilities used by East Bay Municipal Utility District, as described in Chapter 4.

The EIR/EIS evaluated the following range of alternatives.

- Alternative 1: No Action Alternative without use of the CVP contract
- Alternative 2: Diversion of water from the American River into the Folsom South Canal under the Hodge Decision and construction of a pipeline from the Folsom South Canal to the existing East Bay Municipal Utility District Mokelumne Aqueducts. This project also included a water treatment plant to treat the American River water prior to diversion into the Mokelumne Aqueducts because the American River water would require more stringent treatment than the Mokelumne River water used by East Bay Municipal Utility District.
- Alternative 3: Diversion of water from the Lower American River near the confluence with the Sacramento River as a shared project with City of Sacramento and County of Sacramento. This alternative would include a joint pipeline to convey water to treatment plant(s) for the City and County, an East Bay Municipal Utility District-only pipeline to convey water to an East Bay Municipal Utility District treatment plant near the Folsom

South Canal, and a pipeline to convey water from the treatment plant to the Mokelumne Aqueducts.

- Alternative 4: Diversion of water from the Lower American River near the confluence with the Sacramento River as an East Bay Municipal Utility District project only. This alternative would include a pipeline to convey water to an East Bay Municipal Utility District treatment plant near the Folsom South Canal, and a pipeline to convey water from the treatment plant to the Mokelumne Aqueducts.

- Alternative 5: Diversion of water from the Sacramento River near the confluence with the American River as a shared project with City of Sacramento and County of Sacramento. This alternative would include a joint pipeline to convey water to treatment plant(s) for the City and County, an East Bay Municipal Utility District-only pipeline to convey water to an East Bay Municipal Utility District treatment plant near the Folsom South Canal, and a pipeline to convey water from the treatment plant to the Mokelumne Aqueducts. These conditions are similar to alternatives considered in the Water Forum Proposal EIR.

- Alternative 6: Diversion of water from the Sacramento River near the confluence with the American River as an East Bay Municipal Utility District project only. This alternative would include a pipeline to convey water to an East Bay Municipal Utility District treatment plant near the Folsom South Canal, and a pipeline to convey water from the treatment plant to the Mokelumne Aqueducts.

- Alternative 7: Diversion of water from the Sacramento River near the confluence with the American River as an East Bay Municipal Utility District project only. This alternative would include a pipeline to convey water to the Mokelumne Aqueducts and an East Bay Municipal Utility District treatment plant to treat water from the Mokelumne Aqueducts.

- Alternative 8: Diversion of water from the Delta on Indian Slough near Bixler. This alternative would include an East Bay Municipal Utility District treatment plant near the Delta diversion, and a pipeline to convey water from the treatment plant to the Mokelumne Aqueducts. Due to the salinity of the Delta water as compared to American River or Sacramento River water, this treatment plant would probably include a desalination process and a brine discharge pipeline to Suisun Bay.

The recommended federal action considered under the EIR/EIS amended the 1970 East Bay Municipal Utility District contract but did not provide for construction of facilities or diversion of CVP water. The CVP contract amendments added provisions for delivery from Lower American River or Sacramento River under certain conditions, as described above in "Alternative 4" or "Alternative 6".

Additional environmental documentation will be required for NEPA and Endangered Species Act compliance. The CVP contract amendment considered in the EIR/EIS without construction of facilities was determined to not likely to adversely affect any listed species under the jurisdiction of the Secretary of the Interior. Both NOAA Fisheries and the Service concurred in this determination.

The environmental commitments of the recommended federal action stated that any new diversion facility would include a fish exclusionary system and would be designed to meet California Department of Fish and Game, NOAA Fisheries, and the Service criteria. Such a facility would incorporate applicable mitigation measures. The environmental commitments also include requirements if Alternative 4 is

implemented to assure specific diversion rates and flow schedules that maintain appropriate in-stream flow conditions for the Lower American River and compliance with the California Wild and Scenic Rivers Act for any delivery facility constructed in the Lower American River. If Alternative 6 is implemented, the environmental commitments include a requirement to encourage regional water management partnerships.

Amendatory Central Valley Project Contract

The findings of the EIR/EIS were used in the development of the amendatory CVP contract for East Bay Municipal Utility District. The contract provides for East Bay Municipal Utility District to take deliveries near Freeport on the Sacramento River (Alternative 6), in dry years only, or on the Lower American River (Alternative 4) if the Contracting Officer finds that East Bay Municipal Utility District has developed an acceptable water storage component to be incorporated into the project. The amendatory contract would be applicable until 2012.

Under Alternative 6, East Bay Municipal Utility District would be allowed to take delivery of up to a total of 133,000 acre-feet of CVP water at Freeport on the Sacramento River for M&I purposes in dry years in which East Bay Municipal Utility District's March 1 forecast of the October 1 Total East Bay Municipal Utility District System Storage (as revised monthly through May 1) is less than 500,000 acre-feet based on a 50 percent exceedance, or the exceedance used by East Bay Municipal Utility District to declare rationing within the East Bay Municipal Utility District service area, or as otherwise agreed to by East Bay Municipal Utility District and Reclamation. The delivered water cannot exceed a total of 165,000 acre-feet in any three consecutive years that the Total East Bay Municipal Utility District System Storage remains below 500,000 acre-feet.

Under Alternative 4, East Bay Municipal Utility District would be allowed to take delivery of up to a total of 150,000 acre-feet on the Lower American River for M&I purposes in any year type if East Bay Municipal Utility District implements a water storage strategy to meet project purposes within the necessary flow pattern limitations, comply with all relevant state and federal laws and regulations including but not limited to the California Wild and Scenic Rivers Act, and complete appropriate environmental documentation. The diversion would be equal to or less than 155 cubic feet/second, and would comply with the Hodge Decision.

The amendatory contract prohibits deliveries of water diverted from Nimbus Dam as currently provided by the existing 1970 contract. However, if permitting and necessary agreements for another point of diversion are not completed by July 31, 2002, or as otherwise mutually agreed, East Bay Municipal Utility District will have the right to deliveries of up to 150,000 acre-feet/year as provided for in the 1970 contract.

ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT FOR FREEPORT REGIONAL WATER PROJECT

Reclamation and Freeport Regional Water Authority, a joint power agency of East Bay Municipal Utility District and Sacramento County Water Agency, prepared an EIR/EIS to evaluate the construction and operation of a water supply project as considered in Alternative 6 of the EIR/EIS completed for the Amendatory Contract with East Bay Municipal Utility District.

This EIR/EIS considered the following five alternatives in addition to the No Action Alternative.

- Alternative 1 was the No Action Alternative. Under this alternative, East Bay Municipal

Utility District would not divert water at Freeport on the Sacramento River or enlarge Pardee Reservoir, and would need to consider previously identified alternatives for delivery on the American River. Zone 40 would divert water through the City of Sacramento water diversion and treatment facilities on the American or Sacramento rivers.

- Alternative 2 provides facilities at Freeport for diversion of water for East Bay Municipal Utility District and Extended Zone 40 of Sacramento County Water Agency. The facilities would include an intake and pumping plant at Freeport; pipeline, reservoir, and water treatment plant to serve Extended Zone 40 of Sacramento County Water Agency; facilities to convey water to the Folsom South Canal; and settling basins, pretreatment facilities, pipelines, and pump stations to convey water from the Folsom South Canal to the East Bay Municipal Utility District Mokelumne Aqueducts.

- Alternatives 3, 4, and 5 are similar to Alternative 2 with different conveyance routes.

- Alternative 6 provides that Sacramento County Water Agency would use facilities similar to those in Alternative 2 to serve Zone 40 and East Bay Municipal Utility District would enlarge Pardee Reservoir that is currently used by East Bay Municipal Utility District to store water on the Mokelumne River.

Actions under Alternatives 2 through 6 also included the assignment of 30,000 acre-feet/year of water under the Sacramento Municipal Utility District CVP water service contract to Sacramento County Water Agency. The impact assessment included results from the Sacramento Municipal Utility District-Sacramento County Water Agency Water Assignment EIR (described below in this chapter).

The Preferred Alternative was Alternative 5 which included a 185 million gallons/day capacity intake and pump station at Freeport on the Sacramento River, reservoir and water treatment plant to serve Zone 40, a terminal facility at the Folsom South Canal and canal pumping station, settling basins, aqueduct pumping plant and pretreatment facility, and four pipelines to convey water from the intake facility to the Zone 40 water treatment plant and to the Mokelumne Aqueducts.

The environmental commitments were included to reduce construction impacts by minimizing the area of disruption, avoid/protect sensitive habitats near the construction locations, reestablish pre-construction conditions including revegetation to allow natural colonization of plant species, providing compensation actions for unavoidable impacts on jurisdictional waters, implementing construction management plan to reduce air emissions, providing public notification and noise shielding/attenuation, minimizing nighttime construction, reducing visual intrusion using appropriate architecture and vegetative buffers, and preparing cultural resources plan.

This environmental document also evaluated the assignment of CVP water service contract water from Sacramento Municipal Utility District to Sacramento County Water Agency.

The Freeport Regional Water Authority certified the Final Environmental Impact Report in April 2004.

ENVIRONMENTAL IMPACT REPORT FOR SACRAMENTO COUNTY GENERAL PLAN

The 1991 Sacramento County General Plan Update EIR evaluated a range of alternatives, which consisted of several geographic alternatives for new growth in the County, an alternative set of policies for the Plan,

a mitigated alternative, and the No Project Alternative. The EIR on the General Plan Update was not certified. A Subsequent EIR for the Sacramento County General Plan Update was completed in 1993. It evaluated the environmental impacts of implementation of two additional alternatives that were not studied previously. The two alternatives that were evaluated in the Subsequent EIR were the "December 9" Alternative and the Environmentally Constrained Alternative. The December 9 Alternative evaluated a population of 1,072,131, and the Environmentally Constrained Alternative evaluated a population of 826,998. The 1991 General Plan Update evaluated a population of 910,043.

The General Plan indicates that urban communities will accommodate the great majority of the new development projected for the unincorporated area. Near-term urban development will be accommodated through build-out of planned communities because urban infrastructure and services presently exist. The General Plan also designates new urban growth areas because infill development cannot accommodate all the development projected to occur during the planning period. Rural communities will accommodate minimal growth because open space, natural resources, and agricultural values need to be conserved and protected. The County intends to accommodate rural residential demand within existing rural communities and limited expansion of adjoining lands.

The General Plan includes the following policies that are relevant to this EIS.

- The County shall give priority to residential development on vacant or underutilized sites within existing urban areas which have infrastructure capacity available.
- The County shall maintain an Urban Service Boundary that defines the long-range plans (beyond twenty years) for urbanization and extension of public infrastructure and services, and defines important areas for protecting as open space and agriculture.
- County departments shall coordinate implementation of electric service delivery, air quality, water supply, transportation, drainage/flood control, solid waste disposal/recycling, and hazardous waste management plans in conjunction with vested public and quasi-public agencies.
- The County shall not expand the Urban Service Boundary unless certain circumstances are met, including (1) the proposal calling for such expansion can satisfy the requirements of a master water plan as contained in the Conservation Element, and (2) the area of expansion does not include the development of important natural resource areas, aquifer recharge lands, or prime agricultural lands.
- Initiate intergovernmental agreements with state and federal wildlife management authorities in order to mitigate loss of prime farmland or land with intensive agricultural investment due to natural habitat conversion.
- The County shall actively encourage water conservation by both agricultural and urban water users.
- Long-range plans for accommodating population and economic growth shall not be based on the assumption of additional supplies from future storage facilities on the Sacramento, American, or Cosumnes River unless the projects are approved and funding secured.

The General Plan includes the following objectives or goals that are relevant to this EIS.

- Efficient build-out of existing Agricultural-Residential areas within the urban services boundary to meet rural residential demand without contaminating or overdrafting groundwater aquifers.

- Limited agricultural-residential land use expansion outside the urban services boundary, which does not compromise objectives for protecting prime agricultural lands and open space, and avoids groundwater overdraft and contamination.

- Conjunctive use of surface and ground water to provide long-term water supply for Sacramento residents while maintaining river flows and reservoir levels which protect environmental resources and provide substantial recreational benefits.

- Adequate guaranteed long-term surface water supply to meet future needs within the unincorporated area.

- Full utilization of Sacramento City's water rights to the American and Sacramento rivers to meet urban growth needs.

- Adequate water flows to protect riparian, fisheries, and recreation values in the American River.

- Groundwater overdraft eliminated by the year 2000 and a balanced groundwater table thereafter.

- Healthy, well-managed marsh and riparian woodlands along Sacramento County's waterways.

- Riparian and wetland environments managed with sensitivity to threatened species and maintained to the extent feasible in a manner that avoids conflicts with privately owned land and agricultural operations.

- Fisheries in County waterways and water bodies preserved and protected.

- Water flows monitored and maintained, when climatic conditions allow, to promote fish propagation and migration.

- Promote the inventory, protection, and interpretation of the cultural heritage of Sacramento County, including historical and archaeological settings, sites, buildings, features, and/or areas of ethnic historical, religious or socio-economical importance.

- Water facilities developed in an environmentally sound, economically efficient, and financially equitable manner.

- Water treatment and distribution facilities located to minimize environmental impact and maximize distribution efficiency with respect to point of withdrawal and area to be served.

The General Plan Subsequent EIR determined that the following potentially significant or significant adverse impacts would result: impacts of patterns of development, the viability of continuing agriculture in the County, loss of open space, effects on fire services, effects on groundwater overdraft, increase in

solid waste generation, loss of biological resources and wetlands, fragmentation of natural habitats in agricultural and grazing lands, increased risk of flooding, effects on groundwater quality, asbestos emissions, impacts on cultural resources, and increase in light and glare. As a mitigation measure for biological resources, the County initiated a Habitat Conservation Plan.

Specifically with respect to water supplies, concerns were identified in the Subsequent EIR related to impacts on groundwater. To mitigate the potential for groundwater overdraft, the following mitigation were identified to reduce impacts to a less-than-significant level.

- Population and economic activities shall be planned to grow at a rate which will not exceed the capacity of dependable water supplies, in conjunction with safe groundwater yield.

- Utilize up-to-date information on long-term water demand in relationship to available water supply in developing conjunctive use plans and in considering General Plan amendments to expand the urban area.

- Development entitlements shall not be approved in areas where no surface water is available or planned and where there is uncertainty over the adequacy of long-term sustained yield from groundwater wells.

- New rural development shall be required to demonstrate adequate quantity and quality of groundwater prior to approval of residential lots in areas of the County where supply and quality are doubtful.

- All individual wells found to be unsuitable for domestic use shall be sealed according to State standards and inspected by the Environmental Health Department, unless mitigation measures can be found to make water potable and not adversely affect underlying groundwater quality on neighboring parcels.

- Areas selected for urban expansion shall be served from a surface water supply by a public water agency.

- The County shall not approve development in Agricultural-residential areas that are subject to groundwater overdraft.

The following mitigation measures were identified for other issues of concerns.

- The County shall coordinate with the cities and involve other jurisdictions outside of the County in matters of air quality, transportation, water supply, and drainage/flood control.

- The County shall work with the City of Sacramento in obtaining a supply of surface water to serve the unincorporated County.

- Uses in the Industrial Intensive designation will be provided with urban services such as public water and sewer. Uses in the Industrial Extensive designation will not be provided with urban services such as public water and sewer.

The EIR further indicated that no mitigation measures were available beyond the policies and programs in the General Plan that would reduce the following impacts to a less-than-significant level: cumulative loss

of open space and habitat, traffic, air quality, and cultural resources. These impacts were considered to be significant and unavoidable. The Environmentally Constrained Alternative was considered to be the environmentally superior alternative and selected alternative.

DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE 2002 ZONE 40 WATER SUPPLY MASTER PLAN

Zone 40 of Sacramento County Water Agency includes 86,000 acres of agricultural, residential, and industrial land in areas within and around Elk Grove and Rancho Cordova. The 2002 Water Supply Master Plan defined the available and needed water facilities to implement a conjuctive use program using groundwater and surface water from the Freeport Regional Water Project. The EIR served as a programmatic EIR to implement the master plan. The proposed facilities in the master plan include the Freeport Regional Water Project including the diversion of CVP water from the Sacramento River near Freeport, conveyance to and from a new water treatment plant, and increased water recycling.

The EIR acknowledged that the proposed master plan would provide water for growth that was planned by Sacramento County and the cities of Elk Grove and Rancho Cordova, and that these agencies had adopted general plans with measures to mitigate primary and secondary impacts of growth. The EIR identified impacts associated with construction and implementation of the master plan. Mitigation measures for all but five impacts were included to reduce impacts to a level of less than significant. Three of the remaining impacts that could not be avoided are related to loss of habitat, farmland, and visual resources, due to the growth-inducing impacts of providing water in areas that had no other options for water supply. Because Sacramento County Water Agency does not have the authority to regulate land use decisions and implement mitigation measures for land use impacts associated with growth, the EIR refers to the mitigation efforts identified by Sacramento County and the cities of Elk Grove and Rancho Cordova in general plan EIRs. There were also two unavoidable impacts associated with short-term construction emissions and noise from construction equipment due to the uncertainty of the ability of contractors to meet emission and noise thresholds. Additional site-specific impacts to habitat and land use associated with construction are considered to be possibly unavoidable. This document is still in draft form and may be modified in the final EIR.

ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT FOR AMERICAN RIVER PUMP STATION PROJECT FOR PLACER COUNTY WATER AGENCY

Placer County Water Agency holds water rights on the Middle Fork American River, the Rubicon River and some tributaries for irrigation, domestic and commercial purposes, and for the generation of electrical energy. Water under these water rights are conserved and controlled by the multi-purpose Middle Fork Project (MFP). Placer County Water Agency also has a water supply contract with the Pacific Gas & Electric Company (PG&E) for deliveries from PG&E's Drum-Spaulding Project on the upper Yuba River Basin, augmented by Bowman Lake and Lake Spaulding on the south Yuba River and Rollins Reservoir on the Bear River. Total annual supply from these two sources is 220,400 acre-feet. The Placer County Water Agency-PG&E Water Supply Contracts provides for a maximum annual supply of 100,400 acre-feet and the assumed annual yield from the MFP is 120,000 acre-feet.

Placer County Water Agency entered into a CVP water service contract with the Federal government in 1970 in anticipation of the construction of Auburn Dam. The original contract entitlement was for up to 117,000 acre-feet/year of CVP water delivered at Auburn Dam or other mutually agreed location(s). Construction began in 1967 and was suspended in 1977 due to seismic concerns. Reclamation and Placer

County Water Agency completed an EIS/EIR and subsequently entered into an Amendatory Contract that stipulates a change in the authorized diversion point to Folsom Dam or other mutually agreed location(s), and limited the total contract amount to 35,000 acre feet for irrigation and/or M&I supplies until the completion of the contract period or upon the completion of the Auburn Dam, should it be built.

The water supplies from the Placer County Water Agency-PG&E Water Supply Contracts have been fully exercised and depend wholly on the operations of PG&E. This water is delivered to the Agency's Zones 1 and 3 (Gold Run/Dutch Flat/Alta, Placer East, Colfax, Meadow Vista, Weimar/Applegate/Clipper Gap, Auburn-Bowman, Horseshoe Bar/Penryn, Newcastle/Ophir, and the Sunset area) and Zone 5 (agricultural areas in western Placer County).

The Placer County Water Agency planned use of MFP supplies include the diversion of 35,500 acre-feet at their American River Pump Station located upstream of Folsom Lake, and the sale of 25,000 acre-feet to San Juan Water District, 30,000 acre-feet to the City of Roseville, and 29,000 acre-feet to Sacramento Suburban Water District.

Water conservation in Placer County Water Agency includes consideration of water meters, water conserving designs, landscape conservation measures, and use of recycled wastewater.

ENVIRONMENTAL IMPACT REPORT FOR CITY OF FOLSOM GENERAL PLAN

The EIR for the City of Folsom General Plan was completed in 1988. It evaluated five alternatives: Alternative 1- Existing Conditions at the End of 1986 (No Project Alternative), Alternative 2 - Existing General Plan Alternative, Alternative 3 - Composite Applications Alternative, Alternative 4 - Citizens Advisory Committee Alternative, and Alternative 5- Preferred Alternative. These alternatives evaluate a projected population range from 56,165 to 100,120.

The General Plan includes many goals or policies, including the following items that are specifically relevant to this EIS.

- To expand Folsom's Sphere of Influence based on the ultimate boundaries of development that the City can reasonably control and service, and to discourage premature development in unincorporated areas surrounding the City.

- A new Sphere of Influence boundary shall include only those lands to which road, water, sewer, and other facility/service connections can be extended within the next 25 to 30 years and, therefore, to those areas which will ultimately be annexed to the City.

- The City shall only annex those lands which can be developed in accordance with the City's General Plan, are fiscally sound additions to the City, can be adequately served by municipal (or acceptable alternative) facilities and services, and are part of a planned, orderly annexation program.

- The City shall annually monitor the City's available municipal water supply to ensure adequate reserves exist to serve projected water demand. In the event projected demand exceeds supply, the City may take certain actions to prevent the anticipated shortfall. For any area south of U.S. Highway 50 which could be annexed to the City or the area known as the East Area Facilities Plan area consisting of approximately 3,900 acres, the City shall not approve a final subdivision map or final parcel map, or other entitlement which

would permit the commencement of construction until such time as the City has acquired an additional water supply which is adequate to supply such development. The additional water supply may include water conservation programs. Development may be staged and it is only necessary that there is sufficient supply to service the proposed development.

- Wherever feasible, to preserve, acquire, rehabilitate, enhance, and maintain the identified resources for the use and enjoyment of present and future generations. The identified resources include, but are not limited to certain biological resources and scenic resources.

- The surface and groundwater quality of Folsom shall not be degraded from City standards.

- The City should maintain existing and develop new sources of water to ensure adequate, long-term and high quality water supplies.

The General Plan EIR determined that in the General Plan, potentially significant or significant adverse impacts would result to traffic, the housing/employment balance, affordable housing, water supply, and mining resources (gravel). The other identified impacts were either considered not significant or are mitigable. The EIR indicated that the City has insufficient supply of water to meet the demand at buildout (including the area located south of U.S. Highway 50) in any of the alternatives, and has no effective water conservation policy or ordinance in force. The EIR also indicated that the City's unmetered water system for residential users does not encourage water conservation, and that impacts on water supply were considered significant for three of the five alternatives evaluated. The General Plan indicated that the City receives 22,000 acre-feet/year under a water right on the American River, and purchases a minimum of 700 acre-feet of water per year from San Juan Water District.

Following completion of the General Plan EIR, the City increased the water right quantity by 5,000 acre-feet and received a CVP contract under PL 101-514 (as described above) for 7,000 acre-feet. This would provide adequate water supplies in average years unless.

ENVIRONMENTAL IMPACT REPORT FOR PLACER COUNTY GENERAL PLAN

The 1994 Placer County General Plan EIR evaluates two scenarios to analyze the impacts of growth and development in the county: years 2010 and 2040. The future 2010 population is estimated at 310,000, and for 2040, it is estimated at 470,900. The General Plan includes the following goals that are relevant to this EIS.

- To promote the wise, efficient, and environmentally-sensitive use of Placer County lands to meet the present and future needs of Placer County residents and businesses

- To designate adequate commercial land for and promote development of commercial uses to meet the present and future needs of Placer County residents and visitors and maintain economic vitality

- To designate adequate land for and promote development of industrial uses to meet the present and future needs of Placer County residents for jobs and maintain economic vitality

- To designate adequately-sized, well-located areas for the development of public facilities to serve both community and regional needs
- To designate land for and promote the development and expansion of public and private recreational facilities to serve the needs of residents and visitors
- To designate adequate agricultural land and promote development of agricultural uses to support the continued viability of Placer County's agricultural economy
- To establish and maintain interconnected greenbelts and open spaces for the protection of native vegetation and wildlife and for the community's enjoyment
- To protect the visual and scenic resources of Placer County as important quality-of-life amenities for county residents and a principal asset in the promotion of recreation and tourism
- To ensure the timely development of public facilities and the maintenance of specified service levels for these facilities
- To ensure the availability of an adequate and safe water supply and the maintenance of high quality water in water bodies and aquifers used a sources of domestic supply
- To protect the lives and property of the citizens of Placer County from hazards associated with development in floodplains and manage floodplains for their natural resource values
- To identify, protect, and enhance Placer County's important historical, archaeological, paleontological, and cultural sites and their contributing environment
- To protect and enhance the natural qualities of Placer County's streams, creeks, and groundwater
- To protect wetland communities and related riparian areas throughout Placer County as valuable resources
- To protect, restore, and enhance habitats that support fish and wildlife species so as to maintain populations at viable levels
- To preserve and protect the valuable vegetation resources of Placer County
- To preserve and enhance open space lands to maintain the natural resources of the county
- To provide for the long-term conservation and use of agriculturally-designated lands
- To minimize existing and future conflicts between agricultural and non-agricultural uses in agriculturally-designated areas
- To protect and enhance the economic viability of Placer County's agricultural operations
- To maximize the productivity of Placer County's agriculture uses by ensuring adequate supplies of water

- To minimize the risk of loss of life, injury, damage to property, and economic and social dislocations resulting from flood hazards

The General Plan EIR determined that potentially significant or significant adverse impacts would result to land use, traffic, cultural resources, loss of farmland, habitat uses, and habitat quality, air quality, and traffic noise. The EIR further indicated that no mitigation measures were available beyond the policies and programs in the General Plan that would reduce these impacts to a less-than-significant level.

ENVIRONMENTAL IMPACT REPORT FOR CITY OF ROSEVILLE GENERAL PLAN

The City of Roseville 2010 General Plan EIR was completed in 1992. The City of Roseville 2010 General Plan evaluated the following three development scenarios.

- 2010 Market Scenario: This scenario is based on projected market demand in the year 2010. It assumes that all residential land uses (including both infill and specific plan areas) would be fully built out and non-residential land uses would be partially built out. This scenario also assumes year 2010 market demand level of development (residential and non-residential) outside of the City.

- 2010 Market/Specific Plan Buildout Scenario: This scenario also assumes that all residential land uses (within both infill and specific plan areas) would be fully built out in the year 2010 and it assumes that non-residential land uses within the four specific plan areas would be fully built out. Non-residential land uses outside of the four specific plans but within the City (e.g., north industrial area) and areas outside of the City assume year 2010 market demand level of development.

- General Plan Buildout Alternative: This scenario assumes full buildout of existing general plan land use designations. It also includes development of areas outside of the City according to market demand by the year 2010.

The General Plan includes modifications to policies and implementation measures contained within the City's adopted and amended 1977 General Plan. It focuses on policy amendments rather than changes to land uses. No changes to land use allocations or granted entitlements are proposed in conjunction with the current General Plan.

The General Plan includes the following goals.

- Promote and enhance Roseville's unique character and identity

- Distinguish Roseville from adjacent communities through the quality of development and design, and the level of public services and facilities provided

- Protect and enhance Old Town/Downtown and the City's established neighborhoods

- Promote new development which is an integrated and connected part of the City's land use pattern

- Provide a variety of housing types and opportunities, including those for all income groups
- Create a balanced land use pattern with an appropriate mix of uses to accommodate resident employment, service, and social needs within the community
- Promote a land use pattern that provides a high level of open space and recreational amenities and is sensitive to the natural environment
- Create a land use mix and pattern which accommodates and promotes alternative transportation modes for ease of access and improved air quality
- Proactively manage and plan for growth
- Promote the safe, efficient, and reliable movement of people and goods; shift from the automobile to other modes of transportation; and provide an adequate level of transportation service for all persons traveling in and through Roseville
- Protect the health and welfare of the community by promoting development that is compatible with air quality standards
- Preserve a comprehensive interconnecting system of open space, encompassing preservation and enhancement of natural habitat and significant resource areas, for the use, appreciation, and enjoyment of the community
- Provide a variety of both passive and active recreational opportunities for all City residents
- Provide adequate services for residents and enterprises, and have new development contribute its fair share toward the provision of these services and facilities
- Protect the life, property, and the environment of community residents, enterprises, employees, and visitors
- Protect the health and welfare of the community by promoting community development which is compatible with noise level criteria
- Work to accommodate the housing needs of its current and future residents by providing a range of purchase and rental units which are affordable to all income groups
- Strive to guarantee housing affordability over time through the adoption of policies and implementation measures
- The City, its development community, and the business/manufacturing community should jointly work together to ensure the success of an affordable housing program

The General Plan EIR determined that many of the programs to meet these goals would not result in significant environmental impacts. However, the EIR acknowledged that significant impacts could occur with respect to flood hazards, air quality, noise, housing affordability, traffic, biological resources, and hazardous materials. Furthermore, the EIR indicated that those impacts identified as significant were also

unavoidable and could not be fully mitigated. Mitigation measures related to biological resources (conversion of annual grass, oak woodland, riparian woodland, vernal pool, intermittent drainage/other seasonal wetland; or wildlife habitat fragmentation and loss) include mechanisms such as setbacks (buffer areas) to ensure adequate space between natural areas and urban development; wetland preservation, replacement, or offsite wetland replacement mitigation; or easements that would restrict land uses to those compatible with preserve purposes.

ENVIRONMENTAL IMPACT REPORT FOR EL DORADO COUNTY GENERAL PLAN

El Dorado County adopted a General Plan in 1996, however the EIR was successfully challenged in litigation. Over the next eight years, the county considered several alternatives that were evaluated in a new EIR. A new general plan was adopted in July 2004. The modified general plan will be submitted to the court for review prior to implementation. Implementation is anticipated in 2005.

The following four alternatives were considered in detail in the EIR: No Project Alternative, Roadway (Capacity) Constrained, Environmentally Constrained, and the 1996 General Plan. In July 2004, the El Dorado County Planning Commission adopted an "Annotated 1996 General Plan Alternative." The adopted General Plan includes the 1996 General Plan plus mitigation measures proposed in the EIR and several components of the Environmentally Constrained Alternative related to transportation and circulation, agricultural lands, and important biological corridor. An Environmental Assessment of Policy Modifications was completed in July 2004.

The final environmental documentation identifies several significant impacts for the proposed alternative as compared to the No Project Alternative and proposes mitigation measures. The proposed mitigation measures include coordination between the County and cities to provide consistent land use policies, provisions to protect agricultural and rural land uses, preparation of a Scenic Corridor Ordinance, consider circulation plans to reduce traffic impacts, require sufficient water supplies from public water utilities for dry to wet years, support water conservation, establish annual inspection program for septic systems, prepare and implement parks and recreation master plan, establish naturally occurring asbestos land purchase notification program, minimize development in areas of high and very high wildland fire hazard, develop Integrated Natural Resources Management Plan, and adopt a cultural resources preservation ordinance.

ENVIRONMENTAL IMPACT REPORT FOR THE WATER FORUM PROPOSAL

The Water Forum, a diverse group of water agencies, business groups, agricultural interests, environmentalists, citizen groups, and local governments has been coordinating since the fall of 1993 evaluating future water needs and supplies in the Sacramento area, including parts of Sacramento, Placer and El Dorado counties. The Water Forum has formulated a Water Forum Proposal for the effective long-term management of the regional water resources. The Water Forum Proposal was formulated based on the two co-equal objectives: 1) provide a reliable and safe water supply for the region’s economic health and planned development through the year 2030; and 2) preserve the fishery, wildlife, recreational, and aesthetic values of the Lower American River. Water Forum stakeholders represent water-related interests in the cities of Sacramento, Folsom, Galt, and Citrus Heights; the County of Sacramento; Roseville, South Placer County and western El Dorado County.

To achieve the Water Forum coequal objectives, a comprehensive package of linked actions was developed to include the following six elements.

- Element I: Increased Surface Water Diversions- This element provides for increased surface water diversions to serve planned growth through the year 2030 with active conservation programs and sustainable use of the groundwater which are also part of the Water Forum Proposal.

- Element II: Actions to Meet Customer Needs While Reducing Diversion Impacts on the Lower American River in Drier Years - This element is to ensure that sufficient water supplies will be available to customers in dry years as well as wet years, and that suppliers continue to meet their customers' needs to the year 2030 while minimizing diversion impacts on the Lower American River in the drier and driest years. It is envisioned that Lower American River diversions above the H Street Bridge in average and wetter years will increase from the current level of about 216,500 acre-feet/year annually to about 481,000 acre-feet/year. Actions to meet customer needs while reducing diversion impacts on the Lower American River in drier years include: conjunctive use of groundwater basins consistent with the sustainable yield objectives; utilizing other surface water resources; reoperation of reservoirs on the Middle Fork of the American River; increased conservation during drier and driest years; and reclamation.

- Element III: Support for an Improved Pattern of Fishery Flow Releases from Folsom Reservoir - This element supports needed assurances for continued implementation of a pattern of water releases from Folsom Reservoir that more closely matches the needs of anadromous fish, in particular fall run chinook salmon, which need cool water in the fall and are not present in the American River in the summer. The Water Forum convened a Fish Biologists' Working Session with the Service, California Department of Fish and Game (CDFG), SWRCB, Reclamation led to a general agreement regarding which fish species in the Lower American River should be given priority when there are constraints in water availability and developed an improved pattern by which available water can be released from Folsom Reservoir in a "fish friendly" manner consistent with the reservoir's flood control objectives. These objectives were included in the CVPIA Anadromous Fish Restoration Program flow objective for the Lower American River.

- Element IV: Lower American River Habitat Management Element - This element, combined with an "Improved Pattern of Fishery Flow Releases from Folsom Reservoir" and "Actions to Meet Customers' Needs While Reducing Diversion Impacts on the Lower American River in the Drier Years," is included to mitigate the impacts of the increased diversions on the Lower American River. The Water Forum Habitat Management Element will be part of a coordinated multi-agency Lower American River ecosystem partnership to address flow, temperature, and physical habitat issues for the Lower American River:

- Element V: Water Conservation - The Water Conservation Element of the Water Forum Proposal promotes more efficient use of limited water resources. Major components of the Water Conservation Element include: residential water meters; other water conservation programs similar to the Best Management Practices included under CVPIA contracting and the statewide Memorandum of Understanding Regarding Urban Water Conservation; public involvement; water conservation plans; and agricultural water conservation.

- Element VI: Groundwater Management - This element provides a framework by which the groundwater resource in Sacramento County can be protected and used in a sustainable manner and a mechanism for coordination with those adjacent counties that share the groundwater basin. A key provision of the element includes recommendations on "sustainable yield," or the amount of water that can be safely pumped from the basin over a long period of time without damaging the aquifer. Recommendations for locally controlled groundwater management include monitoring groundwater withdrawal and "conjunctive use", or the planned use of surface water in conjunction with groundwater. The Sacramento North Area Groundwater Management Authority was established in 1998 through a joint powers authority using the existing authority of the City of Sacramento, Folsom, the City of Citrus Heights, and the County of Sacramento. The Authority will be charged with facilitating conjunctive use programs and maintaining long-term sustainable yield. Similar actions are proposed in the Water Forum Proposal for the South Area and the Galt Area.

In order to ensure implementation of the Water Forum Proposal, a Water Forum Successor Effort is being created with membership consisting of those organizations signatory to the Water Forum Proposal. Its responsibilities will be to oversee, monitor, and report on implementation of the Water Forum Proposal. The Water Forum Successor Effort will not have any authority to govern or regulate.

The EIR evaluated various implementation methods for these elements using different levels of diversions, conservation, changes in release patterns from Folsom Reservoir, and groundwater management. The major impacts are described below.

The EIR identified significant and potentially significant impacts within the Lower American River and Folsom Reservoir, including effects to certain fisheries, recreational opportunities, and cultural resources. Effects to fisheries include flow-related impacts to chinook salmon in the Lower American River. These impacts are considered potentially significant and mitigation is suggested as a part of the Habitat Mitigation Element. Potentially significant effects to Sacramento splittail of the Lower American River could also occur. In Folsom Reservoir, a potentially significant effect to warmwater fisheries is expected because of the reduction of littoral habitat and spawning success caused by more frequent declines in lake levels. Mitigation measures to improve littoral habitat are identified in the EIR. Coldwater fisheries in the reservoir are not significantly affected.

Effects to recreation opportunities include more frequent periods of inadequate recreation flows in the Lower American River during the summer which affects rafting and boating. In Folsom Reservoir, more frequent lake level declines result in significant impacts to boat ramp operations, use of marina wet slips, and opportunities for swimming at designated beaches. The EIR also identifies adverse effects on cultural resources of Folsom Reservoir due to varying water levels and increased cycles of inundation and exposure of cultural resources sites. Potential mitigation is identified for each of these impacts.

The EIR also identifies that, under future (2030) conditions which include the Water Forum Proposal and other potential future system-wide actions, impacts outside the American River system would occur. These include impacts to water supply, water quality, and power supply. Reclamation may have to operate the CVP differently in the future when purveyors in the Water Forum exercise their water entitlements including water rights and CVP water service contracts. DWR may also need to modify operation of the SWP, and, together with Reclamation, may revise the Coordinated Operations Agreement The changed operation could affect their ability to meet their environmental and water supply obligations, including protection of the Sacramento River and Bay-Delta. For instance, deliveries to some CVP contractors, including some Water Forum purveyors, could be subject to greater and more frequent deficiencies being imposed.

Potentially significant impacts to Sacramento River and Delta water quality were also identified due to reduced flows in the Sacramento River in some years with implementation of the Water Forum Proposal. Reduced flows could cause seasonal elevations in river water temperatures and increased pollutant concentrations due to reduced dilution capacity. Minor power supply impacts to Western Area Power Administration preference power customers would also occur as a result of implementation of the Water Forum Proposal.

Implementation of the Water Forum Proposal would not directly alter land uses in the water service study area. It would, however, allow water purveyors in the Sacramento region to provide a safe and reliable water supply for the region' s planned development through the year 2030. Land use decisions would continue to be made by city and county government decision-makers. The Water Forum Proposal would accommodate development, however, as it would remove water supply as an obstacle to growth in some communities. Therefore, the Water Forum Proposal is considered to be growth inducing in the water service study area, as defined by the State CEQA Guidelines. The Water Forum Proposal EIR does not assess the precise impacts of the regional growth that may be facilitated by the Water Forum Proposal because of the many variables involved. With respect to land use designations already approved in adopted general plans, environmental analysis has already been completed in the general plan EIRs. The Water Forum Proposal EIR does assess the potential for future land use effects resulting from the removal of water supply as an obstacle to growth.

ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL ASSESSMENT FOR A WARREN ACT CONTRACT BETWEEN CITY OF ROSEVILLE AND RECLAMATION

Warren Act contracts are used by local agencies to convey non-federal water through federally-owned facilities, including Folsom Lake.

Roseville and Reclamation have negotiated a long-term Warren Act contract to allow for storage and conveyance of up to 30,000 acre-feet of American River water rights that are either delivered for or purchased from Placer County Water Agency. Environmental and technical reports are being prepared and reviewed for this contract.

ENVIRONMENTAL IMPACT REPORT FOR SACRAMENTO MUNICIPAL UTILITY DISTRICT - SACRAMENTO COUNTY WATER AGENCY WATER ASSIGNMENT

In 2004, Sacramento Municipal Utility District prepared a Final EIR for the water assignment of 30,000 acre-feet with Sacramento County Water Agency. The provisions of the water assignment were set forth in a three-party "Agreement in Principle," signed by Sacramento Municipal Utility District, the City of Sacramento, and Sacramento County Water Agency on February 14, 1994. In the agreement, Sacramento Municipal Utility District agreed to the permanent assignment to Sacramento County Water Agency of 15,000 acre-feet/year of CVP contract water under the contract with Sacramento Municipal Utility District. Sacramento County Water Agency agreed to assist Sacramento Municipal Utility District in paying for up to 5,000 acre-feet/year of City water for use in Sacramento Municipal Utility District cogeneration power plants. The City agreed to treat and convey the assigned water to Sacramento County Water Agency Zone 40 service area and to provide a City water supply to Sacramento Municipal cogeneration power plants. A two-way agreement between Sacramento Municipal Utility District and Sacramento County Water Agency for an additional 15,000 acre-feet/year was negotiated as part of the

Water Forum Agreement. Under the existing conditions, Sacramento Municipal Utility District was not diverting the 30,000 acre-feet in recent years. Therefore, the EIR indicated that there would be some impacts associated with reductions in deliveries to Irrigation CVP water service contractors in many years, reductions in total annual CVP power generation in some months, reduction in end-of-water year storage in Shasta Lake and related changes in Sacramento River flow patterns in some years, related changes in cumulative conditions for chinook salmon in the Upper Sacramento River due to changes in flow patterns and Shasta Lake storage, and related changes in recreational opportunities in Shasta Lake. No mitigation measures were included in this EIR.

APPLICATION FOR CERTIFICATION FOR COSUMNES POWER PLANT

Sacramento Municipal Utility District proposed to develop a natural gas-fired generating facility at Rancho Seco. The proposed project will provide electricity to the district service area. The facility will consist of a nominal 1,000-megawatt combined-cycle generating facility, using natural gas-fired combustion turbines, steam turbines, and associated infrastructure. The plant will be constructed in two phases of 500-megawatts. Each phase will consist of two combustion turbines, one condensing steam turbine, and two heat recovery steam generators. The project also will include a switchyard, approximately 0.4-mile-long new 230-kV transmission line from the switchyard to the existing switchyard, approximately 26 miles of natural gas supply line, and a cooling water pipeline from the existing pipeline connected to the Folsom-South Canal, wastewater treatment plant and leach system, and stormwater detention facilities.

The plant will be constructed using recent technology and emission reduction credits to avoid significant adverse air quality impacts. Specific drainage design criteria and use of stormwater detention basins will result in no significant impacts to water resources.

CHAPTER 4
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

CHAPTER 4
Affected Environment and Environmental Consequences

INTRODUCTION

This chapter explains the organization of the remaining chapters in the EIS, defines the scope and extent of the environmental analysis, including a delineation of the overall study area, the framework for the impact analysis, an explanation of resources areas evaluated and not evaluated, and a list of studies and documents incorporated by reference in the effects analysis.

This document organizes required information by environmental resources. Each resource subsection of this chapter describes the affected environment and environmental consequences associated with renewing long-term water service contracts under Alternatives 1, 2, and 3 as compared to renewing the long-term water service contracts under the No Action Alternative. Each resource subsection also describes potential mitigation measures if necessary or available to avoid, reduce, or otherwise minimize potential adverse impacts to the environment.

RESOURCES CONSIDERED

The resources and issues included in this chapter were identified through a review of NEPA guidance documents, and through the scoping process. The resources and issues described in this chapter are as follows.

- Surface Water Resources and Facilities (including Water Quality)
- Groundwater (including Water Quality)
- Land Use, Demographics, and Sociological Resources
- CVP Water Supply Costs, Agricultural Economics, and Regional Economics
- Fishery and Wildlife Resources
- Recreation
- Cultural Resources
- Indian Trust Assets
- Air Quality
- Soils
- Visual Resources
- Environmental Justice
- Secondary Growth Impacts

This EIS does not analyze resources for which it would be reasonable to assume that substantial or significant impacts could not occur. Specifically, potential effects to transportation, noise, hazards and hazardous material, public services, utilities, and service systems are not analyzed because they were not identified as significant issues during scoping and it would not be reasonable to assume that renewing the long-term water service contracts could result in substantial impact to these resources or services.

STUDY AREA FOR LONG-TERM CONTRACT RENEWAL IN THE AMERICAN RIVER DIVISION

This EIS study area includes specific areas of analysis for each resource that may be directly, indirectly, or cumulatively affected by the alternatives under consideration. The Study Area for this EIS includes the water service areas of Sacramento County Water Agency (Zone 40 and Folsom), San Juan Water District, Sacramento Municipal Utility District, Roseville, Placer County Water Agency, El Dorado Irrigation District (Lake Hills Estates and El Dorado Hills service area), and East Bay Municipal Utility District.

STUDY PERIOD

The analysis period for this EIS is the term of each long-term contract included in this EIS. The contract term for the M&I water service contracts is for 40 years, or Year 2044.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

NEPA Section 102(C)(v) requires federal agencies to consider to the fullest extent possible irreversible and irretrievable commitments of resources involved in the proposed action should it be implemented. The proposed action will be the renewal of existing contracts and does not involve construction or use of nonrenewable resources.

RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

NEPA Section 102(C)(iv) requires all federal agencies to disclose the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity. These water delivery contracts are temporary (of 40 years or less), yet result in long-term benefits to the sustainability and reliability of agricultural and industrial production and economic growth in rural and urban communities. Long-term productivity would be enhanced through the water supply that sustains economics, social benefits, and the long-term productivity of urban and rural populations by providing CVP water.

SURFACE WATER RESOURCES, QUALITY, AND FACILITIES

The Affected Environment description of surface water is limited to major streams and water supply facilities that are directly affected by CVP water supplies in the American River Division. American River Division CVP water users rely upon water diverted from the American and Sacramento rivers and groundwater. Three of the users (Placer County Water Agency, El Dorado Irrigation District, and East Bay Municipal Utility District) also rely upon water diverted from other watersheds. However, this analysis focuses on the diversion of the CVP water and streams within the CVP place of use that rely upon water from the American River. Therefore, this discussion is limited to the American and Sacramento river watersheds within or adjacent to Sacramento, Placer, and El Dorado counties and local streams within the East Bay Municipal Utility District service area. The information presented below is primarily based upon environmental documentation completed by Reclamation and local agencies.

Affected Environment

Operation of the CVP can affect flows of the American, Sacramento, and Stanislaus rivers, Delta, and deliveries of CVP and State Water Project (SWP) water to users located south of the Delta. The overall description of the affected environment of the Delta, other CVP water service contractors, and SWP water service contractors is presented in detail in the PEIS and only summarized below.

Upper American River Watershed. The upper American River consists of four major sub-basins upstream of Folsom Lake: North Fork, Middle Fork, South Fork, and Rubicon River, a tributary of the Middle Fork. The reach of the American River downstream of Folsom Lake is described as the Lower American River.

The North Fork watershed is almost 400 square miles and extends from above Blue Canyon to the confluence of Middle Fork upstream of Folsom Lake. Average annual runoff from the North Fork was about 600,000 acre-feet since 1946, as measured at the North Fork Dam. The Lake Valley Canal diverts a small portion of the flow from the North Fork into the Bear River basin. Other portions of the flow are diverted from the North Fork to serve local areas along Interstate 80. Placer County Water Agency also has water rights on the North Fork.

The Middle Fork watershed includes more than 550 square miles and includes several significant tributaries. Average annual runoff from the Middle Fork is about 800,000 acre-feet, as measured downstream of Oxbow Powerplant. Flows occur in all months, including relatively moderate flows in summer months due to releases from numerous hydropower facilities in the Middle Fork watershed. Placer County Water Agency constructed three reservoirs on the upper and middle reaches of the Middle Fork: French Meadows Reservoir (L.L. Anderson Dam) and Interbay Dam as part of the Middle Fork Project. Placer County Water Agency also constructed Ralston Afterbay near the confluence of the Rubicon River and the Middle Fork as a re-regulating reservoir for the Middle Fork Project. The Oxbow Powerplant was constructed by Pacific Gas & Electric Company (PG&E) on the Middle Fork downstream of the Rubicon River and upstream of the confluence with the North Fork. In the watershed, Sacramento Municipal Utility District constructed numerous reservoirs and Placer County Water Agency constructed Lower Hell Hole Dam downstream of the Sacramento Municipal Utility District reservoirs.

The South Fork watershed includes over 600 square miles and has an average annual runoff of about 1,000,000 acre-feet, as measured downstream of Chili Bar Dam. Flows occur in all months, including relatively moderate flows in summer months due to releases from numerous reservoirs in the South Fork watershed. El Dorado Irrigation District operates the Federal Energy Regulatory Commission (FERC) Project No. 184, which utilizes natural flows of the South Fork and releases from storage in Caples Lake, Silver Lake, and Lake Aloha in the South Fork watershed, plus a small inter-basin transfer from Echo Lake in the Echo Creek subbasin of the Lake Tahoe upper watershed for hydroelectric power production and consumptive uses. Other, smaller reservoirs in the South Fork watershed include Slab Creek Reservoir and Chili Bar Reservoir on the South Fork, and Weber Reservoir on the North Fork of Weber Creek.

El Dorado Irrigation District uses some water stored at the Sly Park Reservoir in the Cosumnes River basin to serve areas located in the American River watershed.

Lower American River Watershed. The Lower American River consists of the river from Folsom Lake to the confluence of the American and Sacramento rivers. The flow regime in the Lower American River is controlled by the flows into Folsom Lake and released at Folsom Dam. Average annual inflows into Folsom Lake are about 600,000 acre-feet from the North Fork, 800,000 acre-feet from the Middle

Fork, and 1,000,000 from the South Fork. Average flows downstream of Folsom Dam at Fair Oaks are approximately 2,650,000 acre-feet.

Folsom Dam is a multi-purpose water storage facility on the American River about 26 miles upstream of the confluence with the Sacramento River and is part of the American River Division of the CVP. The American River Division also includes a power plant , the re-regulating reservoir (Lake Natoma) formed by Nimbus Dam, and the Auburn-Folsom South Unit (Folsom South Canal). The American River Division used to include the Sugar Pine Unit and Sly Park Unit that have been transferred to Foresthill Public Utility District and El Dorado Irrigation District, respectively.

Folsom Lake storage is relatively small (975,000 acre-feet) as compared to the range of annual flows and the water demands in the watershed. Under the current water rights settlements, there are approximately 510,000 acre-feet of local water rights and 410,000 acre-feet of CVP Water Service Contract water that could be delivered to American River users. Because the reservoir volume is approximately equal to the amount of water delivered each year and most of the stream flow enters the reservoir prior to the summer months when the peak urban water demand occurs, it is an operational challenge to meet the multiple demands on Folsom Reservoir storage including instream fisheries needs in the Lower American River and water flow needs in the Delta.

Reclamation holds both direct diversion and storage rights on the American River and uses these rights in combination to deliver water to local users under CVP water service contracts and to meet downstream regulatory requirements and water demands within and south of the Delta. Reclamation facilities are also used to deliver non-project water to senior water rights holders, including El Dorado Irrigation District, Placer County Water Agency, PG&E, Sacramento Municipal Utility District, Folsom, San Juan Water District, State of California, City of Sacramento, Carmichael Water District, and Sacramento Suburban Water District. Many of these water rights holders take delivery from Folsom Lake. Most of the municipal/industrial flows do not return to the American River system because municipal wastewater effluent flows are discharged into another watershed or directly into the Sacramento River. Specific information about the CVP water service contracts is presented below.

Minimum Flow Requirements for the American River. Water rights decisions, downstream water quality control requirements, flood control criteria, fisheries protection requirements (including minimum instream flows and ramping criteria), carryover storage targets, recreation, and power production directly or indirectly influence the flows in the Lower American River. Minimum instream flows upstream of Folsom Lake are primarily influenced by Federal Energy Regulatory Commission licenses.

Minimum flows in the Lower American River have been established to protect fisheries. The SWRCB Decision 893 (D-893) was issued in 1958 and requires minimum flows below Nimbus Dam (re-regulating reservoir below Folsom Lake) and at H Street on the American River. As part of the water rights permits for Auburn Dam, the SWRCB issued Decision 1400 (D-1400) to supercede D-893 if Auburn Dam had been constructed. D-1400 provided higher instream flows for the Lower American River than D-893. Although Auburn Dam was not constructed, Reclamation uses a "Modified D-1400" flow regime to set the historic baseline operations for Folsom Dam when water is available. During drier periods, Reclamation may use D-893 requirements to establish the historic baseline. The historic baseline flows establish what the minimum flows would have been prior to the implementation of CVPIA. Additional releases are then added to the baseline flows with water made available from the 800,000 acre-feet of water annually dedicated to fish and wildlife through Section 3406(b)(2) of the CVPIA.

As part of the Anadromous Fish Restoration Plan (AFRP) program under CVPIA, objectives to decrease water temperatures and increase spawning, incubation, rearing, and emigration habitat for fall-run Chinook salmon and steelhead in the Lower American River were developed. These objectives also

assume that Folsom Lake target storage will provide a cold water pool and spawning/incubation flows in fall and winter. Following the initial AFRP study in 1995, several other studies were completed to evaluate fisheries conditions on the Lower American River and temperature control devices were designed for Folsom Dam and CVP diversions from Folsom Lake. One of those studies was completed as part of the Sacramento Area Water Forum Proposal. Another study was the 2001 Placer County Water Agency American River Pump Station Project. Recently, the Lower American River Task Force (a group of agencies and interests that are affected by conditions along the lower American River) completed a Baseline Report and subsequent evaluations to consider flow fluctuation issues. Results from these studies are being used in developing operating criteria to protect fisheries and continue to meet water demands, including ramping rates to avoid stranding as part of the CVP Operations Criteria and Plan (OCAP).

Water Quality. The upper reaches of the Sacramento and American rivers have high quality water with low concentrations of constituents. As the water flows through the watershed, constituents enter the water as part of the sediment load or as dissolved chemicals. Temperatures also rise as the water enters the reaches near or on the valley floor. Constituents enter the water from both point sources, such as wastewater treatment plant effluent, and non-point sources, such as sediment from erosion.

Water quality of the American River at Folsom Lake and downstream to the confluence with the Sacramento River remains relatively high. Water quality is within Regional Water Quality Control Board requirements during the majority of time even though the river receives urban runoff flows. Water quality of the Sacramento River at Sacramento has higher concentrations of dissolved inorganic nitrogen and phosphorous than the American River due to runoff from cultivated land.

The July 2003 "Freeport Regional Water Project Draft EIR/EIS" indicates that concentrations of most constituents regulated by the Regional Water Quality Control Board in the American River downstream of Nimbus Dam and in the Sacramento River near the confluence with the American River are less than regulatory requirements. However, the lower American River is listed as an impaired water body for organochlorine pesticides, mercury, and toxicity. The Sacramento River near the American River is listed as an unimpaired water body for diazinon, mercury, and toxicity.

Temperatures and dissolved oxygen in both the Sacramento and American rivers within the study area vary on a seasonal basis. The Long-Term CVP OCAP description discusses that temperatures in the Lower American River are regulated to the extent possible through integrated management of the coldwater pool in Folsom Lake. The extent, duration, and magnitude to which downstream temperatures can be managed depends upon the starting volume of cold water available in the spring, penstock shutter operations, reservoir water surface elevation, M&I intake temperature control device operations, and air temperatures. The goal for the Lower American River at Watt Avenue is to the extent possible to be less than 65 degrees Fahrenheit during the late spring and summer to protect steelhead incubation and below 60 degrees in the fall months to protect fall-run chinook salmon spawning and incubation. However, it is not possible to fully meet both of these goals during years when the cold water pool volume is limited. If this happens, Reclamation consults with the fisheries agencies to develop a cold water pool management strategy that balances the needs of both steelhead and fall-run chinook salmon. Hatchery fish were historically transferred to other hatcheries during summer and early fall months in years before cold water was used during the summer to support steelhead rearing. Current studies are underway to determine the effect of Nimbus Dam operations on temperature in the Lower American River.

Temperature Control Methods at Folsom Dam. The existing diversions at Folsom Dam include: the intake to the Folsom Dam Pumping Plant that serves Roseville, Folsom, Folsom State Prison, and San Juan Water District, and the El Dorado Irrigation District pumping plant intake. Downstream releases from Folsom Dam can be made through the Folsom Powerplant, the river outlet works, and spillway

gates. All releases and discharge structures are or can be used as part of the annual cold water pool management plan. The balancing of the demands on the cold water has required elevation of the summer temperature target at Watt Avenue based on the operations schedule and starting volume of cold water. Releases from the Folsom Dam river outlet works have also been used to access cold water beneath the Folsom Dam Powerplant penstock intake elevation at the onset of the fall-run chinook salmon spawning season in late October and November.

Reclamation has installed a Temperature Control Device (TCD) on the Pumping Plant intake that allows elective temperature withdrawal capability. The TCD allows water to be withdrawn from reservoir elevations where temperatures exceed those that are needed to meet the downstream summer temperature targets. Similar selective withdrawal capability is being designed for the El Dorado Irrigation District diversion.

Historically, the cold water pool was accessed in the fall to support spawning of fall-run chinook salmon. Recently, operations were modified to maintain a temperature target in the summer to support rearing juvenile steelhead. These changes were made in accordance with the biological opinion issued by NOAA Fisheries for steelhead and spring-run chinook salmon.

The intakes to the Folsom Dam Power Plant were constructed with nine water release shutters that allow withdrawals at different elevations to improve temperatures at the Nimbus Fish Hatchery and releases to Lake Natoma. The initial shutter configuration allowed the top two shutters to be independently opened and the remaining seven shutters operated as one unit (a "1-1-7" configuration). These shutters were recently modified to become a "3-2-4" configuration to improve downstream temperature control capability. Routine periodic and continuous reservoir temperature profiles are taken to understand temperature stratification in Folsom Lake. This information is used along with operational forecasts to implement the cold water pool management strategy during real-time operations. Shutters are raised as necessary to meet downstream temperature targets. Selective blending of water from different elevations is used in concert with the power production schedule to optimize the use of the cold water pool. The spillway gates have also been used in the spring to make flood control releases that would ordinarily been made from the river outlet works, thereby conserving cold water for future use.

Flood Flow Requirements for the Lower American River. There have been at least nine large floods in the Sacramento area since the construction of Folsom Dam: 1955, 1963, 1964, 1969, 1970, 1980, 1982, 1986, and 1997. During the 1986 storm, Folsom Dam releases rose to 130,000 cubic feet/second and significant levee damage occurred along the Lower American River. Following that event, the Corps of Engineers and the Sacramento Area Flood Control Agency (SAFCA) considered the need for additional flood storage. However, reservation of additional storage would reduce the carry-over storage required by users in the system. In the late 1990s, Reclamation and SAFCA worked with the Corps of Engineers to adopt a variable flood control volume. The modified flood control criteria reserves 400,000 to 670,000 acre-feet of flood control space that varies based on storage in Folsom Lake and in three upstream reservoirs (Lower Hell Hole, Union Valley, and French Meadows reservoirs).

Following the 1997 floods, the Corps of Engineers completed a reevaluation of the hydrology and considered the need for future flood management improvements. The Corps of Engineers is also moving forward with efforts to improve flood protection and that include raising Folsom Dam, modifying river outlets to provide additional release capacity, and use of forecast based advanced releases.

Central Valley Project Operational Requirements that Influence American River Operations. The CVP is operated as an integrated system with reservoirs on the American, Sacramento, Trinity, Stanislaus, and San Joaquin rivers. The combined flows from the CVP facilities and the SWP facilities on Oroville, as well as other tributary flows, are conveyed in the Sacramento River to provide

Delta outflow or water for users located south of the Delta, as described in the June 2004 OCAP report. CVP operates Folsom Lake to meet regulatory and water supply needs both on the American River and downstream along the Sacramento River and in the Delta, as described in the 2004 OCAP report.

Central Valley Project Water Service Contractors in the American River Division. CVP water service contractors in the American River Division include Sacramento County Water Agency, San Juan Water District, Sacramento Municipal Utility District, Roseville, Placer County Water Agency, El Dorado Irrigation District contract for El Dorado Hills and Lake Hills Estates, and East Bay Municipal Utility District. As part of the long-term contract renewal process, Reclamation completed a Needs Assessment, as presented in Chapter 2.

Sacramento County Water Agency. Sacramento County Water Agency was formed to make water available for beneficial use of the lands and inhabitants within Sacramento County and to produce, store, and convey groundwater. In order to carry out those objectives, Sacramento County Water Agency entered into a contract with Reclamation for delivery of 22,000 acre-feet for M&I uses in accordance with Public Law 101-514. This contract includes 15,000 acre-feet allocated for use within Zone 40 and 7,000 acre-feet is provided to the City of Folsom through a subcontract between Sacramento County Water Agency and the city.

Sacramento Municipal Utility District plans an assignment, subject to Reclamation approval, of 30,000 acre-feet of the Sacramento Municipal Utility District CVP contract water to Sacramento County Water Agency.

Sacramento County Water Agency also is working with other local water users to provide up to 30,000 acre-feet of water under an agreement with McDonnell-Douglas Corporation and Aerojet-General Corporation. This water would be used under the Eastern Sacramento County Replacement Water Supply Project in the Rancho Cordova area to provide water to users that had historically used groundwater. The groundwater had been contaminated due to land uses in the area and replacement of the water supply has been considered the most appropriate response to provide a high quality water supply.

Zone 40. Zone 40 consists of 86,000 acres of agricultural, residential, and industrial land in central Sacramento County and encompasses portions of the cities of Elk Grove and Rancho Cordova. Three water purveyors provide retail water service in this area, including Sacramento County Water Agency, Florin Resource Conservation District/Elk Grove Water Service, and California-American Water Company in the Rancho Cordova area. The CVP water will be provided on a wholesale basis by Sacramento County Water Agency to seven separate retail service areas in the communities of Laguna, Vineyard, and Elk Grove. This area has historically relied upon groundwater. A portion of the Laguna/Vineyard area also is provided treated surface water by the City of Sacramento.

Sacramento County Water Agency has a wheeling agreement with the City of Sacramento to provide treatment and conveyance of water through the City of Sacramento's existing treatment and distribution system. The proposed Freeport Regional Water Supply Project will include facilities to maximize the ability of Sacramento County Water Agency to provide CVP water in Zone 40. Groundwater will continue to be used to meet the water demand not met with surface water. Use of the CVP water will increase groundwater recharge in the service area.

City of Folsom. The City of Folsom provides water within the city boundaries. The City of Folsom has 22,000 acre-feet of senior water rights from the American River diverted at Folsom Lake. The City of Folsom entered into a Warren Act contract with Reclamation in 1971 to allow conveyance of this water right through CVP facilities. The City of Folsom also serves water to an

area previously served by Southern California Water Company through the assignment of a 5,000 acre-foot water right. The water right also is diverted from Folsom Lake. Sacramento County Water Agency entered into a subcontract with the City of Folsom for the delivery of up to 7,000 acre-feet of CVP water for M&I uses.

All water rights and CVP water delivered to City of Folsom is diverted from Folsom Lake in facilities owned and operated by Reclamation. The Ashland area uses water from the San Juan Pumping Plant. The main supply for City of Folsom is rights water delivered through the 48-inch Folsom Pipeline, originating just east of the spillway of Folsom Dam. This facility also supplies Folsom Prison. The San Juan Pumping Plant , owned by Reclamation and operated by San Juan Water District, is on the west side of the spillway and provides water to San Juan Water District, City of Folsom, and City of Roseville. Water is provided by gravity when the water level in Folsom Lake is high, generally from the first rains through April. San Juan Water District owns and operates the Sydney N. Peterson Water Treatment Plant, which treats water before transport to partner agencies. Sacramento Suburban Water District and City of Roseville share ownership of the Cooperative Transmission Pipeline. However, pumping is generally required from April through late fall months. A pipeline owned and operated by City of Folsom conveys water to the Folsom Water Treatment Plant. The City of Folsom provides treated water to all users within the city except portions of the Ashland Service Area which is served by San Juan Water District. The City of Folsom also provides up to 5 million gallons/day of raw water to the Aerojet Corporation.

San Juan Water District. San Juan Water District manages water supplies for several communities in northern Sacramento County. The San Juan Water District sells treated water to the Fair Oaks Water District, the Orangevale Water Company, Citrus Heights Water District, the Ashland area of Folsom, and adjacent unincorporated areas. San Juan Water District also conveys water rights water held by Placer County Water Agency to portions of Placer County that cannot be easily served through Placer County Water Agency facilities.

San Juan Water District holds up to 33,000 acre-feet of water rights on the American River and diverted from Folsom Lake. The first 149 acre-feet/day delivered to San Juan Water District are considered to be their water rights water. A Warren Act contract provides for conveyance of this water rights water.

San Juan Water District also entered into a contract with Reclamation to obtain up to 11,200 acre-feet of CVP water from Folsom Lake for Irrigation/M&I uses. The contract also provides for delivery of the water rights water held by San Juan Water District and Placer County Water Agency under a Warren Act contract. The contract was renewed on an interim basis until the long-term contract renewals considered in this EIS are completed.

San Juan Water District also entered a contract with Reclamation for the delivery of up to 13,000 acre-feet for M&I uses in accordance with Public Law 101-514.

Sacramento Municipal Utility District. Sacramento Municipal Utility District started operating the Rancho Seco nuclear power station in southeastern Sacramento County in 1975 and ceased in 1989. The initial water demand was estimated to be up to 75,000 acre-feet for cooling water, power plant operations, and landscape irrigation. Water demands of up to 30,000 acre-feet continued to be utilized for plant maintenance, make-up water for on-site lakes, and landscape irrigation. Sacramento Municipal Utility District is planning new power plants to be constructed on this site and in other locations within its boundaries.

In conjunction with its acquiring of rights to water for its Upper American River hydropower project, Sacramento Municipal Utility District assigned extensive consumptive water rights to the City of

Sacramento for use by the common citizens of the two entities. The City of Sacramento subsequently agreed to let Sacramento Municipal Utility District use 15,000 acre-feet of water for the original Rancho Seco station or for other appropriate uses. Sacramento Municipal Utility District entered into a contract with Reclamation on November 20,1970 for the use and delivery of up to 60,000 acre-feet/year of CVP water for M&I uses, and for the delivery by Reclamation of the 15,000 acre-feet of water rights water made available to the Sacramento Municipal Utility District. Both the water right and CVP waters are diverted from the American River at Nimbus Dam and conveyed through the Folsom South Canal to the Rancho Seco site. The first 40 acre-feet/day or 15,000 acre-feet/year, not to exceed 20 cubic feet/second, is water rights water. The existing CVP water service contract specifically requires Sacramento Municipal Utility District to be responsible for conveyance, handling, disposal, and distribution of water beyond the location operated by the United States. The CVP contract expires on December 31, 2012.

Sacramento Municipal Utility District has taken action to assign, subject to Reclamation approval, 30,000 acre-feet of the CVP water service contract water to Sacramento County Water Agency. Reclamation considered the potential impacts and benefits of the assignment as part of the "EIS/EIR for Freeport Regional Water Project" (East Bay Municipal Utility District and Sacramento County Water Agency), as described in Chapter 3. In September 2004, Sacramento Municipal Utility District published the Final EIR for assignment to Sacramento County Water Agency.

City of Roseville. Roseville has no water rights. Roseville entered into a contract with Reclamation to obtain CVP water from Folsom Lake. The contract provides up to 32,000 acre-feet/year for irrigation and municipal/industrial uses. The Roseville service area includes the incorporated city, although other purveyors serve small areas within the city. Doctor's Ranch, a newly completed development project immediately northwest of the city, negotiated an 800 acre-feet supply from San Juan Water District. San Juan Water District serves the southeastern corner of the city (east of Sierra College Boulevard). Placer County Water Agency is projected to serve the northeastern area of the City which was recently approved as part of the Stoneridge Specific Plan Project.

To provide adequate water supplies during peak flow demand periods and to meet future annual average water demands, Roseville purchases up to 10,000 acre-feet from Placer County Water Agency. In addition, Roseville is considering negotiating with Placer County Water Agency for an additional 20,000 acre-feet of water. The City would need a Warren Act contract to convey at least a portion of this non-CVP water through CVP facilities.

Placer County Water Agency. Placer County Water Agency holds water rights on the Middle Fork American River, the Rubicon River and some tributaries for irrigation, domestic and commercial purposes, and for the generation of electrical energy. Of the 120,000 acre-feet of water rights on the American River, 25,000 acre-feet is delivered by San Juan Water District, up to 30,000 acre-feet may be negotiated for delivery to Roseville, and up to 29,000 acre-feet would be sold to Sacramento Suburban Water District on a pre-determined schedule when the water is available.

In 2004, Placer County Water Agency amended its CVP water service contract with Reclamation from 117,000 acre-feet annually to 35,000 acre-feet annually. The CVP water is to be diverted after the Agency's water rights water is used. This water and the remaining water rights water to be diverted by Placer County Water Agency will be delivered upstream of Folsom Lake, as described in Chapter 3. Placer County Water Agency would deliver CVP water only to the areas within the CVP authorized place of use. The New American River Pumping Plant location is not currently an authorized point of diversion of CVP water under the water right used by Reclamation for CVP operations. At this time, the authorized location for the point of diversion for the CVP in this area is Folsom Lake.

El Dorado Irrigation District. El Dorado Irrigation District provides CVP water and water rights water to residential areas referred to as Lake Hills Estates and El Dorado Hills. El Dorado Irrigation District entered into two contracts to obtain CVP water from Folsom Lake: Lakes Hills Estates for up to 50 acre-feet/year and El Dorado Hills for up to 7,500 acre-feet for M&I purposes. The contracts were renewed on an interim basis until the long-term contract renewals considered in this EIS are completed. It is anticipated that under long-term contract renewals these contracts will be combined for a total of 7,550 acre-feet. Water under both contracts and the water right on the American River is diverted together from Folsom Lake and treated at the same El Dorado Irrigation District treatment plant.

El Dorado Irrigation District also serves water in other portions of El Dorado County using water rights on the North and Middle Fork Cosumnes River and South Fork American River. CVP water cannot be physically delivered to the communities served by groundwater and Cosumnes and South Fork American rivers water rights with existing facilities.

East Bay Municipal Utility District. East Bay Municipal Utility District is a large municipal and industrial water service provider that serves over 1.3 million customers in portions of Alameda and Contra Costa counties. The district also provides wastewater treatment services for Oakland, Piedmont Alameda, Berkeley, Emeryville, Albany, and portions of the City of Richmond.

The East Bay Municipal Utility District primary source of water is the Mokelumne River and several minor local surface waters. At present, the current East Bay Municipal Utility District water supply is insufficient to meet customer demand in multiple-year droughts even with aggressive water conservation and recycling programs. To provide water to meet demands in drier years, East Bay Municipal Utility District is pursuing development of additional water supply projects, including utilization of a contract with Reclamation to obtain CVP water from the Folsom South Canal that was signed in 1970. The contract provided for delivery of up to 150,000 acre-feet/year for municipal/industrial uses. In 1972, the Environmental Defense along with Sacramento County legally challenged delivery of CVP water from Folsom South Canal as "unreasonable" use of American River water. In 1988, the SWRCB adopted findings that the CVP contract for East Bay Municipal Utility District is a reasonable use of American River water. In 1990, Alameda County Superior Court Judge Hodge affirmed the contractual rights subject to a set of specific conditions known as the "Hodge Decision."

In 2001, the CVP contract was amended to provide for delivery of water from three possible diversion points with defined water amounts for each location. The preferred diversion point is located at Freeport on the Sacramento River (downstream of the confluence with the American River). At Freeport, East Bay Municipal Utility District will be able to divert up to 133,000 acre-feet of American River water each year with a total not to exceed 165,000 acre-feet in three consecutive years. This diversion can only occur in drought years when East Bay Municipal Utility District's total system storage is forecast to be less than 500,000 acre-feet. The other diversion locations include "Site 5" on the American River upstream of the Interstate 5 bridge and from the Folsom South Canal as under the initial contract.

The Final EIS was published in April 2004. Reclamation plans to issue a Record of Decision following consultation under Section 7 of the Endangered Species Act. The Freeport Regional Water Authority and its member agencies, East Bay Municipal Utility District, and Sacramento County Water Agency approved and certified the Final EIR in April 2004.

Water Supplies for Other Water Users in the American River Division. There are many water users on the American River that do not use CVP water. There are four major users that directly divert water from CVP facilities or American River: City of Sacramento, Carmichael Water District, Folsom Prison, and California Department of Parks and Recreation.

The City of Sacramento has one of the oldest water rights on the American River. This pre-1914 water right provides for delivery from both the American and Sacramento rivers. The total water right includes up to 326,800 acre-feet. The City diverts water from the American River between the Howe Avenue and J Street bridges, in the Sacramento River near the confluence of the American and Sacramento rivers, and in the Sacramento River south of the American River confluence. The City and Reclamation have developed operating agreements to provide for Reclamation to release adequate amounts of water for the City to divert water from Folsom Lake for use by the City.

Carmichael Water District also has a pre-1914 water right on the American River and diverts water from the American River near Fair Oaks. The Carmichael Water District provides water to portions of the unincorporated areas of northern Sacramento County.

Folsom State Prison has a water right for 4,000 acre-feet on the American River that is diverted from Folsom Lake.

The State of California has a water right for up to 5,000 acre-feet on the American River diverted at Folsom Lake. The water is primarily used for irrigation and other needs at recreational facilities at and near Folsom Lake.

El Dorado County Water Agency. El Dorado County Water Agency and Reclamation has announced the intention to negotiate a long-term CVP water service contract under P.L. 101-514. Under this proposed contract, up to 15,000 acre-feet of CVP water would be provided to El Dorado Irrigation District and Georgetown Divide Public Utility District. The diversions would be located in Folsom Lake or on the American River upstream from Folsom Lake.

P.L. 101-514 does not specify how much of the up to 15,000 acre-feet would be allocated to El Dorado Irrigation District and Georgetown Divide Public Utility District. Ongoing environmental analyses will evaluate impacts and benefits of this proposed contract and the appropriate allocation of water between the two agencies. Because the environmental documentation is not complete and the contracts have not been adopted, this EIS does not address the potential contract for this 15,000 acre-feet under PL 101-514.

Wastewater Treatment and Disposal for Water Users of the American River Division. Wastewater treatment and disposal practices also affect water quality and water supplies. Wastewater from several of the CVP water service contractors (Folsom, San Juan Water District, and Sacramento County Water Agency) and the City of Sacramento and other surrounding unincorporated areas is collected by the local agencies and conveyed and treated by facilities owned and operated by Sacramento Regional County Sanitation District. The Sacramento Regional County Sanitation District wastewater treatment plant is located near Freeport. Most of the effluent is discharged to the Sacramento River. A portion of effluent is used for wetlands restoration and water recycling. The operations of the wastewater treatment plant will be coordinated with the Freeport Regional Water Project to minimize conflicts between beneficial uses in the Sacramento River near Freeport.

Wastewater from Roseville and portions of Placer County served by Placer County Water Agency and San Juan Water District, including South Placer Municipal Utility District (Loomis and Rocklin area), Placer County Sewer Maintenance District No. 2 (Granite Bay area), Placer County/Sunset Area (north of Roseville), Lincoln, Penryn, and Newcastle is treated at one of two Roseville treatment plants with effluent discharged to Dry Creek or Pleasant Grove Creek. Approximately 6,000 acre-feet/year will be recycled for irrigation of golf courses, parks, and other landscaped areas.

Other areas served by Placer County Water Agency, including Auburn, also provide wastewater treatment. The City of Auburn wastewater treatment plant effluent is discharged to Auburn Ravine and

eventually flows into the Sacramento River about 19 miles upstream of the confluence with the American River. Many communities have implemented water recycling programs.

Wastewater services in El Dorado Hills is provided by El Dorado Irrigation District. This district participates in extensive water recycling and conservation programs.

Wastewater treatment in the East Bay Municipal Utility District water service area is either provided by East Bay Municipal Utility District or Central Contra Costa Sanitary District. East Bay Municipal Utility District provides wastewater services for Oakland, Piedmont, Alameda, Berkeley, Emeryville, Albany, and portions of Richmond. The wastewater treatment plant is located near the eastern end of the Bay Bridge and the effluent is discharged into the central bay. East Bay Municipal Utility District has implemented an extensive recycling program that provides water for irrigation and for toilet flushing water in office buildings. In other portions of the East Bay Municipal Utility District water service area, wastewater services are provided by Central Contra Costa Sanitary District, Dublin San Ramon Sanitary District, West County Sanitary District, City of San Leandro, and Ora Loma Sanitary District. These agencies also have implemented wastewater recycling programs.

Response to Existing Reduction in Water Supply Reliability. During dry years when CVP water supplies are significantly reduced, current users of CVP water rely upon water rights, conjunctive use with groundwater, conservation, and/or recycling to meet water demands, as described above. Overuse of groundwater during long droughts could cause a serious overdraft. In areas where groundwater generally is not available, such as Folsom or East Bay Municipal Utility District, severe water conservation requirements have been implemented, such as limitation of outdoor irrigation and increasing water rates for users of large volumes of water.

Environmental Consequences

The effects of Alternatives 1 and 2 on surface water resources are compared to conditions under the No Action Alternative.

No Action Alternative. The No Action Alternative represents the future conditions with contract renewals with most CVPIA provisions, as described in Chapter 2. CVP operations in the No Action Alternative are similar to operations described in the June 2004 OCAP report plus future operations described in American River Pump Station EIR/EIS that was completed by Reclamation and Placer County Water Agency.

Overall water supply reliability in the No Action Alternative would be slightly less than under the Affected Environment conditions because water rights users located along the Sacramento and American rivers are projected to divert more water to serve projected municipal growth. As more water rights water is diverted, the CVP water service contract water reliability is reduced.

Most of the water diverted for municipal uses is returned to the river systems as wastewater effluent and dry weather runoff. The hydrologic model used by Reclamation (CALSIM II) assumes that 55 percent of the municipal water diversion is used for indoor water use and 100 percent of that use is returned as wastewater. The model also assumes that of the 45 percent used for outdoor water use, 28.5 percent returns as runoff. However, municipal uses require an "all-year" diversion pattern.

For the American River Division, the No Action Alternative conditions assume that conveyance facilities will be constructed to allow for full delivery of CVP water service contract water to Zone 40, Placer County Water Agency, and East Bay Municipal Utility District. The No Action Alternative also assumes full delivery of CVP water service contract water under Public Law 101-514 to Folsom and San Juan

Water District. Contract amounts for CVP water service contractors in the American River Division under the No Action Alternative were discussed in Chapter 2 and are summarized in Table 4-1. The contract amounts are equal to existing contract amounts.

Alternative 1. CVP water service contract amounts and CVP operations under Alternative 1 would be identical to conditions under the No Action Alternative. Therefore, there are no environmental impacts of this alternative to surface waters as compared to the No Action Alternative.

Alternative 2. CVP contract amounts and water supply reliability under Alternative 2 would be identical to conditions under the No Action Alternative. Alternative 2 would not alter CVP operations, water storage or release patterns from CVP facilities, or the maximum volume of water to delivered to the American Division as compared to the No Action Alternative.

CVP water service contract rates paid by the contractor would be higher in some years than under the No Action Alternative, as described in later portions of this chapter. If CVP water service contractors choose to reduce the amount of CVP water deliveries, there may be additional water for use by other CVP water service contractors in some years. It is difficult to determine if individual users or water service contractors will react in this manner, therefore, it is difficult to predict the actual water resources conditions under Alternative 2. The minimum amount of CVP water available for deliveries to water service contractors would be identical to the No Action Alternative condition.

TABLE 4-1

2029 CVP WATER DELIVERY ASSUMPTIONS FOR AMERICAN RIVER DIVISION

CVP Contractor	No Action Alternative and Alternatives 1 and 2
Sacramento County Water Agency - Zone 40	15,000 acre-feet under PL 101-514 contract
Sacramento County Water Agency - Folsom	7,000 acre-feet under PL 101-514 contract
San Juan Water District	11,200 acre-feet under 1960 contract 13,000 acre-feet under PL 101-514 contract
Sacramento Municipal Utility District	15,000 acre-feet
Placer County Water Agency	35,000 acre-feet
Roseville	32,000 acre-feet
El Dorado Irrigation District	7,550 acre-feet
East Bay Municipal Utility District	up to 133,000 acre-feet/year and 165,000 acre-feet over three consecutive dry years per the Amendatory Contract

However, if CVP water service contractors selected to not utilize CVP water due to the water rates under Alternative 2, additional water would be available to meet other obligations of the CVP. Because it is difficult to project how CVP water service contractors would respond to water rates under Alternative 2, a conservative approach was assumed with respect to surface water resources. Under a conservative approach, it was assumed that the water service contractors continued to utilize CVP water as under the No Action Alternative. Therefore, there are no environmental impacts to surface waters as compared to the No Action Alternative.

Cumulative Effects

The long-term contract renewals in the American River Division would not result in cumulative adverse impacts to surface water resources, quality, or facilities when considered in combination with future projects. These issues were evaluated as part of the PEIS. That analysis indicated that future projects, including future water transfer projects, may improve CVP water supply reliability.

For example, Reclamation completed the Draft Eastside/Westside Water Transfer/Exchange EA for approval of annual exchange/transfer(s) of up to 150,000 acre-feet of CVP water between CVP contractors through an internal exchange of SWP water by the Kern County Water Agency. This process would be in effect for five years, between March 2001 and February 2006.

Another program was completed by the San Joaquin River Exchange Contractors for the temporary water transfers for water years 2000 through 2005 with Department of the Interior and other agricultural users. These temporary water transfers, limited to 84,000 acre-feet/year, are needed to optimize the use of limited existing water resources for both agriculture and fish and wildlife resources. The Department of the Interior would use the water to provide wildlife refuges with Level 4 water supplies.

These types of programs would modify water supply reliability of specific users involved in the projects, but not change long-term CVP contract amounts or deliveries from within the historical ranges.

GROUNDWATER RESOURCES AND GROUNDWATER QUALITY

Groundwater is used in portions of the American River Division. This section focuses on groundwater resources affected by CVP operations of the American River Division.

Affected Environment

The information presented below is primarily based upon environmental documentation completed for Reclamation, the Water Forum, and local agencies.

Groundwater Use in Portions of Sacramento, Placer, and El Dorado Counties. Alluvium deposits can be found throughout the Sacramento Valley basin in the form of alluvial fans, stream channel deposits, and flood plain deposits. These vast deposits are the source of most of the groundwater pumped in the Sacramento Valley, including the American River watershed. Depth to the base of usable freshwater ranges from 1,000 feet near the base of the foothills to 3,000 feet in the downtown Sacramento area.

The useable water in the aquifers under the American River Division are divided into a shallow aquifer zone and an underlying deeper aquifer zone. The deeper aquifer is separated from the shallow aquifer by a discontinuous clay lens. Groundwater wells withdraw from both aquifers.

Aquifer recharge of the basin has historically occurred from deep percolation, infiltration from stream beds, and subsurface inflow along basin boundaries. Most of the recharge in the American River watershed occurs along the foothills. Groundwater historically has seeped from the aquifer to the American and Cosumnes rivers in portions of the American River Division. However, there are portions of the watershed with overdraft conditions in which groundwater flows from the rivers to the adjacent groundwater. There are three areas of significant overdraft in the American River Division. In northern Sacramento County, groundwater use has increased significantly over the past 50 years as urban areas grew. Similar cones of depression have occurred in the vicinity of Zone 40 and in the Galt area.

Groundwater availability is severely limited due to the presence of bedrock and related geological conditions near and within Folsom; central Placer County east of Roseville; and throughout El Dorado County.

Groundwater quality in the American River Division is relatively good. The lower aquifer has poorer water quality than the upper aquifer due to seepage of constituents from agricultural and urban activities. Elevated levels of iron and manganese occur in the area south of the City of Sacramento. High levels of iron and manganese do not pose a health hazard but may result in odor, taste, and color problems and staining of plumbing fixtures and laundry. Local treatment is provided for some groundwater. Arsenic and radon have also been measured in the groundwater in the study area, although not at levels exceeding the current drinking water standards. Degradation of groundwater quality in Sacramento County can occur as groundwater levels decline and potential in-migration of poorer quality groundwater from the deeper aquifer occurs.

Areas with identified contamination are located in some portions of the study area. Four sites have been designated as U.S. Environmental Protection Agency Superfund sites: Aerojet Corporation, Mather Air Force Base, McClellan Air Force Base, and Sacramento Army Depot. Contamination has also been identified at and near the Kiefer Landfill in southeast Sacramento County, a historic Pacific Gas & Electric Company site near Old Sacramento, Southern Pacific Railroad yards in downtown Sacramento and in Roseville, and the Union Pacific Railroad yard in Sacramento south of U.S. Highway 50. A portion of the contamination from the Aerojet Corporation site has adversely affected water quality near Rancho Cordova and was recently discovered in wells north of the American River within the Carmichael Water District. Therefore, the wells serving the Rancho Cordova area will be abandoned and a portion of the Sacramento County Water Agency surface water supply will be used to serve this area, along with remediated groundwater captured as part of the Sacramento County Water Agency proposed Replacement Water Supply Project.

Groundwater in East Bay Municipal Utility District. Six primary Coastal Basin aquifers are located in the East Bay Municipal Utility District service area: the San Ramon (under Alamo, Danville, and San Ramon), Richmond (between San Pablo Bay and Berkeley), Ygnacio and Clayton Valley (extends from under Walnut Creek to along Suisun Bay), Castro Valley (north of Hayward), and South East Bay Plain basins (from the Hayward fault to beneath San Francisco Bay). The basins have similar morphology and a Mediterranean climate. All are structural depressions formed by folding and faulting, all are filled with marine and alluvial sediments, and all are drained by streams that contain water at least part of the year. Seawater intrusion is common.

Groundwater use in the East Bay Municipal Utility District service area is limited by several factors, including the effects of saltwater intrusion and contamination in shallow aquifers on groundwater quality and the availability of higher quality imported surface water. Groundwater is currently not used by East Bay Municipal Utility District for municipal supplies. Freshwater wells in the East Bay Municipal Utility District service area are used for agricultural and industrial users. Alameda County Water District located south of East Bay Municipal Utility District is using brackish groundwater for municipal water supplies following treatment with membrane technology. East Bay Municipal Utility District is currently considering groundwater storage of water supplies from local runoff. This concept is being evaluated in separate technical and environmental analyses.

Environmental Consequences

The effects of Alternatives 1 and 2 on surface water resources are compared to conditions under the No Action Alternative.

No Action Alternative. The No Action Alternative represents the future conditions with contract renewals with most CVPIA provisions. Surface water supply reliability in the future would be slightly less than under Affected Environment conditions because water rights users located along the Sacramento and American rivers are projected to divert more water in the future to serve projected municipal growth. As more water rights water is diverted, the water available for CVP water use is reduced. Therefore, groundwater use by many CVP water service contractors will be higher than under the existing conditions.

Under the No Action Alternative, groundwater use would be reduced as compared to the existing conditions due to the implementation of conjunctive use programs in Sacramento County and completion of facilities for maximizing delivery of CVP water to Zone 40 and Placer County Water Agency. Groundwater would be used to a greater extent in these areas during drier years, however, the conjunctive use programs and planned groundwater recharge facilities are expected to result in a net reduction in groundwater overdraft. These facilities have been evaluated under separate environmental documentation for Sacramento County Water Agency and Placer County Water Agency. There would be no change in groundwater conditions in the East Bay Municipal Utility District service area.

Alternative 1. CVP contract amounts, water supply reliability, and uses by American River CVP contractors under Alternative 2 would be identical to conditions under the No Action Alternative. Therefore, there would be no changes or environmental impacts of this alternative to groundwater under Alternative 1 as compared to the No Action Alternative.

Alternative 2. CVP contract amounts, water supply reliability, and uses by American River CVP contractors under Alternative 2 would be identical, to conditions under the No Action Alternative. Therefore, there would be no changes or environmental impacts of this alternative to groundwater under Alternative 2 as compared to the No Action Alternative.

Cumulative Effects

The long-term contract renewals in the American River Division would not result in cumulative adverse impacts to groundwater resources, quality, or facilities when considered in combination with future projects. These issues were evaluated as part of the PEIS. That analysis indicated that future projects, including future water transfer projects, may improve CVP water supply reliability and reduce the need for groundwater withdrawals. These types of programs will modify water supply reliability but not change long-term CVP contract amounts or deliveries from within the historical ranges under any of the alternatives.

A program designed to offset potential cumulative effects was recently tested. Reclamation cooperated in a pilot program with the Sacramento Groundwater Authority in 2002 to test the capability of their member agencies to make water available through in-lieu groundwater use as contemplated in their plans for limiting diversions in dry years consistent with the Water Forum proposal. Wholesale recipients of water from San Juan Water District (Fair Oaks Water District and Orangevale Water District) have the capability to pump groundwater. These wells were historically used at times when surface supplies were not sufficient to meet their needs and to supplement peak demands. The Fair Oaks and Orangevale water districts used these supplies beyond what they normally used in-lieu of taking the wholesale supplies from San Juan Water District. San Juan Water District, in-turn, reduced diversion of water from Folsom Reservoir thereby making it available to the Environmental Water Account (EWA) in Folsom Reservoir. Arrangements were then made to release the water from Folsom for the EWA in the fall to help support spawning flows for fall-run chinook salmon and replace exports from the Delta previously forgone to modify the Delta fisheries conditions.

LAND USE, DEMOGRAPHICS, AND SOCIOLOGICAL RESOURCES

The information presented below is primarily based upon environmental documentation completed for Reclamation, Water Forum Proposal, and federal, state, and local agencies. Land use for a region is described for communities either served by CVP water or within the vicinity of communities served by CVP water, such as communities considered in the Water Forum Proposal.

For each existing CVP water service contractor, information was compiled from the California Department of Conservation, Division of Land Resource Protection Farmland Mapping and Monitoring Program (2000) and was compared to land use, population, and sociological resource (housing and employment) projections developed by local agencies within the CVP service area.

Affected Environment

The information presented below concerning land use, demographics, and sociological resources is primarily based upon environmental documentation completed for local agencies, the Sacramento Area Water Forum, California Department of Conservation, U.S. Census Bureau, and Reclamation.

City of Folsom. The City of Folsom encompasses 15,160 acres of land including portions of Folsom Lake. On the northwestern side of the American River, the City extends from the Placer County line to the intersection of Madison Avenue and Greenback Lane. On the southeastern side of the American River, the city extends south from the El Dorado County line to the U.S. Highway 50/Folsom Boulevard interchange at Museum Flat.

Existing land uses in the city include: approximately 1,700 acres of residential; 180 acres of commercial; 150 acres of industrial; 350 acres of schools; 220 acres of parks; 850 acres of open space; 850 acres at Folsom Prison; 10,850 acres of undeveloped areas and other uses. Areas adjacent to the city include undeveloped areas and industrial uses.

The City of Folsom General Plan identifies the following planned land uses within the city limits and on adjacent areas that would be served by Folsom services: 6,132 acres of residential; 3,030 acres of open space; 1,531 acres of industrial; 1,410 acres of water uses; 1,329 acres of commercial; 848 acres for the prison; 580 acres of schools; and 300 acres of parks. Almost 3,600 acres of land south of Highway 50 were added to the city's Sphere of Influence in 2001.

The area to be served by CVP water service contract water is located on the southeastern section of the city (known as the Folsom East Area). This area consists of approximately 3,657 acres identified for urban, agriculture, and open space land uses.

Between 1980 and 1990, the population of Folsom more than doubled, from 11,003 to 29,802. The city's Resolution 2784 sets a growth cap of 69,333 people, representing the 2010 buildout population estimated in the General Plan. As of January 1, 2002, the City estimated its population at 53,691 (excluding prisoners at Folsom Prison). According to the 2002 City of Folsom General Plan Housing Element, the total number of housing units in 2000 was 17,436, composed of 13,511 single-family units, 3,041 multi-family units, and 884 mobile homes.

The City of Folsom has an economy based on many sectors, including services that support the community, Folsom Prison, small and medium-sized businesses, several corporations involved in the development and manufacturing of electronic components, and several large retail/commercial centers.

Sacramento County. Sacramento County is responsible for land use in the unincorporated areas of two CVP water service contractors: San Juan Water District and Sacramento County Water Agency. Urban uses are distributed within the 636,083-acre area of Sacramento County surrounding and including the City of Sacramento. Agricultural and rural residential land uses are primarily located south and east of Elk Grove-Florin Road, south of Cosumnes River, near Folsom and Rio Linda, and in the northernmost portion of the county along the county line.

In 2000, Sacramento County contained lands identified as Prime Farmland (116,116 acres) and Farmland of Statewide Importance (62,650 acres). Prime Farmland is defined by the California Department of Conservation as land that has the best combination of physical and chemical features able to sustain long-term agricultural production. Farmland of Statewide Importance is defined as land that is similar to Prime Farmland, except that it has greater slopes or lower moisture storage capacity. As of 2001, there were approximately 176,632 acres of land in Sacramento County enrolled in Williamson Act contracts. Prime Farmland in Sacramento County within the American River Division is concentrated in the North Natomas areas and along the Cosumnes River floodplain.

In 2000, Sacramento County included approximately 636,083 acres: 396,464 acres of farmland (irrigated and non-irrigated); 157,157 acres of urban uses including residential, industrial, recreational, commercial and office, and urban reserve; 64,209 acres of other uses; and 18,253 acres of water. The Sacramento County General Plan planned land uses for unincorporated Sacramento County in 2010 include the following: 220,000 acres of agriculture; 151,000 acres of residential; 22,000 acres of industrial; 10,000 acres of recreation; 23,000 acres of commercial and office; and 18,000 acres of urban reserve.

The 30,298-acre San Juan Water District includes a portion of the unincorporated Sacramento County area and portions of the incorporated communities of Folsom and Citrus Heights.

Citrus Heights was incorporated in 1997. Citrus Heights is located in northeast Sacramento County, just south of the Placer County boundary. The City of Citrus Heights is comprised of approximately 14 square miles. As of 2000, the city was approximately 95 percent built out.

In 1998, the entire Sacramento County Water Agency service area consisted of approximately 83,375 acres with about 17,000 acres of urban land and 66,375 acres of agriculture or open space**.** Urban uses would increase to about 47,320 acres and agriculture/open spaces would decrease to 36,055 acres. In 2003, Sacramento County Water Agency prepared a Draft EIR for Zone 40 Water Supply Master Plan. This document describes that the use of CVP water in Zone 40 would be consistent with the general plans of Sacramento County and the cities of Elk Grove and Rancho Cordova (incorporated in 2000 and 2003, respectively). Both of these cities are currently using the Sacramento General Plan until separate plans can be developed.

The U.S. Census Bureau estimated the 2001 population at 1,268,770 for Sacramento County. It is projected that Sacramento County will have a population of 1,459,952 in the year 2010 representing a 40 percent increase over 1990. More than half of the increase in population is projected to result from residential development within the unincorporated areas of Sacramento County. The unincorporated areas of Sacramento County currently have 62 percent of the regional population.

In 2000, Sacramento County civilian employment was estimated at 580,100. The estimated housing stock in 2001 was estimated at 480,497. The median home price in December 2000 was $175,000. Persons per household in 2000 were estimated at 2.64.

Sacramento Municipal Utility District. Although Sacramento Municipal Utility District's contract does not specify a particular area in which CVP water must be used, the water delivered under the

existing contract has historically been used at the 2,829-acre Sacramento Municipal Utility District property known as Rancho Seco, which is located in southeast Sacramento County east of the town of Clay. The property's land use is designated as Public/Quasi-Public overlain with a Resource Conservation Area designation. It is zoned AG-80 (permanent agriculture with a 80-acre minimum parcel size). Public parks and ancillary uses, including the lake at Rancho Seco, are considered a permitted use in agricultural zones. Lands surrounding the site are also designated and zoned for agricultural use, with lands to the north, south, and east zoned for 80-acre minimum parcel sizes under the Williamson Act and lands to the southwest zoned for agricultural and residential use (5-acre minimum parcel size). The Rancho Seco Nuclear Generating Station, operated between 1974 and 1989, and is currently undergoing decommissioning, which is expected to be mostly complete in 2008.

Sacramento Municipal Utility District is currently developing approximately 35 acres at the Rancho Seco site for a natural gas-fired power plant. It is anticipated that the existing conditions will be maintained on the site with only minor development of the industrial portions of the site for the new power plant.

City of Roseville. Roseville's Planning Area includes approximately 20,045 acres of incorporated land plus an additional 4,378 acres that are outside of the city limits, but within the city's sphere of influence. The city has designated the following planned land uses on 17,650 acres of incorporated land: 8,281 acres of residential; 1,784 acres of commercial; 931 acres of office; 2,042 acres of industrial; and 4,612 acres of other uses (public/parks/open space). In addition, there are 1,028 acres of road and highway rights-of-way and easements, and 183 acres for the Pleasant Grove Wastewater Treatment Plant. Roseville also has the largest active rail yard in the western states.

The population of Roseville in 1992 was 50,308. The California Department of Finance estimates the January 1, 2002 city population at 85,800.

As of the third quarter of 1990, Roseville had an employment base of approximately 22,030 jobs. The highest 1990 employment sector was commercial, followed by office employment, and industrial activities.

In 1991, there were an estimated 18,901 dwelling units in Roseville. The average household size, based on the 1990 Census, was 2.54 persons per household. Vacancy rates for housing in Roseville varied between 5.39 percent and 7.54 percent between 1980 and 1991.

Placer County. Placer County includes approximately 1,500 square miles, or 960,090 acres. A portion of southwestern Placer County is currently served by water from the American River by Placer County Water Agency. Additional unincorporated areas west of Roseville and Rocklin and near Sheridan could be served American River water by Placer County Water Agency. This area is primarily agricultural with lot sizes of at least 40 acres/parcel.

As of 2000, approximately 19 percent of Placer County's total land area was devoted to agricultural use. Most of the County's agricultural activities are located within southwestern Placer County. As of 2001, there were 44,745 acres of land enrolled in Williamson Act contracts.

Placer County's 1994 General Plan Update projected that by 2044, most of the county's new development will occur within the cities of Lincoln, Rocklin, Roseville, and Auburn. It is estimated that, in 2000, Placer County included 41,448 acres of urban uses and 180,472 acres of agriculture or open space land uses. As of 2003, Placer County Water Agency's service area included 132,779 acres. Placer County Water Agency in 1998 included 25,250 acres of urban uses and 107,429 acres of agricultural and open space uses.

The City of Rocklin was incorporated in 1893. The planning area for the City of Rocklin is 21 square miles, which includes the 12-square-mile area within the city limits. Approximately 47 percent of the acreage within the planning area is designated residential; eight percent is commercial; nine percent is industrial; 12 percent is recreation/conservation; four percent is public/quasi-public; and 20 percent is planning reserve.

The City of Auburn included 4,830 acres in 1992. The city's proposed sphere of influence in 1992 was 17,700 acres. Existing land uses in 1992 include approximately 20 percent residential, four percent commercial, one percent industrial, five percent public/quasi-public, seven percent for streets, and 61 percent vacant land.

The City of Lincoln is currently updating the 1988 General Plan. The planning area comprises approximately 19,500 acres, including approximately 4,000 acres within the city limits. Approximately 19 percent of the planning area is designated residential; 19 percent is designated industrial; two percent is designated commercial; six percent is designated parks and public facilities/schools; 24 percent is designated urban reserve; and 30 percent is designated agricultural.

The Town of Loomis was incorporated in 1984. This community has a rural character with large residential lots, a downtown area, and open space.

The California Department of Finance estimated the County population as of January 1, 2002 County population at 265,700.

In 2000, Placer County labor force consisted of 124,800 people and the unemployment rate was 3.2 percent. Employment opportunities in Placer County exist within all economic sectors. Employment sectors in the county which were expected to grow include retail trade, construction, and manufacturing. As of 2000, civilian employment was estimated at 120,800.

The estimated housing stock in 1990 was 77,879, composed of single-family units (61,482), multi-family units (10,821), and mobile homes and trailers (5,576). In 2001, the housing stock was estimated at 111,075. The median home price in December 2000 was $251,000. Persons per household in 2000 were estimated at 2.63. The average household size in Placer County between 1990 and 2000 was 2.7 persons.

El Dorado County. Land use planning in El Dorado County has been guided by several planning documents, most recently the 2004 General Plan. This general plan was prepared in response to litigation following the adoption of a general plan in 1996. Several alternatives were evaluated in an Environmental Impact Report. The preferred alternative was a modified version of the 1996 General Plan Alternative.

The land use pattern in western El Dorado County generally concentrates urban uses in the vicinity of the U.S. Highway 50 corridor in the portion of the County west of Camino. The portion of the El Dorado Irrigation District service area that uses CVP water service contract is located in Market Area No. 1 (El Dorado Hills). The City of Placerville is the only incorporated city in western El Dorado County. Many small towns exist throughout the rural areas of the county, providing a range of commercial services and residential densities.

Market Area No. 1 in the 2004 General Plan includes 28,287 acres characterized by residential, commercial, a large business park, and several institutional developments. There are no prime agricultural lands in Market Area No. 1. Planning for the area was completed prior to adoption of the 1996 general plan. There are six specific plans that address the area served by CVP water service contract water. The Northwest El Dorado Hills Specific Plan was approved in 1987 and the area is mostly built-out. Future development will be guided by the following specific plans.

- Valley View Specific Plan: 2,837 acres with 2,840 dwelling units
- El Dorado Hills Specific Plan: 3,646 acres with 4,481 dwelling units
- Bass Lake Hills Specific Plan: 1,166 acres with 1,025 dwelling units
- The Promontory Specific Plan: 1,000 acres with 1,097 dwelling units
- The Carson Creek Specific Plan: 1,000 acres with 1,470 dwelling units

Each plan has completed an Environmental Impact Report and has incorporated measures for protection of natural resources such as wetlands, heritage trees, native woodlands, and special status species. The Open Space element of these plans specify avoidance and mitigation measures such as buffers and setbacks, habitat enhancement, and habitat compensation in order to conserve and protect sensitive resources in the planning area. The 2004 General Plan slightly modified several portions of the Carson Creek and El Dorado Hills specific plans to slightly reduce development and slightly increase natural resource areas.

The 2004 General Plan indicates that the 2002 county population was 163,585 with 129,396 located in the western unincorporated area of the county. The 2004 General Plan indicates that Market Area No. 1, El Dorado Hills, had 5,805 housing units in 1999 and supports 5,000 jobs.

East Bay Municipal Utility District. The 259,313-acre East Bay Municipal Utility District service area includes portions of Alameda and Contra Costa counties could be served by CVP water service contract water. East Bay Municipal Utility District-owned lands within the service area have a number of uses. The service area in Alameda County includes the cities of Alameda, Albany, Berkeley, Emeryville, Oakland, Piedmont, and San Leandro, part of Hayward, and the unincorporated communities of San Lorenzo, Cherryland, Fairview, and Castro Valley. The service area in Contra Costa County includes the Orinda, Moraga, Walnut Creek, Alamo, Danville, and San Ramon communities.

The population in Alameda County in 2000 was 1,454,300. The Contra Costa County population totaled 948,816 persons in 2000. Much of these populations is served by other water suppliers than East Bay Municipal Utility District.

In 2000, the civilian labor force in Alameda County was estimated to be 740,400, and the unemployment rate was three percent. The services industry is the County's largest sector, followed by retail trade, government, and manufacturing. In 2000, the civilian labor force in Contra Costa County was estimated to be 505,100, and the unemployment rate was 2.7 percent. Sectors in the employment base are primarily in services because of an increasing local population and companies moving into the region.

In 2001, the housing stock in Alameda County was estimated to be 543,680. In 2001, the median home price in Alameda County was $364,000. In 2001, total housing stock in Contra Costa County was estimated to be 357,028. In 2000, the median home price in Contra Costa County was $267,800.

Environmental Consequences

The effects of Alternatives 1 and 2 on land uses, population, and sociological resources are compared to conditions under the No Action Alternative.

No Action Alternative. Under the No Action Alternative, it is anticipated that growth would continue to occur as described in the county general plans, projections by the Department of Finance, and environmental impact reports prepared for Sacramento County Water Agency, San Juan Water District, Placer County Water Agency, East Bay Municipal Utility District, and Reclamation. The environmental

impact reports and the recent general plans, including the 2004 El Dorado County General Plan, assume water supply conditions that are included in the OCAP proposal and the No Action Alternative.

It should be noted that use of CVP long-term water service contracts is not the sole factor driving growth and land use change. Demographic, economic, political, and other factors, independent of the long-term contract renewal process, are causing changes with direct and indirect effects to land use that are beyond the range of Reclamation's responsibilities. With little exception, virtually all of the long-term contract renewal actions are within the range of existing conditions. This includes the area of use, types of use, range of river flows, and reservoir fluctuations.

In some instances the responsibility to address affects to land uses would be with the local government as part of their California Environmental Quality Act compliance for their actions. For example, Reclamation is not responsible for the development of housing tracts or industrial development in a community. Such actions are approved locally and at the state level (However, other federal agencies, such as Housing and Urban Development, may be involved.). Further, if a farmer changes from one irrigated crop to another because of economic reasons, Reclamation does not control the farmer's decision. On the other hand, Reclamation would need to consider the effects to land uses when Reclamation approves new lands being brought into an irrigation district and when Reclamation approves a change in use. Any such approvals would require independent analysis and environmental documentation.

Alternative 1. Land use and water supply facilities operations in the American River Division under Alternative 1 would be identical to conditions under the No Action Alternative. Therefore, there are no environmental impacts of this alternative as compared to the No Action Alternative.

Alternative 2. Land use and water supply facilities operations in the American River Division under Alternative 2 would be identical to conditions under the No Action Alternative. Therefore, there are no environmental impacts of this alternative as compared to the No Action Alternative.

Cumulative Effects

The long-term contract renewals in the American River Division would not result in cumulative adverse impacts to land use resources when considered in combination with future projects. These issues were evaluated as part of the PEIS and other environmental documents completed for the local agencies and Reclamation. That analysis indicated that future projects, including future water transfer projects, may improve CVP water supply reliability. These types of programs would modify water supply reliability but not change long-term CVP contract amounts or deliveries from within the historical ranges. Therefore, land use would not change under any of the alternatives.

CENTRAL VALLEY PROJECT WATER SUPPLY COSTS

The cost and availability of CVP water can lead to changes in water supply costs, agricultural economics, and regional economics. CVP water service contracts for many of the American River Division contractors provide only part of the total water supplies. Therefore, it is difficult to specifically identify how CVP water reliability and water supply costs would cause changes in communities. CVP water is the sole source of water supply for that portion of Folsom served with CVP water service contract water and for the City of Roseville.

The CVP water service contracts for Sacramento County Water Agency (including Zone 40 and Folsom), Sacramento Municipal Utility District, El Dorado Irrigation District, and East Bay Municipal Utility

District are only for M&I water supplies. Existing contracts for Roseville and San Juan Water District are for agricultural and M&I water supplies. All renewed contracts will be for M&I purposes only.

The CVPIA PEIS economic analysis included use of CVP water in the American River Division, specifically the Sacramento metropolitan area, which also included the cities of Folsom and Roseville. The M&I economic analysis and the regional economic analysis for East Bay Municipal Utility District was aggregated into the analysis of the overall San Francisco Bay Area which relies significantly on non-CVP water sources and costs. This EIS provides more specific details regarding the cost of CVP water to American River Division users.

Affected Environment

The cost of CVP water includes the cost to repay the construction cost of CVP facilities based upon a percentage of use by the specific water service contractor, the operation and maintenance costs, and Restoration Fund. The repayment cost is periodically reviewed to determine if adequate funds are being collected to repay the project costs within a given time frame. Operation and maintenance costs are reviewed annually to reflect actual costs. The Restoration Fund payment was established by CVPIA.

The repayment cost is recovered under several provisions of federal Reclamation Law. The Cost of Service cost is based upon the repayment cost without interest. This was the cost that most agricultural contractors pay for CVP water under the Reclamation Reform Act of 1982. Agricultural contractors that use CVP water to irrigate large parcels or met other criteria pay the repayment cost with interest. This is referred to as Full Cost. Municipal and industrial users pay the repayment cost with an interest rate that is lower than Full Cost interest rate.

City of Folsom. The City of Folsom would use the CVP water obtained under subcontract with Sacramento County Water Agency for M&I users in the Folsom East area. The CVP cost of service rate for the Sacramento County Water Agency M&I water service contract was $19.02 per acre-foot in 2004.

During periods when CVP water supply deficiencies occur on the American River, users would implement individual conservation measures and the city may purchase water from other agencies that use American River water. These costs could increase the overall cost of water.

San Juan Water District. San Juan Water District combines CVP water with water rights water diverted from Folsom Lake and served to the M&I users. The CVP water represents about 40 percent of the total water supplies in wetter years and about 30 percent in drier years. Water rights water includes water rights held by San Juan Water District and a portion of the water rights held by Placer County Water Agency that are delivered under a contract with San Juan Water District. Cost to convey, treat, and distribute both water supplies from Folsom Lake is identical. However, the water rights water is provided from Folsom Lake at no cost. The CVP cost of service rate for San Juan Water District M&I water service contract was $22.64 per acre-foot in 2004.

During periods when CVP water supply deficiencies occur on the American River, users would implement individual conservation measures, the district may rely upon water rights water, and the district may purchase water from other agencies that use American River water. Conservation measures and the purchase of water during dry periods could increase the overall cost of water.

Zone 40. The Sacramento County Water Agency would provide a supplemental water supply to M&I water users. The CVP water could provide more than 30 percent of the total water supply in the future. Deliveries of CVP water to this area would require payment for the water service contract water, but

would decrease the cost of pumping groundwater. The CVP cost of service rate for the Sacramento County Water Agency M&I water service contract was $19.02/acre-foot in 2004.

During periods when CVP water supply deficiencies occur on the American River, users would implement individual conservation measures and rely upon groundwater or the Sacramento County Water Agency could purchase water from other agencies that use American River water. Conservation measures, use of groundwater, or the purchase of water during dry periods could increase the overall cost of water.

Sacramento Municipal Utility District. Sacramento Municipal Utility District currently combines CVP water with water rights water diverted from the Folsom South Canal for use on the Rancho Seco property. Cost to convey, treat, and distribute both water supplies from the Folsom South Canal is identical. However, unlike the CVP water which has a capital component, the cost of the water rights water is limited to the cost for the CVP to divert the water from the American River at Nimbus and convey the water through the Folsom South Canal (the operational costs of conveying the water). The CVP cost of service rate for the Sacramento Municipal Utility District M&I water service contract was $70.17 per acre-foot in 2004.

During periods when CVP water supply deficiencies occur on the American River, Sacramento Municipal Utility District would implement conservation measures and may purchase water from other agencies that use American River water. These costs could increase the overall cost of water.

City of Roseville. Roseville uses CVP water to serve M&I users. The cost of water for Roseville depends upon the cost of the CVP water service contract water provided from Folsom Lake. The CVP cost of service rate for the Roseville M&I water service contract was $20.09 per acre-foot in 2004. Additional water supplies include recycled water and non-CVP water purchased from Placer County Water Agency. Roseville purchases up to 22,000 acre-feet from Placer County Water Agency. In addition, Roseville is considering negotiating with Placer County Water Agency for an additional 10,000 acre-feet of water. The City would need a Warren Act contract to convey at least a portion of this non-CVP water through CVP facilities.

During periods when CVP water supply deficiencies occur on the American River, users would implement individual conservation measures and the city may purchase water from other agencies that use American River water, such as Placer County Water Agency. These costs could increase the overall cost of water.

Placer County Water Agency. The Placer County Water Agency would combine the CVP water with water rights water diverted from the American River. Use of water from the American River will increase as growth in southwestern Placer County increases. The CVP water could represent 20 to 50 percent of the total water supply diverted by Placer County Water Agency from the American River, but approximately 10 to 20 percent of the total surface water supplies. Currently, there are no deliveries to Placer County Water Agency until delivery facilities are constructed in accordance with the analysis completed in previous environmental documentation.

During periods when CVP water supply deficiencies occur on the American River, users would implement individual conservation measures or rely upon groundwater, the agency may solely rely upon water rights water, and the agency may purchase water from other agencies that use American River water. Conservation measures, use of groundwater, and the purchase of water during dry periods could increase the overall cost of water.

El Dorado Irrigation District. El Dorado Irrigation District combines CVP water with water rights water diverted from Folsom Lake and served to the M&I users. The CVP water represents about 20 percent of the total water supplies in wetter years and about 30 percent in drier years. The CVP cost of service rate for El Dorado Irrigation District water service contract was $25.83 per acre-foot in 2004.

During periods when CVP water supply deficiencies occur on the American River, users would implement individual conservation measures, the district may rely upon water rights water, and the district may purchase water from other agencies that use American River water. Conservation measures and the purchase of water during dry periods could increase the overall cost of water.

East Bay Municipal Utility District. East Bay Municipal Utility District would divert CVP water in dry years as a supplemental supply to the Mokelumne River water rights water. East Bay Municipal Utility District has been making annual payments to Reclamation pursuant to the terms of the CVP contract signed in 1970 until the execution of the Amendatory Contract signed in 2001. The Amendatory Contract provides that East Bay Municipal Utility District pay only for CVP water delivered to the district.

Environmental Consequences

The effects of Alternatives 1 and 2 on CVP Water Costs and Regional Economics are compared to conditions under the No Action Alternative.

No Action Alternative. Under the No-Action Alternative, the tiered pricing program of the CVPIA PEIS Preferred Alternative was applied. The unit costs of CVP water service contract water were calculated using tiered pricing to the entire contract amount, as described in Chapter 2.

Alternative 1. The costs under Alternative 1 would be identical to those under the No Action Alternative. Therefore, there are no environmental impacts of this alternative as compared to the No Action Alternative.

Alternative 2. The water costs under Alternative 2 would be higher than the water costs under the No Action Alternative. This analysis assumes that contractors blend the price of all CVP water under tiered rates. Water deliveries from the CVPIA PEIS preferred alternative were used. These deliveries were allocated on a yearly basis into pricing tiers and categories. Blended prices were calculated for each year, with quantities in each tier and category based on the previous five years of delivery. In any given year, the quantity and blended price of water depends on the 6-year sequence leading up to and including the current year. A total of nine water supply sequences were assessed.

- Average-Average: Average water year following 5-years of average years
- Wet-Average: Average water year following 5-years of wet years
- Dry-Average: Average water year following 5-years of dry years

- Average-Wet: Wet water year following 5-years of average years
- Wet-Wet: Wet water year following 5-years of wet years
- Dry-Wet: Wet water year following 5-years of dry years

- Average-Dry: Dry water year following 5-years of average years
- Wet-Dry: Dry water year following 5-years of wet years
- Dry-Dry: Dry water year following 5-years of dry years

For most year types, the cost of water would be higher under Alternative 2 than under the No Action Alternative. Increased treatment costs for CVP water as compared to groundwater also would be considered by users of CVP water when selecting a water supply. Because CVP water costs are only part of the overall water supply cost, it is difficult to specifically identify the response by agricultural, municipal, and industrial users. It has been suggested by some stakeholders that if CVP water is too expensive, then users may rely upon other water supplies, such as groundwater or water transfers. Recent water transfers have cost less than $100/acre-foot to more than $300/acre-foot.

Higher water costs would also affect fixed income or low-income residential and commercial users. Their reaction to the higher costs may be to reduce water use to a level that is less than appropriate under public health and safety codes. Middle-income users may determine that water costs are too high to maintain irrigated landscapes, and therefore, replace these features with hardscape. This could reduce employment in landscaping contractors which are a part of the service sector in the economy.

It is unclear if there would be increased groundwater withdrawals in response to increased CVP water costs. If this occurs on a long-term basis, there would be no change in land use or regional economics, however, there would be a change in groundwater use. If CVP water were continued to be used, there would be an economic impact on CVP users as compared to the No Action Alternative.

Cumulative Effects

The cumulative effect of future programs with long-term contract renewals in the American River Division on water supply costs were considered as part of the CVPIA PEIS. That analysis indicated that future projects, including future water transfer projects, may improve CVP water supply reliability but would increase water costs. These types of programs would modify water supply reliability but not change long-term CVP contract amounts or deliveries from within the historical ranges. Projected costs for other water supplies, including water transfers, are similar to the calculated costs under Alternative 2, and therefore, water use would probably not change from that projected under existing plans. The costs under Alternative 1 are less than those projected for other water supplies, such as recycled water or desalination, and therefore would probably not either encourage or discourage use of the other supplies.

FISH AND AQUATIC HABITAT

Aquatic resources potentially affected by the project are associated with streams and lakes in the upper American River Basin (above Folsom Lake), Folsom Lake, Lake Natoma, the Lower American River, Cirby and Linda creeks, the Sacramento River, and Sacramento-San Joaquin Delta (Delta).

Affected Environment

This section provides an overview of fish resources and aquatic habitats that occur within these areas. This information was based upon studies completed by the local agencies, CDFG, Reclamation, the Service, NOAA Fisheries, and specific researchers referenced below.

Upper American River Basin. Several storage reservoirs have been constructed in the upper basin upstream of Folsom Lake, providing a variety of lake environments interspersed with stream environments throughout the upper American River Basin.

The North Fork American River above Folsom Lake contains both free-flowing stream habitat and reservoir habitat (Lake Clementine) that are suitable for warmwater fish production. Although coldwater species (e.g., trout) are present, low flows and high temperatures during the summer favor warmwater fish

production. Cooler water temperatures exist in the Middle Fork American River during the summer and fall, and provide more favorable conditions for coldwater species. Both warmwater and coldwater species are found in the Middle Fork American River. The South Fork American River provides aquatic habitats similar to those found in the North Fork American River. High water temperatures during the summer and fall may limit production of coldwater species.

Native species that occur in the upper basin include hitch (*Lavinia exilicauda*), Sacramento sucker (*Catostomus occidentalis*), riffle sculpin (*Cottus gulosus*) and Sacramento pikeminnow (*Ptychocheilus grandis*). Several warmwater species have been introduced in the upper basin, including smallmouth bass (*Micropterus dolomieu*), bullhead (*Ictalurus* spp.), and several varieties of sunfish (*Lepomis* spp.). The upper basin's coldwater sport species include introduced brown trout (*Salmo trutta*), and rainbow trout (*Oncorhynchus mykiss*). Brown trout and rainbow trout were stocked in the past, and a population of brown trout remains although they are no longer stocked. Rainbow trout are stocked into streams and reservoirs in the upper basin at a variety of sizes. These trout are stream spawners, and therefore, do not reproduce within the reservoirs. However, some spawning by these species may occur in the stream sections above the reservoirs.

Folsom Lake. Folsom Lake is characterized by strong thermal stratification, which generally begins in April following the spring snowmelt runoff period and extends into November when inflow becomes influenced by winter rains. Thermal stratification establishes a warm surface water layer, a middle water layer (the thermocline) characterized by rapidly decreasing temperature with increasing depth, and a bottom, coldwater layer within the reservoir. In terms of aquatic habitat, the warm upper layer of Folsom Lake provides habitat for warmwater fishes, whereas the reservoir's lower layers form a "coldwater pool" that provides habitat for coldwater fish species throughout the summer and fall portions of the year. Hence, Folsom Lake supports a two-story fishery during the stratified portion of the year, with warmwater species using the upper, warmwater layer and coldwater species using the deeper, colder portion of the reservoir. During the winter rainy season and spring runoff period, high inflows contribute to a mixed reservoir condition with a more uniform temperature profile.

Native species that occur in the reservoir include hardhead (*Mylopharodon conocephalus*) and Sacramento pikeminnow (*Ptychocheilus grandis*). However, introduced largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), spotted bass (*Micropterus punctulatus*), bluegill (*Lepomis machrochirus*), crappie (*Pomoxis* spp.), and catfish (*Ictalurus* spp.) constitute the primary warmwater sport fisheries of Folsom Lake. The reservoir's coldwater sport species include brown trout (*Salmo trutta*), rainbow trout (*Oncorhynchus mykiss*), kokanee salmon (*Oncorhynchus nerka*), and chinook salmon (*Oncorhynchus tshawytscha*). Brown trout were stocked into the reservoir in the past, and a population of brown trout remains although they are no longer stocked. Rainbow trout are stocked into Folsom Lake by Department of Fish and Game at multiple sizes, including catchable size (2 fish/pound). Kokanee salmon are stocked as fingerlings. Chinook salmon reared at the Feather River Hatchery are stocked into Folsom Lake as part of Department of Fish and Game Inland Chinook Salmon Program. Trout and salmon are stream spawners, and therefore, do not reproduce within the reservoir. However, some spawning by one or more of these species may occur in the American River upstream of Folsom Lake.

Folsom Lake is usually subject to substantial reductions in surface elevation from late spring and summer until inflows increase during the winter rainy season and during the spring runoff period. Fluctuations in water-surface elevation that occur during nesting periods can result in nest abandonment and adversely affect both spawning and juvenile survival of some resident warmwater fish species. Periods of concern vary among species depending on the spawning period. Largemouth and smallmouth bass spawn primarily in April and May, while peak spawning for sunfish and catfish generally occurs in late-May and June.

The coldwater pool in Folsom Lake is not only important to the reservoir's coldwater fish species, but also to fall-run chinook salmon and steelhead in the Lower American River. Seasonal releases from the reservoir's coldwater pool provide cooler water temperatures in the Lower American River that support annual in-river production of these salmonid species. Any reduction in the reservoir's coldwater pool reduces the volume of cold water that is available to be released in any given year into the Lower American River to benefit the river's chinook salmon and steelhead populations. The annual coldwater pool is not large enough to facilitate coldwater releases during the warmest months (July-September) and to provide maximum thermal benefits to Lower American River steelhead and coldwater releases during October and November that would maximally benefit fall-run chinook salmon immigration, spawning, and incubation. Consequently, optimal management of the reservoir's coldwater pool on an annual basis is an important consideration in providing the maximum thermal benefits to both fall-run chinook salmon and steelhead.

Lake Natoma. Lake Natoma was constructed to serve as a regulating afterbay with the ability to provide stable flows in the Lower American River, even with fluctuating Folsom Lake power generation flow releases. Consequently, water surface elevations in Lake Natoma typically fluctuate up to three feet on a daily and weekly basis (California Data Exchange Center) published hourly elevation data, 1994 through 2000). During most of the year, Lake Natoma receives controlled (non-flood) releases from Folsom Lake.

Lake Natoma supports many of the same fish species found in Folsom Lake (i.e., rainbow trout, bass, sunfish, and catfish). Some recruitment of warmwater and coldwater fishes likely comes from Folsom Lake. In addition, the Department of Fish and Game stocks catchable-size rainbow trout into Lake Natoma annually. Lake Natoma's limited primary and secondary production and daily elevation fluctuations are believed to reduce the size and annual production of many of its fish populations, relative to Folsom Lake.

Because of Lake Natoma's small size and the magnitude of Folsom Lake outflow, water flowing through Lake Natoma can be significantly warmed by three to seven degrees Fahrenheit. Water temperatures of releases into the Lower American River from Lake Natoma are dependent on a number of factors, including inflow rate, meteorological conditions, and degree of stratification within Lake Natoma. As the lake elevation fluctuates, Nimbus Dam releases are comprised of varying amounts of surface waters. If the lake is stratified, elevation fluctuations lead to varying release temperatures.

Lower American River. The lower 23 miles of the American River (below Nimbus Dam), including backwaters and dredge ponds, supports at least 40 fish species, half of which are game fish. Common species include chinook salmon, steelhead, American shad (*Alosa sapidissima*), rainbow trout, striped bass (*Morone saxatilis*), bass, carp (*Cyprinus carpio*), Sacramento pikeminnow, Sacramento sucker, and hardhead (*Mylopharodon conocephalus*). A number of species are of primary management interest due either to their declining population or their importance to recreational and/or commercial fisheries. Anadromous species that are important for recreational and commercial uses include fall-run chinook salmon, steelhead, striped bass, and American shad.

Use of the American River by three special-status species – fall-run chinook, steelhead, and splittail is briefly described below. More detailed information on the use of the lower American River by special-status species and other species of management interest is included in the descriptions of individual species.

The Lower American River provides spawning and rearing habitat for fall-run chinook salmon and steelhead only below Nimbus Dam. Chinook salmon spawn almost exclusively in the 10 miles of river immediately below Nimbus Dam, and mostly in the upper five miles. Habitat concerns for chinook salmon include sub-optimal flows and water temperatures (in some years), a limited area of suitable

spawning gravels, and various components of rearing habitat (in- and over-water object cover, run-riffle-pool composition). High water temperatures during the fall can delay the onset of spawning by chinook salmon, and river water temperatures can become unsuitably high for juvenile salmon rearing during the spring.

Steelhead spawning takes place on smaller gravels and is more widely distributed in the Lower American River than chinook salmon spawning. The longer rearing period renders this species particularly sensitive to high water temperatures in the summer and early fall, but they may also be affected by other habitat features such as availability of cover and spawning gravels. In the summer and fall of some low carryover storage years, temperatures in the Lower American River may exceed the tolerance of juvenile steelhead.

Splittail spawn over flooded vegetation, and spawning could occur in the lower reaches of the American River. Although spawning has not been verified in the Lower American River, potentially suitable habitat exists. There is a nearly linear relationship between flows and area of potential spawning habitat for splittail in the Lower American River. Increased flows increase the amount of flooded area available for splittail spawning. Temperature is of lesser concern for splittail as they prefer warmer temperatures than either steelhead or chinook salmon.

Water temperature in the Lower American River depends on the rate and temperature of releases from Folsom Lake. The coldwater pool is managed to provide appropriate temperatures for anadromous salmonids. However, the small size of the coldwater pool, particularly in dry years, can impede attainment of suitable water temperatures during certain periods of the year.

Dry Creek Watershed. The Dry Creek watershed encompasses Roseville's service area and surrounding lands. Cirby Creek and its tributary, Linda Creek, are tributaries of Dry Creek, which drains to the East Main Drainage Canal and enters the Sacramento River near the confluence with the Lower American River.

The Dry Creek watershed is urbanized, which has resulted in degraded conditions for fish. Low flows and high stream temperatures are common, particularly in dry years, and act to limit the distribution of anadromous salmonids within the drainage.

Fish communities in the Dry Creek watershed are dominated by exotics such as mosquitofish (*Gambusia affinis*), bullhead, sunfish, bass (*Micropterus* spp.) and golden shiner (*Notemigonus crysoleucas*), and temperature-tolerant native fish, such as Sacramento sucker, hitch, and Sacramento pikeminnow. Both chinook salmon and steelhead are known to spawn and rear in the Dry Creek drainage in Miners Ravine and Secret Ravine. Surveys in Cirby and Linda creeks have found juvenile or yearling chinook salmon and steelhead and may indicate that these species rear in these streams in an opportunistic fashion when flows and temperatures are suitable. Successful spawning of anadromous salmonids has not been documented in Cirby or Linda creeks.

Sacramento River. The Sacramento River serves as an important migration corridor for anadromous fish moving between the ocean and/or Delta and upper river/tributary spawning and rearing habitats. The upper portion of the river provides a diversity of aquatic habitats, including fast-water riffles and shallow glides, slow-water deep glides and pools, and off-channel backwater habitats. The lower Sacramento River is predominantly channelized, leveed, and bordered by agricultural lands. Aquatic habitat in the lower Sacramento River is characterized primarily by slow-water glides and pools, is depositional in nature, and has reduced water clarity and habitat diversity, relative to the upper portion of the river. More than 30 species of fish are known to use the Sacramento River. Of these, a number of both native and introduced species are anadromous. Anadromous species include chinook salmon, steelhead, green and white sturgeon, striped bass, and American shad. The upper Sacramento River is of primary

importance to native anadromous species, and currently is used for spawning and early lifestage rearing, to some degree, by all four runs of chinook salmon (fall, late-fall, winter, and spring) and steelhead. Consequently, various lifestages of the four runs of chinook salmon and steelhead can be found in the upper Sacramento River throughout the year. Other Sacramento River fish are considered resident species, which complete their lifecycle entirely within freshwater, often in a localized area. Resident species include rainbow and brown trout, largemouth and smallmouth bass, channel catfish, sculpin, pikeminnow, Sacramento sucker, hardhead, and common carp. The majority of the fish species found in the upper Sacramento River also occur in the lower river, although some species only use the lower river as a migratory pathway to and from upstream spawning and rearing grounds. In contrast, the lower river supports some fish species that make little to no use of the upper river (upstream of River Mile 163).These species include Sacramento splittail, delta smelt, and striped bass.

The Sacramento River joins with several other rivers and numerous sloughs to form the Delta and ultimately empties into the San Francisco Bay. The Delta and San Francisco Bay make up the largest estuary on the west coast. Its importance to fisheries is illustrated by the more than 120 fish species that rely on its unique habitat characteristics for one or more of their lifestages. Fish species found in the Delta include anadromous species, as well as freshwater, brackish water, and saltwater species. Delta inflow and outflow are important for species residing primarily in the Delta (e.g., delta smelt and longfin smelt), as well as juveniles of anadromous species (e.g., chinook salmon) that rear in the Delta prior to ocean entry. Seasonal Delta inflows affect several key ecological processes, including: (1) the migration and transport of various lifestages of resident and anadromous fishes using the Delta (San Francisco Estuary Project 1992); (2) salinity levels at various locations within the Delta as measured by the location of X2 (i.e., the position in kilometers eastward from the Golden Gate Bridge of the two parts per thousand of total dissolved solids near-bottom isohaline); and (3) the Delta's primary (phytoplankton) and secondary (zooplankton) production.

Species of Primary Management Interest. Species of primary management interest in the Sacramento and American Rivers consist of species that are listed or candidates for listing under the state or federal Endangered Species Acts, as summarized in Table 4-2. In addition to these special status species, several other species are of management interest because of their commercial or recreational importance. The following describes the life history, habitat requirements and distribution the fish species of primary management interest in the project area.

Chinook Salmon. Four runs of chinook salmon (i.e., fall-run, late-fall-run, winter-run, and spring-run) occur in the Sacramento River system. Only fall-run chinook salmon occur in the lower American River. These runs are described below.

Fall-run Chinook Salmon. The fall run of chinook salmon is currently the largest run of chinook salmon in the Sacramento River system, and the primary run of chinook salmon using the lower American River. Because fall-run chinook salmon represent the greatest percentage of all four runs, they continue to support commercial and recreational fisheries of significant economic importance.

Adult fall-run chinook salmon migrate into the Sacramento River and its tributaries from July through December, with immigration peaking from mid-October through November (Reynolds et al., 1990). Fall-run chinook salmon spawn in numerous tributaries of the Sacramento River, including the lower American River, lower Yuba River, Feather River, as well as tributaries to the upper Sacramento River. The majority of mainstem Sacramento River spawning occurs between Keswick and Red Bluff Diversion dams. A greater extent of fall-run chinook salmon spawning (relative to the other three runs) occurs below Red Bluff Diversion Dam, with limited spawning potentially occurring as far downstream as Princeton (River Mile 163) (Burmester, pers. comm., 1996). Spawning generally occurs from October through December, with fry emergence typically beginning in late December and January.

TABLE 4-2

FISH SPECIES OF PRIMARY MANAGEMENT INTEREST IN THE PROJECT AREA

Species	Status	Project Area Occurrence
Central Valley winter-run chinook salmon *Onchorhynchus tshawytscha*	Federal – E State – E	Sacramento River and Delta
Central Valley spring-run chinook salmon *Onchorhynchus tshawytscha*	Federal – T State – T	Sacramento River and Delta
Central Valley fall/late fall-run chinook salmon *Onchorhynchus tshawytscha*	Federal – C State – CSC	Fall run: American and Sacramento Rivers, Delta Late Fall-run: Sacramento River and Delta
Central Valley steelhead *Onchorhynchus mykiss*	Federal – T State – none	American and Sacramento Rivers, Delta
Delta smelt *Hypomesus transpacificus*	Federal – T State – T	Delta
Green sturgeon *Acipenser medirostris*	Federal – C State – CSC	Sacramento River and Delta
Splittail *Pogonichthys macrolepidotus*	Federal – T State – CSC	American and Lower Sacramento Rivers, Delta
Striped bass[a] *Morone saxatilis*	Federal – none State – none	American and Lower Sacramento Rivers, Delta
American shad[a] *Alosa sapidissima*	Federal – none State – none	American and Lower Sacramento Rivers, Delta

E – Listed as endangered under the federal or state Endangered Species Acts
T – Listed as threatened under the federal or state Endangered Species Acts
C – Candidate for listing as threatened or endangered under the federal or state Endangered Species Acts
CSC – California Species of Special Concern
[a] Species of management interest for recreational fishing

Fall-run chinook salmon emigrate as post-emergent fry, juveniles, and as smolts after rearing in their natal streams for up to six months. Consequently, fall-run chinook salmon emigrants may be present in the lower American and Sacramento rivers from January through June (Reynolds et al., 1990; Herbold et al., 1992), and remain in the Delta for variable lengths of time prior to ocean entry.

Adult chinook salmon begin entering the lower American River annually in August and September, with immigration continuing through December in most years and January in some years. Once in the lower American River, the timing of adult chinook salmon spawning activity is strongly influenced by water temperature. When daily average water temperatures decrease to approximately 60 °F, female chinook salmon begin to construct nests (redds) into which their eggs (simultaneously fertilized by the male) are eventually released. Fertilized eggs are subsequently buried with streambed gravel. Approximately 98 percent of all redds observed during these years were located between Watt Avenue (River Mile 9.5) and Nimbus Dam (River Mile 23).

The intragravel residence period of incubating eggs and alevins (i.e., yolk-sac fry) is highly dependent upon water temperature. The intragravel egg and fry incubation lifestage for fall-run chinook salmon in the lower American River generally extends from about mid-October through March. Egg incubation survival rates are dependent on water temperature and intragravel water movement. In 1980, CDFG reported egg mortalities of 80 percent and 100 percent for chinook salmon at water temperatures of 61 and 63 degrees Fahrenheit, respectively. Egg incubation survival is highest at water temperatures at or below 56 degrees Fahrenheit.

Fall-run chinook salmon fry emergence generally occurs from late-December through mid-May in the lower American River (Snider and Titus, 1996). Fall-run chinook salmon emigrate from the lower American River during two distinct time periods. The primary period of emigration occurs from mid-February through early March. Other fry rear in the lower American River where they feed and grow for up to six months, prior to emigrating as juveniles or smolts through June.
Water temperatures between 45 and 58 degrees Fahrenheit have been reported to be optimal for rearing of chinook salmon fry and juveniles (Reiser and Bjornn, 1979; Rich, 1987). Raleigh et al., (1986) suggested a range of approximately 53.6 to 64.4 degrees Fahrenheit as suitable rearing temperatures, and 75 degrees Fahrenheit as an upper limit. Lower American River water temperatures at Watt Avenue generally range from about 46 to 60 degrees Fahrenheit during the period December through April, and from 60 to 69 degrees Fahrenheit during the months of May and June.

Winter-run Chinook Salmon. Winter-run chinook salmon only occur in the mainstem Sacramento River. Adult winter-run chinook salmon migrate upstream through the Delta and into the lower Sacramento River occurs from December through July, with peak immigration during the period January through April. Winter-run chinook salmon primarily spawn in the mainstem Sacramento River between Keswick Dam (River Mile 302) and Red Bluff Diversion Dam (River Mile 258). Winter-run chinook salmon spawn between late-April and mid-August, with peak spawning generally occurring in June.

Winter-run chinook salmon fry rearing in the upper Sacramento River exhibit peak abundance during September, with fry and juvenile emigration past Red Bluff Diversion Dam occurring from August through March. Peak abundance of juveniles in the Delta generally occurs during February, March, or April (Steven, 1989). Juvenile winter-run chinook salmon may exhibit a sustained residence in the middle or lower Sacramento River or upper Delta prior to seaward migration. The location and extent of this middle-area rearing is unknown, although it has been suggested that the duration of fry presence in an area is directly related to the magnitude of river flows during the rearing period (Stevens, 1989). Additional information on the life history and habitat requirements of winter-run chinook salmon is contained in the NOAA Fisheries Biological Opinion for this species.

Critical habitat for the winter-run chinook salmon is defined to occur in the Sacramento River from Keswick Dam (River Mile 302) to Chipps Island (River Mile 0) in the Delta. Also included are waters west of the Carquinez Bridge, Suisun Bay, San Pablo Bay, and San Francisco Bay north of the Oakland Bay Bridge.

Spring-run Chinook Salmon. Spring-run chinook salmon enter the Sacramento River during the period late March through September (Reynolds et. al., 1990), with peak abundance in the Delta and lower Sacramento River from April through June. Adult spring-run chinook salmon hold in areas downstream of spawning grounds during the summer months until their eggs fully develop and become ready for spawning. This is the primary characteristic distinguishing the spring-run from the other runs of chinook salmon. Spring-run chinook salmon spawn primarily upstream of Red Bluff Diversion Dam, and in several upper Sacramento River tributaries (e.g., Mill and Deer creeks). Spawning has been reported to primarily occur during mid-August through early October (Reynolds et al., 1990). Although some portion of an annual year-class may emigrate as post-emergent fry (i.e., individuals less than 45 millimeters (mm) in length), most are believed to rear in the upper river and tributaries during the winter and spring, and emigrate as juveniles (i.e., individuals greater than 45 mm in length, but not having undergone smoltification) or smolts (silvery colored fingerlings having undergone the smoltification process in preparation for ocean entry). The timing of juvenile emigration from the spawning and rearing grounds varies among the tributaries of origin, and can occur during the period November through June.

Late Fall-run Chinook Salmon. Adult immigration of late fall-run chinook salmon in the Sacramento River generally begins in October, peaks in December, and ends in April. Primary spawning grounds for late fall-run chinook salmon are in tributaries to the upper Sacramento River (e.g., Battle, Cottonwood, Clear, and Mill creeks), although late fall-run chinook salmon are believed to return to the Feather and Yuba rivers as well. Spawning in the mainstem Sacramento River occurs primarily from Keswick Dam (River Mile 302) to Red Bluff Diversion Dam (River Mile 258), and generally occurs from December through April. Postemergent fry and juveniles emigrate from their spawning and rearing grounds in the upper Sacramento River and its tributaries during the period May through November. Juveniles emigrate through the Delta primarily during the period October through December.

Steelhead. Adult steelhead migrate through the Sacramento River system beginning in August and continue through March. They return to spawning grounds in the upper Sacramento River and tributaries (the lower American River). Steelhead also are produced at the Coleman Fish Hatchery on Battle Creek, the Nimbus Hatchery on the American River, and the Feather River Hatchery on the Feather River (Reynolds et al., 1990). Spawning generally occurs from January through April (McEwan, pers. comm., 1997). Juvenile steelhead rear in their natal streams for one to two years prior to emigrating from the river. Emigration of one- to two-year-old fish primarily occurs from April through June (Reynolds et al., 1990; McEwan, pers. comm., 1997).

The lower American River steelhead population is believed to be supported primarily by fish produced at Nimbus Hatchery. Adult steelhead immigration into the lower American River typically begins in November and continues into April. The steelhead spawning immigration generally peaks during January. Optimal immigration temperatures have been reported to range from 46 to 52 degrees Fahrenheit.

Spawning usually begins during late-December and may extend through March, but can range from November through April. Optimal spawning temperatures have been reported to range from 39 to 52 degrees Fahrenheit. The egg and fry incubation lifestage for steelhead in the lower American River typically extends from December through May.

Fry emergence from the gravel generally begins in March and occurs through June, with peak emergence occurring during April (Snider and Titus, 1996). Optimal egg and fry incubation temperatures have been reported to range from 48 to 52 degrees Fahrenheit. Optimal temperatures for fry and juvenile rearing is reported to range from 45 to 60 degrees Fahrenheit. As with chinook salmon, it is believed that temperatures up to 65 degrees Fahrenheit are suitable for steelhead rearing, with each degree increase between 65 degrees Fahrenheit and the upper lethal limit of 75 degrees Fahrenheit (Bovee, 1978) being increasingly less suitable and thermally more stressful. The primary period of steelhead emigration from the lower American River is believed to occur from March through June (Castleberry et al., 1991).

American Shad. American shad occur in the Sacramento River, its major tributaries (including the lower American River), and the Delta. A popular sport fishery for American shad exists annually in the Sacramento River and certain tributaries, including the lower American River. Adult American shad typically enter the lower American River from April through early July, with the spawning migration peaking from mid-May through June.

Water temperature is an important factor influencing the timing of spawning. American shad are reported to spawn at water temperatures ranging from approximately 46 to 79 degrees Fahrenheit, although optimal spawning water temperatures are reported to range from about 60 to 70 degrees Fahrenheit (Leggett and Whitney, 1972; Painter et al., 1977; Bell, 1976; Rich, 1987).

Based on their 1990 field investigation, Jones and Stokes Associates (1990) reported that water velocity was the most important physical variable determining shad spawning habitat preference in the lower Yuba

River, followed by depth and water temperature. In contrast to salmonids, distributions of spawning virgin shad are determined by river flow rather than homing behavior (Painter et al., 1979). Substrate and cover played no apparent role in habitat selection. Snider and Gerstung (1986) recommended flow levels of 3,000 to 4,000 cubic feet/second in the lower American River during May and June as sufficient attraction flows to sustain the river's American shad fishery. When suitable spawning conditions are found, American shad school and broadcast their eggs throughout the water column.

Based on laboratory experiments conducted on American shad incubation, Walburg and Nichols (1967) concluded that water temperatures suitable for normal egg development ranged from about 54 to 70 degrees Fahrenheit. These investigators further reported that eggs hatched in three to five days at 68 to 74 degrees Fahrenheit and in four to six days at water temperatures of 59 to 64.4 degrees Fahrenheit. Egg incubation and hatching, therefore, are coincident with the primary spawning period (i.e., May through June). A large percentage of the eggs spawned in the lower American River probably do not hatch until they have drifted downriver and entered the Sacramento River. Few juvenile American shad have been collected in the lower American River. Therefore, the presence of American shad in the lower American River is primarily restricted to adult immigration, spawning, and fry lifestages.

Striped Bass. Striped bass occur in the Sacramento River, its major tributaries (including the lower American River), and the Delta. Substantial striped bass spawning and rearing occurs in the Sacramento River and Delta. Year-class strength of striped bass in the Delta has been correlated with survival and growth during the first 60 days after hatching. The abundance of young striped bass, in turn, was positively correlated with freshwater outflow from the Delta, and negatively correlated with the percentage of Delta inflow diverted from Delta channels during spring and early summer by the SWP and CVP.

Adult striped bass are present in the lower American River throughout the year (DeHaven, 1977), with peak abundance occurring during the summer months (DeHaven, 1977, 1979). No studies have definitively determined whether striped bass spawn in the lower American River. However, the scarcity of sexually ripe adults among sport-caught fish indicates that minimal, if any, spawning occurs in the lower American River. Most striped bass spawning is believed to occur in the Sacramento River and Delta. The majority of Sacramento River spawning occurs in the lower Sacramento River, downstream of River Mile 140.

The number of striped bass entering the lower American River during the summer is believed to vary with flow levels and food production. Snider and Gerstung (1986) suggested that flows of 1,500 cubic feet/second at the mouth during May and June would be sufficient to maintain the striped bass fishery in the lower American River. However, these investigators reported that, in any given year, the population level of striped bass in the Delta was probably the greatest factor determining the relative number of striped bass occurring in the lower American River.

The lower American River apparently is a nursery area for young striped bass. Numerous schools of five- to eight-inch-long fish have been reported in the river during the summer months. In addition, juveniles and young adults have been reported to be abundant in the lower American River during the fall (DeHaven, 1977). Optimal water temperatures for juvenile striped bass rearing has been reported to range from approximately 61 to 71 degrees Fahrenheit.

Sacramento Splittail. Splittail are members of the minnow family, achieving lengths of up to approximately 16 inches. Adults can tolerate a wide range of salinities, but require freshwater for spawning. Adult migrate upstream to freshwater areas in the late fall to early winter prior to spawning activities. Spawning occurs from mid-winter through July in water temperatures between 48 to 68 degrees Fahrenheit (Wang, 1986) at times of high winter or spring runoff. Splittail prefer to spawn over flooded

streambank vegetation or beds of aquatic plants, and the timing of their upstream movements and spawning corresponds to the historically high-flow period associated with snowmelt and runoff each spring. The precise timing and location of spawning varies among years, and the timing and magnitude of winter and spring runoff may play a substantial role in determining the temporal and spatial distribution of spawning in any given year. Water temperature and photoperiod also influence the timing of spawning.

Historically, splittail could be found in the upper reaches of the Sacramento River. Today, Red Bluff Diversion Dam appears to be a complete barrier to upstream movement. The presence of splittail in the Sacramento River and its tributaries (including the lower American River) is believed to be largely restricted to their upstream and downstream movements associated with spawning. Juvenile splittail are not believed to use the Sacramento River or its tributaries for rearing to a great extent. Downstream emigration into the Delta is believed to peak during the period April through August.

Low numbers of splittail have been collected in the lower American River. CDFG has conducted fish sampling surveys on the lower American River annually from 1991 through 1995 (Brown et al., 1992; Snider and McEwan, 1993; Snider and Titus, 1994; Snider and Titus, 1996). The fish sampling surveys were conducted from approximately January through June, when adult and larval splittail likely would be in the river. Splittail were collected in very low numbers, primarily at the lowest sampling station located downstream of U.S. Interstate Business 80 (River Mile 4) (Brown et al., 1992). All splittail captured in 1991 were young-of-the-year. Only two splittail have been captured above River Mile 9.

Delta Smelt. Delta smelt are a short-lived, slender-bodied fish endemic to the Delta. As a euryhaline species, delta smelt can tolerate wide-ranging salinities, but rarely occur in waters with salinities greater than 10-14 parts per thousand (ppt). Historically, they have been abundant in low (around two ppt) salinity habitats.

Delta smelt occur in open surface waters and shoal areas. They are generally found in the lower reaches of the Sacramento River below Isleton, the San Joaquin River below Mossdale, through the Delta and into Suisun Bay (Moyle, 1976; Moyle et al., 1992). Critical habitat for delta smelt is defined as:

> *Areas and all water and all submerged lands below ordinary high water and the entire water column bounded by and contained in Suisun Bay (including the contiguous Grizzly and Honker Bays); the length of Goodyear, Suisun, Cutoff, First Mallard (Spring Branch), and Montezuma Sloughs; and the existing contiguous waters contained within the Delta.*

When not spawning, adult delta smelt tend to concentrate just upstream from the entrapment zone (the saltwater-freshwater interface), the location of which varies daily, seasonally, and annually in response to tidal action and the volume of freshwater inflow to the Delta.

Adults migrate from brackish water areas to freshwater areas to spawn during the winter. Migration can begin as early as October and continue through April, but movement peaks during the period December through April. The adults and young-of-the-year remain in the spawning areas until late summer, when they begin emigrating downstream. In the Sacramento River, delta smelt have been found as far upstream as the confluence with the American River.

Green Sturgeon. Green sturgeon are an anadromous species, migrating from the ocean to freshwater to spawn. They inhabit the Sacramento River system, as well as in the Eel, Mad, Klamath, and Smith rivers in the northwest portion of California. Little information is available on the lifestage-specific environmental requirements of this species in the Sacramento River. In the Sacramento River, most spawning is believed to occur in the upper portion of the river. Egg fertilization occurs in the water column of relatively fast-flowing rivers (Emmett et al., 1991 in Moyle et al., 1992). In the Sacramento

River, green sturgeon presumably spawn at water temperatures ranging from 46 to 57 degrees Fahrenheit (Beak Consultants, 1993). Small numbers of juvenile green sturgeon have been captured and identified each year from 1993 through 1996 in the Sacramento River at the Hamilton City Pumping Plant (River Mile 206) (J. Brown, pers. comm., 1996). Lower American River (Gerstung, 1977), fish surveys conducted by the CDFG in recent years have not collected green sturgeon (Snider, pers. comm., 1997).

San Pablo and Suisun Bays. Winter-run chinook salmon and Sacramento splittail migrate through San Pablo and Suisun Bays during spawning runs. Several creeks and streams in the East Bay Municipal Utility District service area historically supported populations of steelhead, chinook salmon, or other native fish species, but these populations are no longer extant because of urban development, creek channelization, and dam construction.

Environmental Consequences

The effects of Alternatives 1 and 2 on aquatic resources are compared to conditions under the No Action Alternative.

No Action Alternative. The No Action Alternative includes demographic, economic, political, and other factors, independent of the long-term contract renewal process, are causing changes with direct and indirect effects to aquatic resources that are beyond the range of Reclamation's responsibilities. With little exception, virtually all of the long-term contract renewal actions are within the range of conditions that support the biological opinions issued to Reclamation for operations of the CVP and conditions adopted by local agencies as part of environmental documentation for water supply facilities located within the American River Division.

Alternative 1. Aquatic resources under Alternative 1 would be identical to conditions under the No Action Alternative. Alternative 1 would not alter CVP operations as compared to the No Action Alternative. Therefore, biological resource conditions under Alternative 1 would be identical to those under the No Action Alternative.

Alternative 2. Aquatic resources under Alternative 2 would be identical to conditions under the No Action Alternative. Alternative 2 would not alter CVP operations as compared to the No Action Alternative. Therefore, biological resource conditions under Alternative 2 would be identical to those under the No Action Alternative.

Cumulative Effects

The long-term contract renewals in the American River Division would not result in cumulative impacts to aquatic resources in addition to those occurring under the Affected Environment and those addressed in previous biological assessments and environmental documents prepared by Reclamation and local agencies including for facilities to serve Placer County Water Agency, East Bay Municipal Utility District, and water service under Public Law 101-514.

WILDLIFE HABITAT AND WILDLIFE

This subsection discusses wildlife habitat in the American River Division. This information was based upon studies completed by the local agencies, CDFG, Reclamation, the Service, NOAA Fisheries, and specific researchers referenced below.

Affected Environment

The following describes the major habitats found in the project area and the wildlife species typically found in these habitats with particular reference to special-status species. The general description of habitats is followed by a description of existing habitats and wildlife in the service area of the American River Division contractors.

Habitat Types. The types, amounts, and distribution of habitats in the service areas were derived from the California GAP Analysis Project completed by the CDFG in 1998. In the California GAP Analysis, habitats were typed based on the California Wildlife Habitats Relationship System (CWHR) (Mayer and Laudenslayer, 1988). This project focused on mapping habitats at a landscape scale and has a resolution of 274 acres for upland habitats and 98.8 ac for wetland habitat. The database identifies general habitat types throughout the service areas but does not distinguish small habitat patches, such as stringers of riparian habitat or small wetlands, that can have high wildlife value. Additional information is provided on the occurrence of important habitat types not distinguished in the California GAP Analysis.

Conifer Forest. Within the project area, the GAP Analysis identified five CWHR habitat types dominated by conifers: Ponderosa pine (*Pinus ponderosa*), Sierran mixed conifer, Douglas-fir (*Pseudotsuga menziesii*), Jeffrey pine (*Pinus jeffreyi*), and redwood *(Sequoia sempervirens)*.

For this EIS, these five CWHR habitat types are grouped as conifer forest habitat. Conifer forest habitats occur in eastern portions of the project area, in foothill and higher elevation areas of the Sierra Nevada Mountains. A small amount of conifer forest habitat also is present in the coast Range in the western portion of the project area. The species composition of the conifer forest habitat varies with elevation, soil composition, and rainfall. Conifer forest habitats occur at elevations as low as 2,500 feet in elevation. Ponderosa pine occurs at the lowest elevation where it can be interspersed with montane hardwood (described below). At higher elevations, ponderosa pine is replaced by Sierran mixed conifer and Douglas-fir. Sierran mixed conifer habitat consists of a mix of five conifer species and one hardwood species - white fir (*Abies concolor*), Douglas-fir, ponderosa pine, sugar pine (*Pinus lamertiana*), incense-cedar (*Calocedrus decurrens*), and California black oak (*Quercus kelloggii*).

The Sierran mixed conifer habitat type occurs from about 4,000 to 10,000 feet in elevation in the project area and grades with ponderosa pine and Douglas-fir habitats. In the Sierra Nevada, the Douglas-fir habitat is largely a subset of the Sierran mixed conifer type, where Douglas-fir occurs as a pure stand. Jeffery pine typically occurs at high elevations (above Sierran mixed conifer), but because it is tolerant of serpentine soils it occurs as pure stands in some areas of serpentine soils. A small amount of redwood forest occurs in the Coast Range in the western portion of the project area.

Conifer forest habitat of the Sierra Nevada Mountains has been estimated to support about 355 species of vertebrates (Verner and Boss 1980). Mixed conifer forest typically supports greater species diversity than single-species conifer stands because of the greater plant species diversity. The variety in plant species composition of mixed conifer forest provides a diversity of food and cover types. Nonetheless, many wildlife species will exploit all of the conifer forest types to varying degrees.

Special-status species potentially inhabiting conifer forest habitat in the project area include California spotted owl (*Strix occidentalis occidentalis*), northern goshawk (*Accipiter gentilis*), Pacific fisher (*Martes pennanti*), and bald eagle (*Haliaeetus leucocephalus*).

Montane Hardwood Forest. Montane hardwood forest occurs in eastern portions of the project area at lower elevations than conifer forest habitat, although it can be interspersed with ponderosa pine. This forest type is dominated by hardwood tree species including canyon live oak (*Quercus*

chrysolepis), California black oak, tanoak (*Lithocarpus densiflorus*), and Pacific madrone (*Arbutus menziesii*), but often includes some conifers, such as gray pine (*Pinus sabiniana*) and ponderosa pine. Typical understory shrub species include manzanita (*Arctostaphylos* sp.), poison-oak (*Toxicodendron diversilobum*), coffeeberry (*Rhamnus californica*), currant (*Ribes* sp.), and ceanothus (*Ceanothus* sp.).

The oaks comprising montane hardwood forest habitat attract and support a diversity of bird and mammal species that exploit and depend on acorns. Typical species include scrub jays (*Aphelocoma californica*), acorn woodpeckers (*Melanerpes formicivorus*), gray squirrels (*Sciurus griseus*), wild turkey (*Meleagris gallopavo*), dusky-footed woodrats (*Neotoma fuscipes*), black bear (*Ursus americanus*), and mule deer (*Odocoileus hemionus*). Reptiles are found in the litter on the forest floor and include western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis melanoleucus*), and western rattlesnake (*Rotalus viridis*).

Blue Oak Woodland and Coastal Oak Woodland. Blue Oak Woodland occurs in foothill regions of the project area at elevations of 250 to 3,000 feet (Mayer and Laudenslayer, 1988). Blue oak (*Quercus douglasii*) is the dominant overstory species of this habitat, although at the higher elevations of this habitat's distribution, gray pine becomes an important overstory species. Where gray pine or other conifers comprise 25 to 49 percent of the overstory with blue oak comprising at least 50 percent of the overstory canopy, the CWHR classifies this habitat as Blue Oak - Foothill Pine woodland. Both CWHR habitat types (Blue Oak - Foothill Pine woodland and Blue Oak Woodland) are considered collectively in this EIS as blue oak woodland. Typical shrub species in blue oak woodland are poison-oak, coffeeberry, redbud (*Cercis occidentalis*), ceanothus, and manzanita with ground cover consisting of annuals such as bromegrass (*Bromus* sp.), wild oats (*Avena* sp.), foxtail (*Hordeum murinum*), and filaree (*Erodium* sp.) (Mayer and Laudenslayer, 1988).

Coastal oak woodland occurs in the Coast Ranges of the project area. Coast live oak is the dominant overstory species and can be the only overstory species in some locations. In mesic areas, California bay, madrone, tan oak, and canyon live oak contribute to the overstory. The understory typically consists of shade-tolerant shrubs such as California blackberry, creeping snowberry, and toyon.

Blue oak and coastal oak woodlands provide habitat for a diversity of wildlife species, although no species appear to be completely dependent on this habitat type. Barrett (1980) reported that over 60 species of mammals use oaks and Verner (1980) reported that 110 species of birds have been observed during the breeding season in California habitats with oaks. Acorns produced by blue oaks are an important food resource for a diversity of bird and mammal species. Typical species inhabiting oak woodlands in the project area include scrub jays, yellow-billed magpies (*Pica nuttalli*), gray squirrels, and California ground squirrels (*Spermophilus beecheyi*). Special-status species associated with oak woodland habitats include oak titmouse, Lawrence's goldfish, and Nuttall's woodpecker.

Valley Oak Woodland. Valley oak woodland can occur throughout much of the Central Valley and into the Sierra Nevada foothills up to an elevation of about 2,000 feet. The overstory canopy of this habitat type is almost exclusively valley oak (*Quercus lobata*). California sycamore (*Platanus racemosa*), black walnut (*Juglans californica*), interior live oak (*Quercus wislizenii*), boxelder (*Acer negundo*) and blue oak occur sporadically. Shrubs such as poison-oak, toyon (*Heteromeles arbutifolia*), and coffeeberry can occur in the understory although typically, the understory is comprised of annuals such as wild oats, bromegrass, barley (*Hordeum* sp.), and ryegrass (*Lolium* sp.) (Mayer and Laudenslayer, 1988). Valley oak woodland merges with annual grasslands and often borders agricultural fields. This habitat also occurs adjacent to valley foothill riparian habitats As distance from the watercourse increases, tree density declines, thus transitioning from a forest-like structure, to savanna-like to grassland.

Like other habitats containing oaks, valley oak woodland is used by a variety of wildlife species that exploit the acorn food resource. Cavities formed in oaks are also an important habitat feature for cavity-nesting birds and mammals. Common species inhabiting valley oak woodland include California quail (*Callipepla californica*), red-shouldered hawk (*Buteo lineatus*), acorn woodpecker, scrub jay, bushtit (*Psaltriparus minimus*), gray squirrel, mule deer, red-tailed hawk (*Buteo jamaicensis*), and white-tailed kite (*Elanus leucurus*). Special-status species associated with oak woodland habitats include oak titmouse (*Baeolophus inornatus*), Lawrence's goldfish (*Carduelis lawrenci*), and Nuttall's woodpecker (*Picoides nuttallii*).

Chaparral and Coastal Scrub. Chaparral habitats consist of structurally homogenous brushland dominated by shrubs. Shrub height and crown cover vary considerably with fire frequency, precipitation, aspect, and soil type. Chaparral habitats in the project area include two types of habitats distinguished by CWHR: Chemise-Redshank Chaparral and Mixed Chaparral. These two habitats are very similar and their differentiation is somewhat subjective. In general, Chemise-Redshank Chaparral consists of at least 60 percent coverage by chemise (*Adenostoma fasciculatum*) and redshank (*Adenostoma sparsifolium*) combined. Mixed chaparral supports a greater diversity of plant species, including scrub oak (*Quercus berberidifolia*), ceanothus, manzanita, toyon, and yerba-santa (*Eriodictyon californicum*), in addition to chemise and redshank. The upper and lower elevational limits of chaparral habitat varies considerably with precipitation, aspect and soil type, but typically occurs below 5,000 feet.

The project area also contains a small amount of coastal scrub habitat. This habitat is structurally similar to the chaparral habitats but consists of a different mix of plant species. Coyotebush is the predominant overstory shrub species. Other plant species contributing to the overstory include ceanothus, coffeeberry, salal, bush monkeyflower, poison-oak, blackberry, and woolly sunflower.

No wildlife species are restricted to chaparral and coastal scrub habitats of the project area. Common species include western fence lizard, racer (*Coluber constrictor*), common garter snake (*Thamnophis sirtalis*), turkey vultures, red-tailed hawk, golden eagle (*Aquila chrysaetos*), mountain quail (*Oreortyx pictus*), ash-thoated flycatcher (*Myiarchus cinerascens*), sage sparrow (*Amphispiza belli*), opossum (*Didelphis virginiana*), coyote (*Canis latrans*), California ground squirrel, and black-tailed jackrabbit (*Lepus californicus*). No special-status species are dependent on this habitat type although several use chaparral habitats in addition to other habitats.

Annual Grassland. Annual grassland is a common habitat type in the project area. Historically, grasslands in the Central Valley were dominated by native perennial grasses such as needlegrass. Currently, most grasslands in the area are dominated by introduced annual grasses of Mediterranean origin and a mixture of native and introduced forbs. Introduced annual grasses are the dominant plant species and include wild oats, soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus rigidus*), red brome (*Bromus rubens*), barley, and foxtail. Annual native forbs also occur in annual grassland habitat and include filaree, California poppy (*Eschscholtzia californica*), owls clover (*Gilia* spp.), tarweed (*Holocarpha virgata*) and various lupines (*Lupinus* spp.). Yellow star-thistle (*Centaurea solstitialis*), a noxious weed, has invaded many annual grassland habitats and degraded their quality for wildlife and as livestock pasture. Annual grassland habitat merges with valley oak and blue oak woodlands, occurring where soil moisture is insufficient to support tree growth or is suppressed due to grazing.

Many species of birds, mammals, reptiles and amphibians use annual grasslands. Raptors, such as ferruginous hawks (*Buteo regalis*), red-tailed hawks, white-tailed kites, American kestrel (*Falco sparverius*) and northern harriers (*Circus cyaneus*) commonly forage in annual grasslands. Short-eared owls (*Asio flammeus*) and burrowing owls (*Athene cunicularia*) forage and breed in this habitat. Horned larks (*Eremophila alpestris*), western meadowlarks (*Sturnella neglecta*), and savannah sparrows (*Passerculus sandwichensis*) are other common bird species. Characteristic reptiles and amphibians

include western fence lizard, common garter snake, and western rattlesnake. Common mammals include black-tailed jackrabbits, California ground squirrels, California voles (*Microtus californicus*), badgers (*Taxidea taxus*), coyotes, and Botta's pocket gophers (*Thomomys bottae*). A number of special-status species use annual grassland habitat, including white-tailed kite, burrowing owl, and prairie falcon (*Falco mexicanus*).

Vernal Pools. Vernal pools are typically found in association with annual grassland habitat but constitute a unique habitat type. Vernal pools form in shallow depressions that are underlain by hardpan or volcanic rock. The hardpan or volcanic rock impedes drainage such that, in winter, the depressions fill with water and retain moist soil into late spring. The pools are then dry during the summer and fall until the rains commence the following winter. The soils and moist microhabitat of these pools provides a unique habitat within a general matrix of annual grassland habitat. Plant species of vernal pools differ from those of the surrounding annual grassland habitat and many animals associated with annual grassland habitat depend on vernal pools within the annual grassland landscape.

Common plant species found in vernal pools include popcorn flower (*Plagiobothrys stipitata*), navarretia (*Navarretia leucocephala*), toad rush (*Juncus bufonius*), goldfields (*Lathenia chrysostoma*), yellow carpet (*Blennosperma nanum*), coyote thistle (*Eryngium vaseyi*), tidy tips (*Layia* spp.), water buttercup (*Ranunculus* spp.), and hairgrass (*Deschampsia danthonioides*).

The number and distribution of vernal pools in the Central Valley have been greatly reduced as a result of agricultural practices and conversion to urban land uses. Holland (1978) estimated that five to 30 percent of California's vernal pools are intact today; the Central Valley has about five percent of its vernal pools remaining. The reduction in vernal pool habitat has resulted in several plant and animal species being listed under the federal Endangered Species Act.

Freshwater Emergent Wetland. Freshwater emergent wetlands occur in areas that are seasonally or perennially inundated. They form a transitional habitat between open water and upland habitats, and occur in backwater areas of rivers, streams and lakes, and in the flood plains of rivers and streams. Wetlands are characterized by erect rooted, herbaceous vegetation that emerges above the water surface. Water depths are shallow, up to about one to two feet. Common plant species include cattails (*Typha* sp.), bulrushes (*Scirpus* sp.), and rushes (*Juncus* sp.).

Urban and agricultural development, as well as hydrologic changes from flood control and water supply development, has substantially reduced the amount of wetland habitat in the Central Valley. In the 1940s, freshwater emergent wetlands occupied about 554,000 acres of the Central Valley (Frayer et al., 1989; Central Valley Habitat Joint Venture, 1990). By 1990, only 86,704 acres remained. Regional reductions in freshwater emergent wetlands have been estimated at 88.7 percent in the Sacramento Basin, 96.2 percent in the San Joaquin Basin, 99.2 percent in the Tulare Basin, 98.3 percent in the Delta, and 97.2 percent in the San Francisco Bay area.

Freshwater wetlands are among the most important habitats for wildlife. In winter, waterfowl rely on wetlands in the Central Valley as a stopover during their migration or as habitat throughout the winter. Raptors such as golden eagles, and northern harriers frequent wetlands while foraging. Birds such as marsh wrens (*Cistothorus palustris*), tricolored blackbirds (*Agelaius tricolor*), red-winged blackbirds (*Agelaius phoeniceus*), American bitterns (*Botaurus lentiginosus*), great egrets (*Ardea alba*), great blue herons (*Ardea herodias*), black-crowned night herons (*Nycticorax nycticorax*), and green herons (*Butorides virescens*) are common in wetland habitats in the project area and depend on this habitat. Numerous amphibians and mammals also depend on wetlands or frequent this habitat because of its high productivity and diversity. Because much of the wetland habitat in California has been lost, a number of species that require wetlands have been listed as threatened or endangered or are species of concern to the

Service or Department of Fish and Game. Special-status species associated with wetlands in the project area include giant garter snake (*Thamnophis gigas*), tricolored blackbird, white-faced ibis (*Plegadis chihi*), and western pond turtle (*Clemmys marmorata*).

Saline Emergent Wetland. Saline emergent wetlands encompass salt and brackish water marshes in the East Bay Municipal Utility District service area. They occur along the margins of bays, lagoons, and estuaries. These wetlands form above intertidal sand and mud flats and below upland communities not subject to tidal action. Plant species composition and structure varies with the salinity, substrate, and wave action. Characteristic plant species of more saline marshes are cordgrass and pickleweed while bulrushes and cattails occur in lower salinity marshes.

Only a small portion of the saline emergent wetlands that existed in the San Francisco Bay area in the mid-1800s remains. Many of the wetlands were dredged or filled in association with urban development. Runoff and discharges from urban and industrial development also has reduced and degraded wetlands. The suitability of the remaining wetlands for many species has been further limited, and in some cases precluded, by their small size, fragmentation, and lack of other habitat features.

The remaining saline emergent wetlands of the San Francisco Bay area provide important habitat for a variety of birds and mammals. Several species of lizards and snakes use edges of the marshes, and a few amphibians can occur in brackish portions of these wetlands. Saline emergent wetlands provide important wintering and migratory stopover habitat for many birds. Common birds species include waterfowl, herons, egrets, rails, and shorebirds. Several endemic subspecies birds inhabit saline emergent wetlands of the San Francisco Bay area including California clapper rails, California black rails, salt marsh, yellowthroat, and Belding's savannah sparrow. Common mammals include shrews, bats, mice, and raccoons. Special-status species that use this habitat include California's clapper rail, California black rail, and salt marsh harvest mouse.

Valley Foothill Riparian. Valley foothill riparian habitat develops in the flood plains of low-gradient rivers and streams. Riparian habitats form a transitional community between the aquatic, riverine environment and upland habitats. Dominant tree species of valley foothill riparian habitat are cottonwood (*Populus fremontii*), California sycamore, and valley oaks. Typical shrub species include willows (*Salix* sp.), elderberry (*Sambucus* sp.), and wild grape (*Vitis californica*).

The composition of riparian plant communities is shaped by the timing, intensity, and duration of flooding. Willows predominate in areas subject to regular inundation, and quickly colonize newly deposited gravel bars or recently scoured areas. Cottonwoods occur farther from the river channel in areas subject to less frequent and intense flooding. Still, the persistence of cottonwoods is linked to the natural seasonal pattern of flows. Cottonwoods evolved to release seeds at the same time as high spring flows would deposit nutrient rich sediments where germination and seedling survival would be enhanced. Thus, the timing and intensity of flows is critical to the persistence of riparian vegetation. Flood control and water supply projects have resulted in hydrologic alterations that have changed the species composition, structure, and extent of riparian habitats.

In addition, most rivers have been channelized and are confined by levees, which limits the area available to support riparian habitat. As a result of these changes, the extent of riparian habitat in the Central Valley has been substantially reduced.

The structural and compositional diversity, abundant food resources, and availability of water in valley foothill riparian habitat make this habitat particularly valuable to wildlife. Wildlife species diversity is often higher in riparian habitats than in adjacent habitats. Many resident birds, amphibians, reptiles, and mammals breed in riparian habitats, while other species frequent this habitat in winter or during migration

(Sanders et al., 1985.) Special-status species associated with riparian habitats in the project area include the valley elderberry longhorn beetle (*Desmocercus californicus dimorphus*), Swainson's hawk (*Buteo swainsoni*), and western yellow-billed cuckoo.

Agricultural Habitat. Agricultural field habitat in the project area consists of row crops, orchards, vineyards, and field crops. Crop types vary from year to year depending on market conditions on other factors. Agricultural fields have replaced native habitats consisting of grasslands, wetlands, and oak woodlands. Some wildlife species have adapted to using agricultural fields. Pheasants (*Phasianus colchicus*) and other game birds use tall crops for cover and grain crops for foraging. Waterfowl and sandhill cranes (*Grus canadensis*) and other game birds also forage on waste grains after harvest. Small mammals such as black-tailed hare and several species of mice are often abundant in agricultural fields and attract foraging raptors such as red-tailed hawks, Swainson's hawks, northern harriers, and white-tailed kites. No special-status species are dependent on this habitat but some special-status species, such as Swainson's hawk and white-tailed kites frequent agricultural fields for foraging.

Habitats Associated with Central Valley Project Waterways of the Project Area. The following section describes the terrestrial habitats and wildlife associated with the principal waterways potentially affected by the alternatives: Folsom Lake, lower American River, and lower Sacramento River.

Folsom Lake. Habitats associated with Folsom Reservoir include oak woodland and annual grassland. The oak woodland habitat, located on the upland banks and slopes of the reservoir, is dominated by live oak, blue oak, and foothill pine with several species of understory shrubs and forbs including poison oak, manzanita, California wild rose, and lupine. Annual grasslands occur around the reservoir, primarily at the southern end and consist of wild oats, soft chess brome, ryegrass, mustard, and foxtail.

The reservoir rim is surrounded by a barren band (the drawdown zone) as a result of historic fluctuations in water elevations. The majority of this zone is devoid of vegetation, although arroyo willows and narrow-leaved willows have established in some areas. The only contiguous riparian vegetation occurs along Sweetwater Creek at the southern end of the reservoir. Because the drawdown zone is virtually devoid of vegetation and the sparse willows that have established in some areas do not form a contiguous riparian community, the drawdown zone does not possess substantial habitat value.

Oak woodlands and annual grasslands in the reservoir area support a variety of birds, including acorn woodpecker, Nuttall’s woodpecker, western wood pewee, scrub jay, Bewick’s wren, plain titmouse, hermit thrush, loggerhead shrike, black-headed grosbeak, dark-eyed junco, and Bullock’s oriole. A number of raptors also will use oak woodlands for nesting, foraging, and roosting. These include red-tailed hawk, American kestrel, sharp-shinned hawk, Cooper’s hawk, red-shouldered hawk, great horned owl, and long-eared owl. Mammal species likely to occur in the woodland habitat include mule deer, coyote, bobcat, gray fox, Virginia opossum, raccoon, striped skunk, black-tailed jackrabbit, California ground squirrel, and a variety of rodents. Amphibians and reptiles that may be found in oak woodlands include California newt, Pacific tree frog, western fence lizard, gopher snake, common kingsnake, and western rattlesnake.

The annual grassland surrounding Folsom Reservoir represents habitat for a variety of rodents, which, in turn, serve as a prey base for carnivores such as hawks and owls, coyote, bobcat, gray fox, and some snakes. Although very few birds will nest in the grassland areas, a number of species will forage in this habitat, including white-crowned sparrow, lesser goldfinch, western meadowlark, and several raptor species. Migratory waterfowl are known to feed and rest in the grasslands associated with the north fork

of Folsom Reservoir. Several of the reptiles and amphibians that inhabit the oak woodlands also will occur in the adjacent non-native grasslands.

Lower American River. The lower American River provides a diverse assemblage of vegetation communities, including freshwater emergent wetland, riparian forest and scrub, and in the upper, drier areas further away from the river, oak woodland and annual grassland. The current distribution and structure of riparian communities along the river has been determined by human-induced changes such as gravel extraction, dam construction and operations, and levee construction and maintenance, as well as by both historic and ongoing streamflow and sediment regimes and channel dynamics (Sands et al., 1985; Watson, 1985). As a result of these factors, several riparian vegetation zones exist along the banks of the lower American River. The composition and vegetative structure of these zones at any particular location along the river depends on the geomorphology and other physical characteristics of the riverbank.

In general, willow and alders tend to occupy areas within the active channel of the river, which are repeatedly disturbed by river flows, thus prohibiting successional stages in advancement of plant communities leading to full development of the plant community. Plant species in this zone typically include various species of willow. Cottonwood-willow thickets and cottonwood forests occupy the narrow belts along the active river channel where repeated disturbance by occasional large flows keep the communities at earlier stages. Fremont cottonwood dominates these riparian forest zones but willow, poison oak, wild grape, blackberry, northern California black walnut, and white alder also are present.

Cottonwood forest is typical of the steep, moist banks along much of the river corridor. Valley oak woodland occurs on upper terraces composed of fine sediment where soil moisture provides a long growing season. Valley oak is the dominant tree species in these areas, although some of the sites also have a cottonwood component as a result of infrequent flood inundation. Live oak woodland occurs in the more arid and gravelly terraces that are isolated from the fluvial dynamics and moisture of the river. Annual grassland commonly occurs in areas that have been disturbed by human activity and can be found on many of the sites within the river corridor.

Backwater areas and off-river ponds that are recharged during high flows support emergent wetland vegetation. These habitat areas are located throughout the length of the river, but occur more regularly downstream of the Watt Avenue bridge. Plant species that dominate this habitat type include various species of willow, sedge, cattail, bulrush, rush, barnyard grass, slough grass, and lycopus.

Previous studies have determined that the cottonwood-dominated riparian forest and areas associated with the backwater and off-river ponds are highest in wildlife diversity and species richness relative to other river corridor habitats (Sands et. al., 1985; Watson, 1985). More than 220 species of birds have been recorded along the lower American River and more than 60 species are known to nest in the riparian habitats. Common species that can be found along the river include great blue heron, mallard, red-tailed hawk, red-shouldered hawk, American kestrel, California quail, killdeer, belted kingfisher, western scrub jay, ash-throated flycatcher, tree swallow, and American robin. Additionally, more than 30 species of mammals reside along the river, including striped skunk, Virginia opossum, brush rabbit, raccoon, western gray squirrel, California ground squirrel, meadow vole, muskrat, black-tailed deer, gray fox, and coyote. The most common reptiles and amphibians that depend on the riparian habitats along the river include western toad, Pacific tree frog, bullfrog, western pond turtle, western fence lizard, common garter snake, and gopher snake.

Lower American River Channel Hydrology and Riparian Vegetation Relationships. The type and distribution of riparian vegetation along a river is generally a function of the complex hydrologic and geomorphic conditions of the river (Watson, 1985). In particular, water

availability and magnitude (i.e., flow regimes), floodplain geology, and channel morphology are the driving forces behind the ability of various riparian plants to germinate, establish, and grow. Flood flows mobilize bank and riverbed sediments that result in the deposition of nutrient-rich sediments on the floodplain that, when timed with the release of seeds in the spring, provides suitable areas for seed germination. High water (flushing) flows, usually occurring in late winter and early spring, are necessary to clear the river channel of debris, control the encroachment of vegetation, and unclog sediments. Water availability during the summer and early fall months can determine growth rates and plant types. The structure and composition of the channel bed and banks affects the rate of channel migration, the elevation of the water surface during low flow periods, the lateral movement of groundwater into the banks, the transport and deposition of sediments, and how often certain areas are inundated by flood flows. These, in turn, affect overall plant diversity, growth, and generation.

Cottonwood Growth Along the Lower American River. The germination, establishment, growth, and long-term survival of Fremont cottonwoods along the lower American River is dependent upon the dynamic flow regimes and fluvial geomorphic processes of the river. In particular, the capacity of the river to erode, transport, and deposit alluvial materials is central to the structure and maintenance of cottonwood ecosystems. Because cottonwood seed release and establishment has adapted over time to the flow regime and fluvial process of the lower American River, maintenance of this regime is vital to maintain a viable cottonwood riparian system.

Successful regeneration of cottonwoods relies on the synchronous timing of seed dispersal to appropriate soil moisture levels to germinate and establish successfully (Stromberg, 1995). Cottonwoods disperse seeds over a two- to six-week period, typically in the early to mid-spring months. Dispersed seeds rapidly lose the ability to germinate, so seeds must encounter suitable germination sites soon after release. Germination takes place on freshly deposited alluvial soils in areas along the river bank low enough in elevation to provide adequate moisture but high enough to avoid subsequent flooding after establishment. Peak water flows of sufficient magnitude are necessary, just prior to seed dispersal, to provide these suitable germination sites.

To survive, cottonwood seedlings require a continuous source of adequate moisture (Scott et al., 1996). Consequently, river flows must decline at a rate that allows seedling roots to maintain continuous contact with saturated or sufficiently moist substrate. If river flows and the alluvial groundwater table drop too rapidly, seedling survival decreases appreciably (Scott et al., 1996). Studies have shown that first-year seedlings of Fremont cottonwood survive only where the groundwater depth is less than one meter, and tolerate daily declines of no more than a few centimeters per day (Stromberg and Patten et al., 1991). Summer flows are critical to the continued survival of newly established seedlings and provide necessary moisture when evapotranspiration is highest (Scott et al., 1996). Long-term survival of established cottonwoods is generally related to the depth to groundwater and to river flows. While cottonwoods can adapt to drought periods, overall growth and long-term maintenance of these trees depends on the ability of root systems to reach the alluvial groundwater table, the recharging of which depends on adequate river flows.

Backwater Ponds of the Lower American River. Backwater ponds are areas adjacent to the mainstem of a river that may be connected to the river by surface water during high winter flood flows and by groundwater during other times of the year. Backwater pond areas along the American River Parkway are generally the result of naturally formed gravel deposits and man-induced dredging, although some are likely to be remnant oxbow lakes, such as Bushy Lake. These backwater ponds and lagoons are known to occur throughout the lower American River

system, but occur predominantly at Sacramento Bar, Arden Bar, Rossmoor Bar, and between Watt Avenue and Howe Avenue (Sands et al., 1985).

Vegetation around these ponds is typical of the riparian associations in the area and is composed of mixed-age willow, alder, and cottonwood. Because the water is slower moving and the ponds are isolated from human disturbances, these areas tend to be of higher value to wildlife (Sands et al., 1985). Wildlife species that have been recorded in these areas include: pied-billed grebe, American bittern, green heron, common merganser, white-tailed kite, wood duck, yellow warbler, warbling vireo, dusky-footed woodrat, western gray squirrel, Pacific tree frog, and western toad.

Lower Sacramento River. Much of the Sacramento River is confined by levees that reduce the natural diversity of riparian vegetation. Agricultural land (rice, dry grains, pastures, orchards, vineyards, and row and truck crops) is common along the lower reaches of the Sacramento River, but is less common in the upper portions. Riparian vegetation along the lower Sacramento River is largely confined to narrow bands between the river and the river side of the levee. The riparian communities consist of valley oak, cottonwood, wild grape, box elder, elderberry, and willow. The largest and most significant tract of riparian forest remaining on the Sacramento River is a stretch between Chico Landing and Red Bluff. Freshwater emergent wetlands occur in the slow moving backwaters and are primarily dominated by tules, cattails, rushes, and sedges. Although riparian vegetation occurs along the Sacramento River, these areas are confined to narrow bands between the river and the river side of the levee.

The wildlife species inhabiting the riparian habitats along the lower Sacramento River are essentially the same as those found along the lower American River. These include, but are not limited to, wood duck, great blue heron, great egret, green heron, black phoebe, ash-throated flycatcher, sora, great horned owl, Swainson's hawk, California ground squirrel, and coyote. Agricultural areas adjacent to the river also represent foraging habitat for many raptor species.

Habitat within the Central Valley Project Service Areas. The following section describes habitat identified in each of the American River Division CVP water service contractor service areas. In addition, habitats in the vicinity of proposed new facilities associated with the Freeport diversion are presented.

City of Folsom. The portion of Folsom that would receive CVP water is currently largely undeveloped. Annual grassland habitats comprise most of the existing habitat with a small amount of blue oak woodland and montane hardwood. Vernal pool complexes are common within the annual grassland matrix. Based on the GAP data, the Folsom East Area supports 3,355 acres of annual grasslands, 40 acres of blue oak woodlands, and approximately two acres of montane hardwoods. Wildlife using these habitats are those identified as typical for annual grassland, blue oak woodland, and montane hardwood.

San Juan Water District. Most of the San Juan Water District service area has been developed. Limited blue oak woodland occurs in northern areas of the service area along with small amounts of agricultural field and annual grassland habitat. Based on the GAP data, the San Juan Water District supports 30 acres of annual grasslands, approximately 2,700 acres of blue oak woodlands, and 940 acres of cropland. The fragmented character of these habitats and the surrounding urban land uses limit the value of these areas to wildlife. Wildlife species using these habitats consist of those generally associated with agricultural fields and oak woodlands with a tolerance for human activity. A few vernal pools have been identified in the service area (California Department of Fish and Game, 1998). The service area also borders the American River that supports valley foothill riparian habitat.

Zone 40. The Zone 40 service area includes urban areas, annual grasslands, and agricultural fields. Based on GAP data, the Zone 40 supports 30,470 acres of annual grasslands, 10,665 acres of

cropland, 210 acres of freshwater emergent wetlands, and 25,030 acres of pasture. Agricultural fields consist of pasture, row crops, and orchards or vineyards. Freshwater emergent wetlands occur near the southwestern corner of the service area as the Stone Lakes National Wildlife Refuge. The service area also contains oak woodlands and vernal pools; valley foothill riparian habitats occur along waterways. The vernal pool complexes support many of the plant and animal species endemic to vernal pools in the Central Valley. Special-status species reported in vernal pools in the Zone 40 service area include Bogg's Lake hedge hyssop, legenere, Sacramento orcutt grass, and slender orcutt grass.

Sacramento Municipal Utility District. Undeveloped portions of the Rancho Seco site are predominantly annual grassland habitat. The grassland habitat supports an extensive and relatively dense occurrence of vernal pools. About 20 acres of vernal pools have been identified on the site. In addition to vernal pools, the site supports about 10 acres of other wetland habitats such as vernal swales, emergent marsh, seeps, seasonal wetland, and ephemeral drainages. About 14 acres of valley foothill riparian habitat occurs in a thin band adjacent to Rancho Seco Lake. This riparian habitat is dominated by willows, generally lacking large canopy trees. Small, irrigated pasture areas are found in the southeastern portion of the site. These pastures are grazed in addition to much of the annual grassland habitat.

The habitats on the Rancho Seco site support the wildlife species typically associated with these habitats. Surveys for special-status species were conducted in 1993. Vernal pools were found to support Bogg's Lake hedge hyssop, Greene's legenere, viscid orcutt grass, vernal pool fairy shrimp, California linderiella, and vernal pool tadpole shrimp. A number of other species with special-status were also reported using annual grassland habitat, specifically white-tailed kites, northern harriers, and tricolored blackbirds.

Habitat within the service area of Sacramento Municipal Utility District is either identical to or similar to habitat described for other CVP water service contractors within Sacramento County.

City of Roseville. Most of Roseville's service area has been developed for urban, residential, and industrial uses. Remaining wildlife habitat is generally located in the northeastern portion of the service area. Annual grassland is the predominant habitat with only small fragmented areas of oak woodland (blue oak woodland and valley oak woodland). The remaining patches of valley oak woodland are primarily associated with drainages in the northwestern portion of the service area. Blue oak woodland is present in the eastern portion of the service area. Based on the GAP data, the Roseville service area contains 3,020 acres of annual grasslands, 420 acres of blue oak woodland, 2,550 acres of cropland, and 345 acres of valley oak woodland.

Roseville's service area contains several small streams: Kaseberg Creek, Dry Creek, Cirby Creek, Linda Creek, Pleasant Grove Creek, and Antelope Creek. Valley foothill riparian habitat and valley oak woodland habitat occurs in association with these creeks and other small drainages. However, the extent of habitat is limited to areas immediately adjacent to the stream channels because the streams have been channelized for flood control purposes, and adjacent lands have typically been converted to agricultural or urban development.

The annual grasslands within Roseville's service area contain numerous vernal pools. Over 1,500 vernal pools have been identified in the service area. The vernal pool complexes have been documented to support listed species and other special-status species associated with this habitat. The CNDDB reports the occurrence of the following species in vernal pool habitats in Roseville's service area: vernal pool fairy shrimp, California linderiella, vernal pool tadpole shrimp, legenere, hispid bird's beak, and Bogg's Lake hedge hyssop. Other special-status species have been reported in grassland or riparian habitats in the service area, including valley elderberry longhorn beetle, white-tailed kite, and Swainson's hawk.

Placer County Water Agency. Placer County Water Agency's service area encompasses a wide diversity of habitats. Conifer forest and montane hardwood habitat predominate in the higher elevation areas in the eastern portion of the service area. Lower elevation areas in the western portion of the service area support annual grassland, blue oak woodland, and agricultural fields. Valley foothill riparian habitats exist along larger rivers and streams such as the North Fork American River. Based on the GAP data, the Placer County Water Agency service area contained 9,760 acres of annual grasslands, 25,620 acres of blue oak woodland, 30,600 acres of cropland, 20,570 acres of conifer forest, approximately four acres of chaparral, and 20,875 acres of montane hardwood.

The Placer County Water Agency service area borders Folsom Lake. The lake is generally surrounded by oak woodland and annual grassland habitats. The rim of the reservoir is surrounded by a relatively barren band as a result of fluctuations in the water surface elevation. Wildlife communities and special-status species found in the Placer County Water Agency service area are similar to those described above for specific habitats.

El Dorado Irrigation District. The portion of the El Dorado Irrigation District service area served by CVP water from Folsom Lake consists of annual grassland, blue oak woodland, and chaparral. Vernal pool complexes occur within the grassland matrix. Valley foothill riparian is present along larger streams in the lower elevation areas of the service area such as along the South Fork of the American River where they enter Folsom Lake. Based on the GAP data, the portion of El Dorado Irrigation District served by Folsom Lake diversions includes 6,260 acres of annual grasslands, 4,120 acres of blue oak woodland, and 995 acres of chaparral.

The El Dorado Irrigation District service area receiving water from Folsom Lake contains areas of gabbro and serpentine soils. The gabbro soil intrusion is centered around Green Valley Road in El Dorado County extending from approximately the confluence of the South Fork American River with Folsom Lake south to just beyond U.S. Highway 50. Several species of plants have adapted to the unique characteristics of the gabbro and serpentine soils, such that the area now supports several endemic species found only in this area of El Dorado County. Eight plant species inhabiting the gabbro soil intrusion in El Dorado County have special state or federal status; six species are federally listed. These species are Stebbins' morning glory (*Calysstegia stebinsii*), Layne's butterweed (*Senecia leyneae*), El Dorado bedstraw (*Galium californicum* ssp. *sierrae*), Pine Hill flannel bush (*Fremontodendron californicum* ssp. *decumbens*), Pine Hill ceanothus (*Ceanothus roderickii*), and El Dorado County mule ears (*Wyethia reticulata*).

East Bay Municipal Utility District. The East Bay Municipal Utility District service area consists primarily of urban and suburban areas that support low-quality nonnative vegetation. Large tracts of land that historically supported native vegetation have been significantly altered by extensive urban and industrial development. The western portion of the service area consists of a major urban corridor along the bay shoreline from Richmond to San Lorenzo. Over half of the remaining natural land in the East Bay Municipal Utility District service area is either under district or East Bay Regional Parks District ownership and is being managed in large part for resource protection (pers. comm. with John Lampe, 2003).

In general, the service area is host to a variety of vegetation and habitat types because of the region’s diverse combination of climate, topography, and land types. Land types and forms range from saltwater marshes along the bay plain to moderately high uplands and intermountain valleys in the East Bay Hills. A narrow fringe of tidal wetlands, especially coastal and brackish marsh habitats, occurs along the area’s shoreline. The rolling foothills of the Central Coast Range characterize much of the eastern portion of the East Bay Municipal Utility District service area, including large areas of land under the ownership and protection of East Bay Municipal Utility District and the East Bay Regional Parks District.

Native vegetation and significant habitat areas occur in scattered, isolated locations throughout the East Bay Hills in areas that have experienced fewer disturbances. These areas still support coastal scrub, chaparral, oak woodland, annual grassland, montane hardwood-conifer, and coast redwood plant communities of moderate to high quality. The ridge and hillside landscape is mostly dry and covered with grasses, coastal scrub, or oak chaparral and evergreen forests with interspersed redwood forests on the crests of the foothills. There are some agricultural lands for grazing and crops, and older agricultural orchards. The high uplands and intermountain valleys of the East Bay Municipal Utility District service area have many small streams with associated riparian habitat. East Bay Municipal Utility District reservoirs, which support lacustrine habitat, are located along some of these streams.

The areas of open, rolling grassland in the eastern portion of the service area also support numerous springs, seeps, and agricultural stock ponds. Scattered areas of freshwater marsh and wetlands occur along streams and in isolated low-lying areas throughout the service area.

Some federally listed species within the service area include the California clapper rail (*Rallus longirostris obsoletus*), salt marsh harvest mouse (*Reithrodontomys raviventris*), bay checkerspot butterfly (*Euphydryas editha bayensis*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), California red-legged frog (*Rana aurora draytonii*), pallid manzanita (*Arctostaphylos pallida*), and Santa Cruz tarplant (*Holocarpha macradenia*). Most special-status species are found along the area's shoreline in tidal marshes, and in the valleys, foothills, and low mountains of the less developed regions of the service area with dry coastal scrub, grassland, oak woodland, and riparian vegetation.

Environmental Consequences

The effects of Alternatives 1 and 2 on wildlife resources are compared to conditions under the No Action Alternative.

No Action Alternative. Demographic, economic, political, and other factors, independent of the long-term contract renewal process, are causing changes with direct and indirect effects to biological resources that are beyond the range of Reclamation's responsibilities. With little exception, virtually all of the long-term contract renewal actions are within the range of existing conditions. This includes the area of use, types of use, range of river flows, and reservoir fluctuations.

In some instances the responsibility to address affects to biological resources would be with the local government as part of their California Environmental Quality Act compliance for their actions. For example, Reclamation is not responsible for the development of housing tracts or industrial development in a community. Such actions are approved locally and at the state level (However, other federal agencies, such as Housing and Urban Development, may be involved.). Further, if a farmer changes from one irrigated crop to another because of economic reasons, Reclamation does not control the farmer's decision. On the other hand, Reclamation would need to consider the effects to biological resources when Reclamation approves new lands being brought into an irrigation district and when Reclamation approves a change in use. Any such approvals would require independent analysis and environmental documentation.

The Department of the Interior is developing strategies to address the impacts upon special status species in the CVP service areas. In addition, any federal action that may affect listed species must comply with Endangered Species Act. This requirement for compliance is also required for other Federal approvals and permits, including Corps of Engineers permits for dredging and filling of wetlands. Because this type of regulatory compliance is required for several federal actions and would be included in the overall local planning process, Sacramento, El Dorado, Placer, Contra Costa, and Alameda counties have initiated or are considering initiating Habitat Conservation Plans.

Alternative 1. Biological resources in the American River Division under Alternative 1 would be identical to conditions under the No Action Alternative. Therefore, there would be no impacts to biological resource conditions under Alternative 1.

Alternative 2. Biological resources in the American River Division under Alternative 2 would be identical to conditions under the No Action Alternative. Therefore, there would be no impacts to biological resource conditions under Alternative 2.

Cumulative Effects

The long-term contract renewals in the American River Division would not result in cumulative impacts to biological resources in addition to those occurring under the Affected Environment and those addressed in environmental documents completed by Reclamation or local agencies. These issues were evaluated as part of previous environmental documentation. It is not foreseen that land use plans and resource conservation plans would change without additional environmental documentation. As Habitat Conservation Plans programs are prepared, additional environmental benefits to biological resources may occur.

RECREATION

Recreation opportunities described in this EIS are primarily related to activities at CVP facilities or along streams influenced by CVP activities and opportunities within the service areas of the CVP water service contractors.

Affected Environment

The following description of the affected recreation resources is focused upon areas served by CVP water. This information is primarily based upon environmental documentation completed for local agencies, Reclamation, and the Water Forum Proposal.

Sacramento County. Recreation areas in Sacramento County serve the entire American River Division. Some of the municipal parks are within San Juan Water District and Zone 40. Parklands include regional, county, and local parks, recreation areas, and trails. Some recreational areas are administered by the Sacramento County Parks and Recreation Department. Additional parks and recreation facilities are operated by local governmental entities, including park districts, county service areas, and the cities of Sacramento, Folsom, Citrus Heights, and Elk Grove. Recreational opportunities consist of developed park sites and informal recreational use of open space (natural areas set aside primarily for human use). Open space occurs along rivers (including the American and Sacramento rivers) and streams and also exists as agricultural lands.

City of Folsom. The City of Folsom has 37 parks and nature areas, two clubhouses, a community center, and an aquatic center. During the peak visitor season, popular public facilities within the Willow Creek area of the Folsom Lake State Recreation Area (SRA) are often filled to capacity. Excess visitors turn to the City's park and recreation system as an alternative source of outdoor recreation. All of the existing park facilities; especially the softball, basketball, and soccer facilities are being used at capacity.

Sacramento Municipal Utility District. Sacramento Municipal Utility District owns and operates the site located in southeastern Sacramento County that includes the 433-acre Rancho Seco Park and lake complex. The center of the park site supports the 164-acre Rancho Seco Lake, which was constructed to provide emergency cooling water storage for the decommissioned Rancho Seco nuclear power facility

and is used for recreation. Park facilities include group campgrounds and individual camp sites, recreational vehicle sites, group and family picnic areas, two boat launches, a store/snack bar, restrooms, and a swimming area. The lake is a popular fishing spot for catfish, blue gill, bass, crappie, and trout. Most lake facilities are located on the south and west shores of the lake. The peak number of persons at Rancho Seco Lake on a summer weekend is approximately 5,000.

Sacramento Municipal Utility District contracted with the State of California to operate a portion of the site as a public park for 50 years as part of the development agreement to construct and operate the power plant. The contract remains in effect until December 31, 2022. The lake may not be drawn down below an elevation of 237 feet without prior written consent of the state. Sacramento Municipal Utility District also entered into a contract with Sacramento County in 1971 that specified that Sacramento Municipal Utility District would construct water, sanitary, and recreation facilities and would operate the reservoir in accordance with Sacramento Municipal Utility District's state contract. Sacramento County agreed to manage these facilities for the full term of Sacramento Municipal Utility District's contract with the state. However, as a result of a budget shortfall in 1992, Sacramento County discontinued management of the park facilities in September 1992, and Sacramento Municipal Utility District assumed these responsibilities.

Placer County. Recreation areas in western and central Placer County serve the entire American River Division, and include areas within the Placer County Water Agency service area. Numerous federal, state, and local jurisdictions and private entities provide recreation opportunities in Placer County. Park facilities and recreation opportunities in the County range from small neighborhood and community parks and programs to regional recreation areas, natural open space areas, public and private museums and historical sites, and specialized sports facilities.

Local parks in the western portion of the County are provided primarily by Placer County, the Auburn Recreation District, and incorporated cities such as Roseville, Rocklin, and Lincoln. Placer County owns 30 parks, campgrounds, community halls, trails, equestrian areas, reserves, and beaches. Two parks are currently under construction, In addition, Placer County and the California Department of Parks and Recreation are working on a plan to expand the existing network of trails throughout the American River Canyon.

City of Roseville. Parks, public golf courses, and open spaces in the City are managed and maintained by the City Parks and Recreation Department. The City also manages pedestrian and bicyclist pathways, and non-traditional, park/open space areas such as vernal pool preserves, oak woodlands, and watershed/riparian areas, typically used for passive recreation and for visual and aesthetic enjoyment.

El Dorado County. There are 54 parks and recreational areas within western El Dorado County, including 51 existing facilities and three proposed parks. Extensive boating recreation occurs on the South Fork between Chili Bar and Folsom Reservoir.

East Bay Municipal Utility District. Recreational opportunities within and near the East Bay Municipal Utility District service area are primarily oriented to urban parks and lands owned and managed by the East Bay Regional Park District. The regional park district manages 92,000 acres of land in Alameda and Contra Costa counties, performing the function of providing major park facilities, which is normally undertaken by county government. The district maintains parks of differing types that are classified as Regional Parks, Regional Preserves, Regional Recreation Areas, Regional Shorelines, Regional Wilderness Areas, and Regional Open Space. The district’s many parks provide a variety of recreational opportunities, such as swimming, hiking, boating, fishing, jogging, bicycling, picnicking, camping, and horseback riding. The California Department of Parks and Recreation manages and operates

Mt. Diablo State Park, located on the eastern boundary of the East Bay Municipal Utility District service area in Contra Costa County.

Some of the water that is diverted from Pardee Reservoir and conveyed to the East Bay Municipal Utility District's service area is stored in five local terminal reservoirs—Briones, Chabot, Lafayette, San Pablo, and Upper San Leandro. Lafayette and San Pablo Reservoirs are East Bay Municipal Utility District recreation areas that provide visitors with many opportunities for recreation. Lafayette Reservoir and Recreation Area is ideal for hiking, bicycling, jogging, fishing, boating, sailing, and picnicking. At San Pablo Reservoir and Recreation Area, trout and catfish are planted regularly and the reservoir yields large- and smallmouth bass, white sturgeon, bluegill, and crappie. The reservoir also provides opportunities for hiking, bicycling, noncontact water sports, horseback riding, and picnicking. Lake Chabot, managed by the East Bay Regional Park District, also provides recreation opportunities. The lake is stocked with trout and catfish, and is popular for fishing. Services also include canoe and boat rentals, picnicking, hiking, bicycling, jogging, and running trails. Public fishing and boating is not allowed at Briones Reservoir; the U.C. Berkeley women's crew team uses the lake.

Folsom State Recreation Area. The Folsom SRA (consisting of Folsom Lake and Lake Natoma) is heavily used due to its proximity to a rapidly growing metropolitan area; the hot, dry summer climate of the area; the high recreational interest of the surrounding population; the diminishing open space; and its convenience as a recreational resource. Folsom Lake measures approximately 11,500 surface acres in area, and has 75 miles of shoreline. It is the result of damming of the American River at Folsom in the 1950s as part of the CVP. Lake Natoma is the afterbay of Folsom Dam and is located about one mile downstream of the dam. It measures approximately 500 surface acres in area. It is narrow and linear, measuring four miles in length. There are 176 campsites that accommodate tent, trailer, RV, and group campers; 11 day use areas; and over 90 miles of existing trails in the SRA.

Visitation peaks in the summer and tapers off in the fall and winter; 75 percent of all visits to the SRA occur during the spring and summer months. Use in 2000 at the Folsom Lake SRA was more than 1.5 million visitors. Water-enhanced (land-based) activities at the SRA account for approximately 15 percent of the total recreation demand and water-dependent activities account for nearly 85 percent. Water-dependent activities on Folsom Lake include boating, personal watercraft use (jet skis), windsurfing, water skiing, rafting, swimming, and fishing. On Lake Natoma, water-dependent activities include paddling (kayaking, rowing, canoeing, and outriggers), swimming, and fishing. Boating accounts for approximately 30 percent of the total recreation demand at the SRA, swimming and wading account for 27 percent, fishing accounts for nearly 20 percent, and 23 percent consists of picnicking, camping, and miscellaneous water-dependent activities.

Recreation use and quality of the SRA are closely related to Folsom Lakes' function as a flood control, irrigation, and water supply reservoir, particularly as it relates to water surface elevations of the lake. Folsom Lake water surface elevations directly affect the availability of boat ramps, beaches, berth sites, and other facilities that depend on water depth or surface area. These elevations can vary as much as 70 feet in normal years. The highest surface elevations occur during the rainy season and spring run-off in late winter and early spring; the lowest elevations occur in late fall or early winter before it rains. The elevations drop continuously from the start of the recreation season (Memorial Day) through the end of the season (Labor Day). Lake levels in a normal year will generally fall from an elevation of 466 feet at the beginning of the season to a low of 405 feet in late fall, after the season has ended.

If Folsom Lake's water surface elevation stays above about 405 feet mean sea level, berthing slips for year-round mooring is available. When reservoir elevations rise higher than about 450 feet mean sea level, lake inundation results in nearshore boat ramps and parking spaces becoming unavailable, affecting the carrying capacity of the reservoir. When reservoir water levels decline below 436 feet mean sea level,

submerged boat ramps become more exposed and can become unusable at about elevation 420 feet mean sea level. Summer is the most sensitive to changes in water surface elevations because of the lack of access to a recreational facility that can result.

Table 4-3 lists the boat launch facilities at Folsom Lake and the minimum water surface elevations in which those facilities can be operated. Major facilities at Folsom Lake include six developed boat launching areas, one marina, and two formal beach areas.

Lake Natoma is located at the downstream end of the Folsom Lake SRA. Nimbus Dam and Lake Natoma regulate releases to the American River while allowing varied water releases from Folsom Dam so that power production benefits can be optimized. The water surface elevation typically fluctuates four to seven feet daily. Recreation use on Lake Natoma is less affected than at Folsom Lake due to the minimal changes in water surface elevation. Table 4-4 lists the boat launch facilities at Lake Natoma and the minimum water surface elevations in which those facilities can be operated.

Major facilities at Lake Natoma include three boat launching areas, formal beaches at Negro Bar and Nimbus Flat, and the California State University, Sacramento Aquatic Center just upstream of Nimbus Dam. The Aquatic Center provides instruction and equipment rentals for rowing, sail-boarding, canoeing, and small-boat sailing. Other Lake Natoma facilities include several picnic areas and an 8-mile segment of the American River paved trail that is used by equestrians, hikers, runners, mountain bikers, and in-line skaters. Bank fishing is common, and swimming and diving occur from the rock outcrops at the upper end of the lake. The predominant recreational activity is trail use (jogging, bicycling, hiking, and horseback riding). Summer water temperatures in Lake Natoma are generally much cooler than in Folsom Lake; therefore, Lake Natoma is less intensely used for swimming and wading.

Lake Natoma supports an average of half-million visitor-days per year; visitation is greatest during the spring and summer. Water-enhanced activities account for approximately 50 percent of all recreation activities, and water-dependent activities account for the remaining 50 percent. Trail use accounts for 33 percent of the total recreation demand, rafting and boating account for 30 percent, swimming and wading account for 12 percent, picnicking and related activities account for 10 percent, fishing accounts for eight percent, and nature study/sightseeing accounts for seven percent of the total recreation demand.

The distribution of visitors across major facilities at the SRA is shown in Table 4-5. In 2000, approximately 71 percent of all visitors to the SRA visited eight of the facilities, with Granite Bay being the most heavily used.

Lower American River. The Lower American River (23 miles from Nimbus Dam to the confluence with the Sacramento River) includes the American River Parkway. The Parkway includes 14 parks along the publicly owned lands of the river. The County of Sacramento operates and maintains facilities within the Parkway downstream of Nimbus Dam, and the California Department of Parks and Recreation operates and maintains the facilities upstream of the dam. It is widely recognized as one of the nation's premier urban parkways.

The most popular feature of the Parkway is the Jedediah Smith Memorial Trail - more commonly known as the American River Bike Trail - that extends 32 miles east from Discovery Park in Sacramento to Beals Point in the Folsom Lake SRA. This trail offers to hikers, cyclists, and horseback riders opportunities for outdoor recreation, nature viewing, and relaxation. The American River is popular with fishing enthusiasts, canoeists, kayakers, and rafters, and the Parkway offers several picnic areas, and opportunities for nearby golf, guided natural and historic tours, archery, and game fields.

TABLE 4-3

BOAT LAUNCH FACILITIES AT FOLSOM LAKE

Facility Name	No. of Launch Lanes	Minimum Lake Level for Operations (ft.)
Granite Bay		
Stage 1	2	395
Stage 2	10	426
Stage 3	10	435
Stage 4	14	425
Five Percent	4	408
Low Water	2	360
Folsom Point	4	406
Brown's Ravine		
Main Ramp	4	395
Hobie Cove	3	375
Rattlesnake Bar	2	425
Peninsula		
Day Use	1	434
South Ramp	1	410
Beal's Point	1	420

Source: Wallace Roberts & Todd, 2003.

TABLE 4-4

BOAT LAUNCH FACILITIES AT LAKE NATOMA

Facility Name	No. of Lanes	Minimum Lake Level (ft.)
Negro Bar	2	200
Nimbus Flat		
Main Ramp	2	115
Alternate	1	120
Willow Creek	1	35

Source: Wallace Roberts & Todd, 2003.

TABLE 4-5
DISTRIBUTION OF VISITORS TO FOLSOM LAKE STATE RECREATION AREA BY FACILITY IN 2000

Facility	Attendance	Percent of Total Attendance
Granite Bay	507,712	32.0
Beals Point	219,986	14.0
Folsom Point	112,120	7.1
Brown's Ravine	66,856	4.3
Peninsula Area	19,303	1.2
Negro Bar	84,481	5.4
Nimbus Flat	38,801	2.5
Rattlesnake Bar	62,001	3.9
Total Facility Attendance	1,111,260	70.7
Total Park Attendance	1,571,074	

Source: Wallace Roberts & Todd, 2003.

More than five million visitors use the Parkway each year; visitation is expected to increase to about 10 million by 2020, assuming stable riverflows are available. Approximately 31 percent of all visits were associated with water-dependent activities (swimming, boating, and fishing), and 69 percent were associated with water-enhanced activities (jogging, nature study, hiking, picnicking).

The Lower American River has been designated as a Wild and Scenic River pursuant to both the State and Federal Wild and Scenic River Acts. This designation prohibits federal construction, assistance and licensing, or water resource projects that would adversely affect the values for which the designated river segments are included in the national system. The Lower American River is a major site for recreational boating (rafting, kayaking, canoeing). The level of Lower American River boating activity, particularly commercial rafting, primarily depends on air temperature, riverflows, and season of year. Swimming and wading are other popular water-dependent activities affected by riverflows. There are 10 popular swimming areas along the river, although only Paradise Beach and Tiscornia Park have large sand beach areas.

Environmental Consequences

The effects of Alternatives 1 and 2 on recreational opportunities are compared to conditions under the No Action Alternative.

No Action Alternative. The general plans for Sacramento, Placer, El Dorado, Alameda, and Contra Costa counties and all of the CVP water service contractors in the American River Division recognize the importance of recreational opportunities and continue to provide protections and support for the recreational sites. For the recreational sites that are served by CVP water, it is anticipated that without acquired water supplies, low water levels would occur in reservoirs and creeks more frequently than has occurred in past years due to the reduction in CVP water supply reliability.

Alternative 1. Recreational opportunities in the American River Division under Alternative 1 would be identical to conditions under the No Action Alternative. Therefore, there are no environmental impacts of this alternative as compared to the No Action Alternative.

Alternative 2. Recreational opportunities in the American River Division under Alternative 2 would be identical to conditions under the No Action Alternative. Therefore, there are no environmental impacts of this alternative as compared to the No Action Alternative.

Cumulative Effects

The cumulative effect of future programs with long-term contract renewals in the American River Division were considered as part of the CVPIA PEIS. That analysis indicated that future projects, including future water transfer projects, may improve CVP water supply reliability and associated storage volumes in Trinity, Shasta, and Folsom lakes and flows in the American River. These types of programs would modify water supply reliability but not change long-term CVP contract amounts or deliveries from within the historical ranges.

CULTURAL RESOURCES

Cultural resources could be affected by changes in reservoir or stream levels that would allow access to exposed artifacts or by disturbances due to development of CVP water service contractor service areas.

Affected Environment

The following description of the affected cultural resources is focused upon areas served by CVP water. This information is primarily based upon environmental documentation completed for local agencies, Reclamation, and the Water Forum Proposal.

Human occupation of northern California may have begun shortly after 8,000 years Before Present (B.P.), termed the early Milling Stone Horizon, representing a subsistence pattern based largely on wild seeds and other plant foods. Hokan groups may have been the earliest permanent inhabitants of California.

A dramatic intensification of land use began around 4,000-5,000 years ago, possibly linked to a more moderate climate and related to changes in the distribution of plant species or to the appearance in the Central Valley of an early, riverine-adapted Penutian population. This marks the approximate beginning of the Early period. Surviving Early-period sites are rare in the Central Valley; most studies of them have concentrated on burials and associated artifacts, especially charmstones and shell beads and ornaments. Skeletal analyses have suggested that Early-period populations suffered from starvation.

A cultural transition seems to have occurred in the region about 2,500 years ago, marked by changes in burial practices (increased evidence of cremation and of flexed burials), tool types (increased use of mortars and bone tools), and ceremonial items (changing styles of shell beads and ornaments and charmstones). This is referred to as the Middle Period or Middle Horizon; the transition may reflect the eastward spread of Miwok people from the Bay Area. Evaluation of Middle-period burials indicates that they suffered less nutritional stress.

The Late Period in the Central Valley began sometime around 1,500 years ago, reflected by changes in archaeological assemblages throughout the region. Late Period sites reflect dense populations with highly developed social organizations, trade networks, food storage and redistribution systems, ceremonial and funerary complexes, and a strong sense of territoriality. The settlement and subsistence patterns changed possibly from more ingestion of acorns as a staple food and the increase in fishing implements and riverine fauna, which may have been triggered by a warm/dry interval at 1,500 B.P. that would have altered vegetation and hydrologic patterns, and the entry into central California of the ancestral Wintun. The increased regional population (and resulting increased population pressure) may have forced the

intensified use of land and fish and shellfish resources. By the Proto-historic and Historic periods, fishing had become a primary subsistence activity for Central Valley tribes who by that time had come to occupy relatively stable and well-defined territories centered on the major rivers.

Sacramento County. Sites within Sacramento County are of importance whether the sites are located within the CVP service area or along rivers because operations of the CVP could impact cultural resources. Between the Sacramento and Sutter county boundary and Freeport, there are 27 recorded sites (24 prehistoric and three historic) and at least 42 historic structures along this segment of the Sacramento River. Three of the prehistoric sites are considered eligible for the National Register of Historic Places. The Natomas Main Drainage Canal meets the Sacramento River on its northern bank about 0.75 mile west of its confluence with the American River. This historic feature has not been evaluated. In addition, the town of Freeport, founded in the 1860s as an early tidewater railroad terminal has the potential to be determined an important historical resource. Other eligible or potentially eligible historic resources along the lower Sacramento River include a rural historic landscape district, Washington Water Company Water Tower, Sacramento Weir and Yolo Bypass, St. Josephs Church and Rectory, Leonidis Taylor Monument, and 37 houses built between 1855 and 1900. Of the 37 houses, only one (John White House) was not recommended for the National Register; the other 36 are listed as "appears eligible" or "may become eligible."

A records search lists 36 recorded sites (22 prehistoric, 13 historic, one multi-component) on the American River between Folsom Dam and the Sacramento River. The prehistoric sites include village mounds and village middens, small camps, bedrock mortar stations, and flakestone scatters. Several ethnographic Maidu settlements were located along the river. Recorded historic sites on the American River consist of mine tailings, bridge abutments, features associated with the Folsom hydroelectric power system, stone foundations, and a cemetery. The American River is considered highly sensitive for archaeological resources.

No systematic archaeological survey has been conducted for Sacramento County; instead there have been many smaller, project-specific studies, including surveys, test excavations, and site evaluations, as required pursuant to state and/or federal regulations (Reclamation, et al., 1998). These surveys found many prehistoric and historic resources throughout the County, some of which were intact at the time of the survey and some that were disturbed.

The Valley Nisenan (a subdivision of the Southern Maidu) lived in settlements along the Sacramento River from downstream of the confluence with the American River, upstream to beyond Yuba City/Marysville, and eastward along the American River for about eight miles. The Nisenan villages may have had 500 to 1,000 occupants. Each village consisted of a number of pole-frame, dome-shaped houses 10 to 15 feet in diameter, with shallow, excavated floors. Villages also contained granaries for storage of acorns and other winter supplies.

The indigenous patterns of Nisenan society were changed with the arrival of Euro-Americans in California. By the 1830s, many non-Indians were coming to California. They brought diseases, and in 1833, the Indian population was decimated by what is thought to be malaria. In addition, the Mexican government was granting large tracts of land to its citizens to a a small number of other nationals, who used the Indians as a labor force. When gold was discovered at Sutter's sawmill in Coloma on the south fork of the American River in 1848, circumstances worsened for the Nisenan. A year later, 100,000 miners came to the Sierran Foothills, many of them through the Sacramento-Folsom area, disrupting Nisenan and other Indian life and often destroying villages and homes. The riverbeds were a major focus of mining activities; therefore, it is assumed that the Nisenan abandoned the Sacramento and Folsom area by the early 1850s to seek refuge in more remote locations, possibly in the foothills.

Between sites immediately upstream of Freeport and the confluence of the Cosumnes River, the Sacramento River is the ethnographic territory of the Plains Miwok. The Plains Miwok inhabited much of the Sacramento River delta and adjacent plains. Similar to the Nisenan, the Plains Miwok were overrun by overzealous missionaries and later by eager gold-seekers and the diseases they brought. By about 1880, they were considered culturally extinct although they are by no means physically so. Primary information on traditional Plains Miwok culture, subsistence, and settlement patterns is limited and often conflicting.

The first Anglo-American to travel into the region that is now Sacramento County was Jedediah Strong Smith, who opened up the northward Sacramento Trail to trade and immigration in 1828. New Helvetia, the first non-Indian settlement in the central valley, was established by Captain John A. Sutter in 1839. He established Sutter's Fort in the City of Sacramento as a trading post. Gold was discovered at Sutter's Mill on the American River in January 1848. By 1854, Sacramento had become so populous and important that the state capital was established in Sacramento. As the city grew, it became necessary to protect it from flooding of the American and Sacramento rivers by constructing levees and eventually raising the level of the town. Before 1869, the American River was re-channeled to relocate the confluence from the location of about E Street to a point about 0.5 mile north.

Sacramento became the transportation center for California with the Sacramento Valley Railroad, the first railroad in the state, constructed between Sacramento and Folsom by 1856. The first transcontinental railroad was completed in 1869 when the Central Pacific Railroad, linking Sacramento with Promontory, Utah, met the Union Pacific Railroad. Southeastern Sacramento County was settled in the 1850s by hay and barley growers; by 1880, wheat became an important crop. The primary agricultural industry was stock raising. In addition, fruits and wine grapes were grown and timber mills were developed.

Sacramento Municipal Utility District. An archaeological survey conducted in 1993 identified in three archaeological sites on the Rancho Seco site for the Sacramento Municipal Utility District: a prehistoric quarry site (RS-1), a late 19th century ditch and placer mining site (RS-2), and an early 20th century dairy (RS-3). Two resources were identified that are located on the project site: an area of placer mining remains (PR-1), and the possible location of a buried prehistoric site (PR-2). At Site RS-1, about 30 prehistoric artifacts and numerous cultural items were noted on the surface, including flaked cobbles and pebbles. Site RS-2 appears to meet the criteria as defined by the California Environmental Quality Act (CEQA) and the National Register of Historic Places (NRHP). Site RS-2 consists of a main ditch, dams and reservoirs, and two areas of associated placer mining activity likely dating to the late 1800s, and may meet the NRHP and CEQA criteria for significance. Site RS-3 contains the remains of the Skully Dairy, which operated in the 1950s, which does not appear to satisfy the significance criteria of either the NRHP or CEQA. Site PR-1 consists of hand-stacked waste rock piles from placer mining and appears to meet the criteria defined by CEQA and NRHP. Site PR-2 consists of three ground-stone artifacts.

The Rancho Seco site was within lands held by the Plains Miwok at the time of historic contact. The Plains Miwok lived in large, semi-sedentary villages along the major river courses of the delta system. The Plains Miwok focused on plant collecting, with fishing and hunting being subsidiary activities. Unlike foothill groups that used bedrock mortars, the Plains Miwok continued to use bowl mortars, which were often made of wood. Ranching was the primary activity of the Rancho Seco site until Sacramento Municipal Utility District purchased the property.

City of Folsom. The City of Folsom's East Area, in general, is considered highly sensitive for archaeological resources primarily because of its role in the early mining history of California. Most of this area falls within the historic Folsom gold mining district. Prehistoric and ethnographic sites are also likely. Test excavations carried out within the Folsom Boulevard right-of-way indicate that the site is

eligible for listing in the National Register of Historic Places. Surveys within the right-of-way also noted three potentially significant historic structures.

Portions of Folsom were once part of the traditional territory of the Nisenan (a subdivision of the Southern Maidu). The Walltown Nisenan inhabited the area in the vicinity of Folsom, Orangevale, Natoma, Latrobe, Clarksville, and Sloughhouse. An Indian camp was established within the Walltown Mining District, located about 12 miles south of Folsom. The Walltown Indian Village was occupied until the 1880s and was probably established in response to the Euroamerican gold activities. Walltown may have been a semi-permanent settlement because structures were placed on the same location each year when the group returned to the area. Dwellings at Walltown were 15 to 20 feet in diameter. A variety of stone projectile points, knives, scrapers, and choppers have bveen found in the territory of the Walltown Nisenan. In addition, grinding tools, bedrock mortars, portable mortars, and pestles were used to grind seeds and acorns. Nisenan culture in the Folsom area terminated about 1871. Some Indians turned to gold mining to supplement traditional subsistence strategies and continued to do so until the 1930s (Lindstrom, 1993).

Portions of Folsom are part of the historic land grant, Rancho Rio de los Americanos, which was granted to William A. Leidesdorff in 1844. When he died in 1848, Captain Joseph L. Folsom purchased the Leisdedorff estate from the heirs. The town of Folsom was originally settled in 1849 by black miners and was known as Negro Bar. Mining commenced in the area in the 1850s, resulting in a drastic increase in population in the area, but when gold was mined out in 1860 and agriculture and stock-raising began, population began to decline. In 1863, the Placerville and Sacramento Valley Railroad Company began laying track east from Folsom into the foothills. The line to Placerville was completed in 1888. Southern Pacific acquired the line around 1910, and it continued to carry freight and passengers until the 1930s (Lindstrom, 1993).

Folsom has a Historic District that includes most of "Old Folsom", containing most of the remaining commercial and residential buildings dating back to the 1800s. These buildings are identified and protected.

The Sacramento Valley Railroad (the Union Pacific Railroad tracks between Sacramento and Folsom) is a historical resource that has been determined eligible for listing in the National Register of Historic Places and is designed as a California State Historic Landmark, predominantly because of its role as the first commercial line completed west of the Mississippi River, the involvement of Theodore Judah in its design, and the influence over the economic development of California and growth of Folsom and Sacramento.

Placer County. Cultural resources in western and central Placer County may be affected by operations of Placer County Water Agency. Placer County is known to have been occupied by two groups of Native Americans; west of the Sierra Nevada crest were the Nisenan, and east of the Sierran crest were the Washo Indians, whose territory centered on the Tahoe Basin and included the Truckee River Valley. Descendants of the Nisenan are known to live in Placer County.

Both the Nisenan and the Washo were hunter-gatherers. The Washo lived a much more mobile life in smaller groups than the Nisenan. The migratory patterns of the two groups have left unique archaeological remains that include habitation sites, burial sites, and resource procurement and processing sites.

The first documented presence of North Americans of European descent in Placer County was during the 1840s. The earliest towns were Auburn (founded in 1849), Ophir (1852), and Rattlesnake (1853). The economic development of the county was originally based on mining of gold, then coal, granite, iron,

copper, quartz, and clay. Timber and agriculture became important industries; by 1869, 15 saw mills produced 17 million board feet of lumber in the county.

Agricultural activity began because of the need for fruit, vegetables, and flour to feed the miners and immigrants during the gold rush. During the 1920s, Placer County was considered the largest fruit-producing area in the state. In the late 1950s, a disease called "pear decline" and the lower yield of foothill ranches compared to those in the valley contributed to the demise of Placer County's fruit industry. Dairy farming became locally important after the decline of the fruit industry, but by 1960 had also diminished significance. Other agricultural enterprises in the county include raising beef cattle, horses, rice, sheep, turkeys, and producing honey, wine, and brandy.

The Central Pacific Railroad completed track from Sacramento to Auburn in 1865. Placer County's growth and development was greatly enhanced by the Central Pacific Railroad. Few early gold rush era buildings are left in Placer County because early miners and immigrants generally lived outside or in cloth tents; several buildings, structures, and features are left from the later mining era. In addition, structures associated with the early lumber mills, buildings and other features associated with the fruit-growing industry, Depression-era concrete bridges, and other historic resources such as school houses, residences, commercial buildings, community halls, churches, and cemeteries exist throughout the County.

City of Roseville. Prior to exploration by Spanish explorers and American trappers, Roseville and the surrounding area was inhabited by the Valley Nisenan, also known as the Southern Maidu. The Nisenan made their home along tributaries and drainages of the American, Yuba, and Bear rivers and the lower reaches of the Feather River. Near Roseville, the Nisenan inhabited a major village named Pitchiku. Structures included brush shelters, sweat houses, acorn granaries, and dance houses. Two large permanent Nisenan sites located within the Maidu Regional Park in Roseville are listed in the National Register of Historic Places. These sites include petroglyphs, grinding rocks, a burial ground, and a midden area.

Little Euro-American use of the Roseville area occurred prior to the discovery of gold in 1848. Exploration that did occur was conducted primarily by Spanish missionaries and American trappers. Soon after the discovery of gold, the region became heavily populated with prospectors, entrepreneurs, and others seeking easy fortunes. Roseville quickly became established as a railroad town and a local commerce center. Evidence of mining, including ditches, pits, small mounds, and low terraces, is still present along several of the creeks within the City. Within the City are 11 sites of historic and cultural importance.

Historic sites include unmortared rock walls built by immigrants. Four historic isolated artifacts or features were recorded including two buildings on the Diamond K Ranch property identified as eligible for the National Register of Historic Places. These buildings have been preserved and will not be affected by future development. Other historic sites identified in a 1986 survey consist of an old wooden stave pipeline and a barn was constructed in about 1910 using mortise and tenon construction, which is a highly unusual construction method used in California after 1850. The City has planned a public park around the barn.

El Dorado County. El Dorado County contains approximately 850 sites (prehistoric and historic) officially recorded with the North Central Information Center at California State University, Sacramento. In addition to the recorded historic sites, there are also 14 properties listed on the National Register of Historic Places (10 of these are located in the western portion of the county), nine eligible for listing on the National Register, 27 State Historic Landmarks, and 25 named gold mining districts.

El Dorado County also keeps an inventory of county resources not included on state or federal lists. Over 90 sites are on this list; a majority of the sites occurs in the western county. Resources in the county inventory include Wells Fargo Express offices, stage coach stops, the site of the first county courthouse, pioneer cemeteries, historic homes, jail houses, and wineries.

The County was once inhabited by the ancestors of the Nisenan (Southern Maidu), Northern Sierra Miwok, and Washoe peoples. The Nisenan generally occupied the area between the South Fork of the American River and the Cosumnes River from the foothills to the crest of the Sierra Nevada. The Northern Sierra Miwok occupied territory south of the Cosumnes River. The Washoe occupied the area east of the crest of the Sierras into Nevada.

Sites have been identified dating back as far as 6000 B.C. in the Tahoe Basin region, and as recent as circa 1800 A.D. on the west slope of the County. Two "early man" sites have been reported in the southeastern Sacramento area dating to around 12,000 years ago.

A variety of site types have been identified within the County are expected to be found in various geographic areas including: village sites with artifacts, housepits, and the remains of dancehouses; cemeteries and cry sites; petroglyphs (rock art); quarries where materials for stone tools were collected and sometimes processed; temporary campsites; bedrock milling areas where acorns and other seeds were processed; scatters of artifacts and tool production waste materials; and ceremonial sites with little or no physical remnants.

El Dorado County's first mass immigration began because of the discovery of gold at Coloma in 1848. Boom towns appeared overnight between 1848 and 1852. Placer mining was replaced by hydraulic mining, which survived throughout the 1880s. By 1900, much of the transitory population had departed, but many of the communities created by the 1849 Gold Rush lived on. In the 1920s and 1930s, a major attraction was auto touring to Lake Tahoe via "The Wishbone". This route originated in Sacramento and included U.S. Highway 50, State Route 89, and westbound Interstate 80, returning back to the Sacramento Valley.

A systematic survey of all lands within the County has never been performed. Archaeological field work in the County has been conducted for private and public development projects and by the U.S. Forest Services for lands within its jurisdiction; therefore, only about 10 percent of the County has been surveyed.

The lifeways and material culture of the three groups occupying the County were very similar in nature. Typically villages were located on ridges and higher ground near sources of water. However, other types of sites were located in various geographical settings, depending on the availability of resources (plants, wildlife, lithic material). Permanent houses were typically conical in shape and covered with brush or earth. Sweathouses and dancehouses are indicative of more recent occupation. All groups subsisted on a varied assortment of fish, game, and plants. Acorns were a staple throughout most of the territory; other materials were used for food, medicinal, and manufacturing purposes. Commonly hunted game included deer, bear, mountain lions, and rabbits.

The Native American populations within the County remained relatively untouched during the early days of European exploration and settlement-the Native American population Statewide was estimated to be 280,000 to 340,000 at the time of European contact. During the height of the Gold Rush (1845-1855), the Native American culture was almost completely decimated, reducing it to some 50,000 persons. The groups within the county were adversely affected because of their proximity to major Gold Rush activity.

East Bay Municipal Utility District. Human occupation of Northern California and the Bay Area began at least 10,000 to 7,000 years ago. Early inhabitants of the Bay Area lived in nomadic hunter-gatherer societies, but by about 4,000 years ago, villages were located along the shorelines of bay shore marshlands, streams, and other water bodies. The rich and complex array of resources available along the shore enabled prehistoric village populations to increase greatly as the indigenous societies changed from the hunter-gather type to a more sedentary lifestyle. The Bay Area was inhabited by at least three indigenous groups: the Ohlone Costanoan (or "coastal dwellers"), the Bay Miwok, and the Northern Valley Yokut. The most important plant foods included acorns, hazelnuts, buckeye, California laurel, berries, seeds, and bulbs. Deer, elk, antelope, geese, ducks, steelhead, and salmon were also food sources (Basin Research Associates, 2000).

Spanish exploration along the California coast began in the 16th century and some Spanish expeditions passed through the Bay Area in the mid-1700s. Most Spanish settlement in the East Bay consisted of land grants, such as Rancho San Leandro, Rancho San Lorenzo, Rancho San Ramon, and the Peralta land grant. In 1848, the discovery of gold at Sutter's Mill brought thousands of new settlers to northern California and, coupled with the completion of the transcontinental railroad to California in 1869, the nonindigenous populations in the East Bay increased dramatically. By the mid-19th century, most of the Spanish land grants had been subdivided as a result of population growth and the United States taking over California.

The portions of the East Bay in the East Bay Municipal Utility District service area in Contra Costa and Alameda counties first developed as agricultural areas with urban areas located along the San Francisco Bay shoreline. The population of these areas grew significantly after the 1906 earthquake in San Francisco, and during World War II, when many industries moved to the East Bay. Large portions of Contra Costa County remained agricultural until 30 years ago, when the area began to become residential to support employment in other parts of the Bay Area.

The East Bay Municipal Utility District service area contains numerous prehistoric resources, including lithic scatters, quarries, habitations, shell mounds, bedrock mortars, petroglyphs, and burials, and historic resources, as well as standing historic structures, buildings, districts, and objects; and locations of important historic events or sites of traditional or cultural importance (Basin Research Associates, 2000).

Folsom Lake and Lake Natoma. One hundred and eighty-five prehistoric sites or components have been recorded at Folsom Lake. Among these are 126 prehistoric sites or components, some with remnant patches of midden. Human burials are noted on a few of the 1940s-50s site records, but the present status of these burials is unknown. Fifty-nine historic-period sites have been recorded at Folsom Lake, mostly related to mining, transportation, and settlement. Many of the recorded sites shown signs of adverse effects from wave action, inundation, and/or recreation use at the reservoir.

Lake Natoma, downstream from Folsom Dam, lies within the boundaries of the historic Folsom/American River Mining District, which is a dredge field 10 miles long and seven miles wide dating from the 1890s to the 1960s. It includes dredge tailings, and historic mining features like ground sluice systems, ditches, bedrock tunnels, shafts, adits, prospect pits, rock retaining walls, and refuse dumps. This was one of the largest dredging fields in California and produced an estimated $125 million in gold. At least three known prehistoric sites have been inundated by the lake.

Environmental Consequences

The effects of Alternatives 1 and 2 on cultural and historical resources are compared to conditions under the No Action Alternative.

No Action Alternative. Under the No Action Alternative use of CVP long-term contracts is not the sole factor driving growth and land use change. Demographic, economic, political, and other factors, independent of the long-term contract renewal process, are causing changes with direct and indirect effects to cultural resources that are beyond the range of Reclamation's Section 106 of the National Historic Preservation Act (NHPA) responsibilities. With little exception, virtually all of the long-term contract renewal actions are within the range of existing conditions. This includes the area of use, types of use, range of river flows, and reservoir fluctuations.

Long-term contract renewal actions under the No Action Alternative that are not within the range of existing conditions and would affect historic properties, a commitment would be made that Reclamation would comply with Section 106. In some instances the responsibility to address affects to cultural resources would be with the local government as part of their California Environmental Quality Act compliance for their actions. For example, Reclamation is not responsible for the development of housing tracts or industrial development in a community.

Such actions are approved locally and at the state level (However, other federal agencies, such as Housing and Urban Development, may be involved.). Reclamation does not control local agencies land use decision. On the other hand, Reclamation would need to consider the effects to historic properties when Reclamation approves new lands being brought into a district and when Reclamation approves a change in use that could lead to an effect on a historic property.

In compliance with 36 CFR 800.4(a) (4), Reclamation has sent letters to Indian tribes requesting their input regarding the identification of any properties to which they might attach religious and cultural significance to within the area of potential effect. To date we have not received any comments or formal responses from the tribes.

Alternative 1. Cultural resources in American River under Alternative 1 would be identical to conditions under the No Action Alternative. Alternative 1 would not alter CVP operations as compared to the No Action Alternative. Therefore, there are no environmental impacts of this alternative as compared to the No Action Alternative.

Alternative 2. Cultural resources in American River under Alternative 2 would be identical to conditions under the No Action Alternative. Alternative 2 would not alter CVP operations as compared to the No Action Alternative. Therefore, there are no environmental impacts of this alternative as compared to the No Action Alternative.

Cumulative Effects

The cumulative effect of future programs with long-term contract renewals in the American River Division were considered as part of the CVPIA PEIS. That analysis indicated that future projects, including future water transfer projects, may improve CVP water supply reliability. These types of programs would modify water supply reliability but not change long-term CVP contract amounts or deliveries from within the historical ranges.

INDIAN TRUST ASSETS

The United States has a trust responsibility to protect and maintain rights reserved by, or granted to, federally recognized tribes and individual Indians, by treaties, statutes, and executive orders. These rights are sometimes further interpreted through court decisions and regulations. The trust responsibility

requires that all federal agencies, including Reclamation, take all actions reasonably necessary to protect Indian trust assets.

Indian Trust Assets are legal interests in property held in trust by the federal government for federally recognized Indian tribes or individual Indians. “Assets” are anything owned that has monetary value. “Legal interest" means there is a property interest for which there is a legal remedy, such as compensation or injunction, if there is improper interference. Indian trust assets do not include things in which a tribe or individual Indians have no legal interest.

Indian Trust Assets can be real property, physical assets or intangible property rights, such as a lease, or a right to use something. Indian Trust Assets cannot be sold, leased, or otherwise alienated without United States' approval. While most Indian trust assets are located on-reservation, they can also be located off-reservation. Examples of things that can be Indian Trust Assets are land, minerals, hunting and fishing rights, water rights, and instream flows. Off-reservation cultural resources located on non-trust land, are usually not Indian trust assets.

This section describes the Native American resources within or near the American River Division or service areas of the American River Division CVP water service contractors.

Affected Environment

There are three Native American resources and sites within or near the American River Division, including tribal trust assets recognized by the Bureau of Indian Affairs, as shown in Table 4-6.

TABLE 4-6

INDIAN TRUST ASSETS IN AMERICAN RIVER DIVISION

Indian Trust Asset	Nearest CVP Water Service Contractor	Comments
Auburn Rancheria	Placer County Water Agency	Miwok Tribe near Auburn, Placer County
Shingle Springs Rancheria	Within El Dorado Irrigation District	Miwok Tribe - 160 acres near El Dorado, El Dorado County
Wilton Rancheria	Near Rancho Seco Generating Station and Zone 40	Tribal affiliation unknown near Wilton, Sacramento County Rancheria was terminated in 1964 and transferred into fee title (Reclamation, et al., 1998)

These are Trust Assets recognized by the Bureau of Indian Affairs and are not necessarily shown in local land use plans

Source: Welch, Patrick, pers. comm., 2001.

Environmental Consequences

The effects of Alternatives 1 and 2 on Indian Trust Assets are compared to conditions under the No Action Alternative.

No Action Alternative. Indian Trust Assets in the American River Division would be the same as described under existing conditions. The assets are not directly located within or adjacent to CVP facilities.

Alternative 1. Conditions at Indian Trust Assets in the American River Division would be identical under Alternative 1 as under the No Action Alternative. Therefore, there are no environmental impacts of this alternative as compared to the No Action Alternative.

Alternative 2. Conditions at Indian Trust Assets in the American River Division would be identical under Alternative 2 as under the No Action Alternative. Therefore, there are no environmental impacts of this alternative as compared to the No Action Alternative.

Cumulative Effects

The cumulative effect of future programs with long-term contract renewals in the American River Division were considered as part of the PEIS. That analysis indicated that future projects, including future water transfer projects, may improve CVP water supply reliability. These types of programs would modify water supply reliability but not change long-term CVP contract amounts or deliveries from within the historical ranges or cause additional construction activities or access near the Indian Trust Assets.

AIR QUALITY

Most of the air pollutants in Sacramento, Placer, and El Dorado counties may be associated with either urban or agricultural land uses. Pollutants commonly associated with agricultural land uses include particulate matter less than 10 microns in diameter (PM_{10}), carbon monoxide (CO), nitrogen oxides (NO_x), and ozone precursors. No clear relationship exists between agricultural acres and the occurrence or resulting concentrations of ozone (O_3) and PM_{10} in the atmosphere. Several variables other than land uses can affect air quality conditions, and these variables may change over time.

Affected Environment

The following description of the affected air resources is focused upon air quality in areas served by CVP water and is based upon information prepared by Reclamation and the local agencies or the referenced air quality regulatory agencies.

Climate. The climate in northern and central Sacramento County, including Folsom, Zone 40, San Juan Water District, Sacramento Municipal Utility District Rancho Seco site, and agricultural areas located south of Zone 40; and Roseville in western Placer County is characterized by cool, wet winters and hot, dry summers. The seasons are so distinctly different that the period from May to October may be termed the dry season and November to April the wet season. Precipitation varies throughout the area, ranging from 16 to 20 inches on the valley floor to about 70 inches in the foothills near Folsom Lake. Annual precipitation occurs almost entirely between November to March. Winds in the area tend to be fairly strong and predominate from the west through the Carquinez Strait from the Pacific Ocean. During the winter, the sea breezes diminish and winds from the north occur more frequently; however, winds from the south still predominate. Between late spring and early fall, a layer of warm air often overlays a layer

of cool air from the Delta and the San Francisco Bay, resulting in an inversion. Air pollution problems tend to develop when calms combine with inversions.

The areas served with CVP water by Placer County Water Agency and El Dorado Irrigation District are in a transition zone between the climate of the Central Valley and that of the higher Sierra Nevada Mountains. Most winds on the western slopes are from the west and southwest. Summer winds allow for good local mixing, but often bring air pollutants from the Central Valley and Bay Area. During the winter, winds are from the south or southeast. In addition to the wind patterns that affect the rate and orientation of horizontal pollutant transport, temperature inversions control the vertical depth through which pollutants are mixed.

The East Bay Municipal Utility District service area is characterized by moderately wet winters and dry summers. Winter rains account for about 75 percent of the average annual rainfall. During rainy periods, ventilation (rapid horizontal movement of air and injection of cleaner air) and vertical mixing are usually high, and thus pollution levels tend to be low. However, frequent dry periods do occur during the winter, where mixing and ventilation are low and pollutant levels build up. The complex terrain, especially at higher elevations, distorts the normal wind flow patterns. The greatest distortion occurs when low-level inversions are present and the air beneath the inversion flows independently of air above the inversion, a condition that is common during the summer months.

The air flowing in from the coast to the Central Valley begins developing at or near ground level along the coast in the late morning or early afternoon. As the day progresses, the sea breeze layer deepens and increases in velocity while spreading inland. The depth of the Delta breeze depends largely on the height and strength of the inversion. If the inversion is low and strong, and hence stable, the flow of sea breeze will be inhibited and stagnant air quality conditions are likely to result.

During the summer, winds flowing from the northwest are drawn inland through the Golden Gate and over the lower portions of the San Francisco peninsula. Wind speeds may be strong locally in areas where air is channeled through a narrow opening, such as the Carquinez Strait or the Golden Gate.

Air Quality. Air quality is regulated in accordance with federal and state mandates. These regulations are enforced by local and regional authorities. The federal Clean Air Act was passed in 1967, and provided the first national program to control pollution from automobiles and stationary sources. the U.S. Environmental Protection Agency subsequently established national ambient air quality standards in 1971 for the following air pollutants: O_3, CO, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and PM_{10}.

California ambient air quality standards were established by the California Air Resources Board starting in 1969, pursuant to the Mulford-Carrell Act. The California ambient air quality standards are generally more stringent and include more pollutants than the national ambient air quality standards.

Sacramento County and western Placer County (west of Colfax) are located in the Sacramento Valley Air Basin. The eastern portion of Placer County Water Agency (east of Colfax) and the portion of El Dorado Irrigation District served by CVP water service contracts are located in the Mountain Counties Air Basin. The East Bay Municipal Utility District service area is located in the San Francisco Bay Area Air Basin. Eleven air quality monitoring stations existed in the Sacramento County portion of the Sacramento Valley Air Basin as of 2000-2001. Within the Mountain Counties Air Basin in 2000-2001, there were two monitoring stations in El Dorado County and one monitoring station in Placer County. Within the East Bay Municipal Utility District service area, there are two monitoring stations in Alameda County and three monitoring stations in Contra Costa County.

Portion of the Study Area in Sacramento Valley Air Basin. Sacramento County (including Folsom, San Juan Water District, Zone 40, Sacramento Municipal Utility District Rancho Seco site, and agricultural areas located south of Zone 40) and western Placer County (including Roseville and most of Placer County Water Agency) are located in the Sacramento Valley Air Basin.

Sacramento County is within the jurisdiction of the Sacramento Metropolitan Air Quality Management District. The District's overall mission is to achieve clean air goals by leading the region in protecting public health and the environment.

Suspended particulates are generally a regional problem, except when intense emission sources (such as construction activities) affect a small area (Reclamation et al., 1998). In the Sacramento area, pollutants of greatest concern include ozone precursors (reactive organic gases (ROG) and NO_x, CO, PM_{10}, and other visibility-reducing material. The largest single source of pollutants in the Sacramento area is automobile exhaust; O_3 and CO pollution are largely attributable to automobile use. Other sources, such as agricultural and construction/demolition activities, also contribute to high levels in suspended particulates. Prior to 1991, the Sacramento Area Council of Governments was responsible for preparing state implementation plans required by the federal Clean Air Act for the Sacramento Air Quality Maintenance Area. Since 1991, local air districts are responsible for preparing state implementation plans with Sacramento Area Council of Governments taking a support role in document preparation.

The Placer County Air Pollution Control District, headquartered in Auburn, is responsible for managing the County's air quality in a manner to protect and promote public health by controlling and seeking reductions of air pollutants while recognizing and considering the economic and environmental impacts. The District performs several functions:

- Monitors air quality
- Controls air pollution from stationary sources
- Enforces the Statewide Portable Equipment Program
- Responds to citizen complaints regarding air pollution
- Works with County fire districts and agencies
- Administers the County Burn Program
- Assists applicants for land use projects
- Reviews land use development proposals
- Prepares long-range attainments plans for state and federal clean air acts
- Provides information regarding funding opportunities and grants for projects intended to improve air quality in the County

The primary sources of PM_{10} in Placer County are entrained road dust and construction and demolition activities. No CO monitoring stations are located in Placer County; the entire county has been designated as unclassified for CO. The primary source of CO emissions in Placer County is motor vehicle emissions. Ozone is monitored at stations located in Rocklin, Auburn, and in Colfax. Ozone problems are the cumulative result of regional development patterns, rather than the result of a few significant sources. Motor vehicles are the primary source of Placer County NO_x and ROG emissions (NO_x and ROG are precursors to O_3 formation).

Portion of the Study Area in Mountain Counties Air Basin. Areas served by CVP water in El Dorado Irrigation District and areas of Placer County Water Agency located in Colfax or east of Colfax are in the Mountain Counties Air Basin. Within El Dorado County, primary responsibility for air pollution monitoring and control from stationary sources lies with the El Dorado County Air Quality Management District.

As part of the 1988 California Clean Air Act, air districts that are in violation of state ambient air quality standards are required to prepare plans to bring their jurisdictions into compliance with air quality standards. The California Air Resources Board reviews and approves the plans and coordinates the statewide air pollution effort. The El Dorado County Air Quality Management District performs several functions:

- Prepares plans for the attainment of ambient air quality standards
- Adopts and enforces rules and regulations concerning sources of air pollution
- Issues permits for stationary sources of air pollution
- Inspects stationary sources of air pollution
- Responds to citizen complaints
- Monitors ambient air quality and meteorological conditions
- Implements programs and regulations required by the federal and California Clean Air Acts

Air quality in El Dorado County is affected by both stationary sources and mobile sources. Stationary source emissions are composed of point source and area source emissions. Point sources of emissions are limited in the County. They include emissions produced from mining operations, lumber processing, and industrial boilers. Area sources include refuse burning; wildfires; service station operations; pesticide use; farm equipment operations; construction equipment operations; utility equipment; range improvement; forest management; residential wood combustion; residential space and water heating; fuel production and transfer; formulation and application of paints, solvents, and other coatings; organic waste disposal; dry cleaning operations; soil decontamination; wastewater processing; and graphic arts processes. Limited data are available on the amount of area source emissions currently being produced in El Dorado County.

Mobile sources include automobiles, trucks, buses, and other vehicles. Vehicle pollutants are produced by vehicles traveling within the County, but are also carried into the County by prevailing wind patterns from the Sacramento County urbanized area and the San Francisco Bay Area. Vehicular traffic along U.S. Highway 50 between Sacramento and South Lake Tahoe is also a significant contributor of contaminants.

Portion of the Study Area in Bay Area Air Basin. Areas served by East Bay Municipal Utility District are included in the San Francisco Bay Area air basin, which is managed by the Bay Area Air Quality Management District. In 2000, the Bay Area Air Quality Management District prepared a clean air plan designed to bring its jurisdiction into compliance with nonattainment area pollutants. This plan was adopted by the Bay Area Air Quality Management District Board of Directors in December 2000 and submitted to the California Air Resources Board.

The area has been designated as a nonattainment area for O_3 and PM_{10}. Ozone is a respiratory irritant and an oxidant that, when at unhealthy levels, increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. It is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. Its precursors, which include ROG and NO_x, react in the atmosphere in the presence of sunlight to form O_3. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, O_3 is primarily a summer air pollution problem.

Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled (PM_{10} or smaller). Particulates can damage human health and retard plant growth. Particulates also reduce visibility, stain buildings, and corrode materials. PM_{10} emissions are generated by a wide variety of sources, including agricultural activities, industrial emissions, dust suspended by vehicle traffic (including construction traffic), and secondary aerosols formed by reactions in the atmosphere. The area has been designated as an attainment area for NO_2, SO_2, and CO.

The largest sources of air pollution in the area are related to automobile traffic and entrained road dust. Other air pollution sources include petroleum refineries, manufacturers, power plants, construction, demolition, and urban activities such as painting. The counties are coordinating with the Metropolitan Transportation Commission to prepare a Transportation Improvement Plan to be in conformance with the State Implementation Plan for nonattainment areas. The counties also consider air quality issues when considering land use changes.

Environmental Consequences

The effects of Alternatives 1 and 2 on air quality are compared to conditions under the No Action Alternative.

No Action Alternative. Under the No Action Alternative, the use of CVP long-term contracts is not the sole factor driving growth and land use change. Demographic, economic, political, and other factors, independent of the long-term contract renewal process, are causing changes with direct and indirect effects to air quality that are beyond the range of Reclamation's responsibilities. With little exception, virtually all of the long-term contract renewal actions are within the range of existing conditions. This includes the area of use, types of use, range of river flows, and reservoir fluctuations. There would be no increase in deliveries, and no conversion of existing natural habitat into farmland or other uses.

In some instances the responsibility to address affects to air quality would be with the local government as part of their California Environmental Quality Act compliance for their actions. For example, Reclamation is not responsible for the development of housing tracts or industrial development in a community. Such actions are approved locally and at the state level (However, other federal agencies, such as Housing and Urban Development, may be involved). Further, if a farmer changes from one irrigated crop to another because of economic reasons, Reclamation does not control the farmer's decision. On the other hand, Reclamation would need to consider the effects to air quality when Reclamation approves new lands being brought into an irrigation district and when Reclamation approves a change in use.

Alternative 1. Air quality in the American River Division under Alternative 1 would be identical to conditions under the No Action Alternative because there is no change in land use. Therefore, there are no environmental impacts of this alternative as compared to the No Action Alternative.

Alternative 2. Air quality in the American River Division under Alternative 2 would be identical to conditions under the No Action Alternative because there is no change in land use. Therefore, there are no environmental impacts of this alternative as compared to the No Action Alternative.

Cumulative Effects.

The cumulative effect of future programs with long-term contract renewals in the American River Division were considered as part of the CVPIA PEIS. That analysis indicated that future projects, including future water transfer projects, may improve CVP water supply reliability. These types of programs would modify water supply reliability but not change long-term CVP contract amounts or deliveries from within the historical ranges.

SOILS

Soils could be affected by changes in reservoir or stream levels that would allow increase erosion or by disturbances due to development of CVP water service contractor service areas.

Affected Environment

The following description of the affected soil resources is focused upon areas served by CVP water. This information is primarily based upon environmental documentation completed for local agencies, Reclamation, and the Water Forum Proposal.

Sacramento County and Western Placer County. The area in Sacramento County served by CVP water service contracts and areas in the adjacent Sacramento metropolitan areas and the southwestern areas of Placer County are located in the Central Valley Province. This province is composed of tertiary sediments and volcanics, and is a northwest-trending asymmetric trough 400 miles long and averaging 50 miles wide. It is bound on the west by the pre-Tertiary and Tertiary semi-consolidated to consolidated marine sedimentary rocks of the Coast Range. The faulted and folded sediments of the Coast Range extend eastward beneath most of the Central Valley. The east side of the valley is underlain by pre-Tertiary igneous and metamorphic rocks of the Sierra Nevada.

Pre-Tertiary marine sediments account for about 25,000 feet of the total amount of sediments deposited in the sea before the rise of the Coast Range. Marine deposits continued to fill the Sacramento Valley until the Miocene Epoch and portions of the San Joaquin Valley until the late Pliocene, when the last seas receded from the valley. Then continental alluvial deposits from the Coast Range and the Sierra Nevada began to collect in the newly formed valley. In total, the Sacramento and San Joaquin valleys are filled with about 10 and six vertical miles of sediment, respectively.

The valley floor is divided into several geomorphic land types including dissected uplands, low alluvial fans and plains, river flood plains and channels, and overflow lands and lake bottoms. The dissected uplands consist of consolidated and unconsolidated continental deposits of Tertiary and Quaternary that have been slightly folded and faulted.

The alluvial fans and plains consist of unconsolidated continental deposits that extend from the edges of the valleys toward the valley floor. The alluvial plains cover most of the valley floor and make up some of the intensely developed agricultural lands in the Central Valley. Alluvial fans along the Sierra Nevada consist of high percentages of clean, well sorted gravel and sand.

River flood plains and channels lie along the major rivers and to a lesser extent the smaller streams that drain into the valley from the surrounding Coast Range and Sierra Nevada. Some flood plains are well-defined where rivers are incised into their alluvial fans. These deposits tend to be coarse and sandy in the channels and finer and silty in the flood plains. Many of these deposits have been used for gravel mining activities.

Calcic brown and noncalcic brown alluvial soils are found in the Sacramento Valley on deep alluvial fans and flood plains occurring in intermediate rainfall (10 to 20 inches annually). These two soils tend to be brown to light brown with a loam texture that forms soft clods. Calcic brown soil is calcareous; noncalcic soil is usually neutral or slightly acid. These soils are highly valued for irrigated crops.

Terrace soils characterized by a red-iron hardpan layer are found along the east side of the Sacramento Valley. These soils consist of reddish surface soil with a dense silica-iron cemented hardpan, which is

generally one foot thick. Some of these hardpan soils have considerable amounts of lime. Dry farming practices support hay, grains, and pastures, although following ripping, these soils are well suited for orchards and vineyards. These soils are subject to expansive traits which could lead to special building design criteria. These soils are subject to localized landslides and erosion, especially along road cuts or stream banks.

Sacramento County contains no known fault zones or Alquist-Priolo special studies zones. However, the area is subject to influence from fault zones in the surrounding counties. Western Placer County also has low seismic potential.

Central Placer County and Western El Dorado County. The area in Central Placer County (east of Rocklin) and areas within western El Dorado County that are served by CVP water service contract water are located in the Sierra Nevada Province. This province is generally composed of Mesozoic Sierran granitic batholith and associated older metamorphic rocks. In some areas of the northern Sierra Nevada, Tertiary sediments and volcanics overlie the igneous core. The Sierra Nevada resembles a tilted plateau that is depressed on the west side with the eastern side elevated. The Sierra Nevada batholith rises from beneath the sediments of the Central Valley at three to five degrees to its highest point in eastern peaks before it abruptly drops off along a fault escarpment. This fault marks the eastern end of the Sierra Nevada and the western limit of the Basin and Range Province.

The terrace soils from the Central Valley Province area extend into this area. Upland soils continue ont the hilly to mountainous topography and are formed in place through the decomposition and disintegration of the underlying parent material. The more widespread upland soil groups include shallow depth, moderate depth, and deep depth to bedrock. Soils on the east side of the Sacramento Valley have mostly developed on igneous rocks. In the study area, the upland soils are primarily shallow. The soil has a loam-to-clay-loam texture with low organic matter, and some areas have calcareous subsoils. These soils usually have a shallow depth to weathered bedrock, less than two feet. These soils are found in areas of low to moderate rainfall that support grasslands used primarily for grazing. Tilled areas are subject to considerable erosion.

It is recognized that several soil types, including gabro soils, are located in portions of El Dorado County and support specific plant species. However, none of those soils are located with the communities of Lake Hills Estates or El Dorado Hills.

Potential for seismic activity is low, however the area can be influenced by seismic events in the eastern Sierra Nevada. The soils are subject to erosion and landslides near road cuts and stream banks. Gravel mining occurs in some streams that are characterized by rocky cobbles.

East Bay Municipal Utility District Service Area. The portions of Alameda and Contra Costa counties within the East Bay Municipal Utility District service area are located at the northern end of the Diablo Range of central California within the central Coast Range Geomorphic Province. The area is characterized by northwest-trending mountains and intermontane valleys with rounded ridges, steep and moderately steep sides, and narrow canyons. Intensely folded and faulted Franciscan sedimentary, minor volcanic, and metamorphic rocks predominate (U.S. Forest Service, 1998).

Soil characteristics vary widely, in large part because of the wide range of topography, parent material, vegetation, and disturbances associated with past construction. Soils vary from rocky and sandy textures to clayey textures and are mostly well-drained lithic xerorthents, haploxeralfs, and argixerolls. Soil temperature regimes are predominantly thermic; however, north-facing slopes at higher elevations have primarily mesic temperatures. In many areas, soils have been compacted as a result of past construction (U.S. Forest Service, 1998).

In most of the service area, the Franciscan bedrock is overlain by unconsolidated clays, silts, sands, and gravels, referred to as the *Alameda and San Antonio Formations*, or *Bay Muds*. These deposits range in thickness from more than 300 feet to more than 1,100 feet and sediments are fairly continuous beneath San Francisco Bay. These muds are often overlain and interlayered with alluvial deposits of fine-grained and clayey sands that are 10 to 50 feet thick on the east side of the bay (Helley and Graymer, 1997a, 1997b).

The presence of the Hayward/Calaveras fault, Franklin fault, and Concord fault over these formations causes the area to be highly susceptible to seismic activity. In areas where clean, loose, saturated, or sandy soils or sediments within 50 feet of the ground surface are present, the sediments are subject to earthquake-induced liquefaction, which may cause differential ground settlement and lateral spreading. Erosion and soil loss is caused by wind and by water and land use.

Environmental Consequences

The effects of Alternatives 1 and 2 on soils are compared to conditions under the No Action Alternative.

No Action Alternative. Conditions under the No Action Alternative would be similar to the existing Conditions.

Alternative 1. Disturbance to soils in the American River Division under Alternative 1 would be identical to conditions under the No Action Alternative. Therefore, there are no environmental impacts of this alternative as compared to the No Action Alternative.

Alternative 2. Disturbance to soils in the American River Division under Alternative 2 would be identical to conditions under the No Action Alternative. Therefore, there are no environmental impacts of this alternative as compared to the No Action Alternative.

Cumulative Effects

The cumulative effect of future programs with long-term contract renewals in the American River Division were considered as part of the CVPIA PEIS. That analysis indicated that future projects, including future water transfer projects, may improve CVP water supply reliability. These types of programs would modify water supply reliability but not change long-term CVP contract amounts or deliveries from within the historical ranges.

VISUAL RESOURCES

Visual resources could be affected by changes in reservoir or stream levels or by construction at the CVP facilities.

Affected Environment

The following description of the affected visual resources is focused upon areas served by CVP water. This information is primarily based upon environmental documentation completed for local agencies, Reclamation, and the Water Forum Proposal.

Zone 40. The area consists predominantly of agricultural lands, with rivers, creeks, lakes, and urbanized areas. Urbanization has occurred primarily in the northern portion of Zone 40. The rural expanse surrounding the urbanized area consists of a landscape involving little visual diversity but a distinctly

agricultural character typical of the region. Views of the Sierra Nevada foothills, the Sacramento River, and the Cosumnes River that pass through the area provide visual interest. Human-made features include roadways, railroad lines, high voltage transmission line corridors, and the Folsom South Canal.

San Juan Water District. This area is predominantly urban and rural residential areas with rivers, creeks, and parks. The Sierra Nevada foothills, Folsom Dam and Lake, and the American River provide visual interest to this area.

Sacramento Municipal Utility District. The Rancho Seco site is flat to rolling undeveloped rangeland with an industrial complex at the power plant site. The 164-acre Rancho Seco Lake is located adjacent to the industrial site. The agricultural areas and lake facilities provide visual interest in this area surrounded by agricultural vistas.

City of Folsom. The City of Folsom is an urbanized area, exhibiting the typical landscape of a suburban area. Segregated commercial, industrial, and office areas, rows of homes, and numerous roadways comprise Folsom. The southeast portion of Folsom consists of rural open space with gently rolling hills covered with open grasslands and lightly wooded savannas of oak (James A. Roberts and Associates, 1988). Currently, residential development is occurring in the southeast area, and is proposed to continue to occur in this area. This development would transform the landscape to a suburban, developed setting.

Several main thoroughfares in Folsom are designated as scenic in the General Plan: Folsom Boulevard from U.S. Highway 50 to Sutter Street, Greenback Lane from the City limits to Riley Street, Folsom-Auburn Road from the City limits to Greenback Lane, and East Natoma Street from Oak Avenue Parkway to the El Dorado County line. The General Plan considers these scenic corridors to be visual and noise screens between heavy traffic routes and developed areas of the City.

Placer County Water Agency. Placer County has a diverse physical and natural environment and as such, it exhibits variety in its visual resources. Landscapes in the County include the urban areas of Roseville, Auburn, Rocklin, Lincoln, and other small unincorporated communities; timber production and mineral extraction areas; agricultural preserves (lands under Williamson Act contract); areas for preservation of natural resources; recreation areas such as the Granite Chief Wilderness, the Folsom Lake State Recreation Area, and the Auburn State Recreation Area; U.S. Forest Service lands, Bureau of Land Management lands, and private ski areas along I-80 and State Highway 89. Placer County rivers, streams, lakes, and reservoirs add a significant element to the County's visual resource inventory.

City of Roseville. Roseville lies in transitional topography between the Sacramento Valley and the Sierra Nevada foothills. Terrain ranges from gently sloping hills to wooded ravines and open space areas. Roseville is characterized by a mix of older and newer development. Typical views include existing urban development, natural and altered open spaces, and open space corridors. Areas in the City that provide visual opportunities include the many creeks, City parks and recreation areas, community-wide parks, open space areas adjacent to ravines, golf courses, and resource preserves. Among the most prominent views from major roadway corridors include views of Miner's Ravine from Eureka Road at I-80, views from Old Auburn Road near the Sacramento County border, and views of Dry Creek from roadways in the downtown area. Urban areas that offer visual interest and are unique to Roseville include Old Town and Downtown.

El Dorado Irrigation District. The overall character of El Dorado County changes with elevation from west to east. Consequently, several different environments exist, each having distinct vegetative communities and landforms, and different types of development patterns and historical features.

The main highways through the County provide access to the foothills and over the Sierra Nevada. U. S. Highway 50 bisects the County from east to west, and State Routes 49 and 89 provide north-south access. Scenic resources such as rolling grasslands with heritage oaks and oak woodlands, apple orchards and vineyards, evergreen forests and snow-capped mountains, river corridors, and lakes, as well as a wide variety of historic structures, all contribute to the visual character found in the County.

Much of the County is characterized by undeveloped lands. As a result, these natural communities are visible to travelers and local residents. Native vegetation within these natural communities contribute some of the most distinct visual resources within the County, providing foreground, middleground, and background views. Agricultural activities within the County also provide visual opportunities. Ranches, orchards, Christmas tree farms, wineries, and vineyards are scattered throughout the West Slope. Historic trails and historic resources are common throughout the County.

Scenic corridors are highways, local roadways, and rivers which require protection due to their contribution to the character and economic strength of the County. Three highways in El Dorado County have been designated by the California Department of Transportation (Caltrans) as scenic highways: U.S. Highway 50 from the eastern limits of the Government Center interchange in Placerville to South Lake Tahoe; all of State Route 89 within El Dorado County; and those portions of State Route 88, which pass through El Dorado County on its southern border. All of State Route 49 in El Dorado County is on the "Eligible State Highway" list but is not yet officially designated as a "State Scenic Highway."

The urban environment is as varied as the natural environment. The U.S. Highway 50 corridor is characterized by newer high density housing developments, retail centers of varying size, heavy commercial uses, rural housing, and seasonal cabins. Outlying areas are characterized by rural communities with commercial cores with architectural styles ranging from Old West to Victorian to contemporary to efficiency. Multifamily developments and mobile home parks occur throughout many areas of the County.

Folsom Lake and Lake Natoma. Folsom Lake, a man-made reservoir consisting of nearly 75 miles of shoreline, is a significant visual entity that contrasts sharply with the foothill landscape, creating a vivid landscape. Reservoir levels are drawn down as summer progresses creating a ring of bare soil along the water's edge. This ring is a dominant negative visual feature, affecting the visual quality of the area, and is accentuated in dry years. Folsom Lake is generally considered to provide a pleasing visual setting. Views of Folsom Lake have become increasingly limited due to restricted access and residential development abutting public lands and recreation areas.

Lake Natoma, the regulating reservoir for releases from Folsom Dam, is a long, narrow lake. Land surrounding the lake is mostly undeveloped and consists primarily of wooded and undeveloped canyon areas, sheer bluffs, and dredge tailings (cobble piles remaining from the gold mining era).

American River. The American River provides a variety of visual experiences, including steep bluffs, terraces, islands, backwater areas, and riparian vegetation. Its natural environment contrasts significantly with the urban development of the surrounding Sacramento area. The Lower American River first unit (from Nimbus Dam to the Gristmill Dam Recreation area located approximately two miles upstream of the Watt Avenue Bridge) is viewed most by passing motorists at bridge crossings. It receives the most water-oriented recreation visitor-days of the three visual units and is the most sensitive visual unit. The second unit (from the Gristmill Dam Recreation Area to just below the Howe Avenue Bridge) has less visual variety than the upper section of the river, but it still maintains a fairly interesting landscape. The area is commonly viewed by passing motorists over the Howe and Watt Avenue bridges and represents a well-known viewing area for local travelers. The water intake tower for the Fairbairn Water Treatment Plant, located within the second unit, is an intrusion into the American River Parkway natural setting. It

has an industrial structural appearance, contrasts with the parkway, and is visible from distances 0.5 to 1-mile away. Within the third unit (from California State University, Sacramento to the confluence with the Sacramento River) there are some riffles and ponds, but artificial bank protection has degraded the attractiveness of the area.

East Bay Municipal Utility District. The East Bay Municipal Utility District service area, which ranges in topography from sea level to the East Bay Hills and reaches elevations of 1,500 feet and higher, has a diverse physical and natural environment and a wide range of visual resources. Typical views and landscapes include existing urban development, natural and altered open-space areas, open-space corridors, major ridgelines, and scenic waterways. The terrain ranges from the bay plain to the gently sloping hills and wooded ravines. The service area has smaller, localized scenic resources such as isolated hilltops, rock outcroppings, mature stands of trees, lakes, reservoirs, and other natural features. A mix of older and newer developments characterizes the urban areas. Areas in the urban areas that provide visual opportunities include the many ridgelines, knolls, canyons, hillsides, and watershed areas surrounding the communities. City parks and recreation areas, community-wide parks, open-space areas adjacent to ravines, golf courses, and resource preserves also provide visual opportunities for these urban areas.

The most prevalent views in the East Bay Municipal Utility District service area in western portions of Contra Costa County and Alameda County are of San Francisco Bay, the San Francisco skyline, Mount Tamalpais, and the Oakland and Berkeley hills. In central Contra Costa County, the views to the east are dominated by Mount Diablo and the foothills near Orinda and Moraga.

Environmental Consequences

The effects of Alternatives 1 and 2 on visual are compared to conditions under the No Action Alternative.

No Action Alternative. The general plans for counties within the American River Division recognize the importance of protecting visual resources associated with agricultural land and surface water resources, especially along scenic highways, by maintaining low densities in rural areas and avoiding development in areas of visual prominence.

Alternative 1. Disturbance to visual resources within the service area due to local activities and at CVP facilities would be identical under Alternative 1 as compared to the No Action Alternative. Therefore, there are no environmental impacts of this alternative as compared to the No Action Alternative.

Alternative 2. Disturbance to visual resources within the service area due to local activities and at CVP facilities would be identical under Alternative 2 as compared to the No Action Alternative. Therefore, there are no environmental impacts of this alternative as compared to the No Action Alternative.

Cumulative Effects

The cumulative effect of future programs with long-term contract renewals in the American River Division were considered as part of the CVPIA PEIS. That analysis indicated that future projects, including future water transfer projects, may improve CVP water supply reliability. These types of programs would modify water supply reliability but not change long-term CVP contract amounts or deliveries from within the historical ranges.

ENVIRONMENTAL JUSTICE

The environmental justice discussion focuses on Sacramento, Placer, El Dorado, Contra Costa, and Alameda counties in this EIS.

Affected Environment

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires all federal agencies to adopt strategies to address environmental justice concerns within the context of agency operations. The Census of Population and Housing and the California Department of Finance, Demographic Research Unit compiles numbers of both minority and property residents. Minority populations included in the census are identified as Black; American Indian, Eskimo, or Aleut; Asian or Pacific Islander; Hispanic; or Other, as summarized in Table 4-7. It is not possible to identify the specific ethnicity of individual areas served by CVP water.

The U.S. Census Bureau estimates poverty levels by county. In 1999 in Alameda County, it is estimated that 11.0 percent of the population was in poverty. In Contra Costa County, an estimated 7.6 percent of the population was in poverty. In El Dorado County, an estimated 7.1 percent of the population was in poverty. In Placer County, an estimated 5.8 percent of the population was in poverty. In Sacramento County, an estimated 14.1 percent of the population was in poverty (U.S. Census Bureau, 2003a, 2003b, 2003c, 2003d, and 2003e).

In 2000, in Sacramento County, the civilian labor force was 605,800 eligible adults of which 580,100 individuals were employed, equaling an unemployment rate of 4.2 percent. Average per capita income in 1999 was $27,485, with the average wages per job equal to $34,938 (California Department of Finance, 2002e).

In Placer County in 2000, there was a civilian labor force of 124,800 eligible adults of which 120,800 individuals were employed, equaling an unemployment rate of 3.2 percent. Average per capita income in 1999 was $34,972, with the average wages per job equal to $31,608 (California Department of Finance, 2002d).

In 2000, El Dorado County had a civilian labor force of 82,500 eligible adults of which 79,300 individuals were employed. This was equivalent to an unemployment rate of 3.9 percent. Average per capita income in 1999 was $28,487, with the average wages per job equal to $27,305 (California Department of Finance, 2002c).

In 2000, Alameda County had a civilian labor force of 740,400. Civilian employment was 718,500 and unemployment was 21,900, equaling an unemployment rate of three percent. Per capita income in 1999 was $34,131, with the average wages per job equal to $40,563 (California Department of Finance 2002a). In 2000, Contra Costa County had a civilian labor force of 505,100. Civilian employment was 491,400 and unemployment was 13,700, equaling an unemployment rate of 2.7 percent. Per capita income in 1999 was $37,994, with the average wages per job equal to $40,306 (California Department of Finance 2002b).

TABLE 4-7

ETHNIC DIVERSITY IN AMERICAN RIVER DIVISION

Sacramento County

Year	White	Hispanic	Asian & Pacific Islander	Black	American Indian	Total
1990	727,447	122,959	93,594	95,034	9,976	1,049,010
2000	772,453	161,797	142,862	122,635	12,780	1,212,527
2010	826,680	218,551	218,143	157,184	15,728	1,436,286
2020	864,828	284,772	287,365	196,190	18,610	1,651,765
2030	892,152	367,793	368,164	234,847	21,254	1,884,210

Placer County

Year	White	Hispanic	Asian & Pacific Islander	Black	American Indian	Total
1990	154,578	14,100	3,705	988	1,608	174,979
2000	212,634	20,896	6,540	1,604	1,972	243,646
2010	279,802	30,343	10,597	2,230	2,676	325,648
2020	329,820	41,126	14,023	2,892	3,384	391,245
2030	376,172	54,773	18,081	3,546	4,072	456,644

El Dorado County

Year	White	Hispanic	Asian & Pacific Islander	Black	American Indian	Total
1990	114,737	8,933	2,331	581	1,204	127,396
2000	143,492	13,543	3,827	748	1,587	163,197
2010	185,939	20,427	5,844	932	2,013	215,155
2020	216,407	28,676	7,521	1,106	2,409	256,119
2030	242,982	38,913	9,457	1,241	2,752	295,345

TABLE 4-7
ETHNIC DIVERSITY IN AMERICAN RIVER DIVISION

Contra Costa County

Year	White	Hispanic	Asian & Pacific Islander	Black	American Indian	Total
1990	562,840	92,310	74,784	73,224	4,450	807,608
2000	595,579	128,844	115,549	87,000	4,974	931,946
2010	610,578	165,154	146,993	97,846	5,286	1,025,857
2020	613,699	205,627	170,772	109,182	5,445	1,104,725
2030	609,372	256,969	199,286	118,458	5,416	1,189,501

Alameda County

Year	White	Hispanic	Asian & Pacific Islander	Black	American Indian	Total
1990	682,947	183,577	187,527	223,994	6,780	1,284,825
2000	648,127	267,915	295,366	251,959	6,788	1,470,155
2010	611,935	343,463	417,633	274,310	7,144	1,654,485
2020	554,490	415,804	516,352	299,151	7,342	1,793,139
2030	485,412	502,217	627,276	316,369	7,273	1,938,547

Source: California Department of Finance, 1998.

Environmental Consequences

The effects of Alternatives 1 and 2 on Environmental Justice are compared to conditions under the No Action Alternative.

No Action Alternative. Changes to minority or low-income populations are projected to occur as indicated in Table 4-7.

Alternative 1. Alternative 1 would not alter total water supplies in the American River Division. Therefore, there are no environmental impacts of this alternative as compared to the No Action Alternative.

Alternative 2. Impacts to Environmental Justice issues in American River Division counties under Alternative 2 could be identical or greater to conditions under the No Action Alternative do to the increased cost of CVP water. It is not possible to specifically predict the responses of users to higher

water prices. Water users may continue operations or reduce activities, including industrial operations, that use CVP water. However, additional groundwater would be withdrawn as compared to conditions under the No Action Alternative.

Cumulative Effects

Several factors could influence future growth rates. Economic recessions in the high technology industries or the cost of living could limit economic growth which could reduce the number of individuals that could afford housing in the Sacramento, Placer, and El Dorado counties as well as in the East Bay Municipal Utility District service area. Land use restrictions due to resource protections and limitations of public works facilities including water supply, treatment, and distribution facilities also could change future growth patterns.

SECONDARY GROWTH IMPACTS

A project would not cause a secondary growth impact unless the growth would not occur without the project. For the purpose of this EIS, secondary growth effects would need to be evaluated for the alternatives as compared to conditions under the No Action Alternative.

The No Action Alternative assumes the renewal of long-term CVP water service contracts in the American River Division. The No Action Alternative provides less reliability than historical CVP water operations due to implementation of environmental protections and CVPIA.

Alternatives 1 and 2 do not increase the amount of water provided by the CVP or modify the allocation between agricultural and M&I water supplies. Therefore, the alternatives would not increase CVP water supplies or improve the reliability of CVP water supplies to the American River Division as compared to the No Action Alternative.

CHAPTER 5
CONSULTATION AND COORDINATION

CHAPTER 5
Consultation and Coordination

INTRODUCTION

Prior to preparation of this EIS, input was solicited and incorporated from a broad range of cooperating and consulting agencies and the public. This chapter summarizes the public involvement program and key issues raised by the public and interest groups. This chapter also addresses the manner in which Federal statutes, implementing regulations, and executive orders potentially applicable to implementation of the CVPIA have been addressed. The conclusions of compliance are based on the Environmental Consequences presented in Chapter 4. The compliance summaries apply only to the alternatives discussed in this EIS and not the development of concurrent CVPIA implementation programs.

PUBLIC INVOLVEMENT

Reclamation started the preparation of this EIS with Scoping Meetings. Public input continued during long-term contract negotiations to define the contract language. Discussions also were held with the American River Division long-term water service contractors during the preparation of this document. Comments received during this period are summarized below.

Scoping Process

Scoping served as a fact-finding process to identify public concerns and recommendations about the long-term contract renewal issues that would be addressed in this EIS and the scope and level of detail for analyses. Scoping activities began in October 1998 after a Notice of Intent to prepare environmental documentation for long-term contract renewals was filed in the Federal Register. The scoping period formally ended in January 1999. The Scoping Report was released in summer of 1999.

At public scoping meetings, Reclamation provided information about long-term contract renewal process and solicited public comments, questions, and concerns. At these meetings, participants had numerous comments and questions about how important issues would be considered both in the PEIS and the long-term contract renewal process. The majority of the comments received during the Scoping process addressed the Needs Assessment methodology to be used as part of the long-term contract renewal process. Contract renewal negotiation issues also were addressed. The least number of comments addressed environmental review issues.

CONSULTATION WITH OTHER AGENCIES

This EIS was prepared in accordance with the policies and regulations for the following issues. Brief discussions of these issues and how compliance was addressed in this EIS is discussed in the remaining sections of this chapter. Work is continuing on each of these requirements. As individual projects are implemented, compliance requirements will be considered.

- National Environmental Policy Act
- California Environmental Quality Act
- Endangered Species Act
- Fish and Wildlife Coordination Act
- National Historic Preservation Act
- Indian Trust Assets
- Indian Sacred Sites on Federal Land
- Environmental Justice
- State, Area-wide, and Local Plan and Program Consistency
- Floodplain Management
- Wetlands Protection
- Wild and Scenic Rivers Act
- Farmland Protection Policy Act and Farmland Preservation
- Clean Air Act
- Safe Drinking Water Act
- Clean Water Act

National Environmental Policy Act

This EIS was prepared pursuant to regulations implementing the National Environmental Policy Act (NEPA) (42 USC 4321 *et seq.*). NEPA provides a commitment that Federal agencies will consider the environmental effects of their actions. This EIS provides information regarding the No Action Alternative and alternatives, environmental impacts of the alternatives, potential mitigation measures, and adverse environmental impacts that cannot be avoided.

California Environmental Quality Act

Implementation, funding and permitting actions carried out by State and local agencies must comply with the California Environmental Quality Act (CEQA). The CEQA requirements are similar to NEPA requirements. This EIS could be used as a basis for preparation of a CEQA document.

Endangered Species Act

Reclamation has prepared a biological assessment to determine if the preferred alternative will affect listed, threatened, and endangered species. The biological assessment addresses all species affected by the CVP operation for the American River Division Contractors. Reclamation is consulting with both the Service and the National Marine Fisheries Service pursuant to the Endangered Species Act. The terms and conditions, reasonable and prudent measures and all environmental commitments identified in the Service and National Marine Fisheries Service Biological Opinions are hereby incorporated by reference.

Fish and Wildlife Coordination Act

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 implementation of the CVPIA, of which this action is a part, has been jointly analyzed by Reclamation and the Service and is being jointly implemented. This continuous consultation and consideration of the views of the Service in addition to their review of this document and consideration of their comments satisfies any applicable requirements of the FWCA. The FWCA requires that Reclamation consult with fish and wildlife agencies (federal and state) on all water development projects that could affect biological resources. The implementation of the CVPIA, of which this action is a part, has been jointly analyzed by Reclamation and the Service and is being jointly implemented. This continuous consultation and consideration of the views of the Service in addition to their review of this document and consideration of their comments satisfies any applicable requirements of the FWCA.

National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) requires that Federal agencies evaluate the effects of Federal undertakings on historical, archeological, and cultural resources and afford the Advisory Council on Historic Preservation opportunities to comment on the proposed undertaking. The first step in the process is to identify cultural resources included on (or eligible for inclusion on) the National Register of Historic Places that are located in or near the project area. The second step is to identify the possible effects of the alternatives. The lead agency must examine whether feasible alternatives exist that would avoid such effects. If an effect cannot reasonably be avoided, measures must be taken to minimize or mitigate potential adverse effects.

During preparation of this EIS, information from the State Clearinghouse was collected. The counties within the American River Division have initiated separate consultations with respect to their land use planning activities. It was determined by the State Historic Preservation Office that compliance with Section 106 should be coordinated on a project-specific basis.

Indian Trust Assets

The United States Government's trust responsibility for Indian resources requires Reclamation and other agencies to take measures to protect and maintain trust resources. These responsibilities include taking reasonable actions to preserve and restore tribal resources. Indian Trust Assets are legal interests in property and rights held in trust by the United States for Indian tribes or individuals. Indian reservations, rancherias, and allotments are common Indian Trust Assets.

In compliance with 36 CFR 800.4(a) (4), Reclamation has sent letters to Indian tribes requesting their input regarding the identification of any properties to which they might attach religious and cultural significance to within the area of potential effect. To date we have not received any comments or formal responses from the tribes.

During preparation of EIS, it was determined based upon information provided by Reclamation, that no Indian Trust Assets within the American River Division would be impacted by the alternatives.

Indian Sacred Sites on Federal Land

Executive Order 13007 provides that in managing Federal lands, each Federal agency with statutory or administrative responsibility for management of Federal lands shall, to the extent practicable and as permitted by law, accommodate access to and ceremonial use of Indian sacred sites by Indian religious

practioners, and avoid adversely affecting the physical integrity of such sacred sites. No sacred sites were identified during the scoping or planning process, and therefore were not included in the impact assessment of this EIS.

Environmental Justice

Executive Order 12898 requires each Federal agency to achieve environmental justice as part of its mission, by identifying and addressing disproportionately high and adverse human health or environmental effects, including social or economic effects, of programs, policies, and activities on minority populations and low-income populations of the United States. This EIS has evaluated the environmental, social, and economic impacts on minority and low-income populations in the impact assessment of alternatives.

State, Area-wide, and Local Plan and Program Consistency

Agencies must consider the consistency of a proposed action with approved state and local plans and laws. This EIS was prepared with extensive information from local planning agencies.

Floodplain Management

If a Federal agency program will affect a floodplain, the agency must consider alternatives to avoid adverse effects in the flood plain or to minimize potential harm. Executive Order 11988 requires Federal agencies to evaluate the potential effects of any actions they might take in a floodplain and to ensure that planning, programs, and budget requests reflect consideration of flood hazards and floodplain management. The alternatives would not affect floodplain management as compared to the No Action Alternative.

Wetlands Protection

Executive Order 11990 authorizes Federal agencies to take actions to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands when undertaking Federal activities and programs. Any agency considering a proposal that might affect wetlands must evaluate factors affecting wetland quality and survival. These factors should include the proposal's effects on the public health, safety, and welfare due to modifications in water supply and water quality; maintenance of natural ecosystems and conservation of flora and fauna; and other recreational, scientific, and cultural uses. The alternatives would not affect wetlands as compared to the No Action Alternative.

Wild and Scenic Rivers Act

The Wild and Scenic Rivers Act designates qualifying free-flowing river segments as wild, scenic, or recreational. The Act establishes requirements applicable to water resource projects affecting wild, scenic, or recreational rivers within the National Wild and Scenic Rivers System, as well as rivers designated on the National Rivers Inventory. Under the Act, a Federal agency may not assist the construction of a water resources project that would have a direct and adverse effect on the free-flowing, scenic, and natural values of a wild or scenic river. If the project would affect the free-flowing characteristics of a designated river or unreasonably diminish the scenic, recreational and fish and wildlife values present in the area, such activities should be undertaken in a manner that would minimize adverse impacts and should be developed in consultation with the National Park Service. None of the EIS alternatives would affect flows in wild and scenic portions of rivers.

Farmland Protection Policy Act and Farmland Preservation

Two policies require federal agencies to include assessments of the potential effects of a proposed project on prime and unique farmland. These policies are the Farmland Protection Policy Act of 1981 and the Memoranda on Farmland Preservation, dated August 30, 1976, and August 11, 1980, respectively, from the U.S. Council on Environmental Quality. Under requirements set forth in these policies, federal agencies must determine these effects before taking any action that could result in converting designated prime or unique farmland for nonagricultural purposes. If implementing a project would adversely affect farmland preservation, the agencies must consider alternatives to lessen those effects. Federal agencies also must ensure that their programs, to the extent practicable, are compatible with state, local, and private programs to protect farmland. The SCS is the federal agency responsible for ensuring that these laws and polices are followed. No specific consultation was conducted during preparation of this EIS. The alternatives would not affect agricultural or urban lands as compared to the No Action Alternative.

Clean Air Act

The Federal Clean Air Act (CAA) was enacted to protect and enhance the nation's air quality in order to promote public health and welfare and the productive capacity of the nation's population. The CAA requires an evaluation of any federal action to determine its potential impact on air quality in the project region. Coordination is required with the appropriate local air quality management district as well as with the EPA. This coordination would determine whether the project conforms to the Federal Implementation Plan and the State Implementation Plan (SIP).

Section 176 of the CAA (42 U.S.C. Section 7506(c)) prohibits federal agencies from engaging in or supporting in any way an action or activity that does not conform to an applicable SIP. Actions and activities must conform to a SIP's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and in attaining those standards expeditiously. EPA promulgated conformity regulations (codified in 40 CFR Section 93.150 et seq.).

The alternatives assume that current practices to control dust and soil erosion on lands that are seasonally fallowed would continue and the land use agencies would continue to work with the air quality districts. Therefore, it assumed that no air quality impacts would occur due to the alternatives as compared to the No Action Alternative.

Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) (PL 99-339) became law in 1974 and was reauthorized in 1986 and again in August 1996. Through the SDWA, Congress gave the EPA the authority to set standards for contaminants in drinking water supplies. Amendments to the SDWA provide more flexibility, more state responsibility, and more problem prevention approaches. The law changes the standard-setting procedure for drinking water and establishes a State Revolving Loan Fund to help public water systems improve their facilities and to ensure compliance with drinking water regulations and to support state drinking water program activities.

Under the SDWA provisions, the California Department of Health Services has the primary enforcement responsibility. The California Health and Safety Code establishes this authority and stipulates drinking water quality and monitoring standards. To maintain primacy, a state's drinking water regulations cannot be less stringent than the federal standards. The analysis of the EIS alternatives as compared to the SDWA requirements indicated that there were no changes in compliance as compared to the No Action Alternative.

Clean Water Act

The Clean Water Act (CWA) gave the EPA the authority to develop a program to make all waters of the United States "fishable and swimmable." This program has included identifying existing and proposed beneficial uses and methods to protect and/or restore those beneficial uses. The CWA contains many provisions, including provisions that regulate the discharge of pollutants into the water bodies. The discharges may be direct flows from point sources, such as an effluent from a wastewater treatment plant, or a non-point source, such as eroded soil particles from a construction site. The analysis of the EIS alternatives as compared to the CWA requirements indicated that there were no changes in compliance as compared to the No Action Alternative.

ATTACHMENT A
LIST OF PREPARERS

ATTACHMENT A
List of Preparers

Preparers	Degree(s)/Years of Experience	Experience and Expertise	Role in Preparation
U.S. Bureau of Reclamation			
David B. Robinson	M.S., Zoology B.S., Biology 26 years	Biology and Project Management	Project Manager and Environmental Specialist
CH2M HILL			
Gwendolyn M. Buchholz	M.S., Civil-Environmental Engineering B.S., Physics 28 years	Environmental Engineer/Planner	Project Manager
Allan Highstreet	M.S., Agricultural Economics B.S., Agricultural Business Management 22 Years	Agricultural Land Use and Resources Economist	Agricultural Economics and Land Use, Municipal Water Costs
Nancy Lee	Ph.D., Economics, Planning, and Natural Resources M.S., Agricultural Economics B.A., Environmental and Business Economics 8 years	Agricultural Land Use and Resources Economist	Agricultural Economics and Land Use, Municipal Water Costs
Fatuma Yusuf	Ph.D, candidate, Economics M.S., Agricultural Economics B.S., Agricultural Economics 6 years	Agricultural and Resources Economist	Regional Economics, IMPLAN, Municipal Water Costs
Sandra Taylor	M.S./1993/Zoology and Physiology B.A./1989/Biology	Biologist	Biological Resources
Meri Miles	M.S./1993/Fisheries B.S./1988/Biology	Biologist	Biological Resources
Wendy Haydon	M.S./Recreation B.A./Environmental Studies	Planner	Natural, Physical, and Human Resources
Water Resource Economics			
Steve Hatchett	Ph.D., Agricultural Economics M. Admin., Environmental Administration B.S., Forestry 20 Years	Agricultural and Resources Economist	Agricultural Economics

ATTACHMENT B
BIBLIOGRAPHY

ATTACHMENT B
Bibliography

General References

East Bay Municipal Utility District and U.S. Army Corps of Engineers, Draft Environmental Impact Statement Report for the Water Supply Master Plan, 1992

East Bay Municipal Utility District and U.S. Bureau of Reclamation, Final Environmental Impact Report/Environmental Impact Statement, 2000

El Dorado County, 2010 General Plan, Reconnaissance Report, 1989

El Dorado County, General Plan and Final Environmental Impact Report, 2004

El Dorado County, General Plan Update, Supplement to the Draft Environmental Impact Report, 1995

El Dorado County Water Agency, Water Resources Development and Management Plan, 2003

City of Folsom, Water Master Plan, 1998

Placer County, Placer County General Plan Update, 1994

Placer County Water Agency and U.S. Bureau of Reclamation, American River Pump Station Project, Environmental Impact Statement/Environmental Impact Report, 2002

City of Roseville, General Plan Update, Water System Study, 1993

City of Sacramento, Estimate of Annual Water Demand Within the Sacramento County-wide Area, 1995

City of Sacramento and Sacramento County, Final Environmental Impact Report for the Water Forum Proposal, 2000

Sacramento County, Sacramento County General Plan Update, Subsequent Environmental Impact Report, Volume 1, June 1993

Sacramento County Water Agency, 2002 Zone 40 Water Supply Master Plan, Draft Environmental Impact Report, 2003

Sacramento Municipal Utility District, Cosumnes Power Plant Application for Certification, 2001 and 2002

Sacramento Municipal Utility District, Sacramento County Water Agency Water Assignment, Final Environmental Impact Report, 2004

San Juan Water District, Water Master Plan

U.S. Army Corps of Engineers, American River Watershed, California, Folsom Dam Modification Report, Final Limited Reevaluation Report, 2001

U.S. Army Corps of Engineers, American River Long-Term Watershed Study, Final Supplemental Plan Formulation Report/Environmental Impact Statement/Environmental Impact Report, 2002

U.S. Bureau of Reclamation, American River Water Resources Investigation, Planning Report, August 1997

U.S. Bureau of Reclamation, American River Water Resources Investigation, Environmental Impact Statement, 1997

U.S. Bureau of Reclamation and Sacramento County, Central Valley Project Water Supply Contracts Under Public Law 101-514, Final Environmental Impact Statement/Environmental Impact Report, 1998

U.S. Bureau of Reclamation and U.S. Fish and Wildlife Service, Central Valley Project Improvement Ac, Final Environmental Impact Statement, 2000

U.S. Bureau of Reclamation and U.S. Forest Service, Implementation of the Sugar Pine Dam and Reservoir Conveyance Act, Environmental Assessment, 2003

U.S. Bureau of Reclamation and Freeport Regional Water Authority, Freeport Regional Water Project, Final Environmental Impact Statement, 2004

U.S. Bureau of Reclamation, California Department of Water Resources, U.S. Fish and Wildlife Service, and National Oceanic and Atmospheric Administration Fisheries, Environmental Water Accounty, Final Environmental Impact Statement/Environmental Impact Report, 2004

U.S. Bureau of Reclamation, Long-Term Central Valley Project Operations Criteria and Plan and Biological Assessment, CVP-OCAP, 2004

Air Quality

California Air Resources Board, 2002, State and Local Air Monitoring Network Plan, http://www.arb.ca.gov/aqd/namslams/namslams.htm

Biological Resources

California Department of Fish and Game, Geographic Assistance to Planning [GAP] data, 1998

California Department of Fish and Game Lower American River Operations and Fisheries Plan, 1993.

Bell, M.C, Fisheries handbook of engineering requirements and biological criteria, United States Army Corps of Engineers, Office of the Chief of Engineers, Fish Passage Development and Evaluation Program, Portland, Oregon. 307 pp., 1986

Brown, L.R., P.B. Moyle, and C.D. Vanicek, American River Studies: Intensive Fish Surveys, March - June 1991. Department of Wildlife and Fisheries Biology, University of California, Davis, and Department of Biology, California State University, Sacramento, 1992.

Bovee, K.D, Instream Flow Information Paper 12, FWS/OBS-78/07. Probability-of-use criteria for the family Salmonidae. United States Fish and Wildlife Service, 1978

California Department of Fish and Game, California trout, salmon, and warmwater fish production and costs, 1969-1970. Inland Fisheries Branch. Inland Fisheries Administrative Report 71-8, 1971

California Department of Fish and Game, California trout, salmon, and warmwater fish production and costs, 1978-1979. Inland Fisheries Branch. Inland Fisheries Administrative Report 80-1, 1980

California Department of Fish and Game, Stream evaluation Report No. 86-1. Instream flow requirements of the fish and wildlife resources of the lower American River, 1986

California Department of Fish and Game, Steelhead Restoration Plan for the American River, 1991

California Department of Fish and Game, Requirements of American Shad in the Sacramento-San Joaquin River System, Exhibit 23. State Water Resources Control Board 1987 Water Quality/Water Rights Proceeding on the San Francisco Bay/Sacramento-San Joaquin River Delta, 1987.

California Department of Water Resources, Effects of the Central Valley Project and State Water Project on Delta Smelt and Sacramento Splittail. Prepared for the United States Fish and Wildlife Service, 1994.

Castleberry, D.T., J.J. Cech, Jr., M.K. Saiki, and B.A. Martin, Growth, Condition and Physiological Performance of Juvenile Salmonids from the Lower American River. February through June 1991. U.S. Fish and Wildlife Service, National Fisheries Containment Research Center, 1991

Cech, J.J., Jr., S.J. Mitchell, D.T. Castleberry, and M. McEnroe. Distribution of California Stream Fishes: Influence of Environmental Temperature and Bypoxia. Environmental Biology of Fishes, 1990

DeHaven, R.W, Annual Progress Report No. 2. An Angling Study of Striped Bass Ecology in the American and Feather Rivers, California. United States Fish and Wildlife Service, 1977.

DeHaven, R.W., An angling study of striped bass ecology in the American and Feather rivers, California. Prepared for the California Department of Fish and Game. Unpublished Progress Report No. 2, 1978.

DeHaven, R.W, An Angling Study of Striped Bass Ecology in the American River, California. U.S. Fish and Wildlife Service, 1979.

Ganssle, D, Fishes and Decapods of San Pablo and Suisun Bay. Pages 64-94 in D.W. Kelley, editor, Ecological Studies of the Sacramento-San Joaquin Estuary. Part 1. California Department of Fish and Game Bulletin 133, 1966.

Gerstung, E.R, A Report to the California State Water Resources Control Board on the Fish and Wildlife Resources of the American River to be Affected by the Auburn Dam and Reservoir and the Folsom South Canal and Measures Proposed to Maintain These Resources. California Department of Fish and Game, Region 2, 1971.

Jones and Stokes Associates, 1990 Field Investigations of Yuba River American Shad. Prepared by W.T. Mitchell and P.L. Dunn. Sacramento, California. Prepared for Yuba County Water Agency, 1990

Leggett, W.C. and R.R. Whitney, Water Temperature and the Migration of American Shad. National Marine Fisheries Service. Bulletin 70:659-670, 1972

Moyle, P.B, Inland Fishes of California. University of California Press, Berkeley, CA, 1976

Moyle, P.B., B. Herbold, D.E. Stevens, and L.W. Miller, Life History and Status of Delta Smelt in the Sacramento-San Joaquin Estuary, California. Transactions of American Fisheries Society 121:67-77. 1992.

Moyle, P.B., R.M. Yoshiyama, J.E. Williams, and E.D. Wikramanayake, Fish Species of Concern in California. Second Edition. Report Prepared for the California Department of Fish and Game, 1995.

National Marine Fisheries Service, Biological Opinion for Winter-run Chinook Salmon. 1993.

Painter, R.E., L.H. Wixom, and S.W. Taylor, An Evaluation of Fish Populations and Fisheries in the Post-Oroville Project Feather River: A Report Submitted to the Department of Water Resources. California Department of Fish and Game, 1977

Painter, R., L. Wixom, and M. Meinz, American Shad Management Plan for the Sacramento River Drainage. Final Report. CDFG. Sacramento. Anadromous Fish Conservation Act Project. AFS-17, Job 5, 1979

Raleigh, R.F., W.J. Miller, and P.C. Nelson, Habitat suitability index models and instream flow suitability curves: chinook salmon. United States Fish and Wildlife Service Biol. Rep. 82 (10.1222). 64 pp, 1986.

Reiser, D.W. and T.C. Bjornn, Habitat Requirements of Anadromous Salmonids. In: Influence of Forest and Rangeland Management on Anadromous Fish Habitat in the Western United States and Canada. W.R. Meehan, editor. U.S. Department of Agriculture Forest Service General Technical Report. Pacific Northwest Forest and Range Experiment Station, Portland, 1989

Reynolds, F.L., R.L. Reavis, and J. Schuler, Central Valley Salmon Steelhead Restoration and Enhancement Plan. California Department of Fish and Game, 1990.

Rich, Alice A, Report on Studies Conducted by Sacramento County to Determine the Temperature Which Optimize Growth and Survival in Juvenile Chinook Salmon, 1987.

Sacramento Area Flood Control Agency, Effects of Interim Reoperation of Folsom Dam and Reservoir on the Availability of Potential Splittail Spawning Habitat in the Lower American River, 1999

San Francisco Estuary Project, State of the Estuary: A Report on Conditions and Problems in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, 1992

Snider, W.M. and E. Gerstung, Instream Flow Requirements of the Fish and Wildlife Resources of the Lower American River, Sacramento County, California. California Department of Fish and Game, Stream Evaluation Report No. 86-1, 1986.

Snider, W.M. and D. McEwan, Final Report, Fish Community Survey, Lower American River, February-July 1992. California Department of Fish and Game, Environmental Services Division., 1993

Snider, W.M. and R. Titus, Fish Community Survey, Lower American River, January-July 1994. California Department of Fish and Game, Environmental Services Division, 1994

Snider, W. and R. Titus, Fish Community Survey, Lower American River, January-June 1995. California Department of Fish and Game, Environmental Services Division, 1996.

U.S. Bureau of Reclamation. Appendices to Shasta outflow temperature control planning report/environmental statement. Part I - Fisheries, 1991

United States Fish and Wildlife Service, Special Scientific Report Fisheries No. 550. Biology and management of the American Shad and status of the fisheries, Atlantic Coast of the United States, 1987

United States Fish and Wildlife Service, Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates. United States Fish and Wildlife Service Biological Report 82(11.82), 1988.

United States Fish and Wildlife Service, American River Watershed Investigation, detailed report on fish and wildlife resources. Fish and Wildlife Coordination Act Report. Ecological Services, Sacramento Field Office, 1991

United States Fish and Wildlife Service, Technical/Agency Draft Sacramento-San Joaquin Delta Native Fishes Recovery Plan, 1994

Walburg, C.H., and P.R. Nichols, Biology and Management of the American Shad and Status of the Fisheries, Atlantic Coast of the United States, 1960. USFWS Special Sci. Rep. - Fisheries No. 550, 1967

Wang, J.C.S, Fishes of the Sacramento-San Joaquin Estuary and Adjacent Waters, California: A Guide to the Early Life Histories. Interagency Ecological Study Program or the Sacramento-San Joaquin estuary. Tech. Report #9, 1986

Lampe, John. Director of Water and Natural Resources. East Bay Municipal Utility District. 2003. Personal communication on July 24, 2003.

Morse, Mark. Environmental Coordinator. City of Roseville Community Development Department. 2003. Personal communication on July 24, 2003.

Cultural Resources

Basin Research Associates, Cultural resources assessment, East Bay Municipal Utility District Bayside Groundwater Project EIR, San Leandro and San Lorenzo, Alameda County, California, 2000
Available: <http://www.ebmud.com/pubs/eirs/baysidegrwatr/chapter3.14.PDF>.

City of Alameda, Introducing Alameda: a brief history of Alameda, 2001
Available: <http://www.ci.alameda.ca.us/community/history01.html>.

City of San Leandro, San Leandro city history, 1999.
Available: <http://www.ci.san-leandro.ca.us/slcityhistory.html>.

City of San Ramon, History of San Ramon.
Available: <http://www.ci.san-ramon.ca.us/general/service/history.htm>.

Marciel, D., A history of San Lorenzo.
Available: <http://www.slvha.com/docs/hstryslz.html>.

Environmental Justice

California Department of Finance. County Population Projections with Race/Ethnic detail Estimated July 1, 1990-1996 and Projections for 1997 through 2040, 1998

California Department of Finance. California county profiles, 2001
Available: <http://www.dof.ca.gov/HTML/FS_DATA/profiles/pf_home.htm>.

Groundwater

Alameda County, Conservation element of the Alameda County General Plan, 1994
Available: <http://elib.cs.berkeley.edu/cgi-bin/doc_home?elib_id=932>.

California Regional Water Quality Control Board, San Francisco Bay Region, Groundwater Committee, East Bay Plain groundwater basin beneficial use evaluation report, Alameda and Contra Costa Counties, 1999
Available: <http://www.swrcb.ca.gov/~rwqcb2/Download.htm>.

Contra Costa County Community Development Department, Contra Costa County General Plan 1995–2010, 1996
Available: <http://elib.cs.berkeley.edu/cgi-bin/doc_home?elib_id=1792>.

Planert, M., and Williams, J. S,,. Ground water atlas of the United States—Segment 1 California Nevada. Hydrologic Investigations Atlas 730-B, 2000
Available: <http://ca.water.usgs.gov/gwatlas/summary/>.

Land Use

Alameda County Planning Department, General plan for the Central Metropolitan, Eden, and Washington Planning Units—a part of the County of Alameda General Plan, 1981

Alameda County Planning Department, Alameda County Profile, 1986

Association of Bay Area Governments. 1995–2000. Projections 2000 introduction.
Available: <http://www.abag.ca.gov/abag/overview/pub/p2000/intro.html>.
Accessed: November 9, 2001.

Association of Bay Area Governments, Association of Bay Area Governments Projections 2000, 2001

California Department of Conservation, Division of Land Resource Protection. Williamson Act Program. Status Reports. The California Land Conservation (Williamson) Act Status Report 2002.

California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program. 2002a. California Farmland Conversion Report 1998-2000.

California Department of Conservation, Division of Land Resource Protection, Williamson Act Program. 2003. Enrollment Statistics. Total Enrollment: 1991-2001 by County.

California Department of Finance, Demographic Research Unit. 2003. Table E-1: City/County Population Estimates with Annual Percent Change, January 1, 2002 and 2003. http://www.dof.ca.gov/HTML/DEMOGRAP/E-1table.xls.

California Department of Finance, Demographic Research Unit. 2001. Interim County Populations Projections, Estimated July 1, 2000 and Projections for 2005, 2010, 2015, and 2020. June.

California Department of Finance, Reports and research papers: City/county population estimates with annual percent change, January 1, 2000 and 2001. Available: <http://www.dof.ca.gov/HTML/DEMOGRAP/e-1table.htm>.

California Department of Finance, California county profiles. Available: <http://www.dof.ca.gov/HTML/FS_DATA/profiles/pf_home.htm>. Last revised: March 20, 2001. Accessed: October 12, 2001.

City of Auburn, Modified Final EIR. City of Auburn General Plan/Rezone Environmental Impact Report, 1994

Contra Costa Community Development Department, General Plan, 1995–2010, 1996

East Bay Municipal Utility District, Urban Water Management Plan 2000, 2001

City of Folsom, Land Use Data received via email from Steve Banks and Chris Longley/City of Folsom, Planning Services, 2003.

City of Folsom, Population Projections, 2003. http://www.folsom.ca.us/indez.asp?page=39.

City of Folsom, General Plan, 1993

City of Lincoln, Lincoln General Plan, 1988

City of Rocklin, City of Rocklin General Plan, 1991.

City of Roseville, General Plan 2010; Land Use Element, 2002.

City of Sacramento, The Sacramento City General Plan, 2002

El Dorado County Water Agency, Water Resources Development and Management Plan, 2003

Maurer, Peter. El Dorado County, Personal communication with Wendy Haydon/CH2M HILL on May 22, 2003.

Placer County, Placer County General Plan, General Plan Background Report, 1994

Sacramento Area Council of Governments, 2001, Projections. http://www.sacog.org/demographics/proj2001/pdf/cities/sac.pdf.

Sacramento Area Council of Governments, 2001, SACOG Projections.
http://www.sacog.org/demographics/proj2001/pdf/cities/plac.pdf.

Sacramento Area Council of Governments, 2001. SACOG Projections.
http://www.sacog.org/demographics/proj2001/pdf/cities/eldo.pdf.

Town of Loomis, General information regarding Loomis.
http://www.loomis.ca.gov/.

U.S. Bureau of Reclamation, Central Valley Habitat Monitoring Program, 2003

U. S. Census Bureau, Census 2000 summary file 1 [machine-readable data file] 02AUG01, Page 71. Produced by the California Census Data Center. Sacramento, CA.

Wallace Roberts & Todd, LLC, Land Use, Traffic and Circulation, and Utilities. Land Use. Folsom Lake State Recreation Area, 2003

Recreation

City of Folsom, List of Folsom Parks and Nature Areas, 2003
http://www.folsom.ca.us/upload/files/park%20locations.pdf

Placer County, Parks and Grounds Division, List of County-Owned Park Facilities, 2003
http://www.placer.ca.gov/facility/parkgrnd.htm

City of Roseville, List of Roseville Parks and Recreation Areas, 2003
http://www.roseville.ca.us/index.asp?page=293

Wallace Roberts & Todd, LLC, Recreation, Scenic and Cultural Resources. Recreation Resources. Folsom Lake State Recreation Area, 2003

Sociological Resources

Alameda County Planning Department, Alameda County profile, 1996.
Available: <http://www.co.alameda.ca.us/cda/planning/profile96.pdf>.

California Department of Finance, E-1 City/County Population Estimates, with Annual Percent Change, January 1, 2002 and 2003. May.

California Department of Finance, Alameda County Profile.
www.dof.ca.gov/HTML/FS_DATA/profiles/pf_home.htm

California Department of Finance, Contra Costa County Profile.
www.dof.ca.gov/HTML/FS_DATA/profiles/pf_home.htm

California Department of Finance, El Dorado County Profile.
www.dof.ca.gov/HTML/FS_DATA/profiles/pf_home.htm

California Department of Finance, Placer County Profile.
www.dof.ca.gov/HTML/FS_DATA/profiles/pf_home.htm

California Department of Finance, Sacramento County Profile.
www.dof.ca.gov/HTML/FS_DATA/profiles/pf_home.htm

California Department of Finance, County Population Projections with Race/Ethnic Detail Estimated July 1, 1990-1996 and Projections for 1997 through 2040. December.

California Department of Finance, California demographics—summary file 1: Census 2000. Demographic Research Unit.
Available: <http://www.dof.ca.gov/HTML/DEMOGRAP/2000Cover1.htm>.

California Department of Finance, California county profiles, 2001
Available: <http://www.dof.ca.gov/HTML/FS_DATA/profiles/pf_home.htm>.

City of Citrus Heights, City of Citrus Heights General Plan. November.

Contra Costa County, Contra Costa County government information.
Available: <http://www.co.contra-costa.ca.us/about.html>.

City of Elk Grove, Elk Grove Demographic Data Report. May.

City of Elk Grove, The City of Elk Grove General Plan. Public Hearing Draft 1-20-03.

City of Elk Grove, Draft Environmental Impact Report for the Elk Grove General Plan. Volume 1: Draft Environmental Impact Report. SCH # 2002062082. August.

City of Folsom, City of Folsom General Plan Housing Element Background Report. Adopted June 25.

City of Galt, General Plan 1989-2005. Adopted May 15, 1990; includes amendments through March 1991.

Placer County, Placer County Housing Element 2000-2007. Draft. April.

Sacramento Area Council of Governments, A Bold First Step for Mobility in the Sacramento Region. Metropolitan Transportation Plan for 2025. 2002

Sacramento Area Council of Governments, Projections Sacramento County, 2001.
http://www.sacog.org/demographics/proj2001/pdf/cities/sac.pdf

Sacramento Area Council of Governments, Projections Placer County, 2001
http://www.sacog.org/demographics/proj2001/pdf/cities/plac.pdf

Sacramento Area Council of Governments, Projections El Dorado County, 2001
http://www.sacog.org/demographics/proj2001/pdf/cities/eldo.pdf

U.S. Census Bureau, Alameda County Quick Facts, 2003
http://quickfacts.census.gov/qfd/states/06/06001.html

U.S. Census Bureau, Contra Costa County Quick Facts, 2003
http://quickfacts.census.gov/qfd/states/06/06013.html

U.S. Census Bureau, El Dorado County Quick Facts, 2003
http://quickfacts.census.gov/qfd/states/06/06017.html

U.S. Census Bureau, Placer County Quick Facts, 2003
http://quickfacts.census.gov/qfd/states/06/06061.html

U.S. Census Bureau, Sacramento County Quick Facts, 2003
http://quickfacts.census.gov/qfd/states/06/06067.html

U.S. Census Bureau, California Housing Unit Estimates by County: April 1, 2000 to July 1, 2002. Table HU-EST2002-05-06-County Housing Unit Estimates, 2003

U.S. Census Bureau, Population, Housing Units, Area, and Density: 2000. Census 2000 Summary File 1 (SF 1) 100-Percent Data, 2000
http://factfinder.census.gov/servlet/GCTTable?ds_name=DEC_2000_SF1_U&geo_id=040.

Soils

Helley, E. J., and R. W. Graymer, Quaternary geology of Contra Costa County, and surrounding parts of Alameda, Marin, Sonoma, Solano, Sacramento, and San Joaquin Counties, California: A digital database. U.S. Geological Survey Open-File Report 97-0098, 1997
Available: <http://wrgis.wr.usgs.gov/open-file/of97-98/>.

Helley, E. J., and R. W. Graymer, Quaternary geology of Alameda County, and parts of Contra Costa, Santa Clara, San Mateo, San Francisco, Stanislaus, and San Joaquin Counties, California: A digital database. U.S. Geological Survey Open-File Report 97-0097, 1997
Available: <http://wrgis.wr.usgs.gov/open-file/of97-97/>.

U.S. Forest Service, Ecological subregions of California: section and subsection descriptions. May. Internet number: R-5-EM-TP-0005-NET. Prepared in cooperation with Natural Resources Conservation Service and Bureau of Land Management, 1998.
Available: <http://www.r5.fs.fed.us/ecoregions/toc.htm>.

ATTACHMENT C
ACRONYMS, ABBREVIATIONS, AND METRIC CONVERSIONS

ATTACHMENT C
Acronyms, Abbreviations, and Metric Conversions

AFRP	Anadromous Fisheries Restoration Project
BP	Before Present
CAA	Clean Air Act
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
CO	Carbon Monoxide
COA	Coordinated Operations Agreement
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CWA	Clean Water Act
CWHR	California Wildlife Habitats Relationship System
EA	Environmental Assessment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
EWA	Environmental Water Account
Folsom	City of Folsom
FWCA	Fish and Wildlife Coordination Act
FLPMA	Federal Land Policy and Management Act of 1976
HCP	Habitat Conservation Plan
ITA	Indian Trust Asset
LAFCO	Local Area Formation Commission
LTCR	Long-Term Contract Renewal
M&I	Municipal and Industrial
MSHCP	Multi-Species Habitat Conservation Plan
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NO_2	Nitrogen Dioxide
NOx	Nitrogen Oxides
NRDC	Natural Resources Defense Council
NRHP	National Register Historic Places
OCAP	Operations Criteria and Plan
O_3	Ozone
PG&E	Pacific Gas & Electric Company
PEIS	Programmatic Environmental Impact Statement
PM	Particulate Matter
PL	Public Law
Reclamation	U.S. Bureau of Reclamation

ROD	Record of Decision
ROG	Reactive Organic Gases
Roseville	City of Roseville
SAFCA	Sacramento Area Flood Control Agency
SDWA	Safe Drinking Water Act
Secretary	Secretary of the Interior
Service	U.S. Fish and Wildlife Service
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SWP	State Water Project
SWRCB	State Water Resources Control Board
TCD	Temperature Control Device
VAMP	Vernalis Adaptive Management Program
°F	degrees Fahrenheit

CONVERSION TABLES

U.S. CUSTOMARY TO METRIC

Multiply	By	To Obtain
inches (in)	25.4	millimeters
inches (in)	2.54	centimeters
feet (ft)	0.3048	meters
miles (mi)	1.609	kilometers
square feet (ft^2)	0.0929	square kilometers
acres (ac)	0.4047	hectares
square miles (mi^2)	2.590	square kilometers
gallons (gal)	3.785	liters
cubic feet (ft^3)	0.02832	cubic meters
acre-feet (af)	1,233.0	cubic meters
pounds (lb)	0.4536	kilograms
tons (ton)	0.9072	metric tons

Temperature in degrees Fahrenheit can be converted to degrees Celsius as follows:
degrees Celsius = 5/9 (degrees Fahrenheit - 32)

OTHER USEFUL CONVERSION FACTORS

Multiply	By	To Obtain
acre-feet	43,560	cubic-feet
acre-feet	325,851	gallons
cubic feet per second	1.9835	acre-feet per day
cubic feet per second	724.0	acre-feet per year