FINAL ENVIRONMENTAL ASSESSMENT
LONG-TERM RENEWAL CONTRACT
CONTRA COSTA WATER DISTRICT

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RELATED ACTIVITIES

CCWD is planning or has implemented several activities related to the delivery of water to its customers to the year 2044 and beyond. These activities include implementation of the Future Water Supply Implementation (FWSI) program and construction/operation of the Multi-Purpose Pipeline (MPP) project. The FWSI program provides a plan for meeting the expected water supply needs for CCWD's customers through 2044, including the replacement of the existing CVP water service contract with Reclamation through the CVP. The MPP project, which was completed in 2003, provides the physical means to convey and deliver existing and future water supplies, as well as substantially increases the reliability of the existing conveyance system. Water service contract replacement is expected to occur for a renewal period of 40 years.

DEVELOPMENT OF ALTERNATIVES

Three alternatives were developed for the replacement of long-term contracts between Reclamation and the CCWD. 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 replacing the existing water service contract with provisions described in the Preferred Alternative of the CVPIA PEIS. 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 EA also considers these proposals with the No Action Alternative as bookends to be considered for the environmental documentation to evaluate the impacts and benefits of renewing the long-term water service contracts.

No Action Alternative

The No Action Alternative assumes renewal of long-term CVP water service contracts for a period of 25 years in accordance with implementation of the CVPIA, as described in the PEIS Preferred Alternative. The PEIS Preferred Alternative assumed that most contract provisions would be similar to the provisions in the 1997 CVP Interim Renewal Contracts, which included contract terms and conditions consistent with the requirements of the CVPIA. In addition, the No Action Alternative assumes tiered pricing provisions and environmental commitments as described in the PEIS Preferred Alternative.

These provisions were described in the Final CVPIA PEIS. Several of these issues are summarized in the description of the No Action Alternative because they are included in a different manner in Alternatives 1 and/or 2, and therefore could result in changes in environmental impacts or benefits. These issues include tiered water pricing, definition of M&I water users, water measurement, and water conservation.

Tiered Water Pricing

Tiered water pricing in the No Action Alternative is based on use of a "80/10/10 Tiered Water Pricing from Contract Rate to Full Cost" approach with Ability-to-Pay policies. The terms "Contract Rate" and "Full Cost Rate" are defined by the 1982 Reclamation Reform Act (RRA). The Contract Rate is equal to operation and maintenance expenses plus capital cost recovery for CVP facilities without interest charges. The Full Cost Rate includes the interest charges. The prices of CVP water used in the No Action Alternative are based on 1994 irrigation and M&I CVP water rates.

Definition of Municipal and Industrial Users

The definition of M&I water users was established in portions of a 1982 guidance memorandum by Reclamation. In most instances, the term "municipal users" is easily definable. However, with respect to small tracts of land, the 1982 memorandum identified agricultural water as agricultural water service to tracts that can support $5,000 gross income from a commercial farm operation. The memorandum indicates that this criterion can be generally met by parcels greater than 2 acres. However, under the No Action Alternative, M&I water is defined as water for parcels of 5 acres or less. The No Action Alternative provides CVP contractors with the ability to request from the Contracting Officer a contract modification to pay agricultural rates for parcels between 2 and 5 acres if they are able to demonstrate agricultural use.

Water Measurement

The No Action Alternative includes water measurement at every turnout to measure CVP water deliveries. It is assumed that if other sources are commingled with the CVP water, including groundwater or other surface waters, the measurement devices would only report water deliveries. Additional calculations would be required to determine the exact quantity of CVP water.

Water Conservation

The water conservation assumptions in the No Action Alternative include water conservation actions for municipal and on-farm uses assumed in California Department of Water Resources Bulletin 160-93, and conservation plans completed under the RRA, with implementation of all 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 on the proposal presented by CVP Contractors to Reclamation in April 2000. However, 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 Explanatory Recitals and Provisions to provide a highly reliable water supply of a high water quality, and provisions to implement measures that would improve the 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. 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 EA is 40 year. Renewal after 40 years 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.*

- 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.* Reclamation *would continue with separate environmental documents for transfers, establishing criteria to allow rapid technical and environmental review of future transfers.*

- The April 2000 proposal included provisions for transfer of operations and maintenance requirements. *It is recognized that transfers of operations and maintenance to the group of* contractors *will continue and that the CVP long-term contracts will provide mechanisms for such transfers. Reclamation would continue with separate environmental documents for such transfers.*

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

- The April 2000 proposal included 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 new environmental documentation.*

The April 2000 proposal did include several provisions that were different than the assumptions for the No Action Alternative and the provisions included in Alternative 1, as summarized in Table 2-1. It should be noted that the tiered pricing assumptions and definition of M&I users in Alternative 1 would be the same as in the No Action Alternative.

Alternative 2

Alternative 2 is based upon the proposal presented by Reclamation to CVP Contractors in November 1999. However, there were several provisions included in the November 1999 proposal that are not included in Alternative 2 because they would require a separate federal action, as described below.

- The November 1999 proposal included provisions for water transfers. *Water transfers were not included in Alternative 2 because these actions would be separate federal actions and would require separate environmental documentation.*

- The November 1999 proposal included provisions for transfer of operations and maintenance requirements. *Operations and maintenance transfers were not included in Alternative 2 because these actions would be separate federal actions and would require separate environmental documentation.*

The November 1999 proposal did include several provisions that were different than the assumptions for the No Action Alternative and the provisions included in Alternative 2, as summarized below and in Table 2-1. The primary differences are related to tiered pricing and the definition of M&I users.

Tiered Water Pricing

Tiered water pricing in Alternative 2 is based on a definition of "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 5-year period. "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 this approach, 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 value equal to the average between the Contract Rate and Full Cost Rate. The final 10 percent of the Category 1 volume would be priced at the Full Cost Rate. The Category 2 volume would be priced at the Full Cost Rate.

The prices of CVP water, including Restoration Fund payments, would be determined using the current Ability-to-Pay policies, if applicable. The Ability-to-Pay policies do not apply to CVP operation and maintenance costs, M&I water costs, or any non-CVP costs, including federal government loans for construction of irrigation facilities.

The prices of CVP water used in Alternative 2 are based on irrigation and M&I CVP water rates presented in the November 17, 1999 Financial Workshop Handouts 1 and 2.

Definition of Municipal and Industrial Users

The definition of M&I water users includes all tracts less than or equal to 5 acres unless the Contracting Officer is satisfied that the use in such parcels meets the definition of "Irrigation Water."

ALTERNATIVES CONSIDERED BUT ELIMINATED

Nonrenewal of Long-Term Contracts

Nonrenewal of existing contracts is considered infeasible based on Section 3404(c) of the CVPIA. This alternative was considered but eliminated from analysis in this EA because Reclamation has no discretion not to renew the contracts.

Reduction in Contract Amounts

Reduction of contract amounts was considered in certain cases but rejected from analysis because the completed water needs analyses completed for all contracts found in almost all cases that the needs would exceed or equal the current total contract amount, and in order to implement good water management, the contractors would 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 will be available to them for storage investments. Additionally, the CVPIA, in and of itself, achieves a balance in part through its dedication of significant amounts of CVP water and actions to acquire water for environmental purposes.

Renewal of the Existing Amendatory Contract

In 1994, Reclamation and CCWD executed *Amendatory Contract Between the United States and Contra Costa Water District Providing for Water Service and for Facilities Repayment* (Amendatory Contract) (No. I75r-3401). This Amendatory Contract provides up to 195,000 acre-feet per year to the CCWD federal service area through the year 2010. The Amendatory Contract does not specify provisions for tiered pricing. Continuing to supply CVP water to the CCWD service area under the existing Amendatory Contract was considered but eliminated from analysis in this EA because the Amendatory Contract expires in 2010 and would therefore not meet the purpose and need for a long-term contract.

SELECTION OF THE PREFERRED ALTERNATIVE

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

SUMMARY OF PREVIOUS ENVIRONMENTAL DOCUMENTATION

Reclamation and CCWD have undertaken a number of environmental studies evaluating the environmental impacts associated with continued provision of CVP water to CCWD, and specifically to the Contra Costa Canal federal service area. The CVPIA PEIS prepared by Reclamation and the Service programmatically evaluated the regional environmental effects of implementing the CVPIA provisions. The FWSI EIR, prepared by CCWD, programmatically evaluated the environmental effects of implementing water system improvements to facilitate projected increased water demand in Contra Costa County. The MPP EIR/EIS, prepared by CCWD, evaluated the project-specific impacts of constructing a water supply pipeline adjacent to the Contra Costa Canal. The CCWD environmental documents were developed consistent with the Contra Costa County General Plan EIR (County General Plan EIR). However, because the CCWD environmental documents were published relatively recently, their analyses included impacts related to growth planned and approved since publication of the County General Plan EIR. The CCWD environmental documents are incorporated by reference into this EA.

The CVPIA PEIS and FWSI EIR are particularly relevant to this EA because they evaluate programmatic and project-level impacts associated with the continued provision of water by CCWD, and therefore provide the programmatic context for consideration of the more specific impacts associated with the proposed CVP long-term water service contract. The project-specific analysis of impacts potentially occurring within the Contra Costa Canal right-of-way are provided in the MPP EIR/EIS, which adequately evaluates localized indirect impacts that could occur under the long-term contract renewal action.

FOCUS OF THE ENVIRONMENTAL ASSESSMENT

The scope of analysis in this EA is based on previously performed analyses of potential impacts from continued CVP water delivery supply to the CCWD federal service area. The proposed action was first evaluated in the CVPIA PEIS, which assumed that all existing CVP water service contracts, including the CCWD water service contract, would be renewed. The document provided a programmatic review upon which future site-specific actions could be tiered. The FWSI EIR evaluated impacts from projected CCWD water supply demands of 219,400 acre-feet per year by 2040. The MPP EIR/EIS evaluated impacts from developing the physical means to convey and deliver existing and future water supplies, as well as substantially increase the reliability of the existing CCWD conveyance system. The proposed long-term water service contract is a component of these projects because it secures delivery of up to 195,000 acre-feet of water per year to the Contra Costa Canal, part of the CCWD water supply system, with a modified pricing structure. Therefore, the evaluation of impacts under these previous documents provides adequate analysis for most environmental resources, and these documents are incorporated by reference in this EA.

SUMMARY OF ENVIRONMENTAL IMPACTS

The potential impacts of the alternatives are summarized in Table ES-1. The impact analysis focuses on land use, socioeconomics, biological resources, cultural resources, and Indian trust assets. The land use discussion is included to provide a context in which the proposed action can be understood. It summarizes the prevalent land uses and describes County-wide growth management programs. Socioeconomic resources are evaluated because of the potential impacts resulting from the proposed revised pricing structure included as part of the proposed action. Due to the project-specific nature of the socioeconomic resource area, it was identified in the CVPIA PEIS as the single resource area that would require future evaluation. Biological resources are evaluated to summarize project-specific impacts of the proposed action and to describe the on-going consultations among Reclamation, CCWD, and the Service. These consultations included the recent Biological Assessment (Reclamation 2004) prepared for the proposed action and the Biological Opinion issued in April 2000, which establishes the responsibilities of CCWD to protect sensitive biological resources. Cultural resources are included in this EA to disclose the federal requirements specific to the proposed action and the role of Reclamation in complying with Section 106 of the National Historic Preservation Act. Indian trust assets are evaluated to determine if the alternatives would affect the use and enjoyment of such assets.

TABLE ES-1
SUMMARY OF ENVIRONMENTAL IMPACTS

Resource	*Description of Impact*
NO ACTION ALTERNATIVE	
Land Use	The proposed long-term water service contract renewal (proposed action) does not include the development of any physical facilities and structures and therefore would not have a direct effect on land use. Indirect effects to land use could occur due to growth accommodated by the continued provision of water. The No Action Alternative is consistent with Contra Costa County General Plan Policy 7-17, which directs the County to encourage water service agencies to develop supplies and facilities to meet future water needs based on the growth policies contained in the County and cities' general plans.
Socioeconomics	For M&I water costs in the average hydrologic condition, CCWD would pay an estimated $8.2 million to acquire (a) the 155,700 acre-feet of CVP M&I water that would be made available to its customers and (b) an additional 11,300 acre-feet of supplies from alternative water sources it would need to address demand not met by CVP supplies.
	The projected cost of CCWD M&I water in a dry year would be about $20 million.
Biological Resources	No new structures or physical changes to the environment would result from long-term contract renewal. Therefore, no direct effects on biological resources are expected. Indirect impacts to biological resources would result from the planned growth analyzed in the County and cities' general plans. Indirect effects related to the secondary effects of growth within CCWD's service area were evaluated in the FWSI EIR. The FWSI EIR found that the continued provision of water would result in indirect effects to native land and agricultural habitats, special-status communities, and special-status plant and animal species. These impacts were mitigated through the biological opinion developed in consultation with the Service.
Cultural Resources	Although the proposed contract renewal would not directly result in any construction activities, impacts associated with the secondary or indirect impacts of growth resulting from construction and development are expected to occur; these impacts are analyzed in the County General Plan EIR. No indirect impacts beyond those anticipated in the County General Plan EIR would occur from issuing the long-term contract. The secondary impacts resulting from development in currently non-urban areas could affect both known and undiscovered archaeological resources, especially in areas of high sensitivity. Areas specifically identified in the County General Plan EIR that are in the CCWD service area include the Bethel Island region and Alhambra Road west of Martinez.
ALTERNATIVE 1	
Land Use	There would be no impacts in addition to those identified for the No Action Alternative.
Socioeconomics	CCWD's cost of M&I water would be similar to the No Action Alternative. No incremental impacts would result.
	No change in land use or associated value of crop production is anticipated.
	There would be no impacts on the regional economy.
Biological Resources	There would be no impacts in addition to those identified for the No Action Alternative.

Resource	*Description of Impact*
Cultural Resources	There would be no impacts in addition to those identified for the No Action Alternative.
ALTERNATIVE 2	
Land Use	There would be no impacts in addition to those identified for the No Action Alternative.
Socioeconomics	A minimum 30 percent increase in CCWD costs relative to the No Action Alternative would result. Cost of CVP M&I water would increase by about: • $1.3 million in an average hydrologic year following 5 years of average hydrologic conditions, • $1.5 million in an average hydrologic year following 5 years of dry hydrologic conditions, and • $1.2 million in an average hydrologic year following 5 years of wet hydrologic conditions. CCWD's recent average residential water bill would increase by less than 1 percent.
	In a dry year, CCWD's cost of M&I water would increase by about 5 percent over the cost under the No Action Alternative in a dry year.
	There would be an incremental decrease in total industrial output in the County estimated between $1.68 and $2.09 million, depending on hydrologic conditions. This is a decrease of less than approximately 0.01 percent in the County's output.
	There would be an incremental decrease in total employment in the County estimated between 22 and 28 full-time-equivalent jobs, depending on hydrologic conditions. This is a decrease of less than approximately 0.01 percent in the County's employment base under the No Action Alternative.
	The projected incremental decrease in Total Income Place of Work (POW) in the County is estimated to be between $0.94 million and $1.16 million, depending on hydrologic conditions. This is a decrease of less than approximately 0.01 percent in the County's Total Income POW compared to estimated No Action conditions.
Biological Resources	There would be no impacts in addition to those identified for the No Action Alternative.
Cultural Resources	There would be no impacts in addition to those identified for the No Action Alternative.

Chapter 1
Purpose and Need

INTRODUCTION

The Central Valley Project (CVP) is the largest water storage and delivery system in California, with a geographic scope covering 35 of the state's 58 counties. The CVP is divided into nine divisions; one of these divisions is the Delta Division, which includes the Contra Costa Canal system. This Environmental Assessment (EA) addresses the proposed renewal of the long-term water service contract for the Contra Costa Canal system, which is operated by the Contra Costa Water District (CCWD). The U.S. Bureau of Reclamation (Reclamation) and the CCWD propose to execute a new long-term water service contract to replace the existing *Amendatory Contract Between the United States and Contra Costa Water District Providing for Water Service and for Facilities Repayment* (Amendatory Contract) (No. I75r-3401) that is set to expire December 31, 2010. The new long-term water service contract will provide for delivery of water from the CVP to the CCWD (Figure 1-1). The execution of this contract would bring the CCWD contract in line with all other long-term water service contracts being proposed and/or executed within the CVP and would allow CVP water deliveries to the CCWD service area to continue.

The long-term water service contract proposed in this EA would continue to deliver the same amount of CVP water as the existing contract for a period of up to 40 years. The location of the proposed action is the land in the CCWD service area that would receive CVP water under the proposed long-term water service contract.

This EA 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).

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 execute a new long-term water service contract for the CCWD service area, 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 include the terms and conditions of the long-term water service contract and tiered water pricing. Execution of a new long-term water service contract is needed to:

- Continue the 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's 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 hereunder. 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.

Section 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 40 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 40 years.

The Water Service Contracts Act of 1944 provided for delivery of specific quantities of irrigation and municipal and industrial (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

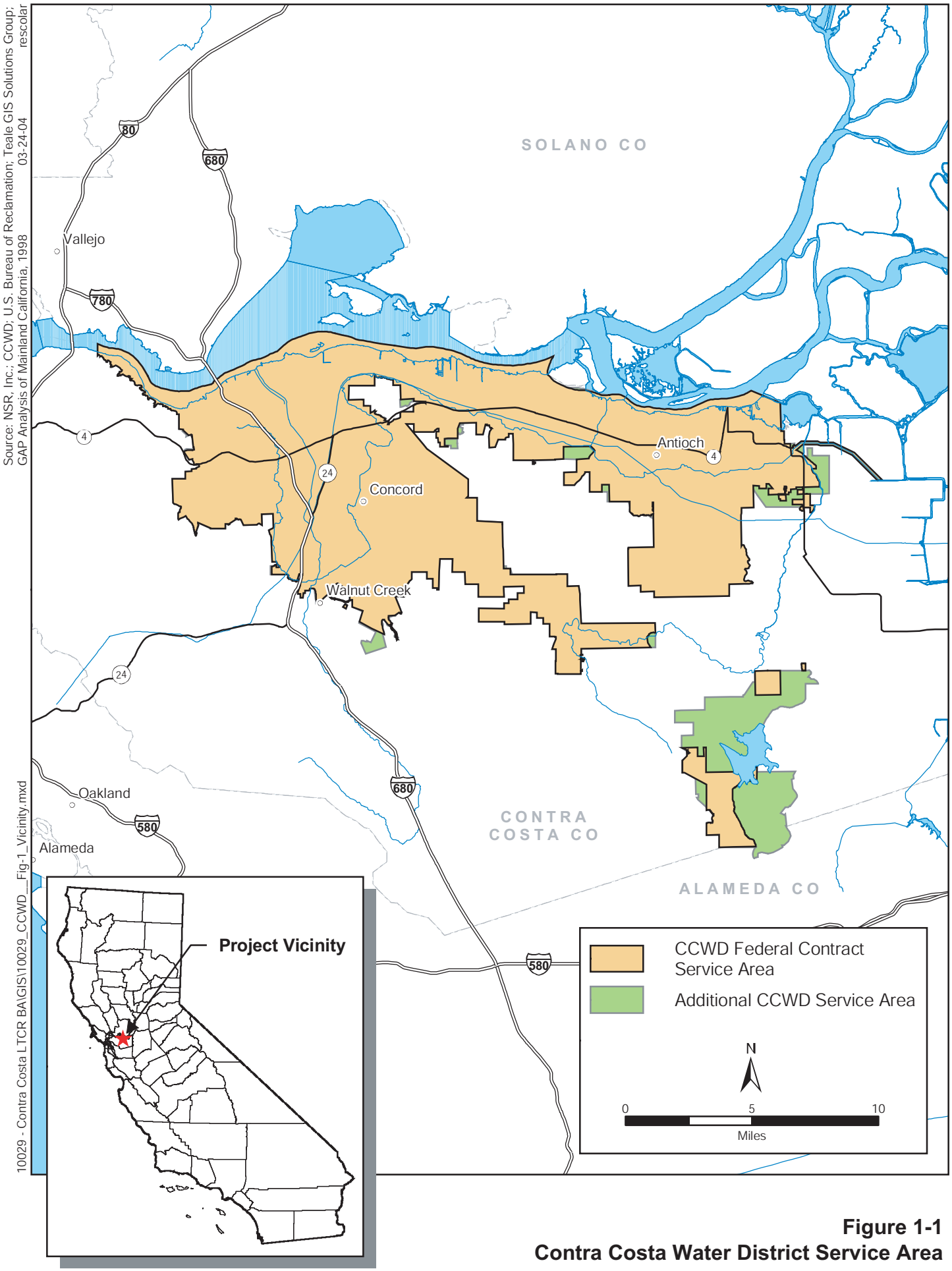

Figure 1-1
Contra Costa Water District Service Area

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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 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) to evaluate the direct and indirect impacts and benefits of implementing the CVPIA. That PEIS was prepared under the NEPA 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 (ROD) in January 2001.

Section 3404(c) of the CVPIA directs the Secretary to renew existing CVP water service and repayment contracts following completion of the PEIS and other 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 CONTRA COSTA WATER DISTRICT WATER SERVICE CONTRACT

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 uses; and third for power. In 1994, CCWD entered into an Amendatory Contract with Reclamation for the delivery of up to 195,000 acre-feet of water per year for M&I and agricultural uses in the CCWD service area. The Amendatory Contract expires in 2010.

Contra Costa Canal, one of the first CVP facilities, was completed in 1948. Figure 1-2 shows the CVP facilities within the CCWD service area. Facilities within the CCWD federal service area

include the Contra Costa Canal system; the intake channel from Rock Slough; the Clayton and Ygnacio Relift Canals and pumping plants 1, 2, 3, and 4; the Contra Loma Dam and Reservoir; the Short Cut Pipeline; and the lateral distribution system.

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

The CVPIA PEIS provided a programmatic evaluation of the impacts of implementing the CVPIA (Reclamation and Service 1999). The impact analysis considered a No Action Alternative; five main alternatives, including a Preferred Alternative; and 15 supplemental analyses.

The impact analysis in the PEIS was completed at a subregional level but was presented in the PEIS on a regional basis. In the PEIS, the Contra Costa Canal was considered a "north of the Delta" facility. The PEIS No Action Alternative assumed that existing water service contracts would be renewed under the same terms as expiring contracts. The CVPIA PEIS included a Preferred Alternative that addressed the regional impacts and benefits of the general method that Reclamation anticipated for implementation of CVPIA, including long-term contract renewals.

The PEIS evaluated the impacts and benefits of long-term contract renewals under CVPIA. Following completion of the PEIS, Reclamation began preparing more specific information related to the renewal of long-term water service contracts, including this document, which addresses specific impacts related to executing a long-term renewal contract for the Contra Costa Canal service area. This document is tiered from the PEIS and includes the Preferred Alternative of the PEIS as the No Action Alternative.

The PEIS and the Biological Opinion prepared for the operation and maintenance of the CVP and implementation of CVPIA considered and addressed impacts caused by CVP actions. Therefore, this document 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 relationship to the execution of a new long-term water service contract with the CCWD. Related studies and projects that have been conducted recently or are currently being completed are summarized in Table 1-1.

In 2003, the CCWD completed a 21-mile Multi-Purpose Pipeline (MMP) that connects a water treatment plant in East Contra Costa County to the distribution system in Central Contra Costa County. The MPP provides the physical means to convey and deliver existing and future water supplies, as well as to substantially increase the reliability of the existing conveyance system. CCWD is also implementing its Future Water Supply Implementation (FWSI) program. The FWSI program provides a plan for meeting the expected water supply needs of CCWD's customers through 2040, including the renewal of the water service contract with Reclamation through the CVP. The city

TABLE 1-1
RELATED ACTIVITIES

Project or Study and Lead Agency	Summary
Long-Term Contract Renewal of Other 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 and Trinity River Divisions, Sacramento Canals Unit, San Luis Unit, San Felipe Unit, Delta-Mendota Canal Unit, San Joaquin National Veterans Cemetery, City of Lindsay, City of Fresno, Cross Valley, and Mercy Springs Water District.
Implementation of CVPIA	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 Delta water concerns. CALFED completed an Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) as part of this process. Renewal of long-term CVP contracts is assumed within the CALFED EIR/EIS and ROD.
Coordinated Operating Agreement (COA) and Operations Criteria and Plan (OCAP) Update – U.S. Bureau of 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 State Water Project 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/Environmental Impact Report	The Service completed a Final EIS/EIR and ROD. Based on subsequent litigation, the Service is preparing a Supplemental EIS and an EIR. The Service and Reclamation also are implementing a portion of the recommendations for restoration activities along the Trinity River.
Vernalis Adaptive Management Plan	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.

and County governments also are implementing projects within their respective spheres of jurisdiction that relate to the CCWD service area. The following summarizes the Reclamation, CCWD, and local jurisdiction projects related to the continued provision of adequate amounts of raw and treated water in the CCWD service area.

Los Vaqueros Project

In 1994, Reclamation executed an Amendatory Contract with CCWD (No. I75r-3401) that provided for operation of the Los Vaqueros Project (LVP). Completed in 1998, the LVP includes a 100,000 acre-foot reservoir located 8 miles south of Brentwood, and related intake, pumping, conveyance, and blending facilities. Water to fill the reservoir comes from the south Delta by means of a new pump station on Old River near Highway 4. The purpose of the reservoir is to improve CCWD's water quality by storing higher quality Delta water during wet periods to blend with CCWD's on-going Delta supply during dry periods. The reservoir also provides CCWD with an assured 30- to 90-day emergency water supply. The Los Vaqueros pumping plants, pipelines, and reservoir are owned and operated by CCWD. On March 2, 2004, voters approved a measure to allow CCWD and CALFED to move forward on CALFED-funded expansion studies related to the Los Vaqueros Reservoir.

Future Water Supply Implementation Program

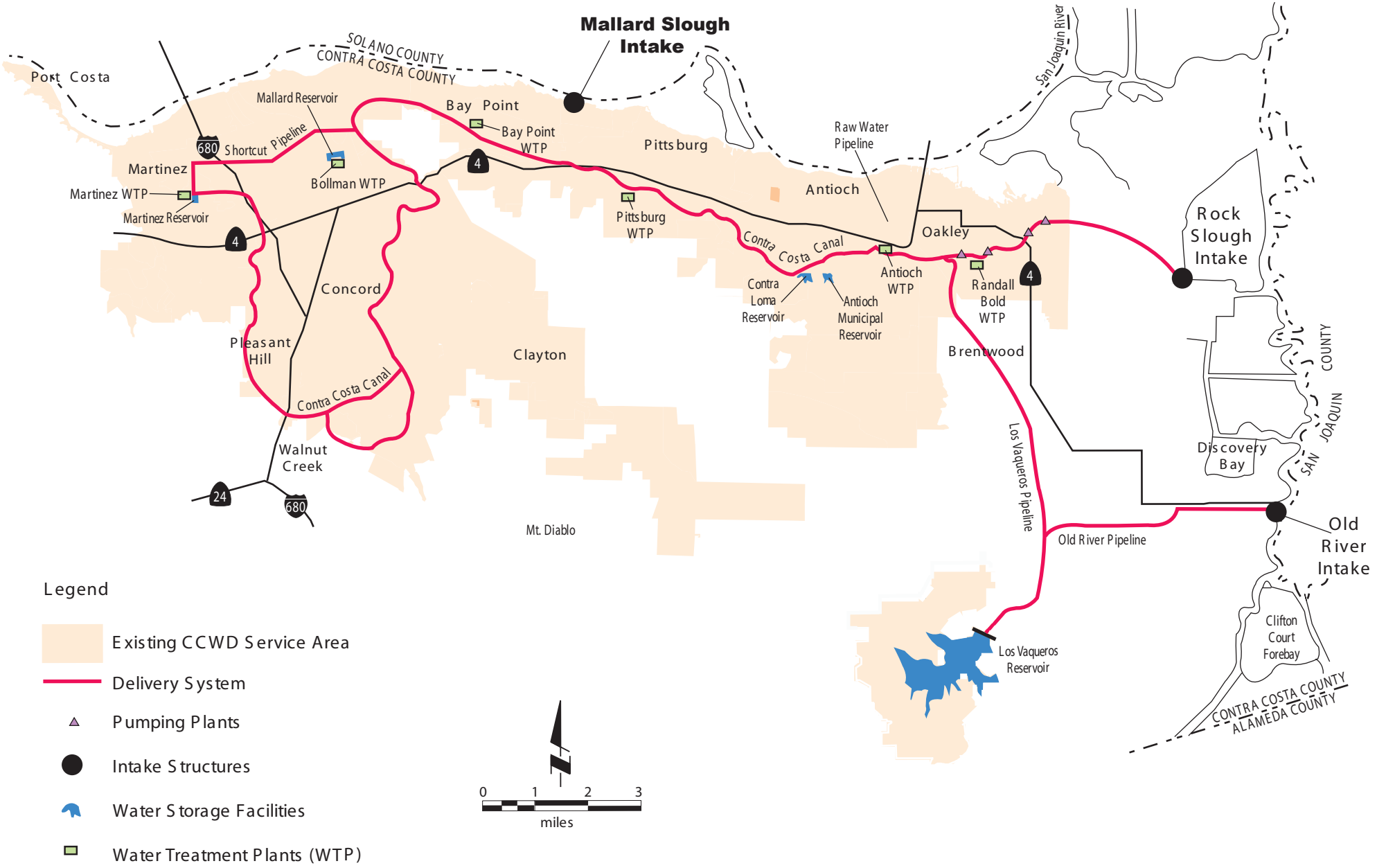
CCWD completed the Future Water Supply Study in 1996 to identify the preferred approach to offering customers a high-quality, reliable water supply for the next 50 years. The study recommendations included developing future water supplies to meet projected demands of 219,400 acre-feet per year by the year 2040, through a combination of phased components. Components of the FWSI program include renegotiation and renewal of the CVP Amendatory Contract; increased conservation by wholesale and retail customers; and purchase of water transfers of up to 24,400 acre-feet per year to accommodate near-term drought needs while allowing the flexibility to meet future demands.

The Seismic Reliability and Improvements Project Study

A study addressing the seismic reliability of the District-wide water delivery system was completed by CCWD in January 1997. To respond to the reliability and capacity needs of CCWD customers, five improvements to the raw water delivery system, in addition to the Multipurpose Pipeline (MPP) project described below, were identified to meet the criteria for reliable service following an earthquake. The improvements include: (1) a pipeline intertie between the existing Shortcut Pipeline and the Mallard Reservoir; (2) modifications to the Shortcut Pipeline at the Concord Fault crossing; (3) landslide mitigation at the canal tunnel; (4) landslide mitigation at Canal Milepost 25; and (5) modification of petroleum pipelines where they cross over the canal.

Multi-Purpose Pipeline Project

The Seismic Reliability and Improvements Project identified the MPP as one of the primary projects to increase the reliability and capacity of the raw water delivery system, and to deliver additional treated water to supplement the Bollman Water Treatment Plant supply. Under the project, which was completed in 2003, CCWD obtained approval from Reclamation to construct and operate two



Source: Jones & Stokes Associates, Inc.

Figure 1-2
CCWD Federal Contract Service Area and Facilities

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water pipelines within the Contra Costa Canal right-of-way (ROW) and to make minor improvements to the canal. The 20-mile pipeline carries treated water from the Randall-Bold Water Treatment Plant in Oakley to CCWD's treated water service area.

The MPP project includes a multi-purpose pipeline, raw water pipeline, and modifications to the canal. The modifications to the canal occurred at the canal gates, the Neroly Blending Facility, and the segment of the canal between Pumping Plant 4 and the tunnel. The gate modifications were designed to improve water flow. The Neroly Blending Facility is a segment of the canal where water from the Sacramento–San Joaquin Delta mixes with water from the Los Vaqueros Reservoir. To improve mixing and to meet year 2020 capacity requirements, this segment of the canal was enlarged.

Mallard Slough Pump Station Project

The Mallard Slough Pump Station is at the southern end of a dredged intake channel in northern Contra Costa County. The pump station pumps up to 25 million gallons per day of raw water to Mallard Reservoir via the Mallard Pipeline. The primary objectives of the project were to replace the approximately 65-year-old pump station to minimize impacts on fisheries and to increase emergency capacity by improving the reliability of the emergency raw water supply following seismic events. This project also included the installation of a new pipeline to convey the flows to the canal. The connection to the existing Mallard Pipeline was maintained for redundancy. Project construction was completed in 2000.

Contra Loma Reservoir Swim Lagoon Project

The Contra Loma Dam and Reservoir were constructed to respond to peaking requirements and system reliability for the CCWD. On June 28, 1997, CCWD was issued a compliance order from the California Department of Health Services (DOHS) regarding Contra Loma Reservoir. The compliance order required that CCWD either prohibit body contact recreation in Contra Loma Reservoir or eliminate use of the reservoir as a source of domestic water supply. In response to the compliance order, CCWD constructed a separate swimming lagoon within the existing reservoir. A concrete-covered earthen berm was constructed that physically separated the swim lagoon from the main portion of the 80-acre reservoir. The purpose of the project was to comply with the DOHS order while maintaining the operational benefits currently derived from the Contra Loma Reservoir. The project is a component of the Contra Costa Canal system.

TERM OF THE CONTRACT

The CVPIA states that the Secretary shall, upon request, renew any existing long-term irrigation repayment or water service contracts for the delivery of CVP water for a 25-year period. 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 Reclamation Project Act of June 21, 1963, which authorized renewal of M&I water contracts for up to 40 years. These authorizations remain in place as guidance for establishing the terms of M&I contracts. Therefore, under the federal action, the term for agricultural (irrigation) water service contracts is 25 years, the term for mixed agricultural/M&I water service contracts is 25 years, and the term for M&I-only

long-term water service contracts is 40 years. Because the proposed long-term water service contract with the CCWD will provide for delivery of CVP water for M&I uses only, the term of the proposed contract is 40 years.

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 meetings 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 long-term water service contract renewal process was conducted as 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 to prepare this EA.

CHAPTER 2
DESCRIPTION OF ALTERNATIVES

INTRODUCTION

This chapter summarizes the negotiations process for the long-term water service contracts and describes the alternatives considered in this EA. Because many districts that contract for CVP water have been operating under interim contracts, the discussion includes references to interim contracts and long-term contract renewals. As explained in Chapter 1, the CCWD has been operating under an Amendatory Contract that is scheduled to expire in 2010. For the purposes of this analysis, the term "long-term contract renewals" includes the replacement of CCWD's existing Amendatory Contract.

LONG-TERM WATER SERVICE CONTRACT NEGOTIATIONS PROCESS

The CVPIA states that the Secretary shall, upon request, renew any existing long-term irrigation repayment or water service contract for the delivery of CVP water for a period of 25 years and may renew such contracts for successive periods of up to 25 years each. Consistent with the 1963 Act, municipal and industrial (M&I) contracts shall be renewed for successive periods of 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 has been completed. The PEIS provided a programmatic environmental analysis of long-term water service contract renewals and identified the need for site-specific environmental documents for each long-term contract renewal.

The CVPIA also stated that contracts that expire prior to the completion of the PEIS may be renewed for interim periods. The interim renewal contracts reflect existing Reclamation law, including modifications by the Reclamation Reform Act (RRA) and applicable CVPIA requirements. The initial interim contract renewals were negotiated in 1994 with subsequent renewals for periods of 2 years or less to provide for continued water service. Many of the provisions from 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 that were consistent with Reclamation law and other requirements, comments on the Draft PEIS, and comments obtained during the interim contract renewal process. Reclamation proposed that the overall provisions of the long-term contracts would be negotiated 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 would be negotiated. Reclamation also proposed that all water service contracts, except for those with the Central San Joaquin Irrigation District, Stockton East Water District, and Colusa Drain Mutual Water Company, would be renewed pursuant to this action. Contract renewals for these three districts are being delayed until the completion of water management studies for their primary sources of CVP water, the Stanislaus River and the Sacramento River.

Reclamation published the initial proposed contract in November 1999, and several negotiation sessions were held throughout the following 6 months. The CVP water service contractors published a counter-proposal in April 2000. The November 1999 proposal represents one "bookend" for the negotiations and the April 2000 proposal represents the other "bookend." The results of the negotiations are reflected in the subsequent proposals.

The primary differences between the proposals are summarized in Table 2-1 at the end of this chapter.

ISSUES CONSIDERED AS PART OF LONG-TERM CONTRACT RENEWALS

The long-term contract renewal process addressed several issues besides the contract provisions. These issues included needs analyses, changes in service areas, and water transfers.

Needs Analyses

The water rights granted to the CVP by the State Water Resources Control Board require the federal government to determine that CVP water is being used in a beneficial manner. To this end, a needs analysis methodology was developed, specifically for long-term contract renewals, to determine if the contractors could use their full contract amount. This assessment was computed for each contractor of the CVP using a multi-step approach. First, the existing water demand was calculated for each contractor based on historic water uses. For agricultural water users, crop acreage, cropping patterns, crop water needs, effective precipitation, and conveyance loss information provided by each contractor were reviewed. For M&I water uses, residential, commercial, industrial, institutional, recreational, and environmental uses along with landscape coefficients, system losses, and landscape acreage information provided by each contractor were reviewed. Second, future changes in water demands were reviewed based on crops, M&I expansion, and changes in efficiencies. Third, existing and future non-CVP water supplies were identified for each contractor, including groundwater and other surface water supplies. The initial calculation of CVP water needs was limited by the assumption that other (non-federal) water supplies would be used first, and groundwater pumping would not exceed the safe yield of aquifers. In addition, the actual water needs were calculated at each division or unit level to allow for intra-regional transfers on an annual basis.

Beneficial and efficient future water demands were identified for each contractor. The demands were compared to available non-CVP water supplies to determine the need for CVP water. If the negative amount (unmet demand) fell within 10% of the contractor's total water supply for contracts greater than 15,000 AF/yr, or within 25% for contracts less than 15,000 AF/yr, the test of full future need of the water supplies under the contract was deemed to be met.

Because the CVP was initially established as a supplemental water supply for areas with inadequate supplies, the needs for most contractors were at least equal to the CVP water service contract and frequently exceeded the previous contract amount. Increased total contract amounts were not included in the needs assessment because the CVPIA stated that Reclamation cannot increase contract supply quantities. Water Needs Assessment (WNA) was completed by Reclamation in March 2004 for the Contra Costa Water District. (The result of the Water Needs Assessment is provided in Appendix A). The WNA presented the contractor's total water supplies including

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.

The analysis for the Water Needs Assessment did not consider that ability of the CVP to deliver CVP water. CVP water has been constrained in recent years and may be constrained in the future due to many factors including hydrologic conditions and implementation of federal and state laws. The likelihood contractors will actually receive the full contract amount in any given year is uncertain. The water service contract amount proposed in this EA is the same as in the existing Amendatory Contract.

Changes in Water Service Areas

This environmental analysis does not consider future changes in water service area boundaries for use of CVP water. Any future changes to water service area boundaries for use of CVP water will be evaluated in separate technical and environmental analyses.

Water Transfers

Intra-CVP contract transfers have occurred regularly throughout the CVP; such transfers are frequently limited to scheduling changes between adjoining districts. It is recognized that water transfers will continue to occur and that the CVP long-term water service contracts will provide the mechanism. Because CVPIA has allowed these transfers, as evaluated in the PEIS for the Preferred Alternative, the No Action Alternative in this EA includes water transfer provisions. These provisions for transfers are also included in Alternatives 1 and 2 of this EA. However, it would be difficult to identify all of the water transfer programs that could occur with CVP water in the next 40 years. Reclamation would continue to issue separate environmental documents for proposed transfers and would establish criteria and protocols to allow rapid technical and environmental review of future proposed transfers.

ALTERNATIVES

Three alternatives were identified for the renewal of the long-term water service contracts between Reclamation and CCWD for the Contra Costa Canal system. These alternatives were also analyzed in an initial Draft EA dated October 2000.

The alternatives represent a range of water service agreement provisions that could be implemented for long-term contract renewals. The No Action Alternative in this EA consists of renewing the existing water service contract with the provisions described in the Preferred Alternative of the CVPIA PEIS. In November 1999, Reclamation published a proposed long-term water service contract with specific provisions for CVP contractors to consider. (This form-contract eventually became Alternative 2 in the October 2000 Draft EA.) In April 2000, the CVP contractors responded to Reclamation's November 1999 form-contract with an alternative form-contract. (That April 2000 form-contract was analyzed in the October 2000 Draft EA as Alternative 1.) Subsequently, Reclamation and the CVP Contractors have continued to negotiate the CVP-wide terms and conditions, with Alternatives 1 and 2 serving as "bookends."

No Action Alternative

The No Action Alternative for this EA assumes renewal of long-term CVP water service contracts for a period of 25 years in accordance with the CVPIA, as described in the PEIS Preferred Alternative. The No Action Alternative assumes that most contract provisions would be similar to the provisions in the 1997 CVP Interim Renewal Contracts, which included provisions consistent with applicable CVPIA requirements. In addition, the No Action Alternative assumes tiered pricing provisions and environmental commitments, as described in the CVPIA PEIS Preferred Alternative. The provisions of the No Action Alternative are summarized in Table 2-1 at the end of this chapter. These provisions were also described in the Final CVPIA PEIS.

Several applicable CVPIA provisions summarized in the description of the No Action Alternative are addressed in a different manner in Alternatives 1 and/or 2, and therefore could result in changes in environmental impacts or benefits. These issues include tiered water pricing, the definition of M&I water users, water measurement, and water conservation. Each of these issues is described in the following paragraphs.

Tiered Water Pricing

Tiered water pricing in the No Action Alterative is based on use of an "80/10/10 Tiered Water Pricing from Contract Rate to Full Cost," including appropriate 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 the Full Cost Rate. The terms "Contract Rate" and "Full Cost Rate" are defined by the CVP rate-setting policies and by P.L. 99-546 and the Reclamation Reform Act (RRA), respectively. The Contract Rate for irrigation and M&I water includes the contractor's allocated share of CVP main project operation and maintenance, 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 RRA 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 provide 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, since 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 on local farm budgets. The Ability-to-Pay law and policy do not apply to CVP operation and maintenance costs, M&I water rates, CVP distribution facilities, or non-CVP water costs.

The prices of CVP water in the No Action Alternative are based on 1994 CVP irrigation and M&I water rates.

Definition of Municipal and Industrial Users

The definition of M&I water users was established in portions of a 1982 Reclamation policy memorandum. In many instances, "municipal users" is easily definable. However, with respect to small tracts of land, the 1982 memorandum identified agricultural water as agricultural water service to tracts that can support $5,000 gross income from a commercial farm operation. The memorandum indicates that this criterion can be generally met by parcels greater than 2 acres. However, under the No Action Alternative, M&I water is defined as water for parcels of 5 acres or less. The No Action Alternative provides CVP contractors with the ability to request from the Contracting Officer a contract modification to pay agricultural rates for parcels between 2 and 5 acres if they are able to demonstrate agricultural use.

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, the measurement devices would report gross water deliveries and additional calculations would then be required to determine the exact quantity of CVP water. However, if groundwater or other surface waters are delivered to the users by other means, the No Action Alternative does 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 California Department of Water Resources Bulletin 160-93 and conservation plans completed under the 1982 RRA, consistent with the criteria and requirements of the CVPIA. Such criteria address Best Management Practices that are cost effective, economical, and appropriate, including measurement devices, pricing structures, demand management, public information measures, and financial incentives.

Alternative 1

Alternative 1 is based on the proposal presented by CVP Contractors to Reclamation in April 2000. However, 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 included Terms and Conditions to provide a highly reliable water supply and provisions to improve the water supply capabilities of the CVP facilities and operations to meet this goal. *These issues were not included in Alternative 1 because they issues would require additional federal actions with separate environmental documentation and would 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 included language to require renewal of contracts after 25 years upon request of the contractor. *The study period for this revised EA is 40 years, which was authorized under the Reclamation Project Act of 1963 and was not clearly disallowed under CVPIA.*

- The April 2000 proposal did not include provisions for compliance with biological opinions from the U.S. Fish and Wildlife Service (Service) and the National Marine Fisheries Service. *Biological consultations with the Service and National Marine Fisheries Service (NOAA-Fisheries) are required by the Consultation and Coordination requirements established by Executive Order for all Reclamation activities. These are binding on Reclamation and provisions are being developed 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 40 years. Reclamation will continue to complete separate environmental documents for transfers and will establish criteria for rapid technical and environmental review of proposed transfers.*

- The April 2000 proposal included 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 40 years. Reclamation will require separate environmental documentation for such transfers.*

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

- The April 2000 proposal included 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 included several provisions that were different than the assumptions for the No Action Alternative, and those provisions are included in Alternative 1, as summarized in Table 2-1. The April 2000 proposal also included several provisions that involve specific language changes that would not significantly modify CVP operations in a manner that would affect the environment as compared to the No-Action Alternative but could affect the specific operations of a contractor.

It should be noted that the tiered pricing requirements (including unit prices for CVP water) and the definition of M&I water users in Alternative 1 would be the same as in the No Action Alternative.

Alternative 2

Alternative 2 is based on the proposal presented by Reclamation to CVP water service contractors in November 1999. However, there were several provisions included in the November 1999 proposal that are not included in Alternative 2. These provisions would constitute a separate federal action, as described below.

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

- The November 1999 proposal included provisions for transfer of operations and maintenance to third parties. *Operations and maintenance transfers were not included in Alternative 2 because these actions would be a separate federal action and would require separate environmental documentation.*

The November 1999 proposal included several provisions that were different than the assumptions for the No Action Alternative and these provisions are included in Alternative 2, as summarized below and in Table 2-1. The primary differences are related to tiered pricing and the definition of M&I water users.

Tiered Water Pricing

Tiered water pricing under Alternative 2 is based on the definitions of "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 5-year period. For the purposes of Alternative 2, 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 required by the CVPIA. All Category 2 water, when available, would be priced at the Full Cost Rate. It should be noted that Category 1 and Category 2 volumes would change each year based on the average deliveries for the "most recent 5 years," with limited exceptions based on 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 contractors' existing water service contract. The quantity is the same as under the No Action Alternative and Alternative 1. 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 Restoration Payments and tiered water rates, as described for the No Action Alternative.

The prices of CVP water used in Alternative 2 are based on CVP agricultural and M&I water rates presented in the November 17, 1999, Financial Workshop Handouts 1 and 2.

Definition of Municipal and Industrial Users

The definition of M&I water users includes users with tracts less than or equal to 5 acres, unless the Contracting Officer is satisfied that the use of such water meets the definition of "Irrigation Water."

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATION

Nonrenewal of Long-term Contracts

Nonrenewal of existing contracts is considered infeasible based on Section 3404(c) of the CVPIA. This alternative was considered but eliminated from analysis in this EA because Reclamation does not have the discretion to not renew the contracts.

Continuing with Existing Amendatory Contract

Continuing to supply CVP water to the CCWD service area under the existing Amendatory Contract was considered but eliminated from analysis in this EA because the Amendatory Contract expires in 2010 and would therefore not meet the purpose and need for a long-term contract.

Reduction in Contract Amounts

Reduction of contract amounts was considered in certain cases but eliminated from analysis because the completed water needs analyses found that, in almost all cases, the needs would exceed or equal the current total contract amount. In addition, in order to implement good water management, the contractors would 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 will be available to them for storage investments. In addition, the CVPIA, in and of itself, achieves a balance in part through its dedication of significant amounts of CVP water to environmental purposes and actions to acquire water for environmental purposes.

SELECTION OF THE PREFERRED ALTERNATIVE

It is anticipated that the final contract language and the 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 Alternative 1, Alternative 2, and the No Action Alternative.

SUMMARY OF ENVIRONMENTAL IMPACTS

The potential impacts of the alternatives are summarized in Table 2-2. The impact analysis focused on land use, socioeconomics, biological resources, and cultural resources. The land use discussion is included to provide a context in which the proposed action can be understood. It summarizes the prevalent land uses in the CCWD service area and describes County-wide growth management programs. Socioeconomic resources are evaluated because of the potential impacts resulting from the proposed revised pricing structure included as part of the proposed action. Due to their project-

specific nature, socioeconomic resources were identified in the CVPIA PEIS as the single resource area that would require future evaluation. Biological resources are evaluated because of the extensive negotiations and consultations among Reclamation, CCWD, and the Service. These consultations included the recent biological opinion, issued in April 2000, which establishes the responsibilities of CCWD to protect sensitive biological resources. Reclamation has initiated consultation with U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration. Cultural resources and Indian trust assets are included in this EA to disclose the federal requirements specific to the proposed action and the role of Reclamation in complying with Section 106 of the National Historic Preservation Act and with American Indian Tribal Trust Rights.

TABLE 2-1
COMPARISON OF CONTRACT PROVISIONS CONSIDERED IN ALTERNATIVES

Provision	*No Action Alternative Based on PEIS and Interim Contracts*	*Alternative 1 Based on April 2000 Proposal*	*Alternative 2 Based on November 1999 Proposal*
Explanatory Recitals	Assumes water rights held by CVP from State 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 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 need for the 3408(j) study.	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.

TABLE 2-1 (continued)
COMPARISON OF CONTRACT PROVISIONS
CONSIDERED IN ALTERNATIVES

Provision	*No Action Alternative Based on PEIS and Interim Contracts*	*Alternative 1 Based on April 2000 Proposal*	*Alternative 2 Based on November 1999 Proposal*
"M&I Water"	Assumes rewording to provide water for irrigation of land in units less than or equal to 5 acres as M&I water unless Contracting Officer satisfied use is irrigation.	M&I water described for irrigation of land in units less than or equal to 2 acres.	Same as No Action Alternative.
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. Same as No Action Alternative.
Water to be Made Available and Delivered to the Contractor	Assumes water availability in any with existing conditions.	Similar to No Action Alternative.	Actual water availability in a year is unaffected by Categories 1 and 2.
Water to be Made Available and Delivered to the Contractor (continued)	Assumes compliance with Biological Opinions and other environmental documents for contracting. Assumes that current operating policies strive to minimize impacts to CVP water users.	Not included. 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. 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.

TABLE 2-1 (continued)
COMPARISON OF CONTRACT PROVISIONS
CONSIDERED IN ALTERNATIVES

Provision	*No Action Alternative Based on PEIS and Interim Contracts*	*Alternative 1 Based on April 2000 Proposal*	*Alternative 2 Based on November 1999 Proposal*
Rates and Method of Payment for Water	Assumes Tiered Pricing is total water quantity. Assumes advanced payment for rates for 2 months.	Assumes Tiered Pricing is total water quantity. Assumes advanced payment for rates for 1 month.	Assumes Tiered Pricing is total water quantity. Assumes advanced payment for rates for 6 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 sellers or purchasers CVP cost of service rate.	Assumes continuation of transfers with the rate for transferred water being the purchasers CVP cost of service rate.	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.
Temporary Reduction Return Flows	Assumes that current operating policies strive to minimize impacts to CVP water users.	Assumes minor changes associated with methods described for discontinuance or reduction of payment obligations.	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.	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 non-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 towards water quality goals.	Same as No Action Alternative.	Same as No Action Alternative.

TABLE 2-1 (continued)
COMPARISON OF CONTRACT PROVISIONS
CONSIDERED IN ALTERNATIVES

Provision	*No Action Alternative Based on PEIS and Interim Contracts*	*Alternative 1 Based on April 2000 Proposal*	*Alternative 2 Based on November 1999 Proposal*
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 be operated 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.	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.
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.	Assumes conditions similar to No Action Alternative with the ability to use state 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.

TABLE 2-1 (continued)
COMPARISON OF CONTRACT PROVISIONS
CONSIDERED IN ALTERNATIVES

Provision	*No Action Alternative Based on PEIS and Interim Contracts*	*Alternative 1 Based on April 2000 Proposal*	*Alternative 2 Based on November 1999 Proposal*
Operation and Maintenance by Non-federal Entity	Assumes that CVP will operate in accordance with existing rules with no additional changes to operation responsibilities.	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.	Not included. Assumption is that Court confirmation not required.	Same as No Action Alternative.

TABLE 2-2 SUMMARY OF ENVIRONMENTAL IMPACTS	
Resource	*Description of Impact*
NO ACTION ALTERNATIVE	
Land Use	The proposed long-term water service contract renewal (proposed action) does not include the development of any physical facilities and structures and therefore would not have a direct effect on land use. Indirect effects to land use could occur due to growth accommodated by the continued provision of water. The No Action Alternative is consistent with Contra Costa County General Plan Policy 7-17, which directs the County to encourage water service agencies to develop supplies and facilities to meet future water needs based on the growth policies contained in the County and cities' general plans.
Socioeconomics	For M&I water costs in the average hydrologic condition, CCWD would pay an estimated $8.2 million to acquire (a) the 155,700 acre-feet of CVP M&I water that would be made available to its customers and (b) an additional 11,300 acre-feet of supplies from alternative water sources it would need to address demand not met by CVP supplies.
	The projected cost of CCWD M&I water in a dry year would be about $20 million.
Biological Resources	No new structures or physical changes to the environment would result from long-term contract renewal. Therefore, no direct effects on biological resources are expected. Indirect impacts to biological resources would result from the planned growth analyzed in the County and cities' general plans. Indirect effects related to the secondary effects of growth within CCWD's service area were evaluated in the FWSI EIR. The FWSI EIR found that the continued provision of water would result in indirect effects to native land and agricultural habitats, special-status communities, and special-status plant and animal species. These impacts were mitigated through the biological opinion developed in consultation with the Service.
Cultural Resources	Although the proposed contract renewal would not directly result in any construction activities, impacts associated with the secondary or indirect impacts of growth resulting from construction and development are expected to occur; these impacts are analyzed in the County General Plan EIR. No indirect impacts beyond those anticipated in the County General Plan EIR would occur from issuing the long-term contract. The secondary impacts resulting from development in currently non-urban areas could affect both known and undiscovered archaeological resources, especially in areas of high sensitivity. Areas specifically identified in the County General Plan EIR that are in the CCWD service area include the Bethel Island region and Alhambra Road west of Martinez.
ALTERNATIVE 1	
Land Use	There would be no impacts in addition to those identified for the No Action Alternative.
Socioeconomics	CCWD's cost of M&I water would be similar to the No Action Alternative. No incremental impacts would result.
	No change in land use or associated value of crop production is anticipated.

TABLE 2-2 SUMMARY OF ENVIRONMENTAL IMPACTS	
Resource	*Description of Impact*
	There would be no impacts on the regional economy.
Biological Resources	There would be no impacts in addition to those identified for the No Action Alternative.
Cultural Resources	There would be no impacts in addition to those identified for the No Action Alternative.
ALTERNATIVE 2	
Land Use	There would be no impacts in addition to those identified for the No Action Alternative.
Socioeconomics	A minimum 30 percent increase in CCWD costs relative to the No Action Alternative would result. Cost of CVP M&I water would increase by about: • $1.3 million in an average hydrologic year following 5 years of average hydrologic conditions, • $1.5 million in an average hydrologic year following 5 years of dry hydrologic conditions, and • $1.2 million in an average hydrologic year following 5 years of wet hydrologic conditions. CCWD's recent average residential water bill would increase by less than 1 percent.
	In a dry year, CCWD's cost of M&I water would increase by about 5 percent over the cost under the No Action Alternative in a dry year.
	There would be an incremental decrease in total industrial output in the County estimated between $1.68 and $2.09 million, depending on hydrologic conditions. This is a decrease of less than approximately 0.01 percent in the County's output.
	There would be an incremental decrease in total employment in the County estimated between 22 and 28 full-time-equivalent jobs, depending on hydrologic conditions. This is a decrease of less than approximately 0.01 percent in the County's employment base under the No Action Alternative.
	The projected incremental decrease in Total Income Place of Work (POW) in the County is estimated to be between $0.94 million and $1.16 million, depending on hydrologic conditions. This is a decrease of less than approximately 0.01 percent in the County's Total Income POW compared to estimated No Action conditions.
Biological Resources	There would be no impacts in addition to those identified for the No Action Alternative.
Cultural Resources	There would be no impacts in addition to those identified for the No Action Alternative.

CHAPTER 3
SUMMARY OF PREVIOUS ENVIRONMENTAL DOCUMENTATION

INTRODUCTION

Reclamation and CCWD have undertaken a number of environmental studies to evaluate the environmental impacts associated with continued provision of CVP water to CCWD. The CVPIA PEIS, prepared by Reclamation and the Service, evaluated the regional environmental effects of implementing the CVPIA provisions at a programmatic level. The Future Water Supply Implementation Environmental Impact Report (FWSI EIR), prepared by CCWD, evaluated at a programmatic level the environmental effects of implementing water system improvements to facilitate projected increased water demand in Contra Costa County. The Multi-Purpose Pipeline Project Environmental Impact Report/Environmental Impact Statement (MPP EIR/EIS), prepared by CCWD, evaluated the project-specific impacts of constructing a water supply pipeline adjacent to the Contra Costa Canal. The CCWD environmental documents were developed to be consistent with the Contra Costa County General Plan Environmental Impact Report (County General Plan EIR), but because they were published more recently, their analyses also included impacts related to growth planned and approved since publication of the County General Plan EIR. These documents are incorporated by reference into this EA.

The PEIS and FWSI EIR are particularly relevant to this EA because they evaluate programmatic and project-level impacts associated with the continued provision of CVP water to CCWD, and therefore provide the programmatic context for consideration of the more specific impacts associated with the proposed CVP long-term water service contract renewals. The project-specific analysis of impacts potentially occurring adjacent to the Contra Costa Canal provided in the MPP EIR/EIS sufficiently evaluates localized indirect impacts that could occur with the continued provision of CVP water to CCWD. The following discussion summarizes these environmental studies and identifies their relevance to this EA.

CVPIA PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

On October 30, 1992, the President signed into law the Reclamation Projects Authorization and Adjustment Act of 1992 (Public Law 102-575), which included Title XXXIV, the Central Valley Project Improvement Act. The CVPIA amended the previous authorizations of the CVP to include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority to irrigation and domestic uses and fish and wildlife enhancement as a project purpose equal to power generation. Through the CVPIA, Reclamation is developing policies and programs to improve environmental conditions that were affected by the 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–Sacramento-San Joaquin Delta system. The PEIS addressed the potential impacts and benefits of implementing provisions of the CVPIA.

The analysis in the PEIS was intended to disclose the probable region-wide effects of implementing the CVPIA and to provide a basis for selecting a decision among alternatives. The PEIS was developed to allow subsequent environmental documents to incorporate the PEIS analysis by reference, thereby limiting 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 from the PEIS.

As 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 evaluated in the PEIS 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 a part of the overall program approved in the PEIS ROD. In this case, an administrative decision could be made that no further environmental documentation would be necessary. If it is determined that a document can be tiered to the PEIS, that document may be an EIS or an EA. In this instance, "tiering" means that the EIS or the EA can use the PEIS by reference to avoid duplication, thereby focusing more narrowly on the new alternatives or more detailed site-specific effects. Therefore, only changes from the alternatives and their effects considered in the PEIS would be addressed in detail in the tiered documents.

Localized Impacts of the PEIS Preferred Alternative

The primary impact to CVP water service contractors of the PEIS Preferred Alternative was not from contract provisions, but rather from the implementation of CVPIA. The re-allocation of CVP water for fish and wildlife purposes under CVPIA reduced average annual CVP water deliveries to water service contractors from 2,270,000 acre-feet per year under the PEIS No Action Alternative to 1,933,000 acre-feet per year under all the PEIS alternatives, including the Preferred Alternative. The reduction occurred differently for various classifications of users, as summarized below.

- Average annual CVP water deliveries for agricultural water service contractors located in the Contra Costa Canal service area decreased by 12 percent from pre-CVPIA affected environment conditions.

- Average annual CVP water deliveries for municipal water service contractors located in the Contra Costa Canal service area decreased by 4 percent from pre-CVPIA affected environment conditions.

FUTURE WATER SUPPLY IMPLEMENTATION EIR

The FWSI EIR adequately evaluated on a programmatic level the direct impacts to the Sacramento-San Joaquin Delta and the secondary or indirect impacts associated with growth in Contra Costa County as a result of the availability of additional water supplies by the District. CCWD's water demand estimates were based on the demands previously planned for by local and regional planning agencies. The FWSI EIR proposed three actions to provide reliability and operational flexibility during droughts: renegotiating the CVP Amendatory Contract (175r-3401); implementing an expanded District-wide conservation program; and completion of two or more water transfers. The FWSI EIR responded to mitigation measures outlined in the County General Plan EIR, including the directive to develop supplies and facilities to meet future water needs based on the growth

policies contained in the County and cities' general plans (Policy 7-17 of the County General Plan). The FWSI EIR found that the implementation of the FWSI would not directly cause growth to occur, but would instead accommodate the growth already planned for in local jurisdictions' general plans and the County General Plan. The FWSI EIR incorporated the County General Plan EIR impact analysis and mitigation measures where appropriate. It expanded the evaluation of terrestrial resources and found that County mitigation and policies governing the permitting of property, in addition to state and federal protections, would be sufficient to reduce the impacts to terrestrial resources to a less-than-significant level.

The environmental resources addressed in the FWSI EIR included population and housing, land use and planning, agriculture, Delta hydrodynamics, Delta water quality, aquatic resources, terrestrial biological resources, public services and utilities, traffic, air quality, noise, cultural resources, aesthetics, and recreation. Potential impacts were related to the ability of the project to accommodate growth or remove an impediment to growth. Potential significant impacts resulting from projected buildout in Contra Costa County were identified for population and housing, land use and planning, agriculture, terrestrial biological resources, public services and utilities, traffic, air quality, noise, and cultural resources. In contrast to the County General Plan EIR, which identified impacts to natural open spaces as significant and unavoidable, the FWSI EIR noted that approximately 40,000 acres of open space have been added to the County inventory since certification of that document. Acquisition of additional acreage was the result of a voter-approved bond measure and CCWD's construction of the Los Vaqueros Reservoir and purchase of its watershed lands.

Indirect effects to the majority of these resources were related to the secondary effects of growth within CCWD's service area accommodated by the availability of additional water supplies. Further analyses of these effects is not required in this EA because they were adequately addressed in the FWSI EIR. The FWSI EIR and CCWD's adopted findings found that impacts to population, jobs, housing, terrestrial biological resources, noise, public services, and utilities as a result of growth could be mitigated to less-than-significant levels. It was concluded in the FWSI EIR and CCWD's adopted findings that all growth-related impacts to cultural resources would be prevented or mitigated to less-than significant-levels through the proper implementation of existing national, state, County, and local policies, including County policies 9-11 through 9-26. CCWD adopted a statement of overriding considerations for potential agricultural, air quality, and traffic impacts related to growth (February 3, 1999). The FWSI EIR did not evaluate the socioeconomic impacts related to the continued water allocation and modified pricing strategy proposed as part of the CVP long-term water service contract renewals.

MULTI-PURPOSE PIPELINE PROJECT EIR/EIS

The MPP EIR/EIS evaluated the direct and indirect impacts of constructing a water transport pipeline to increase the reliability of the Contra Costa County water supply system and allow for increased demand. The MPP project included construction and operation of two new subsurface pipelines and pump stations, along with other improvements to the existing Contra Costa Canal. A pipeline alignment that would parallel the Contra Costa Canal was identified as the preferred alternative in the EIR/EIS. The EIR/EIS found that most project impacts would be temporary impacts resulting from construction activities and that the impacts would be less than significant

with mitigation. The EIR/EIS further concluded that implementation of the MPP Project would support additional growth within the communities served by CCWD, in accordance with the approved local land use plans of the cities and the County. The MPP project would not support growth beyond planned levels or in areas not planned for development by the appropriate land use agencies. Because implementation of the MPP project would support planned growth, it was found to have indirect, secondary effects that were potentially significant, consistent with the FSWI EIR and County General Plan EIR.

The key issues evaluated in the MPP EIR/EIS included water demand/capacity, secondary effects of growth, cumulative effects, hazardous contamination, traffic, encroachment, air quality, noise, parks and recreation, environmental justice, biology, hydrology, and water quality. Potentially significant construction-related impacts from the canal alignment were identified for land use, recreation, transportation, air quality, surface water resources, groundwater resources, geology, seismicity and soils, vegetation and wildlife, cultural resources, hazardous materials, and public services and utilities. Identified mitigation measures reduced all these impacts to less-than-significant levels. Impacts from construction activities to these resources along the Contra Costa Canal were adequately addressed in the MPP EIR/EIS, and no further analysis in this EA is required.

FOCUS OF THE ENVIRONMENTAL ASSESSMENT

The analysis in this EA has been focused on land use, socioeconomics, biological resources, and cultural resources, based on the extensive and adequate analysis of other environmental resources performed in previous documents. The contract renewal action was first evaluated in the CVPIA PEIS, which assumed that all existing water contracts would be renewed. The FWSI EIR evaluated impacts from projected water demands to the year 2040. The MPP EIR/EIS evaluated impacts of a proposed pipeline adjacent to the Contra Costa Canal to convey and deliver water supplies. The proposed long-term water service contract renewal is related to these projects because it would continue delivery of up to 195,000 acre-feet per year of CVP water to CCWD. The direct and indirect impacts of providing water to CCWD have been adequately evaluated in the previous environmental documents, which are incorporated by reference into this EA.

CHAPTER 4
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter includes a description of the environment encompassed by the CCWD service area that could be affected by the proposed long-term water service contract renewal. It describes the existing regional and sub-regional conditions; environmental goals and policies to be considered in relation to the proposed contract renewal action; the direct and indirect environmental consequences of each of the alternatives; and cumulative effects. The description of the environment includes an overview of the CCWD service area, facilities, and operations.

Resources evaluated in detail in this EA include land use, socioeconomics, biological resources, and cultural resources, and Indian trust assets. The land use discussion provides a context in which the proposed action can be understood. It summarizes the prevalent land uses and describes County-wide growth management programs. (Growth-inducing impacts as an indirect effect of the proposed action are discussed in Chapter 5, "Other Impacts.") Socioeconomic resources are evaluated because of the potential impacts resulting from the revised pricing structure included as part of the proposed action. Because of the project-specific nature of socioeconomic resources, they were identified in the CVPIA PEIS as the single resource area that would require future evaluation. Biological resources are evaluated to integrate on-going consultations among Reclamation, CCWD, and the Service. These consultations included the Biological Assessment for the proposed long-term water service contract for the Contra Costa Water District (Reclamation 2004), and the Biological Opinion, issued by the Service in April 2000, which establishes the responsibilities of CCWD regarding sensitive biological resources for future CCWD water supply projects. Cultural resources are included in this EA to disclose the federal requirements specific to the proposed action, and the role of Reclamation in complying with Section 106 of the National Historic Preservation Act.

CONTRACT SERVICE AREA DESCRIPTION

The CCWD contract service area (112,922 acres) is composed of Central and East Contra Costa County. Contra Costa County has been one of the fastest growing counties in the San Francisco Bay Area, due in large part to the availability of housing that is generally more affordable than in the majority of the surrounding region. Contra Costa County encompasses over 470,000 acres, much of which will approach buildout within the next 15 to 20 years. As the County has undergone a transition from rural to increased urban land uses, urbanized development has moved from the central part of the county to the east and into the CCWD service area.

Early growth in the Central County occurred in Martinez along the San Joaquin River, with subsequent suburban growth reflecting the outfall from San Francisco. Over the last two decades, employment centers have developed within the Central County. The majority of the Central County has been urbanized, and future development will generally be limited to in-fill of the few vacant parcels remaining and redevelopment along major transportation corridors. Many of the cities in

this region are now reaching planned buildout. Interstate 680 provides a major north-south transportation and commercial corridor through the region.

The East County includes Antioch, Bay Point, Pittsburg, and Oakley. Antioch is projected to add the highest number of households of any area within the County by the year 2010; Bay Point and Pittsburg are projected to add the second highest (Association of Bay Area Governments 1997). The majority of recent growth has occurred in open space and ranch land previously used for grazing. State Highway 4 provides a major east-west transportation corridor through the region. East County also includes much of the hilly terrain of the Diablo Range.

CONTRA COSTA WATER DISTRICT

CCWD was formed in 1936 under the authority of the State Water Code and is the primary supplier of water to users in central and eastern Contra Costa County. Originally formed to provide water for irrigation and industry, CCWD now serves primarily M&I users. The service area is approximately 137,127 acres. The CCWD receives up to 195,000 acre-feet of CVP water and also receives water from other sources; in dry years, however, virtually 100 percent of its water comes from the CVP. CCWD obtains raw (untreated) water primarily from Reclamation's Contra Costa Canal, a CVP facility. The canal was built by Reclamation in 1948 and is operated by CCWD.

In 2003, CCWD served approximately 450,000 people (both untreated and treated water supplies) (CCWD, Annual Report, 2003a). The untreated water is supplied to about 220,000 people through other water retailers, including the cities of Antioch, Martinez, and Pittsburg; the Southern California Water Company (for Bay Point); and Diablo Water District (Oakley). In addition, raw water is served to more than 50 industries and major businesses, agricultural users, and landscape irrigators. The treated water is supplied to about 230,000 people in the communities of Clayton, Clyde, Concord, Pacheco, Port Costa, portions of Pleasant Hill, Martinez, Walnut Creek, and other unincorporated areas of Contra Costa County. Figure 1-1 shows the CCWD federal contract service areas and other non-federal services areas within the CCWD.

Contra Costa Water District Supplies and Facilities

The CCWD operates raw water distribution and pumping facilities, reservoirs, water treatment plants, and treated water distribution facilities (Figure 1-2). CCWD's raw water comes from the San Francisco Bay–Sacramento-San Joaquin Delta (Delta). The backbone of CCWD's raw water conveyance system is the 48-mile long Contra Costa Canal. Four pumping plants, within the first 7 miles of the canal lift water 124 feet to flow the remaining length of the canal by gravity. Additional raw water facilities operated by the CCWD include the Los Vaqueros facilities (100,000 acre-foot reservoir and associated conveyance and pumping facilities) and the Mallard Slough Pump Station and pipeline. CCWD operates four reservoirs, Martinez, Contra Loma, Mallard and Los Vaqueros, and two water treatment plants, the Bollman water treatment plant and the Randall-Bold water treatment plant. The Randall-Bold plant is jointly owned by CCWD and Diablo Water District.

In 1998, CCWD completed construction of the Los Vaqueros Reservoir, which allows for additional water quality control for water supplied by the Contra Costa Canal. In 2003, CCWD completed the 21-mile Multi-Purpose Pipeline project, a non-CVP project.

CCWD is almost entirely dependent on the Delta for its water supply. The Contra Costa Canal and the Los Vaqueros project make up CCWD's principal water supply and delivery system. CCWD diverts unregulated flows and regulated flows from storage releases from Shasta, Folsom, and Clair Engle reservoirs into the Sacramento River as a contractor to Reclamation's CVP. Under the 1994 Amendatory Contract (Water Service Contract 175r-3401 [amended]) with Reclamation, CCWD can divert and re-divert up to 195,000 acre-feet per year of water from Rock Slough and the new Old River intake for M&I and agricultural uses. CCWD also can divert up to 26,780 acre-feet per year of water from Mallard Slough under its own water rights (Water Rights License No. 317 and Permit No. 19856). The city of Antioch and several industrial customers of CCWD have water rights permits to divert water from the Delta.

The Los Vaqueros Reservoir and related facilities provide the CCWD with the ability to store up to 100,000 acre-feet of water. The primary purposes of the Los Vaqueros project are to improve the quality of water supplied to CCWD customers, to minimize seasonal quality changes, and to improve the reliability of the emergency water supply available to CCWD. The Los Vaqueros Reservoir site is located approximately 8 miles south of Brentwood in southeastern Contra Costa County. Water to fill the reservoir comes from the southern Delta by means of a new pump station on Old River near Highway 4. The Old River pump station can be used for direct diversions and to fill the reservoir. The filling of the reservoir began in February 1998.

On June 2, 1994, the State Board issued Decision 1629, giving CCWD additional rights to divert and store water for beneficial uses. The State Board subsequently issued Water Rights Permits No. 20749 and 20750 for filling Los Vaqueros Reservoir from the new intake at Old River and diversion and storage of the water of Kellogg Creek (up to 9,640 acre-feet per year). These rights are in addition to the contractual rights to divert and store water furnished through the CVP. Up to 95,850 acre-feet per year may be diverted for storage between November 1 of each year and June 30 of the succeeding year under Water Rights Permit No. 20749.

CCWD Federal Contract (CVP) Service Area

Under the CVP, CCWD federal contract water is provided to approximately 112,922 acres (CCWD 2004). CCWD's total service area is approximately 137,127 acres (CCWD 2003a). Water is pumped into the canal from Rock Slough east of Oakley and from Old River east of Discovery Bay. Water from Old River may be pumped to either the Los Vaqueros Reservoir or the Contra Costa Canal near Pumping Plant 4. Water can also be released by gravity to the Contra Costa Canal from the Los Vaqueros Reservoir. Water from Rock Slough is pumped for the first 7 miles of the canal and then flows by gravity approximately 40 miles to Martinez Reservoir. Martinez Reservoir, owned by Reclamation, is the terminal reservoir for the Canal.

LAND USE AND PLANNING

Affected Environment

Existing Land Uses

The County General Plan identifies three distinct geographic areas in the County: West County, Central County, and East County. The East County region, encompassing the largest land area, is further divided into the subareas of Pittsburg-Antioch and Other East County. The Contra Costa Canal is located in the Central and East County regions defined in the County General Plan.

Central County and East County are composed of both urban and suburban land uses. The urban areas consist of single-family and multiple-family residential, commercial, and industrial uses. The suburban areas consist of scattered developed and undeveloped properties and open space and recreational uses. Figure 4-1 illustrates general land uses in Contra Costa County.

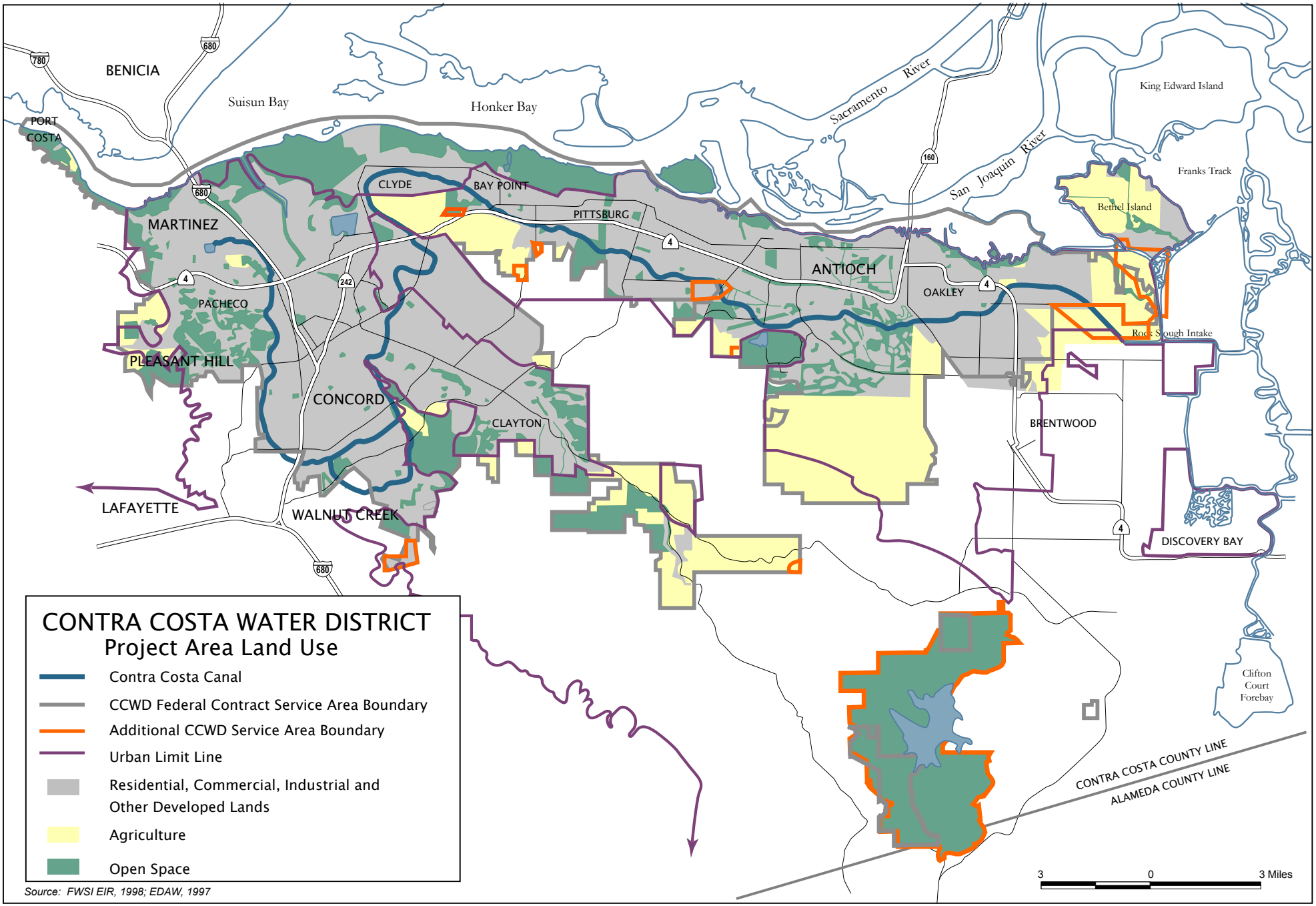
Plans and Agreements

Contra Costa County and the cities served by the CCWD have general plans and other planning vehicles with planning horizons through the year 2000 and beyond. These plans contain goals, policies, and implementation measures that, together with land use designations and zoning codes, are designed to guide land use and resource planning and development to the planning horizon. The County General Plan provides tools to control the pace of growth within the County and policies protecting agricultural land and mineral resources, vegetation and wildlife habitats, natural pathways, and visual, cultural, and wind resources. More specific discussions of these goals and policies can be found in the County General Plan EIR, FWSI EIR, and MPP EIR/EIS, which are incorporated by reference into this EA. Sections 53091 and 53096 of the California Government Code exempt public water supply facilities from regulation under local zoning ordinances. Contra Costa County also provides specific growth-management programs in its General Plan Growth Management Element.

Contra Costa County General Plan Growth Management Element

The Growth Management Element of the County General Plan provides three major tools to control the current pace of growth within the County: the 65/35 Land Preservation Standard; the Urban Limit Line; and the Growth Management Program.

The 65/35 Land Preservation Standard. In 1990, the County Board of Supervisors developed legislation, passed into law through a voter initiative, that established the 65/35 Contra Costa County Land Preservation Standard. This standard limits urban development in the County to not more than 35 percent of the County's total land area and preserves the remaining 65 percent for non-urban uses. These non-urban uses include agriculture, wetlands, open space, and parks. The legislation also developed the Urban Limit Line, described below, as a method for implementing the standard.



Source: FWSI EIR, 1998; EDAW, 1997

Figure 4-1
Project Area Generalized Land Use

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The Urban Limit Line. The County's Urban Limit Line generally defines the boundaries where new development can occur through the life of the County General Plan (see Figure 4-1). The Urban Limit Line is the demarcation of the 65/35 Land Preservation Standard and limits growth beyond those boundaries.

Growth Management Program. The Growth Management Program uses performance standards to verify that services and infrastructure can be provided by developers or are already in place to gain project approvals. Growth management standards include performance standards for traffic levels of service, park land acreage, and drainage and flood management.

Reclamation, CCWD, and East Bay Regional Park District Management Agreement

Reclamation, CCWD, and the East Bay Regional Park District (EBRPD) entered into a management agreement in 1975 concerning the development, administration, operation, and maintenance of recreation uses of the Contra Costa Canal. This agreement (Contract No. 14-06-200-7803A, as amended) states that the primary use of the Contra Costa Canal right-of-way (ROW) is for transporting and distributing the public water supply, transmitting electric power, and accomplishing other purposes of the CVP. All other uses, including recreational uses, are secondary, and the CCWD can temporarily suspend EBRPD's license to use the ROW whenever necessary for public safety, national security, or the operation and maintenance of the Contra Costa Canal system.

The agreement designates responsibility for facility maintenance and operation. Recreational facilities on the Contra Costa Canal are operated and maintained by EBRPD with no cost to CCWD. CCWD maintains the Canal service roads but splits the cost with EBRPD, depending on its share of the wear-and-tear on the service roads. If CCWD finds it necessary to modify EBRPD facilities, the contract requires that CCWD consult with EBRPD and consider means to minimize adverse effects on EBRPD-maintained trails. If, after such consideration, the CCWD still finds it necessary to remove or damage EBRPD facilities, then CCWD will repair, replace, or relocate such facilities to their former condition, function, and use, or will pay EBRPD the depreciated value of the affected facilities.

Contra Costa Water District Code of Regulations Enforcement

Under CCWD's Code of Regulations, Section 5.04.120, proponents of an annexation or applicants for water service to newly annexed lands are required to provide all necessary environmental documentation and approvals by the appropriate regulatory agencies, including the Service, before CVP water can be provided. CCWD will continue to enforce Section 5.04.120 and will keep the Service informed of enforcement actions related to endangered species.

Environmental Consequences

No Action Alternative

Because the proposed long-term water service contract renewal does not include the development of any physical facilities and structures, it would not have a direct effect on land use. Additionally, the

proposed contract renewal would not conflict with any adopted land use or conservation plan. Indirect effects to land use that could occur with growth accommodated by the continued provision of water have been adequately addressed in the FWSI EIR and MPP EIR/EIS, which incorporate the County General Plan EIR by reference. Renewal of the long-term water service contract under the No Action Alternative would aid in the implementation of the FWSI, which was specifically developed to respond to growth projected in the County General Plan and other local planning documents. The FWSI, and thus the long-term water service contract and the No Action Alternative, directly implement Contra Costa County General Plan Policy 7-17, which directs the County to encourage water service agencies to develop supplies and facilities to meet future water needs based on the growth policies contained in the County and cities' general plans.

The majority of future population and housing growth in Contra Costa County is planned for East County, especially within currently existing rural and agricultural land use areas, although some redevelopment is planned for pockets of currently developed cities. Land use development within Contra Costa County is largely governed by the County's Growth Management Element and the Urban Limit Line. Together these programs are responsible for directing, controlling, and monitoring the location and extent of urban development within the County. The FWSI EIR and its adopted findings acknowledged that the intensification of land use and development in the vacant areas of Contra Costa County would reduce open space and alter existing land use patterns. It further noted, however, that development decisions are a function of local and regional planning agencies in the County. CCWD has no land use management authority.

The County General Plan EIR identified significant and unavoidable impacts to natural open spaces as a result of achieving buildout. Since the certification of the County General Plan EIR, however, approximately 40,000 acres of open space have been added to the County inventory. Approximately half of the acres were added as a result of implementing the 1988 voter-approved Bond Measure AA, and the other half were added as a result of CCWD's construction of the Los Vaqueros Reservoir and purchase of the watershed. The County General Plan Growth Management Element also includes performance standards for park land acreage, which would discourage new development from being approved unless provisions for park land are accommodated.

Alternative 1

Alternative 1 is assumed to have effects to land use within Contra Costa County similar to those of the No Action Alternative. These effects to land use are largely governed by the County's Growth Management Element and the Urban Limit Line. CCWD has no land use management authority.

Alternative 2

Alternative 2 is assumed to have effects to land use within Contra Costa County similar to those of the No Action Alternative. These effects to land use are largely governed by the County's Growth Management Element and the Urban Limit Line. CCWD has no land use management authority.

Cumulative Impacts

Implementing the long-term water service contract under each of the alternatives would continue the delivery of CVP water to the CCWD service area at historic levels of up to 195,000 acre-feet,

resulting in no change to existing conditions for water users in the CCWD federal service area. The proposed action would not result in the construction of new facilities or the introduction of additional structures into the CCWD and Reclamation water supply system. Therefore, no physical change to the environment would result from renewal of the long-term water supply contract under any of the alternatives. The differences among the alternatives are contractual features, including water cost, definition of M&I users, and water measurement. None of the alternatives would change the water service amount, increase water system capacity, or introduce new facilities. Therefore, there would be no direct cumulative impacts to land use from the contract renewal action.

Cumulative impacts associated with implementation of the CVPIA, which included long-term CVP water supply contract renewals, were adequately evaluated in the CVPIA PEIS, from which this EA is tiered. Because the differences between the alternatives are essentially contractual features, cumulative impacts associated with implementation of the CVPIA would be the same under the three alternatives evaluated in this EA.

The cumulative impacts related to the planned growth envisioned by the cities' and County land use planning documents in areas that would be served by CVP water through the Contra Costa Canal have been adequately analyzed in the County General Plan EIR, FWSI EIR, and MPP EIR/EIS. These documents found that the cumulative impacts associated with projected countywide growth would be offset by policies and mitigation measures in the general plans and project-level environmental documents. The County's Growth Management Element discourages new development from being approved in unincorporated areas unless there is verification that performance standards can be met, or a funding mechanism has been established to meet the standards at the time of development. The enforcement and implementation of the growth management process is the responsibility of Contra Costa County and is supported through interjurisdictional coordination with the cities, Local Agency Formation Commission (LAFCO), the County Transportation Authority, and various service districts, including CCWD.

SOCIOECONOMICS

This socioeconomic analysis is composed of two technical components. The first component examines the M&I water that the CCWD would receive under proposed the long-term water service contract, focusing specifically on the potential impacts on water-related costs and demographics under Alternatives 1 and 2 compared to the No Action Alternative.[1] The second component evaluates the potential regional economic impacts of the changes to water cost and land use assessed in the first component of the analysis. To the extent possible, the technical areas addressed, methodological approaches employed, and temporal setting of the analysis tier directly from the CVPIA PEIS.

[1] The CVPIA PEIS refers to M&I water as "urban" water. However, for the present analysis, since some of the water designated by Reclamation as M&I is used for agriculture but priced at M&I rates, CVP water is identified based on its designation for rate-setting purposes and end use.

The potential socioeconomic impacts of the long-term water service contract renewal on commercial fishing and recreation were excluded from the analysis because CCWD's CVP water supply and management would not be affected by Alternatives 1 and 2 compared to the No Action Alternative.

The potential socioeconomic impacts of the proposed contract renewal on agriculture were excluded from the analysis because of the proposed conversion of CCWD's CVP agricultural water allocation (1,000 acre-feet) to M&I water and the rapid decline in agricultural activity in Contra Costa County. CCWD agricultural deliveries account for less than 1 percent of all annual deliveries, and these deliveries will be accommodated through non-CVP sources. Apples, wine grapes, peaches, strawberries, pecans, pistachios, and kiwi are the crops grown on the approximately 450 acres served by CCWD. The quantity of water supplied by CCWD for agricultural purposes was approximately 200 acre-feet in 2003, down from over 2,000 acre-feet toward the end of the last decade (CCWD 2004). It is expected that the CCWD will no longer deliver water to agricultural users in the very near term as urbanization displaces the County's agricultural lands.

Affected Environment

This section briefly characterizes the existing socioeconomic and water use conditions in the CCWD service area and Contra Costa County. Additional detail on existing conditions may be found in the County General Plan as well as the FWSI EIR.

Municipal & Industrial Water Use and Cost

In 2003, CCWD served an estimated population of 450,000 (CCWD 2004) and covered an area of 137,127 acres (CCWD 2004). The CCWD depends almost entirely on CVP water, with less than 11 percent of its water coming from other sources (CCWD 1999b). CCWD provides treated water to Clayton, Clyde, Concord, Pacheco, Port Costa, Pleasant Hill, parts of Martinez, Walnut Creek, and unincorporated areas of Contra Costa County. Raw water is provided to Antioch, parts of Martinez, Pittsburg, Southern California Water Company (Bay Point), and Diablo Water District (Oakley) as well as more than 50 industries, agricultural customers, and various landscape irrigators (CCWD 1999b).

According to the County General Plan, the District's service area may be expanded to include Hotchkiss Tract, Veale Tract, Knightsen, Bethel Island, southern Oakley, and other unincorporated areas of East County. This expansion would increase the CCWD service area by 12,280 acres (CCWD 1999b).

In 2003, CCWD recorded 60,036 connections in the treated water service area that used 36,822 acre-feet per year of water. CCWD's M&I raw water sales included approximately 75 metered connections recording 74,900 acre-feet of deliveries. The total water delivered by CCWD, not including a 7 percent estimated raw water loss, was 112,400 acre-feet (CCWD 2004).

Several of CCWD's industrial customers and the City of Antioch hold water rights for water from the San Joaquin River. These supplies are not reliable because of the poor water quality that often exists in the San Joaquin River. In dry years, little or no water is available from this source, and these customers rely on CCWD and the CVP to meet their demands. In 2003, these customers

diverted approximately 9,000 acre-feet of water under their San Joaquin River water rights. CCWD's main industrial water users, Tesoro Golden Eagle (formerly Tosco Oil), USS-Posco, Shell Oil, Gaylord Container, and DuPont, account for one-third of CCWD water use. CCWD deliveries to these customers averaged 38,790 acre-feet per year for the years 1984-1993 (CCWD 1999).

Groundwater resources in the CCWD service area do not supply significant amounts of water. There are an undetermined number of wells throughout the CCWD service area owned by industries, private individuals, and public municipal water utilities. CCWD does not manage groundwater and does not have precise figures concerning how much water is pumped from these wells, but it estimates that the annual groundwater use within the CCWD service area is 3,000 acre-feet.

Table 4-1 summarizes CCWD's 1994 and 2003 cost-of-service and full-cost rates for CVP M&I water. In 2003, the average annual residential water bill for CCWD's service area totaled $590, and household use averaged 370 gallons per day (CCWD 2004).

TABLE 4-1
CCWD 1994 and 2003 PUBLISHED CVP COST-OF-SERVICE WATER RATES

	Cost-of-Service Rate ($ per acre-foot)	*Mid-Point Rate ($ per acre-foot)*[a]	*Full-Cost Rate ($ per acre-foot)*
1994			
M&I Rates	$26.65[b]	$29.92	$33.19[c]
2003			
M&I Rates	$37.14	$39.49	$41.83

Source: Bureau of Reclamation, CH2M Hill, and Dornbusch & Company

a. Calculated as the average of the cost-of-service and full-cost rate.
b. As reported by CH2M Hill in the M&I economic analysis model in the CVPIA PEIS.
c. In 1994, the Bureau did not estimate the full cost rate for CVP M&I water because full cost was not a factor in M&I rate setting at that time. 1997 was the first year that full-cost rates were published for CVP M&I water. Accordingly, the ratio of CCWD's full-cost to cost-of-service rates for CVP M&I water in 1997 was used to estimate the 1994 full-cost rate.

Regional Economy

Contra Costa County is one of the fastest growing counties in the San Francisco Bay Area. The California Department of Finance projects the County's population will increase to more than 1.26 million by the year 2040, compared to 972,100 at the start of 2001. The estimated average annual unemployment rate for Contra Costa County in 2000 was 2.7 percent (EDD 2004). In 1999, the County ranked eighth out of the state's 58 counties with respect to per-capita income (EDD 2004).

Table 4-2 summarizes 1991 industrial output, employment, and income by place-of-work (Income POW) for the County. California's Employment Development Department (EDD) reported that the County's unemployment rate in that year was 5 percent (EDD 2000). The table indicates that the largest sector of the County economy in terms of industrial output is manufacturing. However, the table also shows that the services sector is the County's largest employer. (Data from 1991 rather than more current data are presented for the purposes of establishing an economic baseline that is temporally consistent with the economic baseline conditions presented in the CVPIA PEIS.)

TABLE 4-2
INDUSTRIAL OUTPUT, EMPLOYMENT, AND INCOME BY PLACE OF WORK (1991)

Type of Work	*Output ($M)*	*Employment (Jobs)*	*Income POW ($M)*
Agriculture	$278	5,245	$118
Mining	$3,204	3,100	$1,617
Construction	$3,238	31,958	$1,278
Manufacturing	$15,180	31,629	$4,188
Transportation	$3,398	25,150	$2,057
Trade	$3,327	81,585	$2,064
Finance, Insurance, and Real Estate	$6,498	50,636	$4,328
Services	$5,578	113,006	$3,444
Government	$1,742	51,940	$1,626
Total	**$42,443**	**394,249**	**$20,719**

Source: Minnesota IMPLAN Group 1991

Assessment Methodologies

Municipal and Industrial Water Costs

The assessment of the potential incremental impacts of Alternatives 1 and 2 on the cost of M&I water compared to the No Action Alternative is based on M&I water demand models developed for the CVPIA PEIS. A detailed description of these models is presented in the Municipal Water Costs technical appendix of the PEIS (Reclamation and Service 1997). In summary, the PEIS M&I models are designed to estimate the potential impact on the cost of CVP M&I water resulting from anticipated CVPIA-associated changes in CVP water rates and water deliveries. Thus, the M&I water cost impacts presented in the PEIS derive from (1) the proposed introduction of 80/10/10 tiered pricing, (2) a flat restoration charge applied to each acre-foot of delivered water, and (3) the anticipated cost incurred by individual CVP contractors to acquire alternative water supplies and implement conservation measures to mitigate for water delivery reductions resulting from CVPIA-mandated in-stream and refuge flow set-asides.

Consistent with the PEIS, the primary source of data used to model water demands, local supplies, and costs in evaluating socioeconomic and associated land use impacts from the long-term water service contract renewal were obtained from California Department of Water Resources Bulletin 160-93. Estimates of future CVP deliveries with and without CVPIA were derived using the

PROSIM and SANJASM models. (See the PEIS technical appendices for a description of these hydrologic modeling tools.)

The results of the analysis of the impacts on water cost in the CVPIA PEIS were aggregated into four regions, with the CCWD included in the San Francisco Bay Area Region. An implicit assumption of the PEIS M&I cost impact analysis was that both residential and commercial/industrial water users are extremely price inelastic within a fairly large range of prices for water (i.e., they will effectively not change their use of water in response to even fairly substantial changes in the price of water). Certainly, price does influence the choice of water supply. However, in the case of CCWD, the PEIS analysis concluded that reliable alternative (non-CVP) water supplies would cost an average of $340 per acre-foot, well above the effective CVP M&I water rates for any of the CCWD long-term water service contract renewal proposals under consideration. Accordingly, no incremental change in CCWD's future demand for M&I water from the CVP is anticipated under either Alternatives 1 or 2 when compared to the No Action Alternative.

Consistent with the CVPIA PEIS, the socioeconomic impact analysis for the CCWD long-term water service contract renewal focuses on both the long-run average and short-run drought hydrologic conditions, and associated CVP deliveries. Projected post-CVPIA delivery of CVP water to the CCWD for M&I uses was obtained from the PEIS M&I models prepared by CH2M Hill.

The analysis of M&I cost under the Preferred Alternative in the CVPIA PEIS (the No Action Alternative in this EA) was conducted assuming 80/10/10 tiered pricing and 1994 CVP M&I rates for the CCWD (see Table 4-3). Alternative 1 would not alter the rate-setting scheme stipulated in the No Action Alternative and, therefore, would not have an actual incremental effect on CCWD's CVP M&I water costs relative to the No Action Alternative. Alternative 2, however, would affect CCWD's actual CVP M&I water costs. As Table 4-3 indicates, the M&I cost impact analysis for Alternative 2 was conducted assuming the adoption of 80/10/10 tiered pricing, Category 1/ Category 2 water designation, and the 2003 CCWD CVP M&I rates.

The projected year 2044 M&I water cost impacts under Alternative 2 are presented as the increment above CCWD's estimated cost of CVP M&I water under the No Action Alternative for both the long-run average and short-run dry hydrologic condition. These cost impacts are translated into percentage terms with respect to CCWD's cost of CVP water and the associated approximate effect on average residential water bills within the CCWD.

CVP M&I water rates under Alternatives 1 and 2 are not expected to have any impact on CCWD's demand for CVP M&I water. In addition, the two alternatives do not differ from the No Action Alternative with respect to projected CVP water supply or reliability, although reliability may differ under the alternatives as compared to existing conditions. Therefore, the M&I water provisions in the alternatives are not anticipated to have an impact on demographics or land use. Accordingly, demographic and land use impacts are not addressed in the impact analysis for M&I water. The analysis examines only CCWD CVP water cost-related impacts. As in the CVPIA PEIS, it is assumed that any projected change in CCWD's cost of CVP water would be passed directly on to CCWD's customers.

TABLE 4-3
M&I WATER RATE SETTING
COMPARISON OF THE ALTERNATIVES

	Rate Tiering Method	*Rate Calculation Method*
No Action Alternative	80/10/10	Current
Alternative 1	80/10/10 (same as No Action Alternative)	Current (same as No Action Alternative)
Alternative 2	Category 1/Category 2 80/10/10 on Category 1 Full Cost Rate on Category 2	Revised to adjust capital and deficit repayment period to reflect 5-year rolling average deliveries
Source: Personal communication, Buford Holt, Reclamation		

Regional Economics

The assessment of regional economic impacts under Alternatives 1 and 2 uses the same data sources, models, and model assumptions used for the regional economic impact analysis in the CVPIA PEIS. A detailed description of these data sources, models, and model assumptions was presented in the Regional Economics technical appendix to the PEIS (Reclamation 1997).

In summary, the PEIS regional economic impact model was designed to estimate the impacts on regional employment, output, and income that would result from anticipated changes in M&I, agricultural, and recreational water use and cost resulting from CVPIA implementation. For the assessment in the PEIS, the CVP project area was aggregated into seven sub-regions. CCWD is included in the San Francisco Bay Area Region.

The input-output model Impact Analysis for Planning (IMPLAN) was the primary tool used to quantify the potential regional economic impacts of CVPIA implementation in the PEIS and, accordingly, to assess the regional economic impacts of CCWD's long-term water service contract renewal. A detailed description of the IMPLAN model is provided in the IMPLAN Model technical appendix to the PEIS (Reclamation 1997). Briefly, IMPLAN is used to quantify impacts from changes in policy and resource allocation. The model provides estimates of the total (or multiplied) economic effects that would result from an initial stimulus to an industrial sector (e.g., construction, transportation, utilities). As in the current case, the stimulus might be a reduction in consumer spending in the retail sector resulting from escalation of household water bills.

IMPLAN is extremely useful for characterizing the economic interdependence of different sectors of an economy. Changes in the purchases and sales in one sector of an economy can affect numerous other sectors. Economists call the sum of these changes "multiplier effects." There are many different kinds of economic multipliers. Sales or output multipliers are estimates of the effect on total private sector sales resulting from an initial change in sales. Employment and income multipliers are estimates of a change's effect on jobs and income in an area. Each of these

multipliers provides estimates of the impacts on an economy from a change in output (or jobs or income) in one or more of its sectors.

IMPLAN's multipliers are typically expressed for every $1 million of spending. For example, if the total employment multiplier in the construction sector for an area's economy is estimated at 22, a $1 million drop in spending in that sector would be expected to result in the loss of 22 jobs (both directly in construction and secondarily in other sectors as a result of changes in construction-related spending). IMPLAN multipliers are derived from long-run average relationships between industrial sectors. Accordingly, the regional economic impacts of the anticipated CVP M&I cost effects of Alternative 2 were evaluated only for the long-run average hydrologic condition. Under the short-run drought condition scenario, it is likely that the economic impacts indicated by the IMPLAN model would be overstated since short-run effects tend to be smaller than long-run effects (i.e., there is a delayed response).

Contra Costa County as a whole is the area used for the regional economic impact assessment of Alternatives 1 and 2. While the potential economic effects of the contract renewal alternatives may extend outside of Contra Costa County, it is reasonable to anticipate that the majority of the impacts would be within the County. Furthermore, the localized effects of contract renewal are the most relevant in evaluating local community plans.

Contra Costa County IMPLAN data from 1991 were used for the analysis to be consistent with the CVPIA PEIS. As with the PEIS, the analysis focuses on three economic variables: industrial output, employment, and Income POW. Income POW is defined as the sum of employee compensation, proprietor's income, and other property income. The CCWD contract renewal IMPLAN analysis is also aggregated into the same industrial sector groupings as reported in the PEIS.

The projected impacts of contract renewal on the Contra Costa County economy are presented in terms of the incremental change from the No Action Alternative. The 1991 baseline IMPLAN data are the primary data source used to characterize the affected economic environment (existing conditions) in Contra Costa County. These data are also adjusted to account for the anticipated incremental impact of the CVPIA PEIS preferred alternative on the Contra Costa County economy relative to the "without-CVPIA" condition. These adjusted IMPLAN data define the No Action Alternative for this EA. All of the IMPLAN data are presented in 1991 dollars.[2] Accordingly, while the estimated incremental cost impacts of Alternative 2 are presented in 2003 dollars, those costs are converted to 1991 dollars for the County-level economic impact analysis. In this manner, the magnitude of the potential incremental economic impacts of Alternative 2 is consistently evaluated in 1991 dollars.

If the cost of water for CCWD's residential customers were to increase to pay the government for higher CVP water rates, the increase would have a direct effect on those individuals' disposable income available for other purchases in the local region. Consistent with the PEIS urban water

[2.] The baseline data were used throughout the analysis because the structure of Contra Costa County in 2044 cannot be predicted without substantial speculation. This approach is consistent with the PEIS.

analysis, it is assumed that escalation in residential water costs resulting from renewal of the long-term water service contract would cause disposable income to decrease dollar for dollar. The income change is allocated among all the consumer expenditure categories reported in the IMPLAN model for Contra Costa County to estimate the output, employment, and income effects of that reduction in disposable income. In theory, no such analysis should be conducted for the large-scale industrial customers of the CCWD, since increases to their water bill would simply increase their cost of doing business. Because those industrial water customers are large publicly held companies, it is unlikely that the escalation of their water bills would have any meaningful local impact on the economy. Nonetheless, consistent with the PEIS, all of the anticipated M&I water cost impacts of the contract renewal proposals are assumed to directly affect local consumer spending.

Environmental Consequences

Municipal And Industrial Water Costs

No Action Alternative

Table 4-4 presents the estimated total cost of delivered CVP M&I water in the year 2044 in 1994-dollar terms for the No Action Alternative under both average and dry hydrologic conditions. The table shows that in the year 2044 under the No Action Alternative in a year of average hydrologic conditions, CCWD would have to pay an estimated $8.2 million to acquire (a) the 155.7 thousand-acre-feet of CVP M&I water that would be made available to its customers and (b) an additional approximately 11,000 acre-feet of supplies from alternative water sources it would need to address demand not met by CVP supplies. The table also shows that the projected cost of CCWD M&I water under the No Action Alternative in a dry year increases to over $20 million (assuming the average cost of alternative water supplies for the CCWD is $340 per acre-foot, a 1994 estimate developed by CH2M Hill for the CVPIA PEIS).

TABLE 4-4
CCWD PROJECTED M&I WATER COST (2044)
NO ACTION ALTERNATIVE

Hydrologic Condition	*Long-Run Average Hydrologic Condition*
2044 Average-Year CVP Delivery Only	155.7 taf[1]
2044 Average-Year Other Water Supplies	11.3 taf
Total CCWD Cost (in 1994 dollars)	$8.2 million
	Short-Run Dry Hydrologic Condition
2044 Dry-Year CVP Delivery Only	117.3 taf
2044 Dry-Year Other Water Supplies	49.3 taf
Total CCWD Cost (in 1994 dollars)	$20.2 million

Source: Dornbusch & Company and CH2M Hill

[1] thousand acre feet

Alternative 1

Alternative 1 is assumed to have effects on M&I water costs, water use, and land within the affected region similar to the No Action Alternative. Therefore, this alternative would result in no environmental effects.

Alternative 2

Table 4-5 shows the projected incremental change in CCWD's cost for CVP M&I water in the year 2044 under Alternative 2 compared to the No Action Alternative. The table indicates, for example, that in an average hydrologic year following five dry hydrologic years, CCWD's cost of CVP water would be about $1.5 million more or about 30 percent higher than under the No Action Alternative. While this district-level increase in the cost of water is large, the expected increase in the District's recent average residential water bill of $590 per year would be only about $5.00, or less than 1 percent, because the cost of water is actually a relatively small component of CCWD's cost to treat, store, and deliver water to its customers.

TABLE 4-5
CCWD PROJECTED M&I WATER COST (2044)
ALTERNATIVE 2

		Changes Compared to No-Action		
	No Action Alternative	*Alternative 2*		
Hydrologic Condition	*Long-Run Average Condition*	*Average-Average*	*Dry-Average*	*Wet-Average*
2044 Average-Year CVP Delivery Only	155.7 taf[1]	0	0	0
2044 CVP Cost (in 2003 dollars)	$4.3 million	$1.3 million	$1.5 million	$1.2 million
Incremental Change in CCWD Cost (CVP water only)	N/A	29%	35%	28%
Change in total cost of water (including non-CVP supplies)	N/A	15%	18%	15%
	Short–Run Dry Hydrologic Condition	*Average-Dry*	*Dry-Dry*	*Wet-Dry*
2044 Dry-Year CVP Delivery Only	117.3	0	0	0
2044 CVP Cost (in 2003 dollars)	$3.2	$0.82	$0.95	$0.82
Incremental Change in CCWD Cost (CVP water only)	N/A	25%	29%	25%
Change in total cost of water (including non-CVP supplies)	N/A	4%	5%	4%

Source: Dornbusch & Company and CH2M Hill.

[1] thousand acre feet

Table 4-5 also compares CCWD's projected CVP M&I water costs under Alternative 2 in a year of dry hydrologic conditions compared to No Action Alternative levels in a dry year. The table indicates that in a dry year, the anticipated incremental increase in CCWD's cost for CVP M&I water under Alternative 2 and in CCWD's total cost for M&I water following 5 years of dry, average, or wet hydrologic conditions would be as much as 29 percent and 5 percent, respectively.

Cumulative Impacts

In addition to the potential escalation of CCWD M&I water rates, and thus residential water costs, under Alternative 2, additional escalations in future M&I water cost are anticipated as a result of the addition of new water facilities and the upgrading of existing facilities in the CCWD water system to accommodate planned expansion of the CCWD service area.

Regional Economics

No Action Alternative

Table 4-6 presents in 1991 terms the estimated year 2044 total industrial output, employment, and Income POW in Contra Costa County under the No Action Alternative.

TABLE 4-6
2044 OUTPUT, EMPLOYMENT AND INCOME POW
NO ACTION ALTERNATIVE (1991)

Sector	*Output ($Millions)*	*Employment (FTE[1] Jobs)*	*Income POW ($Millions)*
Agriculture	$278	5,244	$118.
Mining	$3,204	3,100	$1,617.
Construction	$3,238	31,958	$1,278.
Manufacturing	$15,180	31,621	$4,188.
Transportation	$3,398	25,146	$2,057.
Trade	$3,327	81,562	$2,063.
Finance, Insurance, and Real Estate	$6,498	50,625	$4,328.
Services	$5,578	112,977	$3,443.
Government	$1,742	51,936	$1,626.
Total	$42,437	394,169	$20,717.

Source: Dornbusch & Company and Minnesota IMPLAN Group

[1] full-time equivalent

Alternative 1

Alternative 1 is assumed to have impacts on the regional economy similar to the No Action Alternative. Therefore, Alternative 1 would result in no environmental impacts.

Alternative 2

Table 4-7 shows the estimated impacts on total industrial output of the projected cost of M&I water under Alternative 2 by major industrial sector for Contra Costa County. The table indicates that under Alternative 2, the projected incremental decrease in total industrial output in the County in the year 2044 is projected to be from $1.8 million in a year of average hydrologic conditions following 5 years of wet hydrologic conditions to $2.1 million in a year of average hydrologic conditions following 5 years of dry hydrologic conditions (in 1991 dollars). This range represents a decrease of less than 0.01 percent in the County's total projected industrial output.

TABLE 4-7
2044 INDUSTRIAL OUTPUT IMPACTS
ALTERNATIVE 2 (1991 DOLLARS)

	No-Action Average Condition	*Change Compared to No-Action Average Condition*		
		Alternative 2		
Place of Work	*Output ($Millions)*	*Dry-Average*	*Average-Average*	*Wet-Average*
Agriculture	$278	-$0.01	-$0.01	-$0.01
Mining	$3,204	$0.00	$0.00	$0.00
Construction	$3,238	$0.00	$0.00	$0.00
Manufacturing	$15,180	-$0.49	-$0.43	-$0.40
Transportation	$3,398	-$0.16	-$0.14	-$0.13
Trade	$3,327	-$0.40	-$0.34	-$0.32
Finance, Insurance, and Real Estate	$6,498	-$0.38	-$0.33	-$0.31
Services	$5,578	-$0.58	-$0.50	-$0.47
Government	$1,742	-$0.06	-$0.05	-$0.05
Total	$42,437	-$2.09	-$1.80	-$1.68

Source: Dornbusch & Company and Minnesota IMPLAN Group

Table 4-8 presents the total estimated impacts on Contra Costa County employment resulting from contract renewal-related changes in CCWD's M&I and agricultural water costs. The table indicates that the projected year 2044 incremental decrease in total employment in the County under Alternative 2 would be from about 22 full-time-equivalent (FTE) jobs in an average hydrologic year following five wet hydrologic years to 28 jobs in an average hydrologic year following 5 years of dry hydrologic conditions (in 1991 terms). This range of impacts represents a decrease of less than 0.01 percent in the County's employment base compared to the No Action Alternative.

Table 4-9 presents the estimated total impacts on Income POW in Contra Costa County resulting from the CCWD M&I and agricultural water costs anticipated under Alternative 2. The table indicates that in the year 2044, the projected incremental decrease in total Income POW in the County under Alternative 2 ranges from about $940,000 during a year of average hydrologic conditions following 5 years of wet hydrologic conditions to almost $1.2 million in a year of dry hydrologic conditions following 5 years of dry hydrologic conditions (in 1991 dollars). This range of impacts represents a decrease of less than 0.01 percent in the County's total Income POW compared to estimated conditions under the No Action Alternative.

TABLE 4-8
2044 EMPLOYMENT IMPACTS
ALTERNATIVE 2 (1991 DOLLARS)

Place of Work	*No-Action Average Condition*	*Change Compared to No-Action Average Condition*		
		Alternative 2		
	Employment (FTE[1] Jobs)	*Dry-Average (FTE Jobs)*	*Average-Average (FTE Jobs)*	*Wet-Average (FTE Jobs)*
Agriculture	5,244	-0.2	-0.2	-0.2
Mining	3,100	0.0	0.0	0.0
Construction	31,958	0.0	0.0	0.0
Manufacturing	31,621	-2.8	-2.4	-2.3
Transportation	25,146	-1.5	-1.3	-1.2
Trade	81,562	-8.0	-6.9	-6.4
Finance, Insurance, and Real Estate	50,625	-3.7	-3.2	-3.0
Services	112,977	-10.1	-8.6	-8.1
Government	51,936	-1.4	-1.2	-1.1
Total	394,169	-27.8	-23.9	-22.4

Source: Dornbusch & Company and Minnesota IMPLAN Group

[1] full-time equivalent

Cumulative Impacts

It is not anticipated that any currently planned future action, other than planned expansion of the CCWD service area, will have a cumulative impact on the Contra Costa County economy in addition to those impacts projected to result from CVP contract renewal under either Alternatives 1 or 2.

TABLE 4-9
2044 PLACE-OF-WORK INCOME IMPACTS
ALTERNATIVE 2 (1991)

Place of Work	*No-Action Average Condition*	*Change Compared to No-Action Average Condition*		
		Alternative 2		
	Income POW[1] *(1991 $ Millions)*	*Dry-Average (1991 $ Millions)*	*Average-Average (1991 $ Millions)*	*Wet-Average (1991 $ Millions)*
Agriculture	$118	-$0.01	-$0.01	-$0.01
Mining	$1,617	$0.00	$0.00	$0.00
Construction	$1,278	$0.00	$0.00	$0.00
Manufacturing	$4,188	-$0.18	-$0.16	-$0.15
Transportation	$2,057	-$0.10	-$0.08	-$0.08
Trade	$2,063	-$0.24	-$0.21	-$0.19
Finance, Insurance, and Real Estate	$4,328	-$0.24	-$0.21	-$0.20
Services	$3,443	-$0.35	-$0.30	-$0.28
Government	$1,626	-$0.05	-$0.04	-$0.04
Total	$20,717	-$1.16	-$1.00	-$0.94

Source: Dornbusch & Company and Minnesota IMPLAN Group
[1] full-time equivalent

BIOLOGICAL RESOURCES

This section describes the biological resources in the CCWD service areas and the potential indirect effects of the long-term water service contract renewal. This description is provided for informational purposes to summarize project-specific impacts of the contract renewal and to describe on-going consultations among Reclamation, CCWD, the Service, and NOAA-Fisheries regarding biological resources in the CCWD service area.

The information in this section is summarized from the *Biological Assessment on the Contra Costa Canal Long-Term Water Service Contract Renewal* (Reclamation 2004) that Reclamation prepared concurrently with this Revised Draft EA. The submittal of the biological assessment (BA) to the Service and NOAA-Fisheries will serve to initiate formal consultation under Section 7 of the Endangered Species Act (ESA). If the assessment indicates that the federal action will or may affect species listed as threatened or endangered under the ESA (listed species), a draft biological opinion subsequently issued to Reclamation by the Service will determine whether implementing the proposed long-term water service contract with the CCWD is likely to jeopardize the existence of listed species occurring in the CCWD service area.

The discussion of biological resources in the 2000 Draft EA was based on information in the FWSI EIR and MPP EIR/EIS and the biological opinions that resulted from those projects. These and other relevant biological opinions are listed in the BA, which is incorporated by reference.

Affected Environment

Land Use/Land Cover Conditions

The CCWD service area has a diverse range of land cover/community types and unique species. The topographic variety of Contra Costa County, from the summit of Mount Diablo to the San Francisco Bay–Delta estuary complex, combines to form the setting for its range of land cover types and wildlife. Contra Costa County is bounded by San Francisco Bay and San Pablo Bay to the west, by Suisun Bay and the channels of the Sacramento and San Joaquin Rivers to the north, and by Alameda County to the south. The San Francisco Bay–Delta system (including San Pablo Bay) is generally regarded as the most important water body in California. It is used extensively for both recreational and commercial purposes, and it supports diverse wildlife, fish, and plant species.

Historically, the region surrounding the CCWD contained a diverse and productive patchwork of water, wetland, riparian forest, and surrounding terrestrial communities that supported abundant populations of resident and migratory species of wildlife. Huge herds of pronghorn antelope (*Antilocapra americana*), tule elk (*Cervus elaphus nannodes*), and mule deer (*Odocoileus hemionus*) grazed the prairies, and large flocks of waterfowl gathered in the extensive wetlands.

Today, the dominant community types associated with the CCWD service area include water, wetlands, grassland/rangelands, scrub and shrublands, orchards and vineyards, cropland and pastures, forests, urban areas, and barrens. Land uses in the CCWD include agricultural, residential, and M&I uses. Over the years, land has been converted from native land cover types to cultivated fields, pastures, residences, water impoundments, flood control structures, and other developments. Natural communities are now restricted in their distribution and size and are largely fragmented. As a result, these natural communities are increasingly important to resident and migratory wildlife species.

As a result of the conversion of native communities, many species, including listed species, have been displaced or extirpated from the region. Most of the species that occurred historically are now restricted to patches of natural community that are fragmented and isolated, making it difficult for viable populations to exist. Some species have adapted to portions of the new landscape and are able to maintain populations. However, as a result of the largely fragmented natural communities, the potential for expansion or growth of these populations is greatly reduced. Because of the reduction in habitat available to these species, remnants of natural communities such as wetlands and riparian forest/woodlands are increasingly valuable. Substantial natural areas that support federally or state-listed species are protected by public agencies (e.g., Mt. Diablo State Park and the Antioch Dunes National Wildlife Refuge). Wetlands, especially marshes scattered along the County's shoreline, have also been afforded substantial legal and policy protection.

Historical fishery resources within the CCWD service area were different from today's fishery resources. Many native species have declined in abundance and distribution, and several introduced

species have become well established. All CCWD water drains either directly or indirectly into the San Francisco Bay–Delta system. A water quality plan ("basin plan") has been prepared that serves as a blueprint for water pollution control activities for the Bay. The basin plan identifies a number of beneficial uses of the Bay that must be protected, including non-contact recreation, wildlife habitat, preservation of rare and endangered species, estuarine habitat, warm freshwater and cold freshwater fish habitat, fish spawning and migration, industrial service supply, navigation, and commercial and sport fishing.

Land Cover/Community Types

This section describes the land cover/community types in the CCWD service area, as depicted in Figure 4-2. The following electronic data sources were consulted to generate the land cover and community types shown on the figure: Reclamation Federal Water District, the California Natural Diversity Database (CNDDB), the Service's Wetlands Inventory and Conservation Program, and the California-Gap Analysis Project (CA-GAP) (USGS et al. 1998).

Fifteen land cover/community types were identified within the CCWD service area: annual grassland, barren, blue oak/foothill pine, blue oak woodland, coastal oak woodland, chamise redshank chaparral, cropland, estuarine, lacustrine, mixed chaparral, montane hardwood, orchard and vineyard, riverine, saline emergent wetland, and urban.

Because the distribution of land cover/community types on Figure 4-2 is identified at the landscape level, community boundaries are approximate and small areas (areas of less than approximately 10 acres) and linear habitat features (e.g., corridors of riparian vegetation) are not mapped but could be present as inclusions within larger mapped units of land cover. The minimum mapping unit was 250 acres for upland cover and 100 acres for wetlands.

Table 4-10 shows the acreages of land cover/community types in the CCWD service area. The predominant native land cover type is the annual grassland community, which constitutes approximately 23 percent of the CCWD service area. Approximately 41 percent of the CCWD service area remains in native land cover, approximately 2 percent is used for agriculture, and 57 percent is developed or barren. The BA (Reclamation 2004) describes the land cover types in the CCWD service area in more detail.

Table 4-10. Land Cover/Community Types and Acreages in the CCWD Service Area

Land Cover/Community Type	*Acres*
Water	
Estuarine	5,277
Lacustrine	122
Riverine	1
Subtotal	5,400
Wetlands	
Coastal Brackish Marsh	3,145
Northern Coastal Salt Marsh	102
Saline Emergent Wetland	3,128
Subtotal	6,375
Grasslands	
Annual Grassland	25,479
Scrub/Shrub Lands	
Chamise Redshank Chaparral	286
Mixed Chaparral	1,488
Subtotal	1,774
Forests	
Blue Oak – Foothill Pine	436
Blue Oak Woodland	6,102
Coastal Oak Woodland	78
Montane Hardwood	178
Riparian Woodland	107
Subtotal	6,901
Agricultural Lands	
Cropland	2,384
Orchard and Vineyard	328
Subtotal	2,712
Other Land Cover Types	
Urban	64,021
Barren	180
Stabilized Interior Dunes	80
Subtotal	64,281
TOTAL	112,922

Protected Species and Critical Habitats

Protected species are plants and animals that are legally protected under the federal Endangered Species Act (ESA) and species that are considered candidates by the scientific community to qualify for such protection. Critical habitats are habitats that are legally protected under the ESA. Protected plants and animals are defined as follows:

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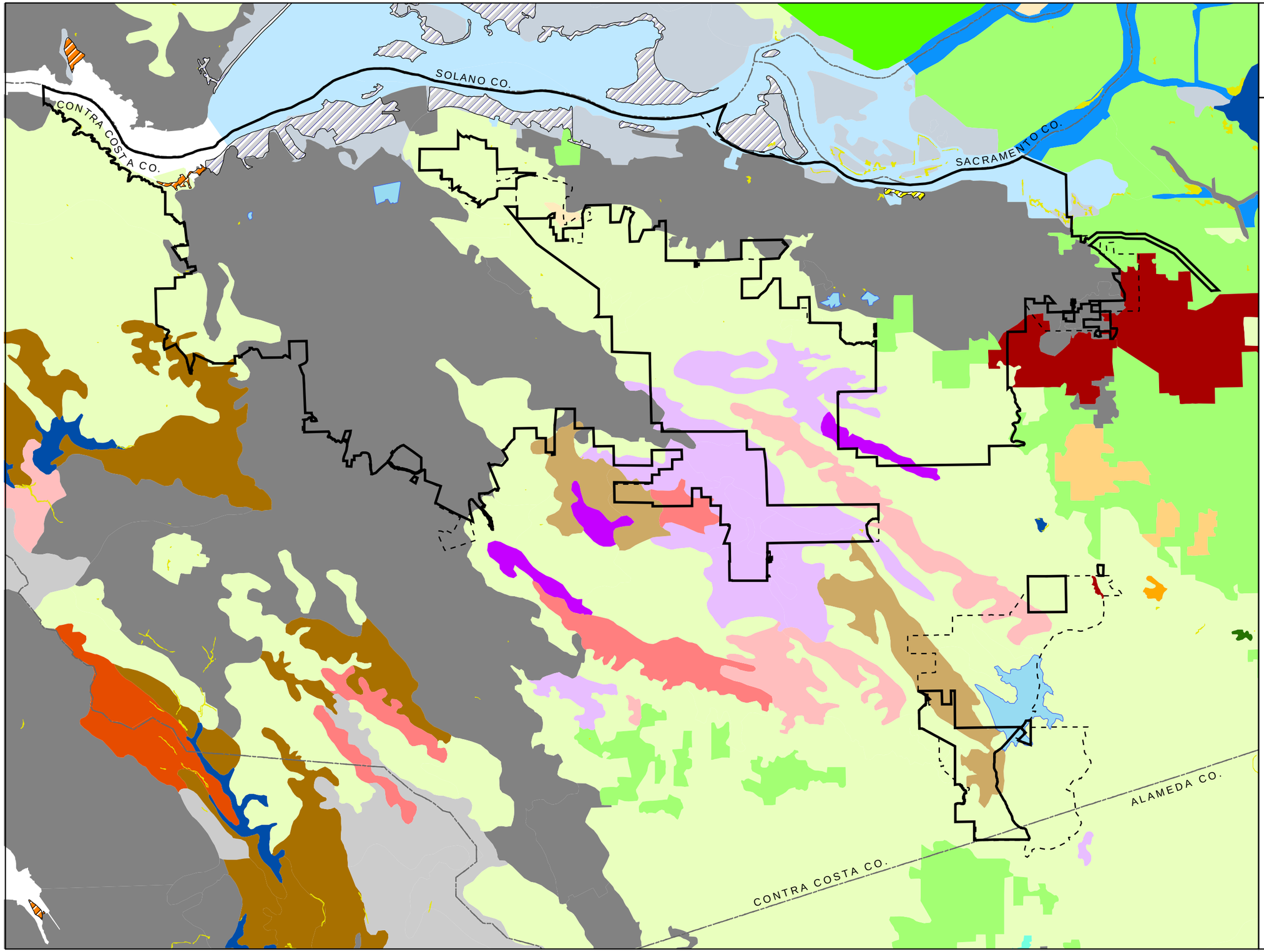
Figure 4-2
Land Cover Types in the Project Area and Vicinity

Contra Costa Water District Long-Term Water Service Contract Replacement



CCWD Federal Contract Service Area

Additional CCWD Service Area

CCWD Reservoirs

County Boundaries

WHR Habitat Types in the CCWD Service Area

- Annual Grassland
- Barren
- Blue Oak - Foothill Pine
- Blue Oak Woodland
- Coastal Oak Woodland
- Chamise Redshank Chaparral
- Cropland
- Estuarine
- Lacustrine
- Mixed Chaparral
- Montane Hardwood
- Orchard and Vineyard
- Riverine
- Saline Emergent Wetland
- Urban

Source: GAP Analysis of Mainland California, 1998

- Riparian Woodland

Source: National Wetlands Inventory, 1997

- Coastal Brackish Marsh
- Northern Coastal Salt Marsh
- Stabilized Interior Dunes

Source: California Natural Diversity Database, 2003

Other WHR Habitat Types in the Project Vicinity

- Coastal Scrub
- Deciduous Orchard
- Eucalyptus
- Freshwater Emergent Wetland
- Pasture
- Redwood
- Valley Foothill Riparian

Source: GAP Analysis of Mainland California, 1998

N

0 2.5 5

Miles

10029 - Contra Costa LTCR BA\GIS\10018_CCWD_EA_Fig-4-2_WHR.mxd

Source: NSR, Inc.; CCWD; U.S. Bureau of Reclamation; GAP Analysis of Mainland California, 1998; U.S. Fish and Wildlife Service; California Dept. of Fish and Game 04-13-04 rescolar

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- Species listed or proposed for listing as threatened or endangered under the federal ESA (50 CFR 17.12 [listed plants], 50 CFR 17.11 [listed wildlife and fish], and various notices in the Federal Register [FR] [proposed species]);

- Species that are candidates for possible future listing as threatened or endangered under the federal ESA (61 FR 7596-7613, February 28, 1996).

Critical habitat is defined as "the specific areas within the geographic area occupied by a species on which are found those physical and biological features essential to the conservation of the species, and that may require special management considerations or protection; and specific areas outside the geographic area occupied by a species at the time it is listed, upon determination that such areas are essential for the conservation of the species."

In 2001, in conjunction with the 2000 Draft EA and BA, Reclamation requested from the Service a list of species and critical habitats that could occur in the CCWD service area, in accordance with requirements of the ESA. The Service provided a species list in June 2001, and Reclamation met with the Service to discuss the scope of analysis and level of detail for a BA. A BA, dated November 2001, was drafted, but not submitted to the Service at the discretion of Reclamation. Reclamation began to revise and update the BA in 2003. A new species list was downloaded from the Service's Sacramento Field Office website (http://sacramento.fws.gov/es/spp_list.htm) on January 29, 2004. A memorandum of Request for Concurrence with this species list was sent to the Service and NOAA-Fisheries on February 25, 2004. The species list, which also shows critical habitats in the CCWD service area, is included as Appendix B.

Plans and Policies

Numerous laws, planning regulations, and previous environmental commitments provide protection for specific biological resources in the CCWD service area.

Some of the potential secondary effects of growth on terrestrial biological resources, including special-status species, will be avoided or minimized through general plan policies and implementation measures; through mitigation measures identified in EIRs on general plans adopted by the County and by city jurisdictions within the CCWD service area; and through compliance with CEQA; NEPA; the federal and state ESAs; and Section 404 of the Clean Water Act. In addition, these laws and regulations may require compensation or mitigation to offset some effects on species and their habitats. Biological opinions also establish protections for sensitive species.

Biological Assessment on Long-Term Water Contract Renewals

As described above, Reclamation has prepared a *Biological Assessment on the Contra Costa Canal Long-Term Water Service Contract Renewal* (Reclamation 2004). Reclamation's determination in the BA is that the proposed long-term water service renewal contract with CCWD:

- *may affect, but is not likely to adversely affect* listed fish species or their critical habitat because the proposed contract renewal would not result in any changes in conditions in the Delta and, therefore, would not affect the habitat or populations of those fish species that

have a moderate potential of occurring in the CCWD service area. The operations of the CVP, including the export of water from the Delta, are governed by separate criteria in biological opinions on CVP operations, by the CVPIA, and by hydrologic conditions.

- *may affect, but is not likely to adversely affect* listed or proposed wildlife species or their critical habitat because the proposed contract renewal would not result in any direct changes to land use and, therefore, would not affect the habitat or populations of those wildlife species with a moderate potential of occurring in the CCWD service area.
- *may affect, but is not likely to adversely affect* listed or proposed plant species or their critical habitat because the proposed contract renewal would not result in any direct changes to land use and, therefore, would not affect the habitat or populations of those plant species with a moderate potential of occurring in the CCWD service area.

This determination was based on the following:

- The proposed long-term water service contract renewal would continue the deliveries of CVP water to the CCWD and would not result in changes to or alterations of habitat used by species listed or proposed for listing as threatened or endangered that are known to occur or have the potential to occur in the CCWD service area
- The contract renewal would not affect the habitat or populations of fish species listed or proposed for listing as threatened or endangered that have a moderate potential of occurring in the CCWD service area. The operations of the CVP, including the export of water from the Delta, are governed by separate criteria in biological opinions on CVP operations, by the CVPIA, and by hydrologic conditions.
- Application of the Reasonable and Prudent Measures, Terms and Conditions, and Conservation Recommendations provided in the *Final Biological Opinion on the Construction of the Multipurpose Pipeline and Future Water Supply Implementation Program, Contra Costa County*, and provided in the CVPIA biological opinion would mitigate for potential site-specific effects to wildlife species listed or proposed for listing as threatened or endangered that have a moderate potential of occurring in the CCWD service area.

Environmental Consequences

No Action Alternative

The No Action Alternative for the long-term service contract for continued provision of water to the CCWD service area would not introduce new structures or result in any physical changes to the environment. Therefore, no direct effects on biological resources are expected to occur as a result of renewing the long-term water service contract for the CCWD service area.

Indirect effects to terrestrial resources related to the secondary effects of growth within CCWD's service area were adequately evaluated in the FWSI EIR. The FWSI EIR found that the continued provision of water would result in indirect effects to native land and agricultural habitats, special-

status communities, and special-status species. These impacts were mitigated through the biological opinion on the MMP and the FWSI.

The biological opinion sets forth the process for addressing the indirect effects on terrestrial species related to the renewal of CCWD's CVP contract, as provided under the consultation on the Implementation of the CVP Improvement Act and Operation of the CVP (1-1-98-F-0124). The Service concluded that five species were not likely to be jeopardized by the effects of construction of the MPP and that 12 plant and wildlife species would not likely be jeopardized by the indirect effects of urban development associated with the FWSI program. The Service's conclusion was predicated on the commitment of CCWD to the conservation measures contained in the biological opinion.

Alternative 1

Alternative 1 is assumed to have effects to biological resources similar to the No Action Alternative. Biological consultations are required by the Consultation and Coordination requirements established by Executive Order for all Reclamation activities. Impacts have been mitigated through the biological opinion for the MPP and FWSI.

Alternative 2

Alternative 2 is assumed to have effects to biological resources similar to the No Action Alternative. These impacts have been mitigated through the biological opinion for the MPP and FWSI.

Cumulative Impacts

Implementing the long-term water service contract under each of the alternatives would continue the provision of CVP water to the CCWD federal service area up to their existing contract amount, resulting in no change to existing conditions for water users in the CCWD service area. The contract renewal does not include construction of new facilities or the introduction of additional structures into the CCWD and Reclamation water supply system. Therefore, no physical change to the environment would result from renewal of the long-term water service contract under any of the alternatives. The differences among the alternatives are contractual features, including water cost, definition of M&I users, and water measurement. None of the alternatives would change the water service amount, increase water system capacity, or introduce new facilities. Therefore, there would be no direct cumulative impacts to biological resources from the replacement of the existing water contract with a long-term water service contract.

Cumulative impacts associated with implementation of the CVPIA, which included a long-term CVP water supply contract with CCWD, were adequately evaluated in the CVPIA PEIS, from which this EA is tiered. Since the differences among the alternatives are essentially contractual features, cumulative impacts associated with implementation of the CVPIA to biological resources would be the same under all alternatives. The ROD developed by Reclamation and the Service for the CVPIA PEIS incorporated strategies for maintaining protected biological resources.

Cumulative impacts to biological resources related to the planned growth envisioned by the cities' and County land use planning documents, including continued water service by Reclamation, were adequately analyzed in the FWSI EIR and the MPP EIR/EIS, which incorporated the discussion from the County General Plan EIR. The biological opinion developed for the FWSI program and MPP project identified specific conservation measures to be undertaken by CCWD to ensure that protected species would not be jeopardized by these actions. Development, however, is planned and managed through the County and cities' general plans and land management processes. Reclamation and CCWD have no jurisdiction over local land use policy or decision-making relative to specific land development proposals.

CULTURAL RESOURCES

This section describes cultural resources in the project area and programs in place to protect these resources. The discussion is summarized from the FWSI EIR and MPP EIR/EIS, which are incorporated by reference into this EA, because cultural resources potentially affected by these projects are the same as those within the CCWD service area. These documents considered cultural resources in the CCWD service area. Cultural resources include prehistoric and historic archaeological sites, districts, and objects; standing historic structures and buildings; and locations of important historic events, or sites of traditional/cultural importance.

Study Methods

To prepare the FWSI EIR and MPP EIR/EIS, prehistoric and historic site record and literature searches were conducted by the California Historical Resources Information System, Northwest Information Center, Sonoma State University, Rohnert Park (CHRFS/NWIC File Nos. 98-150, 97-348, 97-563, 98-25). In addition, focused prehistoric, ethnographic, and general historical research was conducted using reference material from the Bancroft Library, University of California, Berkeley, and Basin Research Associates, San Leandro.

The cultural resources evaluation for the MPP project also involved the following:

- Focused prehistoric, ethnographic, and general historical research, as well as a review of specialized findings;
- Review of 30 cultural resource compliance reports on file with the CHRIS/NWIC which include or are adjacent to the area analyzed for the project alternatives. Twenty-four reports are relevant to the Contra Costa Canal;
- A field survey of selected areas along the Contra Costa Canal was conducted. The Canal was previously surveyed during the archaeological inventory of the Contra Costa Canal for the Bureau of Reclamation in 1996 (West and Welch 1996).
- An Environmental Documentation Study and Cultural Resources Review also was prepared by Basin Research Associates for the MPP project.

Affected Environment

The CCWD service area is within the San Francisco Bay and San Pablo Bay Region, which is part of the Coast Ranges geomorphic province, with San Francisco Bay marking the division between the North and South Coast ranges. This region of central California has a long history of human occupation beginning 12,000 to 10,000 years ago.

Prehistoric Period

Contra Costa County was an area especially favored by prehistoric Native Americans due to favorable environmental conditions and the variety of landforms (e.g., Self et al. 1993). The majority of the CCWD service area has no archaeological sensitivity rating assigned by the County General Plan, since it is located in or adjacent to developed urban areas and publicly owned lands.

In general, Native American occupation sites appear to have been selected for accessibility, protection from seasonal flooding, and the availability of resources. Sea-level changes over the past 6,000-8,000 years have also influenced site location and distribution, especially in the Delta portions of the service area (Bickel 1978a-b; Moratto 1984; West 1977).

Prior to 5,000-4,500 years ago, Native American use of the San Francisco Bay region appears to have been intermittent and sparse. Evidence of early occupation along the bayshore may have been hidden by rising sea levels from about 15,000 to 7,000 years ago or buried under sediments caused by bay marshland infilling along estuary margins from 7,000 years onward (Moratto 1984). Early groups probably focused on hunting and the gathering of various plant foods along with shellfish collection. A three-part development sequence has been used by archaeologists to explain local and regional cultural change in prehistoric central California from 4,500 years ago to European contact (Lillard et al. 1939). This scheme of three major time periods called horizons—Early, Transitional, and Late—is known as the central California Taxonomic System (Beardsley 1948, 1954). Recent chronological placement of the divisions suggests that the Early Horizon dated to ca. 4,500-3500/3000 years ago, the Middle Horizon to ca. 3,500-1,500 years ago, and the Late Horizon to ca. 1500-250 years ago (Moratto 1984). Overviews of regional prehistoric information are presented in Elsasser (1978), C. King (1978a-b), Moratto (1984), Stewart (1981), and West and Welch (1996).

Historic Period

The CCWD service area was explored by the Spanish between 1772 and 1811. After this initial period of Spanish exploration, the Spanish concentrated on the founding of presidios, missions, and secular towns along the California coast (1769-1821). The closest Spanish settlements to the CCWD service area were Mission San Jose in present-day Fremont and San Francisco de Asis in San Francisco.

Control of California passed from Spain to Mexico in 1822. Mexican policy stressed individual ownership of the land, with large ranchos being granted to individuals. Five former ranchos are located in the *Central County Primary Region.* One former rancho was located in the *East County Primary Region,* and no ranchos granted or patented were located in the *Rural East County Primary*

Region. For the most part, the CCWD service area was used for grazing during the Hispanic and early American Periods (Hendry and Bowman 1940; Beck and Haase 1974).

Control of California passed to the United States in 1847. Throughout the late 19th century, ranchos and other lands were subdivided as the result of population growth. Reclamation of the Delta was undertaken to provide land for agriculture, with agricultural activities predominating during the American Period and into the Contemporary Period. Further development of the area was facilitated by the development of regional rail and road networks to service both industry and agriculture with market links, the introduction of the refrigerator railcar in the 1880s allowing the transport of agricultural produce to distant markets, and a coal mining boom from the 1850s-1880s. Towns along Suisun Bay/San Joaquin River were important points for services and the transport of goods shipped to San Francisco and Sacramento by water and later by rail (Goddard 1857, Whitney 1873, Elliot Publishing Company 1893, Smith and Elliot 1897, Slocum 1882, Weber & Co. ca. 1914, Gudde 1974, Emanuels 1986, Fickewirth 1992, and McLeod 1994). The Southern Pacific Railroad constitutes both a major 19th as well as 20th century feature in the CCWD service area along with the San Pablo and Tulare Railroad (owned and controlled by the Central Pacific Railroad) and the San Francisco and San Joaquin Railroad Company (later purchased by the Santa Fe Railroad Company). The town of Clyde is notable, as it was designed by Bernard Maybeck as a residential community for the Pacific Coast Shipbuilding Company to house workers during World War I (Sloan & Robson 1918, Gudde 1974, Kyle 1990).

Identified Cultural Resources

Numerous cultural resources studies have been completed in the CCWD service area over the past 30 years, usually in support of environmental compliance requirements. Approximately 300 reports are on file that include the CCWD service area, although systematic surveys are rare. Two "reported" cultural resources, C-810 and C-811 (near James Donlon Boulevard in Antioch), and an "earthmound" noted on the Stratton and Thompson 1865-1869 Rancho Los Medanos plat at Post Marker #9 (near Serrana Court in Pittsburg) have been identified as being located south of the Contra Costa Canal. These resources were not relocated during the archaeological inventory of the Contra Costa Canal conducted for Reclamation in 1996 (West and Welch 1996) or during the construction of the canal, according to Reclamation records. No indicators of these three potential resources were observed during a field review conducted by Basin Research Associates in 1997.

Industrial and residential development in Contra Costa County has already affected archaeological resources. Development, particularly in the Ygnacio Valley and along the Bay margins, has destroyed an unknown number of both prehistoric sites and historic resources associated with the early development of the area. However, a number of archaeological sites are known to be present in the CCWD service area, both in currently developed areas and in the primarily agricultural areas east of Oakley. There is also the potential for the discovery of unknown sites in both urban and rural contexts, with some potential for deeply buried sites in both the inland and Delta areas of the CCWD service area.

Areas specifically designated for development in the County General Plan within the CCWD service area that are sensitive for cultural resources include the Alhambra Valley Road west of Martinez (Central County Area). Other sensitive areas within the East County area include the

Lone Tree Valley area of Antioch and areas to the south; two areas along Marsh Creek Road, one east of Mt. Diablo State Park and the area east of Clayton; and the eastern areas of the City of Pittsburg south of State Highway 4. Portions of the Veale Tract in the Rural East County are also extremely sensitive for prehistoric archaeological resources. A total of 72 archaeological sites have been recorded in or adjacent to the primary regions within the CCWD service area. These include 52 prehistoric sites, 19 historic sites, and one multi-component site with both a prehistoric and historic component.

Prehistoric Resources

The 52 prehistoric sites include village sites, temporary camps, lithic scatters, milling sites, petroglyph sites, quarry sites, middens, and burial sites. Prehistoric sites occur throughout the service area, although a locational analysis study was not undertaken. Research undertaken by West and Welch (1996) suggests a strong correlation between site location and soils/landform elevation. However, intact prehistoric cultural deposits are more likely to be present in areas relatively unaffected by urbanization and agriculture, although subsurface deposits could exist below the plow zone or underneath pavement or structures.

Historic Resources

The 19 historic sites located within the CCWD service area include railroad grades and associated railroad features, ranches and farmsteads, water conveyance systems and wells, mine sites, industrial sites, refuse deposits, and architectural features. Historic resources are likely to occur throughout the area, although many are likely to have been destroyed by subsequent development or redevelopment. The CCWD service area is situated within a number of former ranchos and includes the City of Martinez in the former *Rancho El Pinole*, which has a number of former adobe dwelling sites as well as several extant adobe structures. Potential historic properties associated with the built environment, rural farms and farm complexes, transportation-related features including roads, bridges, and landings, and historic archaeological sites may be present in both developed and undeveloped areas, although the resources may have been affected by urbanization, agriculture, and industrial development.

Traditional Cultural Properties

Mount Diablo, a dominant natural feature located just outside of the CCWD service area but visible throughout the service area, is a California State Landmark and designated Native American Ethnic Site. It has spiritual significance to the Costanoan as the focal point of their creation myth as well as for its role in several Miwok legends. No reservations or rancherias are present in the CCWD service area. A number of Native American burial sites are known as the result of archaeological discoveries, and there is a potential for others. The locations of these sites are considered sacred by Native American groups. Other traditional cultural properties (e.g., gathering areas, sacred use areas) may be present in rural areas.

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 within the area of potential effect. To date, Reclamation has not received any comments or formal responses from the tribes.

National Register of Historic Places and Other Listed Cultural Resources

At least 44 individual properties or districts (buildings, building sites, landings, etc.) listed on the National Register of Historic Places (NHRP) or eligible for listing are located in the three primary regions of the CCWD service area. These historic properties are also included in the California Register of Historical Resources (CRHR).

The Contra Costa Canal facility was evaluated and was determined not to be eligible for the National Register by Reclamation and the State Historic Preservation Officer (SHPO) in 1992 (West and Welch 1996). No National Register and/or California Register historic properties, architecturally significant structures, landmarks, or points of interest are present either within or adjacent to the canal.

Plans and Policies

National Historic Preservation Act

The primary law governing cultural resources is the National Historic Preservation Act (NHPA), 16 USC 470-470mm. This act established the NRHP and the Advisory Council on Historic Preservation (ACHP).

Section 106 of the NHPA requires that federal agencies consult with the ACHP prior to any undertaking that would affect a property either on or eligible for the NRHP. Since compliance with Section 106 of the NHPA is usually in response to a proposed action that has the potential to affect historic properties, consultation with the California SHPO, interested parties, and, when appropriate, the ACHP is required.

According to federal law, significant cultural resources are those that are either listed on the NHRP, nominated to the NHRP, eligible for listing on the NHRP, designated a National Historic Landmark, or valued by modern Native Americans for maintaining their traditional culture.

Environmental Consequences

No Action Alternative

The No Action Alternative would not introduce new structures, construction activities, or result in physical changes to the environment, and would therefore not directly affect cultural resources. Indirect effects to cultural resources would result from the planned growth and development projected in the County General Plan and evaluated in the County General Plan EIR. Any potential indirect impacts would be the responsibility of the decision-making land management agencies. Demographic, economic, political, and other factors, independent of the proposed contract renewal, that result in changes with direct and indirect effects to cultural resources are beyond the range of Reclamation's NHPA Section 106 responsibilities. Reclamation would need to consider the effects to historic properties when Reclamation *approves* new lands being brought into an irrigation district (Inclusions) and when Reclamation *approves* a change in use that could lead to an effect on a historic property.

The County General Plan EIR previously examined impacts to significant historical or archaeological resources associated with projected development from buildout under the General Plan. The EIR found that secondary impacts resulting from development in currently non-urban areas could affect both known and undiscovered archaeological resources, especially in areas of high sensitivity. Areas specifically identified in the County General Plan EIR, which are included in the CCWD service area, include the Alhambra Road west of Martinez. The County General Plan EIR identified potentially significant adverse impacts to significant historic or archaeological resources associated with growth (CCC CDD 1992).

In addition to the Countywide growth impacts evaluated in the County General Plan EIR, the FWSI EIR evaluated impacts of the CCWD water supply plan developed in response to projected increased future demand at buildout under the General Plan. The FWSI EIR concluded that implementation of the water supply plan would not result in impacts to cultural resources in the service area beyond those identified in the County General Plan EIR. The MPP EIR/EIS also concluded that implementation of the MPP project would not result in impacts to cultural resources beyond those identified in the County General Plan EIR.

The following Historic and Cultural Resource Implementation Measures were provided in the County General Plan EIR to reduce the potential impacts of Countywide development on cultural resources:

- Develop an archaeological sensitivity map to be used in the environmental review process for discretionary permits;
- Include a procedure to be followed in the event that archaeological resources are encountered during development or construction as a condition of approval of discretionary permits;
- Develop design guidelines for areas adjacent to or within scenic corridors or historic sites;
- Review existing County ordinances and guidelines and make amendments as necessary;
- Promote the use of the State of California Historic Building Code to protect sites;
- Encourage owners of eligible historic properties to apply for registration of these sites and participate in programs for historic restoration;
- Seek coordination and cooperation with government agencies and organizations to fund preservation, restoration, and enhancement of unique historic sites;
- Identify funding mechanisms to fund preservation, restoration, and enhancement of unique historic sites; and
- For development in areas with medium to high sensitivity, perform, at a minimum, a Phase I, Level I survey.

Alternative 1

Alternative 1 is assumed to have effects to cultural resources similar to the No Action Alternative. Therefore, there are no environmental impacts anticipated for this alternative beyond those identified in the County General Plan EIR. These impacts would be minimized by implementation of Historic and Cultural Resource Implementation Measures.

Alternative 2

Alternative 2 is assumed to have effects to cultural resources similar to the No Action Alternative. Therefore, there are no environmental impacts anticipated for this alternative beyond those identified in the County General Plan EIR. These impacts would be minimized by implementation of Historic and Cultural Resource Implementation Measures.

Cumulative Impacts

Implementing the long-term water service contract under each of the alternatives would continue the provision of CVP water to the CCWD service area at historic levels, resulting in no change to existing conditions for water users in the CCWD service area. The contract renewal action would not result in the construction of new facilities or introduction of additional structures into the CCWD and Reclamation water supply system. Therefore, no physical change to the environment would result from renewal of the long-term water supply contract under any of the alternatives. The differences among the alternatives are contractual features, including water cost, definitions of M&I users, and water measurement. None of the alternatives would change the water service amount, increase water system capacity, or introduce new facilities. Therefore, there would be no direct cumulative impacts to cultural resources from the contract renewal action.

Cumulative impacts associated with implementation of the CVPIA, which included long-term CVP water supply contract renewal, were adequately evaluated in the CVPIA PEIS from which this EA is tiered. The PEIS analysis provides the programmatic cumulative analysis for the No Action Alternative to which Alternatives 1 and 2 are compared. Since the differences among the alternatives are essentially contractual features, cumulative impacts associated with implementation of the CVPIA to cultural resources would be the same under all alternatives.

Cumulative impacts to cultural resources related to planned growth have been adequately analyzed in the FWSI EIR, and MPP EIR/EIS, which incorporated the discussion from the County General Plan EIR. The effects to cultural resources resulting from planned development actions supported by the County and cities' general plans and other land use planning programs are beyond the range of Reclamation's Section 106 responsibilities. 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. For actions undertaken by CCWD or Reclamation within the federal service area that could affect historic resources, Reclamation and CCWD are required to comply with Section 106 of the NHPA.

INDIAN TRUST ASSETS

Affected Environment

Indian trust assets are legal interests in property that are held in trust by the U.S. Government for Indian tribes or individuals. The Secretary of the Interior is the trustee for the United States on behalf of recognized Indian tribes. Examples of trust assets are lands, minerals, hunting and fishing rights, and water rights.

Reclamation shares the responsibility to protect and maintain Indian trust assets reserved by or granted to Indian tribes or Indian individuals by treaty, statute, or Executive Order. Reclamation carries out its activities in a manner that protects trust assets and avoids impacts, where possible. Where not possible, compensation or mitigation is provided in consultation with affected tribes.

There are no known federally recognized Indian trust assets within the contract service area of the CCWD.

Environmental Consequences

No Action Alternative

There would be no environmental effects to Indian trust assets under the No Action Alternative.

Alternative 1

There would be no environmental effects to Indian trust assets under Alternative 1.

Alternative 2

There would be no environmental effects to Indian trust assets under Alternative 2.

Cumulative Effects

Implementation of Alternative 1 or Alternative 2 would not affect Indian trust assets and would therefore not contribute to cumulative effects to those assets.

CHAPTER 5
OTHER ACTIVITIES AND RELATED IMPACTS

GROWTH INDUCEMENT

The National Environmental Policy Act (NEPA) requires consideration of potential growth-inducing impacts as indirect effects of proposed actions (40 CFR 1508.8(b)). To find that there would be a growth-inducing impact as a result of the proposed long-term water service contract renewal action, a determination would need to be made that the proposed action would result in increased growth and that the increased growth would be reasonably certain to occur. The proposed long-term water service contract renewal between Reclamation and CCWD would not result in growth-inducing impacts, for the reasons described below.

Growth Inducement Analysis Completed for Related Projects

Environmental documentation completed for two related projects undertaken by the CCWD, the MPP and the FWSI, analyzed potential growth inducement associated with implementation of these projects. The MPP EIR/EIS studied modifications to the Contra Costa Canal to provide structural upgrading and a water backup supply system, and the FWSI EIR evaluated future water demand and considered increasing the water supply over the current allotment of 195,000 acre-feet per year to 219,400 acre-feet per year. An increased water supply could be accommodated under both of these projects. The environmental documents concluded that while provision of additional water would remove an obstacle to growth, it would not alter the time, magnitude, or location of growth forecasted by the regional planning and land use agencies in Contra Costa County.

The MPP EIR/EIS concluded that the MPP would indirectly support growth in the cities and the County but also concluded that this growth would not exceed planned levels or occur in areas not planned for development by the lead land use agencies. The impacts of this growth have also been evaluated in the environmental documentation of the cities and the County.

The FWSI was developed to respond to growth projected by the County and cities' general plans. The FWSI specifically responded to policies outlined in the County General Plan EIR, including the development of supplies and facilities to meet future water needs (Policy 7-17 of the County General Plan). The FWSI EIR also concluded that the projects included in the FWSI would not directly cause growth, but would accommodate growth already anticipated in the County and cities' general plans.

In contrast to the MPP and FWSI projects, the proposed action would not either directly or indirectly increase the amount of CVP water historically provided to the CCWD. The continued provision of water would, however, accommodate the need for water generated by current development and projected countywide growth forecasts. Development is planned and managed through the County and cities' general plans and land management processes. Reclamation and CCWD have no jurisdiction over local land use policy or decision-making related to land development proposals.

Water System Capacity

A project would be growth inducing if it resulted in increased water system capacity. Since the proposed contract renewal would not increase water system capacity, it would not be growth inducing. The capacity of CCWD's water system was increased by the MPP, resulting in indirect impacts on growth in the County.

Growth Inducement Analysis of the Proposed Action

The purpose and need for a proposed action are key considerations in evaluating its potential to induce future growth. As identified previously in this EA, the purpose of the proposed action is to replace CCWD's Amendatory Contract. Long-term contract renewal is needed to continue the provision of CVP water, incorporate administrative conditions into the renewed contract in compliance with federal reclamation law, and allow the continued reimbursement to the federal government for costs related to CVP operation. These actions would neither increase the amount of water provided to the CCWD nor introduce new structures or facilities that could accommodate increased water volumes.

The proposed action would renew the long-term water service contract to deliver water from the CVP to the CCWD. All alternatives would secure continued CVP water delivery to the CCWD service area at the current level of up to 195,000 acre-feet per year. The differences among the alternatives are contractual features, including water cost, definition of M&I users, and water measurement. None of the alternatives would change the water service amount, increase water system capacity, or introduce new facilities. The provision of a reliable water supply to CCWD would not directly cause growth to occur, but would rather accommodate existing water demands and future growth envisioned in the cities' and County general plans and amendments. Regional growth issues have been adequately addressed in the County General Plan, the general plan for each city within the project service area, and regional plans generated by the Association of Bay Area Governments, the California Department of Transportation, and others. These planning efforts used historical analysis, the formulation of public goals and policies, and various types of forecasting to generate growth management plans addressing the nature, pace, scale, and geographical distribution of future changes in population, economy, and land use with the service area. Each plan was developed with substantial community and public agency input, and each was subject to comprehensive environmental review prior to approval and adoption.

Local and regional plans incorporate consideration of the regional water system as one basis of land use planning. The discretionary approval of land development projects within each local jurisdiction is predicated on conformance with these land use regulations. Thus, limitations to new land development that exist due to capacities in the regional water system are imposed through the land development approval process. Since the proposed action would not alter the regional water delivery and storage system, it would not affect any existing or anticipated limitations to population growth.

UNAVOIDABLE ADVERSE IMPACTS

No unavoidable direct adverse impacts resulting from long-term water service contract renewal have been identified. None of the alternatives would change the water service amount, increase water system capacity, or introduce new facilities. They would therefore not directly cause any physical changes to the environment. Implementation of the alternatives would accommodate planned development and growth in accordance with city and County land use plans.

Contra Costa County has identified some significant unavoidable impacts of planned growth, including loss of farmland, air quality degradation, traffic congestion, and a change in aesthetic character. These issues were adequately evaluated in previous environmental documents, and the County adopted a statement of overriding considerations for these impacts.

CHAPTER 6
CONSULTATION AND COORDINATION

INTRODUCTION

Prior to the preparation of this EA, 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 EA and not the development of concurrent CVPIA implementation programs.

PUBLIC INVOLVEMENT

Reclamation started the preparation of this EA with scoping meetings. 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 EA 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 and the *Scoping Report* was released in the summer of 1999.

Public input continued during long-term contract negotiations to define the contract language. Discussions also were held with the CCWD during the preparation of this document.

At public scoping meetings, Reclamation provided information about the 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 CVPIA PEIS and during 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 fewest number of comments addressed environmental issues.

Reclamation received numerous comments about issues to be considered in this EA and methodologies for analyzing impacts. Comments concerning the development of alternatives were considered in the formation of the alternatives analyzed in this EA. It was determined that the description of the alternatives in this EA largely would focus on the contract provisions. Comments on methods used to address impacts were considered in the development of the Environmental Consequences section of this EA. The impact analysis focused on comparing the alternatives with the CVPIA PEIS Preferred Alternative (which is the No Action Alternative in this EA) rather than with existing conditions.

CONSULTATION WITH OTHER AGENCIES

This EA was prepared in accordance with the policies and regulations for the following issues. These issues and how compliance was addressed in this EA are briefly 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
- Safe Drinking Water Act
- Clean Air Act
- Clean Water Act

NATIONAL ENVIRONMENTAL POLICY ACT

This EA 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 EA provides information regarding the No Action Alternative, the alternatives, and the environmental impacts of the alternatives.

The Revised Draft EA/Draft FONSI was made available to the public on December 14, 2004. The comment period closed on January 12, 2005. No comments were received.

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 EA 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 alternatives will affect listed threatened and endangered species. The biological assessment addresses all species affected by the CVP operation in the CCWD service area. The biological assessment does not indicate that the

proposed action is likely to adversely affect a listed species. However, if it is determined that the proposed action may affect a listed species, Reclamation will request formal consultation pursuant to the ESA.

Consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) has been initiated by Reclamation. USFWS and NOAA concurrences with the determinations of the BA would mean that the long-term contract renewal may affect, but is not likely to adversely affect special-status species and designated or proposed critical habitats of those species.

Consultation with the National Oceanic and Atmospheric Administration (NOAA) and USFWS must be completed before Reclamation can approve Findings for a proposed action. Reclamation must sign the Finding (FONSI) before long term renewal contracts can be signed by Reclamation.

FISH AND WILDLIFE COORDINATION ACT

The Fish and Wildlife Coordination Act (FWCA) requires that Reclamation consult with federal and state fish and wildlife agencies 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 the CVPIA is being jointly implemented. This continuous consultation with, and consideration of the views of, the Service in addition to its review of this document and consideration of its comments satisfies any applicable requirements of the FWCA.

NATIONAL HISTORIC PRESERVATION ACT

Section 106 of the 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 NRHP that are located in or near the project area. The second step is to identify the possible effects of proposed actions. 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 EA, information from the State Clearinghouse was collected. The County and city governments in Contra Costa County have initiated separate consultations with respect to their land use planning activities. It was determined by the SHPO 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. During

preparation of this EA, it was determined, based upon information provided by Reclamation that no Indian trust assets exist within the CCWD service area.

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 practitioners, and avoid adversely affecting the physical integrity of such sacred sites. No sacred sites were identified during the scoping or planning process, and sacred sites were therefore not included in the impact assessment of this EA.

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 EA evaluated the environmental, social, and economic impacts on minority and low-income populations in the impact assessment of the 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 EA 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 floodplain 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 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 in 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 EA 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 the 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. No specific consultation concerning farmlands was conducted during preparation of this EA because the alternatives would not affect agricultural 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 Environmental Protection Agency (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 that 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 provided more flexibility, more state responsibility, and more problem prevention approaches. The law changed the standard-setting procedure for drinking water and established a State Revolving Loan Fund to help public water systems improve their facilities, 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 EA alternatives as compared to the SDWA requirements indicated that there would be 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 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 EA alternatives as compared to the CWA requirements indicated that there would be no changes in compliance as compared to the No Action Alternative.

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ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
CALFED	Consortium of state and federal agencies created through the Bay-Delta Accord
CCCGP	Contra Costa County General Plan
CCWD	Contra Costa Water District
CRHR	California Register of Historical Resources
CNDDB	California Natural Diversity Database
County	Contra Costa County
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
Delta	Sacramento-San Joaquin Delta
DOHS	Department of Health Services
EA	Environmental Assessment
EBRPD	East Bay Regional Parks District
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FTE	Full Time Equivalent
FWSI	Future Water Supply Implementation project
IMPLAN	Impact Analysis for Planning
LAFCO	Local Agency Formation Commission
LVP	Los Vaqueros Project
M&I	Municipal and Industrial
MPP	Multipurpose Pipeline

NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
PEIS	Programmatic Environmental Impact Statement
POW	Place of Work
PROSIM	A Hydrologic Model Developed by the USBR
Reclamation	U.S. Bureau of Reclamation
ROD	Record of Decision
ROW	Right of Way
RRA	Reclamation Reform Act
Secretary	Secretary of the Interior
State Board	State Water Resources Control Board
USBR	U.S. Bureau of Reclamation
USFWS	U.S. Fish and Wildlife Service
VAMP	Vernalis Adaptive Management Plan

APPENDIX A

Table A-1 Summary of Current and Draft Water Service Contract Provisions

(9 pages)

11/2004 Draft Long Term Renewal Contract Between United States and CCWD

(60 pages)

Table A-1. Summary of Contract Provisions for the CCWD Proposed Long Term Water Service Contract, Contra Costa County, California (from North State Resources, Inc., May 2004)

Provision	Existing Amendatory Contract (1994 – 2010)	Federal Action Proposed Long-Term Water Service Contract Renewal	Effects Analysis
Explanatory Recitals			
	Assumes the U.S. is operating the CVP for beneficial uses.	Same as Existing Contract.	**No effect; explanatory recitals are not operative provisions.**
	Assumes the CCWD is developing a Los Vaqueros Project to assist the CCWD in providing high quality water to its customers and to increase water supply reliability.	Same as Existing Contract. Language modified to indicate Los Vaqueros Project has been constructed.	**No effect; explanatory recitals are not operative provisions.**
Explanatory Recitals			
	Assumes CCWD and the U.S. must agree on how the Los Vaqueros Project will be utilized with CVP water and facilities.	Same as Existing Contract.	**No effect; explanatory recitals are not operative provisions.**
	No similar recital.	Assumes the rights to CVP water were acquired by the U.S.	**No effect; explanatory recitals are not operative provisions.**
	No similar recital.	Assumes the Amendatory Contract exists.	**No effect; explanatory recitals are not operative provisions.**
	No similar recital.	Assumes that the CCWD is required to operate and maintain the Contra Costa Canal System and Contra Loma Dam and reservoir.	**No effect; explanatory recitals are not operative provisions.**
	No similar recital.	Assumes the U.S. and CCWD have a binding agreement (No. I75r-3401-BA) and supplemental agreement (No. I75r-3401-SA) that set out terms for renewing the existing contract before it expires, and to complete necessary environmental documentation and negotiation of a renewal contract.	**No effect; explanatory recitals are not operative provisions.**
	No similar recital.	Provides for long-term renewal of the Existing Contract following completion of appropriate environmental documentation, including PEIS for CVPIA implementation and all CVP long-term contracts renewal. Also recognizes partial assignment of the contract to a 3rd party or acquisition of CVP water through assignments, if covered under this contract.	**No effect; explanatory recitals are not operative provisions.**
	No similar recital.	Assumes PEIS and other environmental review is complete.	**No effect; explanatory recitals are not operative provisions.**
	No similar recital.	Assumes CCWD requested the renewal of the Existing Contract, pursuant to existing laws and contract terms.	**No effect; explanatory recitals are not operative provisions.**

Table A-1. Summary of Contract Provisions for the CCWD Proposed Long Term Water Service Contract, Contra Costa County, California (from North State Resources, Inc., May 2004)

Provision	Existing Amendatory Contract (1994 – 2010)	Federal Action Proposed Long-Term Water Service Contract Renewal	Effects Analysis
	No similar recital.	Assumes CCWD has fulfilled all of its obligations under the Existing Contract; and the CCWD has utilized CVP water for reasonable and beneficial use.	**No effect; explanatory recitals are not operative provisions.**
	No similar recital.	Assumes CVP water is an essential portion of the CCWD water supply; and that the CCWD service area depends on the continued availability of CVP water.	**No effect; explanatory recitals are not operative provisions.**
	No similar recital.	Assumes the Secretary intends to pursue ways to improve water supply, quality, and reliability.	**No effect; explanatory recitals are not operative provisions.**
Explanatory Recitals			
	No similar recital.	Assumes mutual goals of U.S. and CCWD relating to water reliability, costs, repayment, shortage prevention, and balance among demands; and that a cooperative relationship among parties will be developed to achieve goals.	**No effect; explanatory recitals are not operative provisions.**
	Assumes annual adjustment in Rates to be paid for CVP water by CCWD.	No similar recital.	**No effect; explanatory recitals are not operative provisions.**
Definitions			
"Calendar Year"	No similar definition.	The period January 1 through December 31.	**No effect; see operative provisions.**
"Charges"	Payments in addition to the Rates determined by the Contracting Officer each year.	Rewording of definition of Charges to include both Rates and Tiered Pricing Increments.	**No effect; see operative provisions.**
"Condition of Shortage"	No similar definition.	Project condition such that in any Year, the Contracting Officer is unable to deliver sufficient water to meet the Contract Total.	**No effect; see operative provisions.**
"Contra Costa Canal System"	Contra Costa Canal, including the intake channel from Rock Slough, Clayton and Ygnacio Relift Canals and pumping plants, the Martinez Reservoir and Pumping Plants 1, 2, 3, and 4.	Same as Existing Contract but also adds "and such facilities as may be authorized by Congress from time to time for rehabilitation or replacement thereof."	**No effect; see operative provisions.**
"Contra Loma Dam and Reservoir"	The Dam, pumping plant, and reservoir constructed as an addition to the Contra Costa Canal System.	Same as Existing Contract.	**No effect; see operative provisions.**
"Contract Total"	No similar definition.	Maximum amount of water to which the CCWD is entitled.	**No effect; see operative provisions.**

Table A-1. Summary of Contract Provisions for the CCWD Proposed Long Term Water Service Contract, Contra Costa County, California (from North State Resources, Inc., May 2004)

Provision	Existing Amendatory Contract (1994 – 2010)	Federal Action Proposed Long-Term Water Service Contract Renewal	Effects Analysis
"CVP water" (Existing Contract) or "Project Water" (Proposed Contract)	Water appropriated by the U.S. for the operation of the CVP, in addition to and not including the Los Vaqueros water rights water.	All water developed, diverted, stored, or delivered by the Secretary in accordance with the statutes authorizing the Project and with the terms and conditions of water rights and California Law.	**No effect; see operative provisions.**
"CVP" (Existing Contract) or "Project" (Proposed Contract)	Central Valley Project, California, of the Bureau of Reclamation.	The Central Valley Project owned by the U.S. and managed by the Department of the Interior, Bureau of Reclamation.	**No effect; see operative provisions.**
"CVPIA"	No similar definition.	Central Valley Project Improvement Act, Title XXXIV of the Act of October 30, 1992 (106 Stat. 4706).	**No effect; see operative provisions.**
"District Service Area"	The area to which CCWD provides continuing service.	The area to which the Contractor is permitted to provide Project Water under the Contract.	**No effect; see operative provisions.**
Definitions			
"Full Cost Rate"	No similar definition.	Annual rate, as determined by the Contracting Officer, that shall include expenditures for construction allocable to Project irrigation or M&I functions, of facilities in service, less payments; defines how interest will be calculated on costs outstanding; Full Cost Rate includes actual operation, maintenance, and replacement costs.	**__Financial Effect ☒ Administrative Effect ☒ No Effect/__ Effect on Listed Species Minor administrative change only.**
"Lateral Distribution System"	The water conveyance system constructed by the U.S., consisting of pipelines extending service to CCWD water users from the Contra Costal Canal at Milepost 5.3, 6.2, 7.1, 7.3, 9.1, 14.0, 25.6, 36.6, and Y-2-6.	Same as Existing Contract.	**No effect; see operative provisions.**
"Los Vaqueros water rights water"	Water appropriated pursuant to State Water Rights Application #20245.	Same as Existing Contract.	**No effect; see operative provisions.**
"Los Vaqueros"	The Los Vaqueros Project, consisting of a storage reservoir and associated facilities to be constructed by CCWD on property owned by the CCWD, to store and convey Los Vaqueros water rights water and CVP water, as well as additional water that CCWD may acquire.	Substantially the same as Existing Contract. Language has been added to indicate Los Vaqueros has been constructed.	**No effect; see operative provisions.**

Table A-1. Summary of Contract Provisions for the CCWD Proposed Long Term Water Service Contract, Contra Costa County, California (from North State Resources, Inc., May 2004)

Provision	Existing Amendatory Contract (1994 – 2010)	Federal Action Proposed Long-Term Water Service Contract Renewal	Effects Analysis
"M&I Full Cost Water Rate"	No Similar Definition.	Full Cost Rate applicable to the delivery of M&I water.	**No effect; see operative provisions.**
"M&I Supplemental Charge"	A charge in addition to the cost of service rate, to be applied to the repayment of the CCWD's allocated share of CVP capital costs by the Contracting Officer.	Same as Existing Contract.	**No effect; see operative provisions.**
Definitions			
"New Facilities"	Short Cut Pipeline located between Contra Costa Canal Milepost 25.70 and Milepost 47.77 and the Pump Units in Pumping Plant 1, 2, 3, and 4 of the Contra Costa Canal System. "Short Cut Pipeline" is the Contra Costa Canal intake, pipeline, pipeline appurtenances, Martinez Reservoir inlet; and "Pump Units" are the pump, motor, motor controls, wiring, structural supports and discharge control apparatus for pumping 100 cubic feet per second (cfs) of water.	Same as Existing Contract.	**No effect; see operative provisions.**
"O&M"	Normal and reasonable care, control, operation, repair, replacement, and maintenance.	Same as Existing Contract.	**No effect; see operative provisions.**
"Project Contractors"	No similar definition.	All parties who have water service contracts for Project Water with the U.S., pursuant to Reclamation law.	**No effect; see operative provisions.**
"Project Works"	The following facilities, as described above: Contra Costa Canal System, Contra Loma Dam and Reservoir, New Facilities, and Lateral Distribution System.	Same as Existing Contract.	**No effect; see operative provisions.**
"Rates"	Payments determined annually by the Contracting Officer in accordance with the then current ratesetting policies for the CVP.	Same as Existing Contract.	**No effect; see operative provisions.**
"Recent Historic Average"	No similar definition.	Most recent 5-year average of the final forecast of Water Made Available to the CCWD pursuant to this or preceding contracts.	**No effect; see operative provisions.**

Table A-1. Summary of Contract Provisions for the CCWD Proposed Long Term Water Service Contract, Contra Costa County, California (from North State Resources, Inc., May 2004)

Provision	Existing Amendatory Contract (1994 – 2010)	Federal Action Proposed Long-Term Water Service Contract Renewal	Effects Analysis
"Secretary" or "Contracting Officer"	The Secretary of the Interior or a duly authorized representative.	Same as Existing Contract, but also adds "or a duly appointed successor".	**__Financial Effect __Administrative Effect ☒ No Effect/__ Effect on Listed Species No substantive change.**
Definitions			
"Tiered Pricing Component"	No similar definition.	Incremental amount to be paid for each AF of Water Delivered as described under "Full Cost Rate."	**☒ Financial Effect ☒ Administrative Effect __No Effect/ ☒ Effect on Listed Species Changes in pricing could result in indirect effects to listed species as a result of subsequent changes in land use.**
"Water Delivered" or "Delivered Water"	No similar definition.	Project Water diverted for use by CCWD at points of delivery approved by the Contracting Officer.	**No effect; see operative provisions.**
"water for irrigation use," or "irrigation water"	Water made available from the CVP that is used primarily in the production of agricultural crops or livestock, including domestic use incidental thereto, and the watering of livestock.	No similar definition.	**No effect. Irrigation water use is not being eliminated, only the type of water is changing.**
"water for M&I use," or "M&I Water"	Water made available from the CVP other than irrigation water. Includes water used for domestic uses/purposes such as watering of landscaping or pasture for animals (e.g., horses) kept for personal use. Assumes use of water delivered to land in units less than or equal to 2 acres to be M&I use, unless CCWD convinces the Contracting Officer that use is for irrigation.	Substantially same as Existing Contract, with the following exception: Assumes use of water delivered to land in units less than or equal to 5 acres to be M&I use.	**☒ Financial Effect ☒ Administrative Effect __No Effect/ ☒ Effect on Listed Species Eliminating irrigation water to parcels from 2 to 5 acres in size could result in indirect effects to listed species as a result of subsequent changes in land use if irrigated lands are taken out of production and converted to urban use.**
"Water Made Available"	No similar definition.	Estimated amount of Project Water that can be delivered to CCWD for the upcoming Year.	**No effect; see operative provisions.**
"Water Scheduled"	No similar definition.	Project Water made available to CCWD for which times and quantities for delivery have been established by CCWD and the Contracting Officer.	**No effect; see operative provisions.**
"Year"	Period of time from and including March 1 of each calendar year through the last day of February of the following calendar year.	Same as Existing Contract.	**No effect; see operative provisions.**

Table A-1. Summary of Contract Provisions for the CCWD Proposed Long Term Water Service Contract, Contra Costa County, California (from North State Resources, Inc., May 2004)

Provision	Existing Amendatory Contract (1994 – 2010)	Federal Action Proposed Long-Term Water Service Contract Renewal	Effects Analysis
Term of Contract – Right to Use of Water	Contract expires on December 31, 2010. Provides for successive renewals, for periods not exceeding 25 years each, under specified conditions.	Assumes that the dates of the Contract shall be determined. Sets forth renewal standards and deadlines. 25-year renewal term for Irrigation Water; 40-year renewal term for M&I Water. Sets forth conditions for renewal, including establishing a water conservation plan and compliance with terms and conditions of the contract. Sets forth conditions for conversion of contract portions to a contract under the Reclamation Project Act of 1939.	**☒ Financial Effect** **☒ Administrative Effect** **__No Effect/ ☒ Effect on Listed Species** **Because the contract term would be increased from 25 to 40 years, less frequent renewals will be required. Less frequent scrutiny for ESA compliance could indirectly affect listed species.**
Water to be Made Available and Delivered to the District	The CCWD is entitled to, and the Contracting Officer shall make available to the CCWD, up to 195,000 AF of CVP water during any Year. Assumes unused CVP water will be put to reasonable beneficial use for CVP purposes, in accordance with applicable state water rights permits and licenses, and the CCWD will operate Los Vaqueros in accordance with applicable state water rights permits and licenses.	Substantially same as Existing Contract, with the following additions: Specifies that 195,000 AF of CVP water will be for M&I purposes. Assumes the Contract Total will not be available to the CCWD in many years. Allows groundwater recharge and banking, surface water storage, and similar programs, subject to certain provisions and approval by the Contracting Officer. Assumes CCWD will comply with relevant Biological Opinions. Provides methods for Contracting Officer to allocate water among Contractors, to approve "pre-use," to approve other purposes of use. Contracting Officer is to make efforts to protect Project water rights and to provide the water made available.	**☒ Financial Effect** **☒ Administrative Effect** **__No Effect/ ☒ Effect on Listed Species** **Eliminating irrigation water delivered to CCWD service area could indirectly affect listed species due to subsequent land use changes if irrigated lands are taken out of production and converted to urban use.**
Time for Delivery of Water	Describes methods for delivering CVP water. The CCWD will submit annual written schedules to the Contracting Officer that show the times, quantities, and points of delivery of CVP water, forecasts of Los Vaqueros operations, and forecasts of the conveyance and use of non-CVP water. The U.S. will provide annual forecasts of CVP operations to the CCWD.	Substantially same as Existing Contract.	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No substantive change.**

Table A-1. Summary of Contract Provisions for the CCWD Proposed Long Term Water Service Contract, Contra Costa County, California (from North State Resources, Inc., May 2004)

Provision	Existing Amendatory Contract (1994 – 2010)	Federal Action Proposed Long-Term Water Service Contract Renewal	Effects Analysis
Points of Delivery and/or Diversion – Measurement – and Responsibility for Distribution of Water	Describes points of delivery and/or diversion of CVP water and Los Vaqueros water rights water in the CCWD, given certain provisions. The U.S. shall not be held responsible for certain activities, as set forth. Describes methods of and locations for installing water measuring and recording devices in the CCWD, and provisions for adjustments and repairs for such devices.	Substantially same as Existing Contract, and adds that CCWD shall not deliver Project Water to land outside the Service Area without written approval from the Contracting Officer.	**__Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor administrative change only.**
Measurement for the Conservation of Water	States that CCWD will measure water delivered for irrigation purposes at each agricultural turnout, and will measure water delivered for M&I purposes at each M&I service connection. Describes purposes of use of measurement data obtained, and provides for annual summary of deliveries to be provided to the Contracting Officer.	Substantially same as Existing Contract, but omits references to 'water for irrigation purposes at each agricultural turnout.'	**☒ Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Measurement of the water will not have an impact on threatened and endangered species.**
Rate and Method of Payment for Water	Assumes payment of cost-of-service rates pursuant to rate-setting policy; payment of rates for first two months of scheduled deliveries with submission of delivery schedule each year; payment before end of month for next succeeding month's deliveries thereafter; assumes payment for charges before end of month following delivery. No provision for tiered pricing.	Assumes payment of rates and charges substantially same as Existing Contract; assumes obligation to pay tiered pricing on same schedule as charges; tiered pricing applies to deliveries over 80% of Contract Total; separate rates apply to deliveries over 80% and deliveries over 90% of the contract total. Specifies that Project Water and Los Vaqueros water rights water shall be considered M&I Water. Tiered pricing does not apply to Los Vaqueros water rights water.	**☒ Financial Effect** **☒ Administrative Effect** **__No Effect/ ☒ Effect on Listed Species** **Changes in the pricing of CVP water could indirectly affect listed species in the CCWD service area through subsequent changes in land use.**
Repayment of Project Works	Assumes costs and rates of interest for project works (Contra Costa Canal System; New Facilities; Contra Loma Dam and Reservoir; lateral distribution system); establishes annual payment schedule, under certain provisions.	Assumes same as Existing Contract.	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No substantive change.**
Non-Interest Bearing Operation and Maintenance Deficits	No similar provision.	Assumes the CCWD has no non-interest bearing O&M deficits and therefore no liability.	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No substantive change.**

Table A-1. Summary of Contract Provisions for the CCWD Proposed Long Term Water Service Contract, Contra Costa County, California (from North State Resources, Inc., May 2004)

Provision	Existing Amendatory Contract (1994 – 2010)	Federal Action Proposed Long-Term Water Service Contract Renewal	Effects Analysis
Sales, Transfers, or Exchanges of Water	Assumes sales, transfers or exchanges with others in accordance with federal and state laws, guidelines and regulations, with prior written approval of Contracting Officer.	Substantially same as Existing Contract; makes express required environmental documentation; assumes Contracting Officer to facilitate historic transfers by providing environmental documentation; establishes rules for qualifying water transfers.	**__Financial Effect** **☒ Administrative Effect** **__No Effect/ ☒ Effect on Listed Species** **Potential beneficial effect to listed species because of the express requirement for environmental documentation.**
CVP Use Power (Existing Contract) or Project Use Power (Proposed Contract)	Assumes the U.S. will furnish the CCWD with appropriate CVP use power to operate necessary facilities for conveying CVP or Los Vaqueros water rights water, and that the U.S. can request the CCWD utilize particular points of diversion, subject to agreement and certain provisions.	Same as Existing Contract.	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No substantive change.**
Adjustments (Existing Contract) or Application of Payment and Adjustments (Proposed Contract)	Assumes refund of overpayment after satisfaction of any accrued indebtedness upon contractor request.	Same as Existing Contract, with minor changes associated with methods described for overpayment including requirement for $1,000 or greater overpayment for refund.	**☒ Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor financial/administrative change only.**
Temporary Reduction – Return Flows	Assumes the U.S. reserves right to return-flows, seepage, and waste that escapes or is discharged beyond contractor boundaries; assumes temporary reductions for operation, maintenance, and rehabilitation of facilities; makes express existing obligation of the U.S. to make CVP water available.	Same as Existing Contract, except that references Contracting Officer as CVP operator, in lieu of United States; excludes non-Project water acquired by CCWD from carriage water costs.	**☒ Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor financial/administrative change only.**
Water Shortage and Apportionment (Existing Contract) or Constraints on the Availability of Water (Proposed Contract)	Assumes obligation of the U.S. to make full supplies of CVP water available; no liability of the U.S. for shortages from specified causes; provides mechanism for apportionment of shortages among existing contractors; no reduction to M&I water unless and until reductions also imposed on irrigation users to prevent undue hardship; defines quantities of CVP water that can legally be withheld from CCWD under regulatory restriction, under water shortage, and under water shortage emergency scenarios.	Assumes obligation of the Contracting Officer to utilize all reasonable means to guard against a condition of shortage; no liability of the U.S. for shortages from specified causes; if shortage occurs, Project Water will be allocated in accordance with the existing Project M&I Water Shortage Policy. CCWD has proposed to maintain the shortage provisions from the Existing Contract.	**__Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor administrative change only**.

Table A-1. Summary of Contract Provisions for the CCWD Proposed Long Term Water Service Contract, Contra Costa County, California (from North State Resources, Inc., May 2004)

Provision	Existing Amendatory Contract (1994 – 2010)	Federal Action Proposed Long-Term Water Service Contract Renewal	Effects Analysis
Existing or Acquired Water or Water Rights	Assumes contract provisions not applicable to non-CVP water or water rights, except as specifically provided.	Same as Existing Contract.	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No substantive change.**
Quality of Water	Assumes operation and maintenance of CVP facilities to enable the U.S. to deliver water in accordance with existing statutory quality standards; no warranty of quality; U.S. not under obligation to furnish water treatment facilities to better the quality of CVP water; no warranty of quality.	Substantially same as Existing Contract, with the following additional provision: O&M of Project Facilities will be performed in such a manner as to maintain the quality of raw water.	**__Financial Effect** **☒ Administrative Effect** **__No Effect/ ☒ Effect on Listed Species** **Potential beneficial effect on listed species if water quality improves or is maintained.**
Water and Air Pollution Control	Assumes that CVP will operate in accordance with all applicable water and air pollution laws and regulations and obtain all required permits or licenses.	Same as Existing Contract.	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No substantive change.**
Operation and Maintenance of Project Works (Existing Contract) or Operation and Maintenance of the Project Works by the Contractor (Proposed Contract)	Assumes the CCWD will operate and maintain facilities at their cost, in compliance with Reclamation laws and contract terms; Contracting Officer may periodically review Project Works O&M to assess facilities; if O&M on all or any part of Project Works is insufficient, the U.S. may take back possession and the O&M of said Work(s) at the CCWD's expense; changes to existing Project Works requires prior written consent of Contracting Officer.	Substantially the same as the Existing Contract.	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No effect.**
Conveyance of Non-CVP Water (Existing Contract) or Water Acquired by the Contractor Other Than From the United States (Proposed Contract)	Assumes the CCWD may use Project Works to convey non-CVP water, under certain conditions.	Similar to Existing Contract, but applicable conditions differ. Assumes that water or water rights now owned or later acquired by CCWD other than from the U.S. may be stored, conveyed, and/or diverted through Project facilities, subject to environmental documentation, with Contracting Officer's approval, if certain conditions are met. This does not apply to Los Vaqueros water rights water.	**☒ Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor financial/administrative change only.**

Table A-1. Summary of Contract Provisions for the CCWD Proposed Long Term Water Service Contract, Contra Costa County, California (from North State Resources, Inc., May 2004)

Provision	Existing Amendatory Contract (1994 – 2010)	Federal Action Proposed Long-Term Water Service Contract Renewal	Effects Analysis
District to Pay Certain Miscellaneous Costs Relating to Project Works (Existing Contract) or Contractor to Pay Certain Miscellaneous Costs (Proposed Contract)	Assumes the CCWD will repay specific direct costs and a percentage of direct costs for administrative and general overhead to the U.S., in accordance with Reclamation policy and procedures.	Substantially same as Existing Contract, with the following exceptions: Assumes the CCWD will also repay specific indirect costs to the U.S., in accordance with Reclamation policy and procedures. Deletes percentage payment for administrative and general overhead costs.	**☒ Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor financial/administrative change only.**
Water Conservation	Assumes compliance with conservation programs established by Reclamation and the state; establishes reporting and evaluation requirements.	Similar to Existing contract, but describes requirements for water conservation and efficiency program in more detail, assumes that if M&I amount delivered equals or exceeds 2,000 AF annually, CCWD will implement Best Management Practices; extends revision period for water conservation plans from 3 to 5 year intervals.	**☒ Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor financial/administrative change only.**
Emergency Reserve Fund	Assumes the CCWD will accumulate and maintain a reserve fund for payment of O&M costs incurred during emergency circumstances; establishes rules for maintaining and using reserve fund.	No similar provision.	**☒ Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor financial/administrative change only.**
Transfer of Title to Project Works	Assumes all rights, title and interest in and to the relevant Project Work(s) will be transferred to CCWD upon repayment of all costs, pending authorization by Congress.	Same as Existing Contract.	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No substantive change.**
Performance of Work with Contributed Funds	Assumes the Contracting Office may accept CCWD funds to finance authorized construction or O&M work on CVP facilities not specifically provided for and for which funds may not be available, subject to certain provisions and upon approval.	Same as Existing Contract.	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No substantive change.**
General Obligation—Benefits Conditioned Upon Payment	Assumes that CCWD has an obligation to pay the U.S. as provided in this contract; payment of Charges must occur before CCWD can receive benefits (i.e., CVP water) under the contract.	Substantially same as Existing Contract, with the following addition: Assumes no requirement for contractor to levy in advance.	**☒ Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor financial/administrative change only.**

Table A-1. Summary of Contract Provisions for the CCWD Proposed Long Term Water Service Contract, Contra Costa County, California (from North State Resources, Inc., May 2004)

Provision	Existing Amendatory Contract (1994 – 2010)	Federal Action Proposed Long-Term Water Service Contract Renewal	Effects Analysis
Compliance with Reclamation Laws	Assumes contract implementation will comply with all provisions of Reclamation law.	Omitted; replaced with "Federal Laws" provision, below.	**__Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor administrative change only.**
Federal Laws	No similar provision.	Assumes CCWD will comply with this Contract unless and until relief from Federal law or regulation is granted by a court; by entering into the Contract, CCWD does not waive its right to contest it.	**__Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor administrative change only.**
Books, Records, and Reports	Assumes that CCWD will establish and maintain accounts and other books and records pertaining to contract administration, provide reports as needed to the Contracting Officer; each party will make their administrative record available for review by the other party.	Assumes same record keeping requirements as Existing Contract; clarifies that only contract-related records will be requested and requires copies to go to Operating Non-Federal Entity.	**__Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor administrative change only.**
Contingent on Appropriation or Allotment of Funds	Expenditure or advance of any money or the performance of any obligation of the U.S. is contingent upon appropriation or allotment of funds; U.S. is not liable if funds are not appropriated or allocated.	Same as Existing Contract.	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No substantive change.**
Rules, Regulations, and Determinations	Delivery of water or use of Federal facilities is subject to Reclamation law; Contracting Officer has the right to make necessary determinations to administer the contract within existing provisions, rules, and laws.	See "Rules and Regulations" and "Opinions and Determinations" Provisions, below.	**__Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor administrative change only.**
Rules and Regulations	See "Rules, Regulations, and Determinations," above.	Same as Existing Contract (Delivery of M&I Water or use of Federal facilities is subject to Reclamation law.)	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No substantive change.**

Table A-1. Summary of Contract Provisions for the CCWD Proposed Long Term Water Service Contract, Contra Costa County, California (from North State Resources, Inc., May 2004)

Provision	Existing Amendatory Contract (1994 – 2010)	Federal Action Proposed Long-Term Water Service Contract Renewal	Effects Analysis
Opinions and Determinations	See "Rules, Regulations, and Determinations," above.	Substantially same as Existing Contract (Contracting Officer has the right to make necessary determinations to administer the contract within existing provisions, rules, and laws.) Assumes the parties to this Contract reserve the right to seek relief from and appropriate adjustment for arbitrary, capricious, or unreasonable opinion or determination in a timely manner.	**__Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor administrative change only.**
Coordination and Cooperation	No similar provision.	Assumes that coordination and cooperation between Contracting Officer and users should be implemented to improve the operation and management of the Project. Provides mechanism for developing coordination process. Parties retain exclusive decision-making authority for determinations by that party.	**__Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor administrative change only.**
Officials Not to Benefit	Officials are not to benefit from this contract other than as would a water user or landowner in the CCWD.	Same as Existing Contract.	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No substantive change.**
Notices	Establishes methods to notice, demand, or request on behalf of the CCWD.	Same as Existing Contract.	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No substantive change.**
Assignment Limited	Assumes that CVP will operate in accordance with existing rules.	Assumes substantially same as Existing Contract.	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No substantive change.**
Severability	No similar provision.	Assumes mechanism to address correction of provision found to be invalid upon legal challenge.	**__Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor administrative change only.**
Resolution of Disputes	No similar provision.	Assumes a dispute resolution process.	**__Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor administrative change only.**

Table A-1. Summary of Contract Provisions for the CCWD Proposed Long Term Water Service Contract, Contra Costa County, California (from North State Resources, Inc., May 2004)

Provision	Existing Amendatory Contract (1994 – 2010)	Federal Action Proposed Long-Term Water Service Contract Renewal	Effects Analysis
Equal Opportunity	Assumes CCWD will operate in accordance with existing rules, regulations, or orders regarding equal opportunity; establishes sanctions or remedies to be invoked in the event of non-compliance.	Same as Existing Contract.	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No substantive change.**
Charges for Delinquent Payments	Establishes procedures and penalties for account delinquency.	Same as Existing Contract.	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No substantive change.**
Compliance with Civil Rights Laws and Regulations	Assumes CCWD will operate in accordance with existing civil rights laws and regulations, as set forth in the contract.	Same as Existing Contract.	**__Financial Effect** **__Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **No substantive change.**
Privacy Act Compliance	Assumes CCWD will comply with the Privacy Act of 1974, as set forth in the contract.	Omitted.	**__Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor administrative change only.**
Confirmation of Contract	Assumes required validation of contract under state law.	Assumes required validation of contract under state law; CCWD will supply the U.S. with pertinent records.	**☒ Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor financial/administrative change only.**
Changes in District's Organization (Existing Contract) or Changes in Contractor's Service Area (Proposed Contract)	Assumes that while this contract is in effect, no change may be made to the CCWD organization except upon written consent of the Contracting Officer to ensure that obligations are met and compliance with certain provisions of Reclamation law.	Assumes that while this contract is in effect, no change may be made to the CCWD service area except upon written consent of the Contracting Officer; establishes methods for processing such a request.	**☒ Financial Effect** **☒ Administrative Effect** **☒ No Effect/__ Effect on Listed Species** **Minor financial/administrative change only.**

M&I Only
R. O. Draft 11/30-2004
Contract No.
I75r-3401A-LTR1

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Central Valley Project, California

LONG-TERM RENEWAL CONTRACT BETWEEN THE UNITED STATES AND CONTRA COSTA WATER DISTRICT PROVIDING FOR PROJECT WATER SERVICE AND FOR FACILITIES REPAYMENT

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Central Valley Project, California

LONG-TERM RENEWAL CONTRACT BETWEEN THE UNITED STATES
AND
CONTRA COSTA WATER DISTRICT
PROVIDING FOR PROJECT WATER SERVICE
AND FOR FACILITIES REPAYMENT

THIS CONTRACT, made this _____ day of _____, 2005, in pursuance generally of the Act of June 17, 1902 (32 Stat. 388), and acts amendatory or supplementary thereto, including, but not limited to, the Acts of August 26, 1937 (50 Stat. 844), as amended and supplemented, August 4, 1939 (53 Stat. 1187), as amended and supplemented, July 2, 1956 (70 Stat. 483), June 21, 1963 (77 Stat. 68), October 12, 1982 (96 Stat. 1263), October 27, 1986 (100 Stat. 3050), as amended, and Title XXXIV of the Act of October 30, 1992 (106 Stat. 4706), all collectively hereinafter referred to as Federal Reclamation law, between THE UNITED STATES OF AMERICA, hereinafter referred to as the United States, and CONTRA COSTA WATER DISTRICT, hereinafter referred to as the Contractor, a public agency of the State of California, duly organized, existing, and acting pursuant to the laws thereof;

WITNESSETH, That:

EXPLANATORY RECITALS

[1st] WHEREAS, the United States has constructed and is operating the Central Valley Project, (Project) California, for diversion, storage, carriage, distribution and beneficial use, for flood control, irrigation, municipal, domestic, industrial, fish and wildlife mitigation, protection and restoration, generation and distribution of electric energy, salinity control, navigation and other beneficial uses, of waters of the Sacramento River, the American River, the Trinity River, and the San Joaquin River and their tributaries; and

[2nd] WHEREAS, the Contractor has constructed the Los Vaqueros Project, that is intended to exclusively serve the Contractor to assist in attaining its goals of providing high quality water to the Contractor customers, while also providing reliability to the Contractor's existing contract water supply during emergencies, droughts or other water shortages; and

[2.1] WHEREAS, it is necessary for the Contractor and the United States to agree on how the Los Vaqueros Project will be utilized in conjunction with Project Water and Project facilities; and

[3rd] WHEREAS, the rights to Project Water were acquired by the United States pursuant to California law for operation of the Project; and

[4th] WHEREAS, the Contractor and the United States entered into Contract No. I75r-3401, on September 18, 1951, which established terms for the delivery to the Contractor of Project Water and for construction and repayment of certain facilities. This contract was amended on November 9, 1970, April 26 1973, May 26, 1994 (hereinafter referred to as Existing Contract), and February 7, 2000.

[4.1] WHEREAS, the United States and the Contractor executed Memorandum of Agreement No. 14-06-200-6072A dated June 28, 1972, and subsequent Amendment 1 dated

May 15, 1995, that requires the Contractor to operate and maintain the Contra Costa Canal System and Contra Loma Dam and Reservoir; and

[5th] WHEREAS, the United States and the Contractor have, pursuant to Subsection 3404 (c) (3) of the Central Valley Project Improvement Act (CVPIA), subsequently entered into a binding agreement, identified as Binding Agreement No. I75r-3401-BA, and Supplemental Agreement No. I75r-3401-SA, which sets out the terms pursuant to which the Contractor agreed to renew the Existing Contract before its expiration date after completion of a programmatic environmental impact statement (PEIS) and other appropriate environmental documentation and negotiation of a renewal contract, and which also sets out the consequences of a subsequent decision not to renew; and

[6th] WHEREAS, Section 3404(c) of the CVPIA provides for long-term renewal of the Existing Contract following completion of appropriate environmental documentation, including a PEIS pursuant to the National Environmental Policy Act (NEPA) analyzing the direct and indirect impacts and benefits of implementing the CVPIA and the potential renewal of all existing contracts for Project Water; and

[7th] WHEREAS, the United States has completed the PEIS and all other appropriate environmental review necessary to provide for long-term renewal of the Existing Contract; and

[8th] WHEREAS, the Contractor has requested the long-term renewal of the Existing Contract, pursuant to the terms of the Existing Contract, Federal Reclamation law, and the laws of the State of California, for water service from the Project; and

[9th] WHEREAS, the United States has determined that the Contractor has fulfilled all of its obligations under the Existing Contract; and

[10th] WHEREAS, the Contractor has demonstrated to the satisfaction of the Contracting Officer that the Contractor has utilized the Project Water supplies available to it for reasonable and beneficial use and/or has demonstrated projected future demand for water use such that the Contractor has the capability and expects to utilize fully for reasonable and beneficial use the quantity of Project Water to be made available to it pursuant to this Contract; and

[11th] WHEREAS, water obtained from the Project has been relied upon by urban areas within California for more than 50 years, and is considered by the Contractor as an essential portion of its water supply; and

[12th] WHEREAS, the economies of regions within the Project, including the Contractor's, depend upon the continued availability of water, including water service from the Project; and

[13th] WHEREAS, in the CALFED Programmatic Record of Decision, dated August 28, 2000, the United States and the State of California adopted a general target of continuously improving Delta water quality for all uses. The CALFED Agencies' target for providing safe, reliable, and affordable drinking water in a cost-effective way, is to achieve either: (a) average concentrations at Clifton Forebay and other southern and central Delta drinking water intakes of 50 ug/L bromide and 3.0 mg/L total organic carbon, or (b) an equivalent level of public health protection using a cost-effective combination of alternative source waters, source control and treatment technologies; and

[14th] WHEREAS, the Secretary intends through coordination, cooperation, and partnerships to pursue measures to improve water supply, water quality, and reliability of the Project for all Project purposes; and

[15th] WHEREAS, the mutual goals of the United States and the Contractor include: to provide for reliable Project Water supplies; to control costs of those supplies; to achieve repayment of the Project as required by law; to guard reasonably against Project Water shortages; to achieve a reasonable balance among competing demands for use of Project Water; and to comply with all applicable environmental statutes, all consistent with the legal obligations of the United States relative to the Project; and

[16th] WHEREAS, the parties intend by this Contract to develop a more cooperative relationship in order to achieve their mutual goals; and

[17th] WHEREAS, the United States and the Contractor are willing to enter into this Contract pursuant to Federal Reclamation law on the terms and conditions set forth below;

NOW, THEREFORE, in consideration of the mutual and dependent covenants herein contained, it is hereby mutually agreed by the parties hereto as follows:

DEFINITIONS

1. When used herein unless otherwise distinctly expressed, or manifestly incompatible with the intent of the parties as expressed in this Contract, the term:

(a) "Calendar Year" shall mean the period January 1 through December 31, both dates inclusive;

(b) "Charges" shall mean the payments required by Federal Reclamation law in addition to the Rates and Tiered Pricing Component specified in this Contract as determined annually by the Contracting Officer pursuant to this Contract;

(c) "Condition of Shortage" shall mean a condition respecting the Project during any Year such that the Contracting Officer is unable to deliver sufficient water to meet the Contract Total;

(c.1) "Contra Costa Canal System" shall mean the Contra Costa Canal, including the intake channel from Rock Slough, Clayton, and Ygnacio Relift Canals and pumping plants, the Martinez Reservoir and Pumping Plants 1, 2, 3, and 4, and such other facilities as may be authorized by Congress from time to time for rehabilitation or replacement thereof;

(c.2) "Contra Loma Dam and Reservoir" shall mean the dam, pumping plant, and reservoir constructed as an addition to the Contra Costa Canal System;

(d) "Contracting Officer" shall mean the Secretary of the Interior's duly authorized representative acting pursuant to this Contract or applicable Federal Reclamation law or regulation;

(e) "Contract Total" shall mean the maximum amount of water to which the Contractor is entitled under subdivision (a) of Article 3 of this Contract;

(f) "Contractor's Service Area" shall mean the area to which the Contractor is permitted to provide Project Water under this Contract as described in Exhibit "A" attached hereto, which may be modified from time to time in accordance with Article 35 of this Contract without amendment of this Contract;

(g) "CVPIA" shall mean the Central Valley Project Improvement Act, Title XXXIV of the Act of October 30, 1992 (106 Stat. 4706);

(h-i) Omitted

(j) "Full Cost Rate" shall mean an annual rate, as determined by the Contracting Officer that shall amortize the expenditures for construction properly allocable to the Project irrigation or M&I functions, as appropriate, of facilities in service including all O&M deficits funded, less payments, over such periods as may be required under Federal Reclamation

law, or applicable contract provisions. Interest will accrue on both the construction expenditures and funded O&M deficits from October 12, 1982, on costs outstanding at that date, or from the date incurred in the case of costs arising subsequent to October 12, 1982, and shall be calculated in accordance with subsections 202(3)(B) and (3)(C) of the RRA. The Full Cost Rate includes actual operation, maintenance, and replacement costs consistent with Section 426.2 of the Rules and Regulations for the RRA;

(k - 1) Omitted;

(m) "Irrigation Water" shall mean water made available from the Project that is used primarily in the production of agricultural crops or livestock, including domestic use incidental thereto, and watering of livestock;

(n) Omitted;

(n.1) "Lateral Distribution System" shall mean the water conveyance system constructed by the United States which consists of pipelines extending to Contractor's water users from the Contra Costa Canal at milepost 5.3, 6.2, 7.1, 7.3, 9.1, 14.0, 25.6, 36.6, and Y-2-6;

(n.2) "Los Vaqueros" shall mean the Los Vaqueros Project consisting of a storage reservoir and associated facilities constructed by the Contractor on property which is owned by the Contractor, and in which the United States has no legal interest, to store and convey Los Vaqueros Water Rights Water and Project Water as well as additional water that may be acquired by the Contractor;

(n.3) "Los Vaqueros Water Rights Water" shall mean that water appropriated pursuant to State Water Rights Application 20245 (Permit 20749), which is in addition to Project Water;

(o) "Municipal and Industrial (M&I) Water" shall mean Project Water, other than Irrigation Water, made available to the Contractor. M&I Water shall include water used for human use and purposes such as the watering of landscaping or pasture for animals (e.g., horses) which are kept for personal enjoyment or water delivered to landholdings operated in units of less than five acres unless the Contractor establishes to the satisfaction of the Contracting Officer that the use of water delivered to any such landholding is a use described in subdivision (m) of this Article;

(p) "M&I Full Cost Water Rate" shall mean the Full Cost Rate (applicable to the delivery of M&I Water;

(p.1) "New Facilities" shall mean the Short Cut Pipeline located between Contra Costa Canal at milepost 25.70 and at milepost 47.77 and the Pump Units in Pumping Plant 1, 2, 3, and 4 of the Contra Costa Canal System;

(1) "Pump Units" shall mean the pump, motor, motor controls, wiring, structural supports and discharge control apparatus for pumping 100 cubic feet per second ("cfs") of water; and

(2) "Short Cut Pipeline" shall mean the Contra Costa Canal intake, pipeline, pipeline appurtenances, Martinez Reservoir inlet;

(q) "Operation and Maintenance" or "O&M" shall mean normal and reasonable care, control, operation, repair, replacement (other than capital replacement), and maintenance of Project facilities;

(r) Omitted.

(s) "Project" shall mean the Central Valley Project owned by the United States and managed by the Department of the Interior, Bureau of Reclamation;

(t) "Project Contractors" shall mean all parties who have water service contracts for Project Water from the Project with the United States pursuant to Federal Reclamation law;

(u) "Project Water" shall mean all water that is developed, diverted, stored, or delivered by the Secretary in accordance with the statutes authorizing the Project and in accordance with the terms and conditions of water rights acquired pursuant to California law;

(u.1) "Project Works" shall mean all those facilities defined in subsections (c.1), (c.2), (n.1), and (p.1) of this Article;

(v) "Rates" shall mean the payments determined annually by the Contracting Officer in accordance with the then current applicable water ratesetting policies for the Project, as described in subdivision (a) of Article 7 of this Contract;

(w) "Recent Historic Average" shall mean the most recent five-year average of the final forecast of Water Made Available to the Contractor pursuant to this Contract or its preceding contract(s);

(x) "Secretary" shall mean the Secretary of the Interior, a duly appointed successor, or an authorized representative acting pursuant to any authority of the Secretary and through any agency of the Department of the Interior;

(y) "Tiered Pricing Component" shall be the incremental amount to be paid for each acre-foot of Water Delivered as described in subdivision (j) of Article 7 of this Contract;

(z) "Water Delivered" or "Delivered Water" shall mean Project Water diverted for use by the Contractor at the point(s) of delivery approved by the Contracting Officer;

(aa) "Water Made Available" shall mean the estimated amount of Project Water that can be delivered to the Contractor for the upcoming Year as declared by the Contracting Officer, pursuant to subdivision (a) of Article 4 of this Contract;

(bb) "Water Scheduled" shall mean Project Water made available to the Contractor for which times and quantities for delivery have been established by the Contractor and Contracting Officer, pursuant to subdivision (b) of Article 4 of this Contract; and

(cc) "Year" shall mean the period from and including March 1 of each Calendar Year through the last day of February of the following Calendar Year.

TERM OF CONTRACT

2. (a) This Contract shall be effective March 1, 2005, through February 28, 2045. This Contract when effective supersedes the Existing Contract. In the event the Contractor wishes to renew this Contract beyond February 28, 2045, the Contractor shall submit a request for renewal in writing to the Contracting Officer no later than two years prior to the date this Contract expires.

(b) Omitted;

(c) This Contract shall be renewed for successive periods of up to 40 years each, which periods shall be consistent with the then-existing Reclamation-wide policy, under terms and conditions mutually agreeable to the parties and consistent with Federal and State law. The Contractor shall be afforded the opportunity to comment to the Contracting Officer on the proposed adoption and application of any revised policy applicable to the delivery of M&I Water that would limit the term of any subsequent renewal contract with the Contractor for the furnishing of M&I Water to less than 40 years.

(d) The Contracting Officer shall make a determination ten years after the date of execution of this Contract and every five years thereafter during the term of this Contract of whether a conversion of this Contract to a contract under subsection 9 (c)(1) of the Reclamation Project Act of 1939 can be accomplished. The Contracting Officer anticipates that during the term of this Contract, all authorized Project construction expected to occur will have occurred, and on that basis the Contracting Officer agrees upon such completion to allocate all costs that are properly assignable to the Contractor, and agrees further that, at any time after such allocation is made, and subject to satisfaction of the condition set out in this subdivision this Contract shall, at the request of the Contractor, be converted to a contract under said subsection (c)(1) of Section 9, is applicable of the Reclamation Project Act of 1939, subject to applicable Federal law and under stated terms and conditions mutually agreeable to the Contractor and the Contracting Officer. A condition for such conversion to occur shall be a determination by the Contracting Officer that, account being taken of the amount credited to return by the Contractor as provided for under Federal Reclamation law, the remaining amount of construction costs assignable for ultimate return by the Contractor can probably be repaid to the United States within the term of a contract under said subsection (c) (1) of Section 9. If the remaining amount of costs that are properly assignable to the Contractor cannot be determined during the term of this Contract, the Contracting Officer shall notify the Contractor, and provide the reason(s) why such a determination could not be made. Further, the Contracting Officer shall make such a determination as soon thereafter as possible so as to permit, upon request of the Contractor and satisfaction of the conditions set out above, conversion to a contract under said subsection (c)(1) of Section 9. In the event such determination of costs has not been made at a time which allows conversion of this Contract during the term of this Contract or the Contractor has not requested

conversion of this Contract within such term, the parties shall incorporate in any subsequent renewal contract as described in subdivision (b) of this Article a provision that carries forth in substantially identical terms the provisions of this subdivision.

WATER TO BE MADE AVAILABLE AND DELIVERED TO THE CONTRACTOR

3. (a) During each Year, consistent with all applicable State water rights, permits, and licenses; Federal law; and subject to the provisions set forth in Articles 11 and 12 of this Contract, the Contracting Officer shall make available for delivery to the Contractor 195,000 acre-feet of Project Water for M&I purposes. Water Delivered to the Contractor in accordance with this subdivision shall be scheduled and paid for pursuant to the provisions of Articles 4 and 7 of this Contract.

(b) Because the capacity of the Project to deliver Project Water has been constrained in recent years and may be constrained in the future due to many factors including hydrologic conditions and implementation of Federal and State laws, the likelihood of the Contractor actually receiving the amount of Project Water set out in subdivision (a) of this Article in any given Year is uncertain. The Contracting Officer's most recent modeling referenced in the PEIS projected that the Contract Total set forth in this Contract will not be available to the Contractor in many years. During the most recent five years, the Recent Historic Average of Water Made Available to the Contractor was 152,100 acre-feet. Nothing in subdivision (b) of this Article shall affect the rights and obligations of the parties under any provision of this Contract.

(c) The Contractor shall utilize the Project Water in accordance with all applicable legal requirements.

(d) The Contractor shall make reasonable and beneficial use of all Project Water and other water furnished pursuant to subdivision (f) of this Article. Groundwater recharge programs (direct, indirect, or in lieu), groundwater banking programs, surface water storage programs, and other similar programs utilizing Project Water or other water furnished pursuant to this Contract conducted within the Contractor's Service Area which are consistent with applicable State law and result in use consistent with Federal Reclamation law will be allowed; Provided, That any direct recharge program(s) is (are) described in the Contractor's Water Conservation Plan submitted pursuant to Article 26 of this Contract; Provided, further, That such Water Conservation Plan demonstrates sufficient lawful uses exist in the Contractor's Service Area so that using a long-term average, the quantity of Delivered Water is demonstrated to be reasonable for such uses and in compliance with Federal Reclamation law. Groundwater recharge programs, groundwater banking programs, surface water storage programs, and other similar programs utilizing Project Water or other water furnished pursuant to this Contract conducted outside the Contractor's Service Area may be permitted upon written approval of the Contracting Officer, which approval will be based upon environmental documentation, Project Water rights, and Project operational concerns. The Contracting Officer will address such concerns in regulations, policies, or guidelines.

(e) The Contractor shall comply with requirements applicable to the Contractor in biological opinion(s) prepared as a result of a consultation regarding the execution of this Contract undertaken pursuant to Section 7 of the Endangered Species Act of 1973 (ESA), as amended, that are within the Contractor's legal authority to implement. The Existing Contract, which evidences in excess of 50 years of diversions for irrigation and/or M&I purposes of the quantities of water provided in subdivision (a) of Article 3 of this Contract, will be

considered in developing an appropriate baseline for biological assessment(s) prepared pursuant to the ESA, and any other needed environmental review. Nothing herein shall be construed to prevent the Contractor from challenging or seeking judicial relief in a court of competent jurisdiction with respect to any biological opinion or other environmental documentation referred to in this Article.

(f) Following the declaration of Water Made Available under Article 4 of this Contract, the Contracting Officer will make a determination whether Project Water, or other water available to the Project, can be made available to the Contractor in addition to the Contract Total under this Article during the Year without adversely impacting other Project Contractors. At the request of the Contractor, the Contracting Officer will consult with the Contractor prior to making such a determination. If the Contracting Officer determines that Project Water, or other water available to the Project, can be made available to the Contractor, the Contracting Officer will announce the availability of such water and shall so notify the Contractor as soon as practical. The Contracting Officer will thereafter meet with the Contractor and other Project Contractors capable of taking such water to determine the most equitable and efficient allocation of such water. If the Contractor requests the delivery of any quantity of such water, the Contracting Officer shall make such water available to the Contractor in accordance with applicable statutes, regulations, guidelines, and policies.

(g) The Contractor may request permission to reschedule for use during the subsequent Year some or all of the Water Made Available to the Contractor during the current Year, referred to as "rescheduled water." The Contractor may request permission to use during the current Year, a quantity of Project Water which may be made available by the United States to the Contractor during the subsequent Year referred to as "preuse." The Contracting Officer's

written approval may permit such uses in accordance with applicable statutes, regulations, guidelines, and policies.

(h) The Contractor's right pursuant to Federal Reclamation law and applicable State law to the reasonable and beneficial use of Water Delivered pursuant to this Contract during the term thereof and any subsequent renewal contracts, as described in Article 2 of this Contract, during the terms thereof shall not be disturbed so long as the Contractor shall fulfill all of its obligations under this Contract and any renewals thereof. Nothing in the preceding sentence shall affect the Contracting Officer's ability to impose shortages under Article 11 or subdivision (b) of Article 12 of this Contract or applicable provisions of any subsequent renewal contracts.

(i) Project Water furnished to the Contractor pursuant to this Contract may be delivered for purposes other than those described in subdivision (o) of Article 1 of this Contract upon written approval by the Contracting Officer in accordance with the terms and conditions of such approval.

(j) The Contracting Officer shall make reasonable efforts to protect the water rights necessary for the Project and to provide the water available under this Contract. The Contracting Officer shall not object to participation by the Contractor, in the capacity and to the extent permitted by law, in administrative proceedings related to the Project Water rights; Provided, That the Contracting Officer retains the right to object to the substance of the Contractor's position in such a proceeding; Provided further, That in such proceedings the Contracting Officer shall recognize the Contractor has a legal right under the terms of this Contract to use Project Water.

TIME FOR DELIVERY OF WATER

4. (a) On or about February 20 of each Calendar Year, the Contracting Officer shall announce the Contracting Officer's expected declaration of the Water Made Available. Such declaration will be expressed in terms of both Water Made Available and the Recent Historic Average and will be updated monthly, and more frequently if necessary, based on then-current operational and hydrologic conditions and a new declaration with changes, if any, to the Water Made Available will be made. The Contracting Officer shall provide forecasts of Project operations and the basis of the estimate, with relevant supporting information, upon the written request of the Contractor. Concurrently with the declaration of the Water Made Available, the Contracting Officer shall provide the Contractor with the updated Recent Historic Average.

(b) On or before each March 1 and at such other times as necessary, the Contractor shall submit to the Contracting Officer a written schedule, satisfactory to the Contracting Officer, showing the monthly quantities of Project Water to be delivered by the United States to the Contractor pursuant to this Contract for the Year commencing on such March 1. The Contracting Officer shall use all reasonable means to deliver Project Water according to the approved schedule for the Year commencing on such March 1.

(c) The Contractor shall not schedule Project Water in excess of the quantity of Project Water the Contractor intends to put to reasonable and beneficial use within the Contractor's Service Area or to sell, transfer, or exchange pursuant to Article 9 of this Contract during any Year.

(d) Subject to the conditions set forth in subdivision (a) of Article 3 of this Contract, the United States shall deliver Project Water to the Contractor in accordance with the initial schedule submitted by the Contractor pursuant to subdivision (b) of this Article, or any

written revision(s), satisfactory to the Contracting Officer, thereto submitted within a reasonable time prior to the date(s) on which the requested change(s) is/are to be implemented.

POINT OF DIVERSION AND RESPONSIBILITY FOR DISTRIBUTION OF WATER

5. (a) Project Water scheduled pursuant to subdivision (b) of Article 4 of this Contract shall be delivered to the Contractor at Rock Slough at the intake of Pumping Plant 1 of the Contra Costa Canal System or in the Sacramento-San Joaquin Delta at the intake and any additional point or points of delivery either on Project facilities or another location or locations mutually agreed to in writing by the Contracting Officer and the Contractor. Such deliveries at the Sacramento-San Joaquin Delta may be made at the intake to the Tracy Pumping Plant of the Project at Old River, the intake of the State Water Project to Clifton Court at Old River and/or the intake to Los Vaqueros at Old River. Los Vaqueros Water Rights Water shall be delivered and/or diverted in the Sacramento-San Joaquin Delta. Said point(s) of delivery and/or diversion of Project Water and Los Vaqueros Water Rights Water shall be subject to change by written agreements of the parties hereto: Provided, That such change(s) is/are consistent with the applicable state water right permit(s) or license(s) as they may be amended or modified. The United States shall not be obligated to construct additional facilities for the delivery and/or diversion of water under this Contract.

(b) Omitted.

(c) The Contractor shall not deliver Project Water to land outside the Contractor's Service Area unless approved in advance by the Contracting Officer.

(d) All Water Delivered to the Contractor pursuant to this Contract shall be measured and recorded with equipment furnished, installed, operated, and maintained by the United States, or the Contractor at the point or points of delivery established pursuant to

subdivision (a) of this Article. Upon the request of either party to this Contract, the Contracting Officer or the Contractor shall investigate the accuracy of such measurements and shall take any necessary steps to adjust any errors appearing therein. For any period of time when accurate measurements have not been made, the Contracting Officer shall consult with the Contractor prior to making a final determination of the quantity delivered for that period of time.

(e) The Contracting Officer shall not be responsible for the control, carriage, handling, use, disposal, or distribution of Water Delivered to the Contractor pursuant to this Contract beyond the delivery points specified in subdivision (a) of this Article. The Contractor shall indemnify the United States, its officers, employees, agents, and assigns on account of damage or claim of damage of any nature whatsoever for which there is legal responsibility, including property damage, personal injury, or death arising out of or connected with the control, carriage, handling, use, disposal, or distribution of such Water Delivered beyond such delivery points, except for any damage or claim arising out of: (i) acts or omissions of the Contracting Officer or any of its officers, employees, agents, or assigns, with the intent of creating the situation resulting in any damage or claim; (ii) willful misconduct of the Contracting Officer or any of its officers, employees, agents, or assigns; (iii) negligence of the Contracting Officer or any of its officers, employees, agents, or assigns; or (iv) damage or claims resulting from a malfunction of facilities owned and/or operated by the United States; Provided, That the Contractor is not the entity that owned or operated the malfunctioning facility(ies) from which the damage claim arose.

(f) Water diverted by the Contractor pursuant to this Contract shall be measured and recorded by the Contractor for each of the points set forth below through measuring and recording devices, acceptable to the Contracting Officer: Provided, The parties

thereto, may agree in writing that such points and/or method of water measurement may be changed or added to. Except for Rock Slough at the intake of Pumping Plant 1, the Contractor shall O&M each of the measuring and recording devices at no cost to the United States. The Contractor shall install all measuring and recording devices:

(1) At the intake to Pumping Plant 1 of the Contra Costa Canal System;

(2) At the Los Vaqueros intake in Old River;

(3) At the intake to the Los Vaqueros storage reservoir; and

(4) At the point at which the Los Vaqueros Water Rights Water and Project Water diverted from other than Rock Slough are introduced into the Contra Costa Canal System from Los Vaqueros;

(g) The Contractor shall measure or compute and record daily, or at such other intervals as may be agreed upon in writing by the parties, and provide to the United States on or before the 20th day of each month following the month in which the measurement or computation was made the rates and quantities associated with the following:

(1) Diversion of Project Water at Rock Slough;

(2) Diversion of Project Water from Old River for direct use;

(3) Diversion of Los Vaqueros Water Rights Water to storage in Los Vaqueros storage reservoir;

(4) Diversion of Project Water to storage in Los Vaqueros storage reservoir;

(5) Diversion to storage in Contra Loma Dam and Reservoir;

(6) Withdrawal of Project Water from Los Vaqueros storage reservoir;

(7) Withdrawal of Los Vaqueros Water Rights Water from Los Vaqueros storage reservoir;

(8) Withdrawal of water from Contra Loma Dam and Reservoir for delivery to the East Bay Regional Park District pursuant to Contract No. 4-06-200-6023A, dated September 18, 1972, as amended on November 29, 1977;

(9) Withdrawal of water from Contra Loma Dam and Reservoir for purposes other than that specified in subdivision (g)(8) above; and

(10) Total M&I water distributed.

MEASUREMENT OF WATER WITHIN THE CONTRACTOR'S SERVICE AREA

6. (a) The Contractor has established a measuring program satisfactory to the Contracting Officer. The Contractor shall ensure that all surface water delivered for M&I purposes within the Contractor's Service Area is measured at each M&I service connection. The water measuring devices or water measuring methods of comparable effectiveness must be acceptable to the Contracting Officer. The Contractor shall be responsible for installing, operating, and maintaining and repairing all such measuring devices and implementing all such water measuring methods at no cost to the United States. The Contractor shall use the information obtained from such water measuring devices or water measuring methods to ensure its proper management of the water, to bill water users for water delivered by the Contractor; and, if applicable, to record water delivered for M&I purposes by customer class as defined in the Contractor's water conservation plan provided for in Article 26 of this Contract. Nothing herein contained, however, shall preclude the Contractor from establishing and collecting any charges, assessments, or other revenues authorized by California law. The Contractor shall

include a summary of all its annual surface water deliveries in the annual report described in subdivision (c) of Article 26.

(b) To the extent the information has not otherwise been provided, upon execution of this Contract, the Contractor shall provide to the Contracting Officer a written report describing the measurement devices or water measuring methods being used or to be used to implement subdivision (a) of this Article and identifying the M&I service connections or alternative measurement programs approved by the Contracting Officer, at which such measurement devices or water measuring methods are being used, and, if applicable, identifying the locations at which such devices and/or methods are not yet being used including a time schedule for implementation at such locations. The Contracting Officer shall advise the Contractor in writing within 60 days as to the adequacy and necessary modifications, if any, of the measuring devices or water measuring methods identified in the Contractor's report and if the Contracting Officer does not respond in such time, they shall be deemed adequate. If the Contracting Officer notifies the Contractor that the measuring devices or methods are inadequate, the parties shall within 60 days following the Contracting Officer's response, negotiate in good faith the earliest practicable date by which the Contractor shall modify said measuring devices and/or measuring methods as required by the Contracting Officer to ensure compliance with subdivision (a) of this Article.

(c) All new surface water delivery systems installed within the Contractor's Service Area after the effective date of this Contract shall also comply with the measurement provisions described in subdivision (a) of this Article.

(d) The Contractor shall inform the Contracting Officer and the State of California in writing by April 30 of each Year of the monthly volume of surface water delivered within the Contractor's Service Area during the previous Year.

(e) Omitted.

RATES AND METHOD OF PAYMENT FOR WATER

7. (a) The Contractor shall pay the United States as provided in this Article for all Delivered Water at Rates, Charges, and the Tiered Pricing Component established in accordance with: (i) the Secretary's then-existing Project ratesetting policy for M&I Water. Such ratesetting policies shall be amended, modified, or superseded only through a public notice and comment procedure; (ii) applicable Federal Reclamation law and associated rules and regulations, or policies; and (iii) other applicable provisions of this Contract. Payments shall be made by cash transaction, electronic funds transfer, or any other mechanism as may be agreed to in writing by the Contractor and the Contracting Officer. The Rates, Charges, and Tiered Pricing Component applicable to the Contractor upon execution of this Contract are set forth in Exhibit "B," as may be revised annually.

(a.1) The payment to be made by the Contractor for Los Vaqueros Water Rights Water and Project Water Made Available to it pursuant to this Contract shall be the applicable Rates and Charges determined annually in accordance with the applicable Federal law and associated regulations.

(b) The Contracting Officer shall notify the Contractor of the Rates, Charges, and Tiered Pricing Component as follows:

(1) Prior to July 1 of each Calendar Year, the Contracting Officer shall provide the Contractor an estimate of the Charges for Project Water that will be applied to the

period October 1, of the current Calendar Year, through September 30, of the following Calendar Year, and the basis for such estimate. The Contractor shall be allowed not less than two months to review and comment on such estimates. On or before September 15 of each Calendar Year, the Contracting Officer shall notify the Contractor in writing of the Charges to be in effect during the period October 1 of the current Calendar Year, through September 30, of the following Calendar Year, and such notification shall revise Exhibit "B."

(2) Prior to October 1 of each Calendar Year, the Contracting Officer shall make available to the Contractor an estimate of the Rates and Tiered Pricing Components for Project Water for the following Year and the computations and cost allocations upon which those Rates are based. The Contractor shall be allowed not less than two months to review and comment on such computations and cost allocations. By December 31 of each Calendar Year, the Contracting Officer shall provide the Contractor with the final Rates and Tiered Pricing Components to be in effect for the upcoming Year, and such notification shall revise Exhibit "B."

(c) At the time the Contractor submits the initial schedule for the delivery of Project Water for each Year pursuant to subdivision (b) of Article 4 of this Contract, the Contractor shall make an advance payment to the United States equal to the total amount payable pursuant to the applicable Rate(s) set under subdivision (a) of this Article, for the Project Water scheduled to be delivered pursuant to this Contract during the first two calendar months of the Year. Before the end of the first month and before the end of each calendar month thereafter, the Contractor shall make an advance payment to the United States, at the Rate(s) set under subdivision (a) of this Article, for the Water Scheduled to be delivered pursuant to this Contract during the second month immediately following. Adjustments between advance payments for

Water Scheduled and amounts due for Water Delivered shall be made before the end of the following month; Provided, That any revised schedule submitted by the Contractor pursuant to Article 4 of this Contract which increases the amount of Water Delivered pursuant to this Contract during any month shall be accompanied with appropriate advance payment, at the Rates then in effect, to assure that Project Water is not delivered to the Contractor in advance of such payment. In any month in which the quantity of Water Delivered to the Contractor pursuant to this Contract equals the quantity of Water Scheduled and paid for by the Contractor, no additional Project Water shall be delivered to the Contractor unless and until an advance payment at the Rates then in effect for such additional Project Water is made. Final adjustment between the advance payments for the Water Scheduled and payments for the quantities of Water Delivered during each Year pursuant to this Contract shall be made as soon as practicable but no later than April 30th of the following Year, or 60 days after the delivery of Project Water rescheduled under subdivision (g) of Article 3 of this Contract if such water is not delivered by the last day of February.

(d) The Contractor shall also make a payment in addition to the Rate(s) in subdivision (c) of this Article to the United States for Water Delivered, at the Charges and the appropriate Tiered Pricing Component then in effect, before the end of the month following the month of delivery. The payments shall be consistent with the quantities of M&I Water Delivered as shown in the water delivery report for the subject month prepared by the Contractor. The water delivery report shall be deemed a bill for the payment of Charges and the applicable Tiered Pricing Component for Water Delivered. Adjustment for overpayment or underpayment of Charges shall be made through the adjustment of payments due to the United States for Charges

for the next month. Any amount to be paid for past due payment of Charges and the Tiered Pricing Component shall be computed pursuant to Article 20 of this Contract.

(e) The Contractor shall pay for any Water Delivered under subdivision (a), (f), or (g) of Article 3 of this Contract as determined by the Contracting Officer pursuant to applicable statutes, associated regulations, any applicable provisions of guidelines or ratesetting policies; Provided, That the Rates for Water Delivered under subdivision (f) of Article 3 of this Contract shall be no more than the otherwise applicable Rates for M&I Water under subdivision (a) of this Article.

(f) Payments to be made by the Contractor to the United States under this Contract may be paid from any revenues available to the Contractor.

(g) All revenues received by the United States from the Contractor relating to the delivery of Project Water or the delivery of non-Project water through Project facilities shall be allocated and applied in accordance with Federal Reclamation law and the associated rules or regulations, and the then-current Project ratesetting policies for M&I Water.

(h) The Contracting Officer shall keep its accounts pertaining to the administration of the financial terms and conditions of its long-term contracts, in accordance with applicable Federal standards, so as to reflect the application of Project costs and revenues. The Contracting Officer shall, each Year upon request of the Contractor, provide to the Contractor a detailed accounting of all Project and Contractor expense allocations, the disposition of all Project and Contractor revenues, and a summary of all water delivery information. The Contracting Officer and the Contractor shall enter into good faith negotiations to resolve any discrepancies or disputes relating to accountings, reports, or information.

(i) The parties acknowledge and agree that the efficient administration of this Contract is their mutual goal. Recognizing that experience has demonstrated that mechanisms, policies, and procedures used for establishing Rates, Charges, and Tiered Pricing Components, and/or for making and allocating payments, other than those set forth in this Article may be in the mutual best interest of the parties, it is expressly agreed that the parties may enter into agreements to modify the mechanisms, policies, and procedures for any of those purposes while this Contract is in effect without amending this Contract.

(j) (1) Beginning at such time as deliveries of Project Water in a Year exceed 80 percent of the Contract Total, then before the end of the month following the month of delivery the Contractor shall make an additional payment to the United States equal to the applicable Tiered Pricing Component. The Tiered Pricing Component for the amount of Water Delivered in excess of 80 percent of the Contract Total, but less than or equal to 90 percent of the Contract Total, shall equal one-half of the difference between the Rates established under subdivision (a) of this Article and the M&I Full Cost Water Rate. The Tiered Pricing Component for the amount of Water Delivered which exceeds 90 percent of the Contract Total shall equal the difference between (i) the Rates established under subdivision (a) of this Article and (ii) M&I Full Cost Water Rate.

(2) Omitted.

(3) For purposes of determining the applicability of the Tiered Pricing Components pursuant to this Article, Water Delivered shall include Project Water that the Contractor transfers to others but shall not include Project Water transferred to the Contractor, nor shall it include the additional water provided to the Contractor under the provisions of subdivision (f) of Article 3 of this Contract.

(4) The Tiered Pricing Component does not apply to Los Vaqueros Water Rights Water.

(k) For the term of this Contract, Rates applied under the respective ratesetting policies will be established to recover only reimbursable O&M (including any deficits) and capital costs of the Project, as those terms are used in the then-current Project ratesetting policies, and interest, where appropriate, except in instances where minimum Rates are applicable in accordance with the relevant Project ratesetting policy. Changes of significance in practices which implement the Contracting Officer's ratesetting policies will not be implemented until the Contracting Officer has provided the Contractor an opportunity to discuss the nature, need, and impact of the proposed change.

(l) Except as provided in subsections 3405(a)(1)(B) and 3405(f) of the CVPIA, the Rates for Project Water transferred by the Contractor shall be the Contractor's Rates adjusted upward or downward to reflect the changed costs, if any, incurred by the Contracting Officer in the delivery of the transferred Project Water to the transferee's point of delivery in accordance with the then applicable Project ratesetting policy.

(m) Omitted.

(n) With respect to the Rates for M&I water, the Contractor asserts that it is not legally obligated to pay any Project deficits claimed by the United States to have accrued as of the date of this Contract or deficit-related interest charges thereon. By entering into this Contract, the Contractor does not waive any legal rights or remedies that it may have with respect to such disputed issues. Notwithstanding the execution of this Contract and payments made hereunder, the Contractor may challenge in the appropriate administrative or judicial forums; (1) the existence, the computation, or imposition of any deficit charges accruing during

the term of the Existing Contract; (2) interest accruing on any such deficits; (3) the inclusion of any such deficit charges or interest in the Rates; (4) the application by the United States of payments made by the Contractor under its Existing Contract; and (5) the application of such payments in the Rates. The Contracting Officer agrees that the Contractor shall be entitled to the benefit of any administrative or judicial ruling in favor of any Project M&I contractor on any of these issues, and credits for payments heretofore made, provided that the basis for such ruling is applicable to the Contractor. [Pending Litigation]

REPAYMENT OF PROJECT WORKS

7.1. (a) Contra Costa Canal System. The remaining capitalized cost of the Contra Costa Canal System on December 31, 2004, will be $839,101. The Contractor shall fully repay $914,032.56, including interest at 2.5 percent per annum, by making six annual payments of $152,338.76, beginning January 1, 2005, and ending January 1, 2010.

(b) New Facilities. The remaining capitalized cost of the New Facilities on December 31, 2004, will be $1,446,457.07. The Contractor shall fully repay $1,620,281.05, plus interest at 3.342 percent per annum, by making six annual payments of $270,046.84 beginning January 1, 2005, and ending January 1, 2010.

(c) Contra Loma Dam and Reservoir. The remaining capitalized costs of the Contra Loma Dam and Reservoir on December 31, 2004, will be $1,689,039.16. The Contractor shall fully repay $1,879,257.85, including interest at 3.137 percent per annum, by making six annual payments of $313,209.63 beginning January 1, 2005, and ending January 1, 2010.

(d) The Contractor may, instead of making the payments provided for in subdivisions (a), (b), and (c) above, at any time, make full payment of the sum then due and owing on any or all of the facilities described in those subdivisions: Provided, That the

Contractor agrees that such accelerated repayment shall not exempt the Contractor from compliance with the otherwise applicable ownership and full cost pricing provisions of Federal Reclamation laws. If payment is made at any time in the year other than that specified in subdivisions (a), (b), and (c) of this Article, the remaining payment balance as of such date will be determined by the Contracting Officer and provided to the Contractor. Upon full repayment, the Contractor shall have no further repayment obligations associated with the capitalized costs specified in subdivisions (a), (b), and (c) of this Article.

NON-INTEREST BEARING OPERATION AND MAINTENANCE DEFICITS

8. The Contractor and the Contracting Officer concur that, as of the effective date of this Contract, the Contractor has no non-interest bearing O&M deficits and shall have no further liability therefore.

SALES, TRANSFERS, OR EXCHANGES OF WATER

9. (a) The right to receive Project Water provided for in this Contract may be sold, transferred, or exchanged to others for reasonable and beneficial uses within the State of California if such sale, transfer, or exchange is authorized by applicable Federal and State laws, and applicable guidelines or regulations then in effect. No sale, transfer, or exchange of Project Water under this Contract may take place without the prior written approval of the Contracting Officer, except as provided for in subdivision (b) of this Article, and no such sales, transfers, or exchanges shall be approved absent all appropriate environmental documentation, including but not limited to, documents prepared pursuant to the NEPA and ESA. Such environmental documentation should include, as appropriate, an analysis of groundwater impacts and economic and social effects, including environmental justice, of the proposed water transfers on both the transferor and transferee.

(b) In order to facilitate efficient water management by means of water transfers of the type historically carried out among Project Contractors located within the same geographical area and to allow the Contractor to participate in an accelerated water transfer program during the term of this Contract, the Contracting Officer shall prepare, as appropriate, all necessary environmental documentation including but not limited to documents prepared pursuant to NEPA and ESA analyzing annual transfers within such geographical areas and the Contracting Officer shall determine whether such transfers comply with applicable law. Following the completion of the environmental documentation, such transfers addressed in such documentation shall be conducted with advance notice to the Contracting Officer, but shall not require prior written approval by the Contracting Officer. Such environmental documentation and the Contracting Officer's compliance determination shall be reviewed every five years and updated, as necessary, prior to the expiration of the then existing five-year period. All subsequent environmental documentation shall include an alternative to evaluate not less than the quantity of Project Water historically transferred within the same geographical area.

(c) For a water transfer to qualify under subdivision (b) of this Article, such water transfer must: (i) be for irrigation purposes for lands irrigated within the previous three years, for M&I use, groundwater recharge, groundwater banking, or similar groundwater activities, surface water storage, or fish and wildlife resources; not lead to land conversion; and be delivered to established cropland, wildlife refuges, groundwater basins or M&I use; (ii) occur within a single Year; (iii) occur between a willing seller and a willing buyer; (iv) convey water through existing facilities with no new construction or modifications to facilities and be between existing Project Contractors and/or the Contractor and the United States, Department of the Interior; and (v) comply with all applicable Federal, State, and local or tribal laws and

requirements imposed for protection of the environment and Indian Trust Assets, as defined under Federal law.

PROJECT USE POWER

9.1. (a) During each Year, the United States shall furnish to the Contractor the quantity of Project use power, not to exceed 164.8 kWh of energy for each acre-foot of Project Water or Los Vaqueros Water Rights Water, required to operate facilities needed to pump through the Contra Costa Canal System and Contra Loma Dam and Reservoir the full quantity of Project Water scheduled and the Los Vaqueros Water Rights Water forecasted for delivery and diversion to and by the Contractor for use within the Contractor's Service Area during that Year. Such quantity of Project use power may be utilized at one or more of the following locations: the Contra Costa Canal System; the intake of Los Vaqueros in Old River; Contra Loma Dam and Reservoir; and such other points of diversion set forth in Article 5(a) as may be mutually agreed upon. Project use power can only be used to convey Project Water or Los Vaqueros Water Rights Water and shall be available to pump no more than 195,000 acre-feet annually.

(b) The United States may, at any time, request in writing that the Contractor take delivery of some or all of the Project Water Made Available to the Contractor pursuant to this Contract at the point of diversion for Los Vaqueros Water Rights Water in lieu of taking delivery of such water at the intake of Pumping Plant 1 of the Contra Costa Canal System at Rock Slough. If the Contractor agrees in writing to such a request, the United States shall furnish to the Contractor during the term of the agreement, the quantity of Project use power required to pump said Project Water and Los Vaqueros Water Rights Water from the point of diversion for Los Vaqueros Water Rights Water to the Los Vaqueros transfer reservoir, not to exceed 350 kWh of energy per acre-foot; Provided, That such a written agreement by the parties

for the delivery to and diversion at the point of diversion for Los Vaqueros Water Rights Water of the full supply of Project Water Made Available under this Contract during the term of such agreement shall not be implemented absent modification acceptable to the Contracting Officer of applicable Sacramento-San Joaquin Delta water quality standards during the entire term of such agreement.

(c) If the Contracting Officer and the Contractor are required under any biological opinion issued by an agency of the United Sates to take delivery of some or all of the Project Water Made Available to the Contractor pursuant to this Contract at the point of diversion for Los Vaqueros Water Rights Water in lieu of taking delivery of such water at the intake to Pumping Plant 1 of the Contra Costa Canal System at Rock Slough, the United States shall furnish to the Contractor the quantity of Project use power required to pump said Project water from the point of diversion for Los Vaqueros Water Rights Water to the Los Vaqueros transfer reservoir, not to exceed 350 kWh of energy per acre-foot; Provided, That the quantity of Project use power furnished pursuant to this subdivision shall not exceed the quantity of Project use power needed to convey the quantity of Project Water diverted at the point of diversion of Los Vaqueros Water Rights Water for immediate delivery through the Contra Costa Canal; and Provided further, That the Contractor shall notify the Contracting Officer by March 1 of each calendar year, in accordance with the written schedules submitted pursuant to Article 4(b), of the projected quantity of Project Water which will be pumped with Project use power described in this subdivision.

(d) The Contractor shall pay the United States for the quantity of Project use power as set forth in subdivision (a), (b), and (c) above as a component of the water Rates described in Article 7(a) of this Contract.

(e) The Contracting Officer may adjust the quantity of Project use power required to pump each acre-foot of Project Water or Los Vaqueros Water Rights Water if the Contracting Officer determines based on substantial evidence that the actual energy required for such pumping is different from the quantity set forth in this Article. Such determinations and adjustments by the Contracting Officer shall not require further amendment to this Contract.

APPLICATION OF PAYMENTS AND ADJUSTMENTS

10. (a) The amount of any overpayment by the Contractor of the Contractor's O&M, interest, capital, and deficit (if any) obligations for the Year shall be applied first to any current liabilities of the Contractor arising out of this Contract then due and payable. Overpayments of more than $1,000 shall be refunded at the Contractor's request. In lieu of a refund, any amount of such overpayment, at the option of the Contractor, may be credited against amounts to become due to the United States by the Contractor. With respect to overpayment, such refund or adjustment shall constitute the sole remedy of the Contractor or anyone having or claiming to have the right to the use of any of the Project Water supply provided for herein. All credits and refunds of overpayments shall be made within 30 days of the Contracting Officer obtaining direction as to how to credit or refund such overpayment in response to the notice to the Contractor that it has finalized the accounts for the Year in which the overpayment was made.

(b) All advances for miscellaneous costs incurred for work requested by the Contractor pursuant to Article 25 of this Contract shall be adjusted to reflect the actual costs when the work has been completed. If the advances exceed the actual costs incurred, the difference will be refunded to the Contractor. If the actual costs exceed the Contractor's advances, the Contractor will be billed for the additional costs pursuant to Article 25.

TEMPORARY REDUCTIONS--RETURN FLOWS

11. (a) Subject to: (i) the authorized purposes and priorities of the Project and the requirements of Federal law and (ii) the obligations of the United States under existing contracts, or renewals thereof, providing for water deliveries from the Project, the Contracting Officer shall make all reasonable efforts to optimize Project Water deliveries to the Contractor as provided in this Contract.

(b) The Contracting Officer may temporarily discontinue or reduce the quantity of Water Delivered to the Contractor as herein provided for the purposes of investigation, inspection, maintenance, repair, or replacement of any of the Project facilities or any part thereof necessary for the delivery of Project Water to the Contractor, but so far as feasible the Contracting Officer will give the Contractor due notice in advance of such temporary discontinuance or reduction, except in case of emergency, in which case no notice need be given; Provided, That the United States shall use its best efforts to avoid any discontinuance or reduction in such service. Upon resumption of service after such reduction or discontinuance, and if requested by the Contractor, the United States will, if possible, deliver the quantity of Project Water which would have been delivered hereunder in the absence of such discontinuance or reduction.

(c) The United States reserves the right to all seepage and return flow water derived from Water Delivered to the Contractor hereunder which escapes or is discharged beyond the Contractor's Service Area; Provided, That this shall not be construed as claiming for the United States any right to seepage or return flow being put to reasonable and beneficial use pursuant to this Contract within the Contractor’s Service Area by the Contractor or those claiming by, through, or under the Contractor.

CONSTRAINTS ON THE AVAILABILITY OF WATER

12. (a) In its operation of the Project, the Contracting Officer will use all reasonable means to guard against a Condition of Shortage in the quantity of water to be made available to the Contractor pursuant to this Contract. In the event the Contracting Officer determines that a Condition of Shortage appears probable, the Contracting Officer will notify the Contractor of said determination as soon as practicable.

(b) If there is a Condition of Shortage because of errors in physical operations of the Project, drought, other physical causes beyond the control of the Contracting Officer or actions taken by the Contracting Officer to meet legal obligations then, except as provided in subdivision (a) of Article 18 of this Contract, no liability shall accrue against the United States or any of its officers, agents, or employees for any damage, direct or indirect, arising therefrom.

(c) Omitted.

(d) Project Water furnished under this Contract will be allocated in accordance with the then existing Project M&I Water Shortage Policy. Such policy shall be amended, modified, or superseded only through a public notice and comment procedure.

(e) By entering into this Contract, the Contractor does not waive any legal rights or remedies it may have to file or participate in any administrative or judicial proceeding contesting (i) the sufficiency of the manner in which any Project M&I Water Shortage Policy adopted after the effective date of this Contract was promulgated; (ii) the substance of such a policy; or (iii) the applicability of such a policy. By agreeing to the foregoing, the Contracting Officer does not waive any legal defenses or remedies that it may then have to assert in such a proceeding.

13. Omitted.

RULES AND REGULATIONS

14. The parties agree that the delivery of M&I Water or use of Federal facilities pursuant to this Contract is subject to the applicable provisions of Federal Reclamation law, and any applicable rules and regulations promulgated by the Secretary of the Interior under such law.

WATER AND AIR POLLUTION CONTROL

15. The Contractor, in carrying out this Contract, shall comply with all applicable water and air pollution laws and regulations of the United States and the State of California, and shall obtain all required permits or licenses from the appropriate Federal, State, or local authorities.

QUALITY OF WATER

16. (a) Project facilities used to deliver Project Water to the Contractor pursuant to this Contract shall be operated and maintained to enable the United States to deliver Project Water to the Contractor in accordance with the water quality standards specified in subsection 2(b) of the Act of August 26, 1937 (50 Stat. 865), as added by Section 101 of the Act of October 27, 1986 (100 Stat. 3050) or other existing Federal laws. The United States is under no obligation to construct or furnish water treatment facilities to maintain or to improve the quality of Water Delivered to the Contractor pursuant to this Contract. The United States does not warrant the quality of Water Delivered to the Contractor pursuant to this Contract.

(b) O&M of Project facilities shall be performed in such manner as is practicable to maintain the quality of raw water made available through such facilities at the highest level reasonably attainable as determined by the Contracting Officer. The Contractor shall be responsible for compliance with all State and Federal water quality standards applicable to surface and subsurface agricultural drainage discharges generated through the use of Federal or Contractor facilities or Project Water provided by the Contractor within the Contractor's Service Area.

WATER ACQUIRED BY THE CONTRACTOR OTHER THAN FROM THE UNITED STATES

17. (a) Omitted.

(b) Water or water rights now owned or hereafter acquired by the Contractor, other than from the United States may be stored, conveyed, and/or diverted through Project facilities, other than Project Works, subject to the completion of appropriate environmental documentation, with the approval of the Contracting Officer and the execution of any contract determined by the Contracting Officer to be necessary, consistent with the following provisions:

(1) The Contractor may introduce non-Project water into Project facilities, other than Project Works, subject to payment to the United States of an appropriate rate as determined by the applicable Project ratesetting policy and the RRA, and the Project use power policy, if such Project use power policy is applicable, each as amended, modified, or superseded from time to time. In addition, if electrical power is required to pump non-Project water through the facilities, the Contractor shall be responsible for obtaining the necessary power and paying the necessary charges therefore.

(2) Delivery of such non-Project water in and through Project facilities, other than Project Works, shall only be allowed to the extent such deliveries do not: (i) interfere with other Project purposes as determined by the Contracting Officer; (ii) reduce the quantity or quality of water available to other Project Contractors; (iii) interfere with the delivery of contractual water entitlements to any other Project Contractors; or (iv) interfere with the physical maintenance of the Project facilities.

(c) The Contractor may use Project Works to convey non-Project water, subject to each of the following conditions:

(1) Such conveyance shall not interfere with deliveries of water hereunder;

(2) Non-Project water for irrigation use shall be utilized in accordance with the applicable acreage limitation provisions of the Federal Reclamation laws;

(3) Project use power shall not be used to pump or convey non-Project water except as provided for in Article 9.1(a);

(4) The United States shall not incur any liability or unreimbursed cost or expense thereby;

(5) The quantities of non-Project water introduced into and conveyed through the Project Works shall be measured or otherwise determined by the Contractor in a manner consistent with Article 6 of this Contract, acceptable to the Contracting Officer and at no cost to the United States;

(6) The amount the Contractor is to pay to the United States for conveying non-Project water through Project Works shall be determined annually by the United States in accordance with the applicable provisions of Federal law, including but not limited to the Warren Act of February 21, 1911 (36 Stat. 935), as amended and supplemented, associated regulations, and the then-current applicable federal ratesetting policies.

(d) The United States shall not be responsible for control, care, or distribution of the non-Project water before it is introduced into or after it is delivered from the Project facilities. The Contractor hereby releases and agrees to defend and indemnify the United States and their respective officers, agents, and employees, from any claim for damage to persons or property, direct or indirect, resulting from the Contractor's or its officers', employees', agents',

or assigns', act(s) of (i) extracting or diverting non-Project water from any source, or (ii) diverting such non-Project water into Project facilities.

(e) Diversion of such non-Project water into Project facilities shall be consistent with all applicable laws, and if involving groundwater, consistent with any applicable groundwater management plan for the area from which it was extracted.

(f) After Project purposes are met, as determined by the Contracting Officer, the United States and the Contractor shall share priority to utilize the remaining capacity of the facilities declared to be available by the Contracting Officer for storage, conveyance, and transportation of non-Project water prior to any such remaining capacity being made available to non-Project contractors.

OPINIONS AND DETERMINATIONS

18. (a) Where the terms of this Contract provide for actions to be based upon the opinion or determination of either party to this Contract, said terms shall not be construed as permitting such action to be predicated upon arbitrary, capricious, or unreasonable opinions or determinations. Both parties, notwithstanding any other provisions of this Contract, expressly reserve the right to seek relief from and appropriate adjustment for any such arbitrary, capricious, or unreasonable opinion or determination. Each opinion or determination by either party shall be provided in a timely manner. Nothing in subdivision (a) of Article 18 of this Contract is intended to or shall affect or alter the standard of judicial review applicable under Federal law to any opinion or determination implementing a specific provision of Federal law embodied in statute or regulation.

(b) The Contracting Officer shall have the right to make determinations necessary to administer this Contract that are consistent with the provisions of this Contract, the

laws of the United States and of the State of California, and the rules and regulations promulgated by the Secretary of the Interior. Such determinations shall be made in consultation with the Contractor to the extent reasonably practicable.

COORDINATION AND COOPERATION

19. (a) In order to further their mutual goals and objectives, the Contracting Officer and the Contractor shall communicate, coordinate, and cooperate with each other, and with other affected Project Contractors, in order to improve the operation and management of the Project. The communication, coordination, and cooperation regarding operations and management shall include, but not be limited to, any action which will or may materially affect the quantity or quality of Project Water supply, the allocation of Project Water supply, and Project financial matters including, but not limited to, budget issues. The communication, coordination, and cooperation provided for hereunder shall extend to all provisions of this Contract. Each party shall retain exclusive decision making authority for all actions, opinions, and determinations to be made by the respective party.

(b) Within 120 days following the effective date of this Contract, the Contractor, other affected Project Contractors, and the Contracting Officer shall arrange to meet with interested Project Contractors to develop a mutually agreeable, written Project-wide process, which may be amended as necessary separate and apart from this Contract. The goal of this process shall be to provide, to the extent practicable, the means of mutual communication and interaction regarding significant decisions concerning Project operation and management on a real-time basis.

(c) In light of the factors referred to in subdivision (b) of Article 3 of this Contract, it is the intent of the Secretary to improve water supply reliability. To carry out this intent:

(1) The Contracting Officer will, at the request of the Contractor, assist in the development of integrated resource management plans for the Contractor. Further, the Contracting Officer will, as appropriate, seek authorizations for implementation of partnerships to improve water supply, water quality, and reliability.

(2) The Secretary will, as appropriate, pursue program and project implementation and authorization in coordination with Project Contractors to improve the water supply, water quality, and reliability of the Project for all Project purposes.

(3) The Secretary will coordinate with Project Contractors and the State of California to seek improved water resource management.

(4) The Secretary will coordinate actions of agencies within the Department of the Interior that may impact the availability of water for Project purposes.

(5) The Contracting Officer shall periodically, but not less than annually, hold division level meetings to discuss Project operations, division level water management activities, and other issues as appropriate.

(d) Without limiting the contractual obligations of the Contracting Officer under the other Articles of this Contract, nothing in this Article shall be construed to limit or constrain the Contracting Officer's ability to communicate, coordinate, and cooperate with the Contractor or other interested stakeholders or to make decisions in a timely fashion as needed to protect health, safety, or the physical integrity of structures or facilities.

CHARGES FOR DELINQUENT PAYMENTS

20. (a) The Contractor shall be subject to interest, administrative and penalty charges on delinquent installments or payments. When a payment is not received by the due date, the Contractor shall pay an interest charge for each day the payment is delinquent beyond the due date. When a payment becomes sixty (60) days delinquent, the Contractor shall pay an administrative charge to cover additional costs of billing and processing the delinquent payment. When a payment is delinquent ninety (90) days or more, the Contractor shall pay an additional penalty charge of six (6%) percent per year for each day the payment is delinquent beyond the due date. Further, the Contractor shall pay any fees incurred for debt collection services associated with a delinquent payment.

(b) The interest charge rate shall be the greater of the rate prescribed quarterly in the Federal Register by the Department of the Treasury for application to overdue payments, or the interest rate of one-half of one (0.5%) percent per month prescribed by Section 6 of the Reclamation Project Act of 1939 (Public Law 76-260). The interest charge rate shall be determined as of the due date and remain fixed for the duration of the delinquent period.

(c) When a partial payment on a delinquent account is received, the amount received shall be applied, first to the penalty, second to the administrative charges, third to the accrued interest, and finally to the overdue payment.

EQUAL OPPORTUNITY

21. During the performance of this Contract, the Contractor agrees as follows:

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination, rates of payment or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Contracting Officer setting forth the provisions of this nondiscrimination clause.

(b) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without discrimination because of race, color, religion, sex, or national origin.

(c) The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the Contracting Officer, advising the said labor union or workers' representative of the Contractor's commitments under Section 202 of Executive Order 11246 of

September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(d) The Contractor will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(e) The Contractor will furnish all information and reports required by said amended Executive Order and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the Contracting Officer and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(f) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated, or suspended, in whole or in part, and the Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in said amended Executive Order, and such other sanctions may be imposed and remedies invoked as provided in said Executive Order, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(g) The Contractor will include the provisions of paragraphs (a) through (g) in every subcontract or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of said amended Executive Order, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, That in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

GENERAL OBLIGATION--BENEFITS CONDITIONED UPON PAYMENT

22. (a) The obligation of the Contractor to pay the United States as provided in this Contract is a general obligation of the Contractor notwithstanding the manner in which the obligation may be distributed among the Contractor's water users and notwithstanding the default of individual water users in their obligations to the Contractor.

(b) The payment of charges becoming due hereunder is a condition precedent to receiving benefits under this Contract. The United States shall not make water available to the Contractor through Project facilities during any period in which the Contractor may be in arrears in the advance payment of water rates due the United States. The Contractor shall not furnish water made available pursuant to this Contract for lands or parties which are in arrears in the advance payment of water rates levied or established by the Contractor.

(c) With respect to subdivision (b) of this Article, the Contractor shall have no obligation to require advance payment for water rates which it levies.

COMPLIANCE WITH CIVIL RIGHTS LAWS AND REGULATIONS

23. (a) The Contractor shall comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d), Section 504 of the Rehabilitation Act of 1975 (P.L. 93-112, as amended), the Age Discrimination Act of 1975 (42 U.S.C. 6101, et seq.) and any other applicable civil rights laws, as well as with their respective implementing regulations and guidelines imposed by the U.S. Department of the Interior and/or Bureau of Reclamation.

(b) These statutes require that no person in the United States shall, on the grounds of race, color, national origin, handicap, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity receiving financial assistance from the Bureau of Reclamation. By executing this Contract, the Contractor agrees to immediately take any measures necessary to implement this obligation, including permitting officials of the United States to inspect premises, programs, and documents.

(c) The Contractor makes this agreement in consideration of and for the purpose of obtaining any and all Federal grants, loans, contracts, property discounts, or other Federal financial assistance extended after the date hereof to the Contractor by the Bureau of Reclamation, including installment payments after such date on account of arrangements for Federal financial assistance which were approved before such date. The Contractor recognizes and agrees that such Federal assistance will be extended in reliance on the representations and agreements made in this Article, and that the United States reserves the right to seek judicial enforcement thereof.

24. Omitted.

CONTRACTOR TO PAY CERTAIN MISCELLANEOUS COSTS
RELATING TO PROJECT WORKS

25. In addition to all other payments to be made by the Contractor pursuant to this Contract, the Contractor shall pay to the United States, within 60 days after receipt of a bill and detailed statement submitted by the Contracting Officer to the Contractor for such specific items of direct cost incurred by the United States for work requested by the Contractor associated with this Contract plus indirect costs in accordance with applicable Bureau of Reclamation policies and procedures. All such amounts referred to in this Article shall not exceed the amount agreed

to in writing in advance by the Contractor. This Article shall not apply to costs for routine contract administration.

WATER CONSERVATION

26. (a) Prior to the delivery of water provided from or conveyed through Federally constructed or Federally financed facilities pursuant to this Contract, the Contractor shall be implementing an effective water conservation and efficiency program based on the Contractor's water conservation plan that has been determined by the Contracting Officer to meet the conservation and efficiency criteria for evaluating water conservation plans established under Federal law. The water conservation and efficiency program shall contain definite water conservation objectives, appropriate economically feasible water conservation measures, and time schedules for meeting those objectives. Continued Project Water delivery pursuant to this Contract shall be contingent upon the Contractor’s continued implementation of such water conservation program. In the event the Contractor's water conservation plan or any revised water conservation plan completed pursuant to subdivision (d) of Article 26 of this Contract have not yet been determined by the Contracting Officer to meet such criteria, due to circumstances which the Contracting Officer determines are beyond the control of the Contractor, water deliveries shall be made under this Contract so long as the Contractor diligently works with the Contracting Officer to obtain such determination at the earliest practicable date, and thereafter the Contractor immediately begins implementing its water conservation and efficiency program in accordance with the time schedules therein.

(b) Should the amount of M&I Water delivered pursuant to subdivision (a) of Article 3 of this Contract equal or exceed 2,000 acre-feet per Year, the Contractor shall implement the Best Management Practices identified by the time frames issued by the California

Urban Water Conservation Council for such M&I Water unless any such practice is determined by the Contracting Officer to be inappropriate for the Contractor.

(c) The Contractor shall submit to the Contracting Officer a report on the status of its implementation of the water conservation plan on the reporting dates specified in the then existing conservation and efficiency criteria established under Federal law.

(d) At five-year intervals, the Contractor shall revise its water conservation plan to reflect the then current conservation and efficiency criteria for evaluating water conservation plans established under Federal law and submit such revised water management plan to the Contracting Officer for review and evaluation. The Contracting Officer will then determine if the water conservation plan meets Reclamation's then-current conservation and efficiency criteria for evaluating water conservation plans established under Federal law.

(e) If the Contractor is engaged in direct groundwater recharge, such activity shall be described in the Contractor's water conservation plan.

EXISTING OR ACQUIRED WATER OR WATER RIGHTS

27. Except as specifically provided in Article 17 of this Contract, the provisions of this Contract shall not be applicable to or affect non-Project water or water rights now owned or hereafter acquired by the Contractor or any user of such water within the Contractor's Service Area. Any such water shall not be considered Project Water under this Contract. In addition, this Contract shall not be construed as limiting or curtailing any rights which the Contractor or any water user within the Contractor's Service Area acquires or has available under any other contract pursuant to Federal Reclamation law.

OPERATIONS AND MAINTENANCE BY NON-FEDERAL OPERATING ENTITY

28. (a) Omitted.

OPERATION AND MAINTENANCE OF PROJECT WORKS BY THE CONTRACTOR

28.1. (a) The Contractor, without expense to the United States, shall operate and maintain the Project Works in full compliance with the Federal Reclamation laws and the terms of this Contract. The provisions of this Article shall be implemented by the Memorandum of Agreement relating to Details of Transfer Operations and Maintenance of Contra Costa Canal System, dated June 28, 1972, and Amendment 1, dated May 15, 1995, and may be amended from time to time in such manner that Project Works shall be maintained in good and efficient condition. The Contractor shall use proper methods to assure the reasonable and beneficial use of Water Delivered by means of Project Works. At any time the Contracting Officer determines the O&M by the Contractor of one or more of the Project Works is insufficient, the United States may take back the O&M of all or any part of such Project Works and the Contractor hereby agrees to surrender possession of said Project Works. The O&M of such Project Works so taken back for O&M may be retransferred to the Contractor upon the furnishing by the Contracting Officer of a written notice of intention to retransfer O&M to the Contractor 90 days in advance of the date of retransfer by the United States. Such transfer shall not be made until the Project Works have been placed in efficient operating condition: Provided, That for Project Works taken back by the United States for O&M, the Contractor shall pay the United States quarterly, in advance, sufficient funds, on the basis of an estimate to be submitted by the Contracting Officer, to finance the O&M of such Project Works. If the actual O&M costs should exceed the estimated costs, the Contractor shall pay the United States the necessary additional sums of money within 60 days after receipt of a bill submitted by the Contracting Officer to the Contractor. Any surplus of advances by the Contractor shall be refunded or, at the option of the

Contracting Officer, be applied against any obligation of the Contractor under this Contract due at that time.

(b) No substantial change in any of the Project Works or the installation of Contractor facilities on the lands and rights of way of Project Works shall be made by the Contractor without first obtaining the written consent of the Contracting Officer. The Contractor shall promptly make at its expense any and all repairs or replacements to one or more of the Project Works which the Contracting Officers determines are necessary for the proper O&M of such Project Works. If at any time, in the opinion of the Contracting Officer one or more of the Project Works shall from any cause be in a condition unfit for service, the Contracting Officer may order that the water be shut off from that Project Works until, in the Contracting Officer's opinion, said Project Works are put in proper condition for service. If the Contractor neglects or fails to make necessary repairs or replacements, at the option of the Contracting Officer, such repairs or replacements may be made by the United States and the cost therefore charged to the Contractor. The Contractor shall repay such costs as a miscellaneous cost in accordance with Article 25 of this Contract. The Contractor at its own expense shall repair any damage to the Project Works resulting from negligence of its officers, employees, or agents.

(c) From time to time the Contracting Officer, without cost to the Contractor, may make a review of the maintenance of the Project Works in order to assist the Contractor in determining the condition of those facilities and the adequacy of the maintenance program. The review may include any or all of the Project Works. A report of each such review, including recommendations, if any, shall be prepared and a copy shall be furnished to the Contractor. If deemed necessary by the Contracting Officer or when requested by the Contractor, an inspection of any of the Project Works and of the Contractor's books and records relating thereto may be

made to ascertain whether the requirements of this Contract are being satisfactorily performed by the Contractor or to assist the Contractor in solving specific problems. Any such inspection shall, except in a case of emergency, be made after written notice to the Contractor and the actual cost thereof shall be paid by the Contractor to the United States as a miscellaneous cost pursuant to Article 25 of this Contract. The Contractor may participate in either the review or inspection.

(d) The Contractor shall have the right to abandon one or more of the Project Works with the prior written approval of the Contracting Officer: Provided, That abandonment of one or more of the Project Works shall not relieve the Contractor of its obligation to repay the capital cost plus interest as appropriate of such Project Works less any disposal or salvage value which may be realized.

(e) If and when the Contractor fully repays the United States the costs of one or more of the Project Works and the ownership of such Project Works is transferred to the Contractor pursuant to an Act of Congress, the provisions of subdivision (a), (b), (c), and (d) of this Article and subdivision (c) of Article 17 shall no longer apply to such Project Works

EMERGENCY RESERVE FUND

28.2. (a) The Contractor shall accumulate and maintain a reserve fund, as set forth in subdivision (b) below, which the Contractor shall keep available to pay O&M costs incurred during periods of special stress caused by damaging droughts, storms, earthquakes, floods, or other emergencies threatening or causing interruption of water service.

(b) The Contractor shall establish a reserve fund of not less than $1,000,000 in a Federally insured interest- or dividend-bearing account, or investments in securities guaranteed by the Federal Government; Provided, That the money so deposited or invested shall be available within a reasonable time to meet expenses for the purposes identified in subdivision (d) of this

Article. Whenever said reserve fund is reduced below $1,000,000 by expenditures therefrom, it shall be restored to that amount by accumulation of annual deposits at a minimum of $250,000. The interest earnings shall continue to accumulate and be retained as part of the reserve fund except when required to meet expenditures pursuant to subdivisions (a) and (d) of this Article.

(c) By written agreement between the Contractor and the Contracting Officer, the basic amount of the reserve fund may be adjusted to account for risk and uncertainty stemming from the size and complexity of the Project Works, the size of the Contractor's annual O&M budget and O&M costs not contemplated when this Contract was executed.

(d) The Contractor may withdraw money from the reserve fund only for meeting unusual O&M costs incurred during periods of stress as described in subdivision (a) above, and unforeseen extraordinary O&M costs, unusual or extraordinary repair or replacement costs, and betterment costs (in situations where recurrence of severe problems can be eliminated) during periods of special stress. The Contractor shall notify the Contracting Officer of any expenditure from the reserve fund pursuant to this subdivision.

TRANSFER OF TITLE TO PROJECT WORKS

28.3. Upon repayment of all outstanding capitalized costs of one or more of the Project Works, and upon appropriate authorization of Congress, all rights, title, and interests in and to the relevant Project Work(s) shall be transferred to the Contractor.

PERFORMANCE OF PROJECT WORKS WITH CONTRIBUTED FUNDS

28.4. (a) Pursuant to the Act of March 4, 1921 (41 Stat. 1367, 1404), the Contracting Officer may accept funds contributed by the Contractor to finance any authorized construction work on the Project facilities not otherwise provided for by this Contract for which funds may not be available. Pursuant to the Act of January 12, 1927 (44 Stat. 957, 43 U.S.C. §

397a), the Contracting Officer may also accept funds contributed by the Contractor to finance any authorized O&M work on the Project facilities not otherwise provided for by this Contract for which funds may not be available. When the undertaking of such work is approved, funds therefore shall be advanced by the Contractor as may be directed by the Contracting Officers and there shall be submitted to the Contracting Officer a certified copy of the resolution of the Board of Directors of the Contractor describing the work to be done and authorizing its performance with contributed funds.

(b) After completion of any work on Project facilities financed in whole or in part with funds contributed by the Contractor under subdivision (a) of this Article, the Contractor shall be furnished with a statement of the final cost thereof. Any unexpended balance of funds shall be refunded to the Contractor or applied as otherwise directed by the Contractor. The amount by which the cost of such work exceeds the amount of funds advanced by the Contractor therefore shall be paid by the Contractor to the United States as the Contracting Officer may direct.

CONTINGENT ON APPROPRIATION OR ALLOTMENT OF FUNDS

29. The expenditure or advance of any money or the performance of any obligation of the United States under this Contract shall be contingent upon appropriation or allotment of funds. Absence of appropriation or allotment of funds shall not relieve the Contractor from any obligations under this Contract. No liability shall accrue to the United States in case funds are not appropriated or allotted.

BOOKS, RECORDS, AND REPORTS

30. (a) The Contractor shall establish and maintain accounts and other books and records pertaining to administration of the terms and conditions of this Contract, including: the Contractor's financial transactions, water supply data, and Project land and right-of-way agreements; the water users' land-use (crop census), land ownership, land-leasing and water use data; and other matters that the Contracting Officer may require. Reports thereon shall be furnished to the Contracting Officer in such form and on such date or dates as the Contracting Officer may require. Subject to applicable Federal laws and regulations, each party to this

Contract shall have the right during office hours to examine and make copies of the other party's books and records relating to matters covered by this Contract.

(b) Notwithstanding the provisions of subdivision (a) of this Article, no books, records, or other information shall be requested from the Contractor by the Contracting Officer unless such books, records, or information are reasonably related to the administration or performance of this Contract. Any such request shall allow the Contractor a reasonable period of time within which to provide the requested books, records, or information.

(c) Omitted.

ASSIGNMENT LIMITED--SUCCESSORS AND ASSIGNS OBLIGATED

31. (a) The provisions of this Contract shall apply to and bind the successors and assigns of the parties hereto, but no assignment or transfer of this Contract or any right or interest therein shall be valid until approved in writing by the Contracting Officer.

(b) The assignment of any right or interest in this Contract by either party shall not interfere with the rights or obligations of the other party to this Contract absent the written concurrence of said other party.

(c) The Contracting Officer shall not unreasonably condition or withhold approval of any proposed assignment.

SEVERABILITY

32. In the event that a person or entity who is neither (i) a party to a Project contract, nor (ii) a person or entity that receives Project Water from a party to a Project contract, nor (iii) an association or other form of organization whose primary function is to represent parties to Project contracts, brings an action in a court of competent jurisdiction challenging the legality or enforceability of a provision included in this Contract and said person, entity, association, or organization obtains a final court decision holding that such provision is legally invalid or unenforceable and the Contractor has not intervened in that lawsuit in support of the plaintiff(s),

the parties to this Contract shall use their best efforts to (i) within 30 days of the date of such final court decision identify by mutual agreement the provisions in this Contract which must be revised and (ii) within three months thereafter promptly agree on the appropriate revision(s). The time periods specified above may be extended by mutual agreement of the parties. Pending the completion of the actions designated above, to the extent it can do so without violating any applicable provisions of law, the United States shall continue to make the quantities of Project Water specified in this Contract available to the Contractor pursuant to the provisions of this Contract which were not found to be legally invalid or unenforceable in the final court decision.

RESOLUTION OF DISPUTES

33. Should any dispute arise concerning any provisions of this Contract, or the parties' rights and obligations thereunder, the parties shall meet and confer in an attempt to resolve the dispute. Prior to the Contractor commencing any legal action, or the Contracting Officer referring any matter to the Department of Justice, the party shall provide to the other party 30-days written notice of the intent to take such action; Provided, That such notice shall not be required where a delay in commencing an action would prejudice the interests of the party that intends to file suit. During the 30-day notice period, the Contractor and the Contracting Officer shall meet and confer in an attempt to resolve the dispute. Except as specifically provided, nothing herein is intended to waive or abridge any right or remedy that the Contractor or the United States may have.

OFFICIALS NOT TO BENEFIT

34. No Member of or Delegate to Congress, Resident Commissioner, or official of the Contractor shall benefit from this Contract other than as a water user or landowner in the same manner as other water users or landowners.

CHANGES IN CONTRACTOR'S SERVICE AREA

35. (a) While this Contract is in effect, no change may be made in the Contractor's Service Area, by inclusion or exclusion of lands, dissolution, consolidation, merger, or otherwise, except upon the Contracting Officer's written consent.

(b) Within 30 days of receipt of a request for such a change, the Contracting Officer will notify the Contractor of any additional information required by the Contracting Officer for processing said request, and both parties will meet to establish a mutually agreeable schedule for timely completion of the process. Such process will analyze whether the proposed change is likely to: (i) result in the use of Project Water contrary to the terms of this Contract; (ii) impair the ability of the Contractor to pay for Project Water furnished under this Contract or to pay for any Federally-constructed facilities for which the Contractor is responsible; and (iii) have an impact on any Project Water rights applications, permits, or licenses. In addition, the Contracting Officer shall comply with the NEPA and the ESA. The Contractor will be responsible for all costs incurred by the Contracting Officer in this process, and such costs will be paid in accordance with Article 25 of this Contract.

FEDERAL LAWS

36. By entering into this Contract, the Contractor does not waive its rights to contest the validity or application in connection with the performance of the terms and conditions of this Contract of any Federal law or regulation; Provided, That the Contractor agrees to comply with the terms and conditions of this Contract unless and until relief from application of such Federal law or regulation to the implementing provision of the Contract is granted by a court of competent jurisdiction.

NOTICES

37. Any notice, demand, or request authorized or required by this Contract shall be deemed to have been given, on behalf of the Contractor, when mailed, postage prepaid, or

delivered to the Area Manager, South-Central California Area Office, 1243 N Street, Fresno, California 93721, and on behalf of the United States, when mailed, postage prepaid, or delivered to the Board of Directors, Contra Costa Water District, P. O. Box H_20, Concord, California 94524. The designation of the addressee or the address may be changed by notice given in the same manner as provided in this Article for other notices.

CONFIRMATION OF CONTRACT

38. The Contractor, after the execution of this Contract, shall furnish to the Contracting Officer evidence that pursuant to the laws of the State of California, the Contractor is a legally constituted entity, and the Contract is lawful, valid, and binding on the Contractor.

IN WITNESS WHEREOF, the parties hereto have executed this Contract as of the day and year first above written.

THE UNITED STATES OF AMERICA

By: _____
Regional Director, Mid-Pacific Region
Bureau of Reclamation

(SEAL)

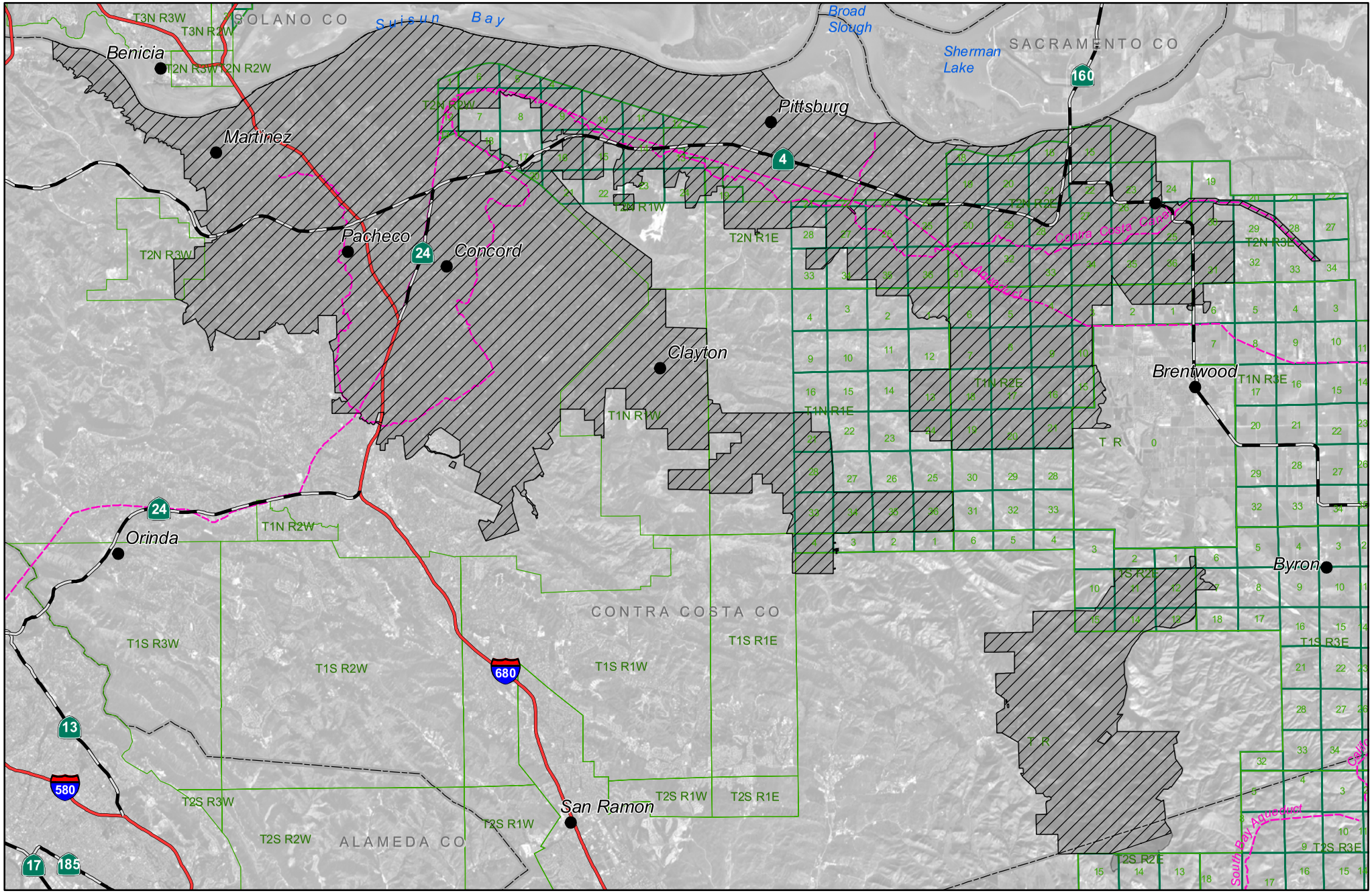
CONTRA COSTA WATER DISTRICT

By: _____
President of the Board of Directors

Attest:

By: _____
Secretary of the Board of Directors

(H:\pub 440\LTRC\Final Draft LTRC's – Fresno, Tracy\11-30-04 Contra Costa WD Final Draft LTRC with exhibits.doc)



Contra Costa Water District

Contract No. I75r-3401A-LTR1
Exhibit A

District Boundary
Contractor's Service Area

0 5 10 Miles

Date: December 2, 2004
File Name: N:\districts\contracts\contra_costa\contra_costa.mxd

214-202-796

EXHIBIT B
CONTRA COSTA WATER DISTRICT
2004 Water Rates and Charges

Note: Rates and Charges are 2004 rates. This exhibit will be updated prior to execution of the contract to reflect the current Rates and Charges.

	Central Valley Project M&I	*Non-Project Water Los Vaqueros M&I	Other M&I
COST-OF-SERVICE RATES:			
Capital Rates	$10.75	$ 1.24	
O&M Rates:			
Water Marketing	$ 5.01	$ 5.01	$ 5.01
Storage	$ 6.38		
San Luis Drain			
Direct Pumping	$ 3.70	$ 3.70	
Conveyance			
Conveyance Pumping			
Total O&M Rates	$15.09	$ 9.95	$ 5.01
Deficit Rates:			
Non-Interest Bearing	N/A	N/A	N/A
Interest Bearing	$10.49	N/A	N/A
Total Deficit Rate	$10.49	N/A	N/A
Cost-Service Rate	$36.33	$ 9.95	$5.01
FULL COST RATES as defined in Reclamation Reform Act (96 Stat. 1263):			
Section 202(3) Rate is applicable to a Qualified Recipient or to a Limited Recipient receiving irrigation water on or before October 1, 1981.	N/A	N/A	N/A
Section 205(a)(3) Rate is applicable to a Limited Recipient that did not receive irrigation water on or before October 1, 1981.	N/A	N/A	N/A
CHARGES UNDER P.L. 102-575 TO RESTORATION FUND: **			
Restoration Payments [Section 3407(d)(2)(A)]	$15.64	N/A	N/A

* Non-Project Rates/Chares may be modified by various methods on a CVP-Wide Basis at some future point.

** The surcharges are payments in addition to the water rates and were determined pursuant to Title XXXIV of Public Law 102-575. Restoration fund surcharges under P. L. 102-575 are on a fiscal year basis (10/1-9/30).

HISTORIC USE as defined in CVP M&I Water Shortage Policy:

Recent Historic Average - 152,100

APPENDIX B

Table B-1 Special Status Species

Table B-1. Special-Status Species Considered in the Analysis for the Contra Costa Water District Proposed Long-Term Water Service Contract, Contra Costa County, California. (North State Resources, Inc., March 2004)

Species		Federal Status[1]	General Habitat and Distribution	Is Species Analyzed Further in the BA[2]?	Occurrence in the Service Area
Common Name	**Scientific Name**				
Mammals					
riparian (San Joaquin Valley) woodrat	*Neotoma fuscipes riparia*	E	Inhabits riparian forest and scrub communities along low portions of the San Joaquin and Stanislaus rivers in the northern San Joaquin Valley. Historical localities are distributed in San Joaquin, Stanislaus, and Merced counties. Known occupied range is limited to the Stanislaus River riparian areas near Caswell Memorial State Park; a possible second population is near Vernalis, San Joaquin County.	NO	The CCWD service area is outside the species known occupied range.
salt marsh harvest mouse	*Reithrodontomys raviventris*	E	Inhabits tidal and nontidal salt marshes of Suisun, San Pablo, and central and south San Francisco bays.	YES	CNDDB results show 25 known occurrences in the project vicinity, in the following USGS quadrangles: *Vine Hill*, *Honker Bay*, *Antioch North*, and *Benicia*. Suitable habitat is present in the CCWD service area, and the species is known to occur within the CCWD boundary.
riparian brush rabbit	*Sylvilagus bachmani riparius*	E	Found in San Joaquin Valley native riparian areas with large clumps of dense shrubs, low growing vines, and some tall shrubs and scrubby trees. Known populations exist: in Caswell Memorial State Park in southern San Joaquin County, in the Paradise Cut area south of Stockton, and near Lathrop, California.	NO	The CCWD service area is outside the species current known range.
Mammals					
San Joaquin kit fox	*Vulpes macrotis mutica*	E	Inhabits semiarid communities of the San Joaquin Valley and adjacent foothill grasslands and open canopied woodlands. Current range extends from Contra Costa and San Joaquin counties in the north, south to Kern and Santa Barbara counties.	YES	Suitable habitat in the CCWD service area is highly fragmented, but the species has been observed in the CCWD service area. CNDDB results show 25 known occurrences in the project vicinity, in the following USGS quadrangles: *Woodward Island*, *Clayton*, *Antioch South*, *Brentwood*, *Tassajara*, *Byron Hot Springs*, *Diablo*, *Altamont*, and *Livermore*.

Table B-1. Special-Status Species Considered in the Analysis for the Contra Costa Water District Proposed Long-Term Water Service Contract, Contra Costa County, California. (North State Resources, Inc., March 2004)

Species		Federal Status[1]	General Habitat and Distribution	Is Species Analyzed Further in the BA[2]?	Occurrence in the Service Area
Common Name	**Scientific Name**				
Birds					
California brown pelican	*Pelecanus occidentalis californicus*	E	Winter range is the Pacific Coast from the Gulf of California to southern British Columbia. Forages almost entirely on fish in open water or near shorelines. Rests on water or inaccessible rocks, mudflats, sandy beaches, wharfs, and jetties. Nesting and roosting take place outside the CCWD service area. Nesting is restricted to islands in the Gulf of California and along the outer coast from Baja California to West Anacapa and Santa Barbara Islands in Southern California.	NO	Extremely low probability of occurrence. Suitable foraging habitat may be present. However, the species would occur infrequently or irregularly in the CCWD service area.
California clapper rail	*Rallus longirostris obsoletus*	E	Occurs within a range of salt and brackish marshes. Requires emergent wetlands and tidal sloughs. Forages in higher marsh vegetation, along vegetation and mudflat interface, and along tidal creeks. Restricted almost entirely to the marshes of San Francisco estuary, where the only known breeding populations occur. Present sporadically and in low numbers at various locations throughout the Suisun Marsh Area (Carquinez Strait to Browns Island, including tidal marshes adjacent to Suisun, Honker, and Grizzly Bays).	YES	Brackish tidal marshes in the area (approximately 4,900 acres) are suitable habitat, and the adjacent grasslands and levees are suitable upland refugia (CCWD 1999). CNDDB results show four known occurrences in the project vicinity, in the following USGS quadrangles: *Vine Hill*, *Honker Bay*, and *Benicia*.

Table B-1. Special-Status Species Considered in the Analysis for the Contra Costa Water District Proposed Long-Term Water Service Contract, Contra Costa County, California. (North State Resources, Inc., March 2004)

Species		Federal Status[1]	General Habitat and Distribution	Is Species Analyzed Further in the BA[2]?	Occurrence in the Service Area
Common Name	**Scientific Name**				
Birds					
California least tern	*Sterna antillarum (=albifrons) browni*	E	Winters in Latin America, but winter range and habitats are unknown. Nesting range is along the Pacific coast from southern Baja California to San Francisco Bay. Nests in colonies on bare or sparsely vegetated flat substrates near the coast. Typical nesting sites are on isolated or specially protected sand beaches or on natural or artificial open areas in remnant coastal wetlands, typically near estuaries, bays, or harbors where small fish are abundant.	YES	Suitable habitat is present in the CCWD service area. Two nesting colonies are present in the CCWD service area, in the *Honker Bay* quadrangle: one is located at the Pacific Gas and Electric (PG&E) plant in Pittsburg and the second is located at the Avon-Port Chicago Marsh (CNDDB 2003).
western snowy plover	*Charadrius alexandrinus nivosus*	T	Breeds on coastal beaches from southern Washington to southern Baja California, Mexico. Northern California populations are concentrated in San Francisco Bay. Nests in flat, open areas with sandy or saline substrates. Uses sandy coastal beaches, salt pans, coastal dredged spoils sites, dry salt ponds, salt pond levees and gravel bars. May forage in the salt marshes near Suisun Bay.	NO	Extremely low probability of occurrence. Evidence indicates that western snowy plovers do not use marshes in the CCWD service area for nesting. The species would occur infrequently or irregularly in the CCWD service area.
Bald eagle	*Haliaeetus leucocephalus*	T	Winter visitor and migrant at reservoirs and Delta waterways in the CCWD service area. Requires large bodies of water, or free flowing rivers with abundant fish, and adjacent snags or other perches. Roosts communally in winter in dense, sheltered, remote conifer stands. Current nesting distribution is restricted to mostly mountainous habitats in the northern Sierra Nevada, Cascade Range, and northern Coast Ranges.	NO	Although potential nesting habitat is present in areas adjacent to but outside of the CCWD service area, bald eagles are not known to nest within the CCWD service area. Potential nesting habitat in the CCWD service area is of marginal quality because it lacks suitable nesting trees near reservoirs with minimal human activity. The species would occur infrequently or irregularly in the CCWD service area.

Table B-1. Special-Status Species Considered in the Analysis for the Contra Costa Water District Proposed Long-Term Water Service Contract, Contra Costa County, California. (North State Resources, Inc., March 2004)

Species		Federal Status[1]	General Habitat and Distribution	Is Species Analyzed Further in the BA[2]?	Occurrence in the Service Area
Common Name	**Scientific Name**				
Birds					
Aleutian Canada goose	*Branta canadensis leucopareia*	D	Wintering geese forage in agricultural fields supporting pasture, corn, wheat, and rice crops and typically roost on land surrounded by water, on open water, and occasionally on open pastureland. In the San Joaquin Valley, they roost on artificially impounded waters, such as farm ponds, sewage ponds, and duck-club ponds. Winters in California's central valley, move south to the Delta as they migrate toward their nesting grounds in the Aleutian Islands.	NO	This species is not known to regularly occur in the CCWD service area and is considered an occasional winter visitor. Additionally, the Aleutian Canada goose was de-listed by the Service on March 20, 2001. The species would occur infrequently or irregularly in the CCWD service area.
American peregrine falcon	*Falco peregrinus anatum*	D	Nests on ledges of large cliff faces and less often on city buildings and bridges. Nesting and wintering habitats include wetlands, woodlands, other forested habitats, cities, agricultural areas and coastal habitats. Current winter range includes most of California, except deserts. Breeding range includes the Channel Islands, coast of southern and central California, inland north coastal mountains, Klamath and Cascade ranges, and the Sierra Nevada.	NO	This species is not known to regularly occur in the CCWD service area and is considered an occasional winter visitor. Additionally, the American peregrine falcon was de-listed by the Service on August 25, 1999. The species would occur infrequently or irregularly in the CCWD service area.
Reptiles					
Alameda whipsnake	*Masticophis lateralis euryxanthus*	T	Typically found in chaparral—northern coastal sage scrub and coastal sage. Recent telemetry data indicate that, although home ranges are centered on shrub communities, the species ventures up to 500 feet into adjacent habitats, including grassland, oak savanna, and occasionally oak-bay woodland. Inhabits the inner coast range in western and central Contra Costa, Alameda, San Joaquin, and Santa Clara counties.	YES	Suitable habitat is present in the CCWD service area. CNDDB results show 42 known occurrences in the CCWD service area, in the following USGS quadrangles: *Briones Valley*, *Walnut Creek*, *Clayton*, *Antioch South*, Tassajara, *Las Trampas Ridge*, *Byron Hot Springs*, and *Diablo*. The CCWD service area is within designated critical habitat (Units 1 and 4) for this species.

Table B-1. Special-Status Species Considered in the Analysis for the Contra Costa Water District Proposed Long-Term Water Service Contract, Contra Costa County, California. (North State Resources, Inc., March 2004)

Species		Federal Status[1]	General Habitat and Distribution	Is Species Analyzed Further in the BA[2]?	Occurrence in the Service Area
Common Name	**Scientific Name**				
Reptiles					
Giant garter snake	*Thamnophis gigas*	T	Inhabits agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes, low gradient streams, and adjacent uplands in the Central Valley. Requires adequate water during the active season (early-spring through mid-fall); emergent, herbaceous wetland vegetation for escape cover and foraging habitat during the active season; grassy banks and openings in waterside vegetation for basking; and higher elevation uplands for cover and refuge during the winter.	YES	Suitable habitat is present within the CCWD service area, and includes freshwater marshes and agricultural ditches in the Delta, east of the Antioch Bridge (Service 2000). CNDDB results show three known occurrences in the project vicinity, in the following USGS quadrangles: *Jersey Island*, *Antioch North*, and *Bouldin Island*. The CCWD service area is within designated critical habitat (Units 1 and 4) for this species.
Amphibians					
California red-legged frog	*Rana aurora draytonii*	T	Occupies a fairly distinct habitat, combining both specific aquatic and riparian components. Adults require dense, shrubby or emergent riparian vegetation closely associated with deep still or slow moving water. Largest frog densities are associated with deep-water pools with dense stands of overhanging willows and an intermixed fringe of cattails. Locally abundant within portions of the San Francisco Bay area (including Marin County) and the central coast, but only isolated populations are documented in the Sierra Nevada, northern Coast, and northern Transverse ranges.	YES	Suitable habitat is present and the species is known to occur in the CCWD service area. CNDDB results show 146 known occurrences in the project vicinity, in the following USGS quadrangles: *Briones Valley*, *Honker Bay*, *Clayton*, *Walnut Creek*, *Antioch South*, *Tassajara*, *Las Trampas Ridge*, *Byron Hot Springs*, *Benicia*, *Altamont*, *Livermore*, and *Diablo*.

Table B-1. Special-Status Species Considered in the Analysis for the Contra Costa Water District Proposed Long-Term Water Service Contract, Contra Costa County, California. (North State Resources, Inc., March 2004)

Species		Federal Status[1]	General Habitat and Distribution	Is Species Analyzed Further in the BA[2]?	Occurrence in the Service Area
Common Name	**Scientific Name**				
Amphibians					
California tiger salamander	*Ambystoma californiense*	PT	Restricted to grasslands and low foothill regions where lowland aquatic sites are available for breeding. Prefer natural vernal pools, vernal playas, large sag ponds, and other ephemeral ponds. Current range includes Sonoma and Santa Barbara counties, the Central Valley from southern Colusa County south to northern Kern County, and the coast ranges from Suisun Bay south to the Temblor Range.	YES	Suitable habitat is present in the CCWD service area. CNDDB results show 146 known occurrences in the CCWD service area, in the following USGS quadrangles: *Antioch North*, *Honker Bay*, *Clayton*, *Walnut Creek*, *Antioch South*, *Tassajara*, *Brentwood*, *Byron Hot Springs*, *Altamont*, *Livermore*, and *Diablo*. This species is discussed in further detail in **Section 5.5**.
Fish					
tidewater goby	*Eucyclogobius newberryi*	E PD	Inhabits brackish shallow lagoons of coastal wetlands and lower stream reaches, where the water is fairly still but not stagnant. Requires backwater, marshy habitats to avoid winter flood flows. Formerly distributed along the California coast. In San Francisco Bay and its associated streams, nine of ten previously identified populations have disappeared, and a survey of streams of the Bay drainage in 1984 failed to record any populations.	NO	Although suitable habitat is present, the species is not known to occur in the CCWD service area. In addition, populations north of Orange County, California were proposed for delisting on June 24, 1999.
Sacramento River winter-run ESU chinook salmon	*Oncorhynchus tshawytscha*	E	Spawn and rear in mainstem Sacramento River. Juveniles spend five to nine months in the river and Sacramento-San Joaquin Estuary before entering the ocean. Require cool year-round water temperatures, since spawning occurs during the summer. Requires deep pools and riffles, and clean gravel and cobble substrate to spawn. Sacramento River and Delta are designated as critical habitat and essential fish habitat for this species.	YES	Although it does not reside in the CCWD service area, the species migrates through the CCWD service area between upstream spawning grounds as adults, and the ocean as juveniles.

Table B-1. Special-Status Species Considered in the Analysis for the Contra Costa Water District Proposed Long-Term Water Service Contract, Contra Costa County, California. (North State Resources, Inc., March 2004)

Species		Federal Status[1]	General Habitat and Distribution	Is Species Analyzed Further in the BA[2]?	Occurrence in the Service Area
Common Name	**Scientific Name**				
Fish					
Delta smelt	*Hypomesus transpacificus*	T	Lives along the freshwater edge of the mixing zone (saltwater-freshwater interface). Shortly before spawning, migrates upstream and disperses widely into river channels and tidally influenced backwater sloughs. Spawns in shallow, fresh or slightly brackish water upstream of the mixing zone. Currently found only from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano and Yolo counties.	YES	This species is known to inhabit the CCWD service area. In addition, the CCWD service area is within designated critical habitat for the species.
Central California Coast ESU coho salmon	*Oncorhynchus kisutch*	T	The ESU includes all naturally spawned populations of coho salmon from Punta Gorda in northern California south to and including the San Lorenzo River in central California, as well as populations in tributaries to San Francisco Bay, excluding the Sacramento-San Joaquin River system.	NO	The CCWD service area is outside the species current known range.
Central California Coast ESU steelhead	*Oncorhynchus mykiss*	T	Occupies river basins from the Russian River, Sonoma County to Aptos Creek, Santa Cruz County and the drainages of San Francisco and San Pablo Bays eastward to the Napa River, excluding the Sacramento-San Joaquin River Basin.	NO	Only a very small portion of the CCWD service area overlaps with the range of this steelhead ESU. Presence of this ESU in the CCWD service area would be unlikely. Implementation of the proposed project would not likely result in adverse effects.
Central Valley ESU steelhead	*Oncorhynchus mykiss irideus*	T	Spawn and rear in Sacramento River and its tributaries and some San Joaquin tributaries. Require cool, swift shallow water; clean, loose gravel for spawning; and runs and suitable large pools in which to rear and over-summer. Sympatric and synonymous with resident, non-anadromous rainbow trout, which are abundant in Central Valley streams.	YES	This species may rear seasonally and migrates through the CCWD service area between upstream spawning grounds as adults, and the ocean as juveniles.

Table B-1. Special-Status Species Considered in the Analysis for the Contra Costa Water District Proposed Long-Term Water Service Contract, Contra Costa County, California. (North State Resources, Inc., March 2004)

Species		Federal Status[1]	General Habitat and Distribution	Is Species Analyzed Further in the BA[2]?	Occurrence in the Service Area
Common Name	**Scientific Name**				
Fish					
Central Valley spring-run ESU chinook salmon	*Oncorhynchus tshawytscha*	T	Spawn and rear in the Feather and Sacramento rivers and suitable perennial tributaries. Require cool year-round water temperatures and deep pools for over-summering habitat. Spawn in riffles with gravel and cobble substrate. Sacramento River, suitable perennial tributaries, and Delta are considered essential fish habitat for this species.	YES	This species may rear seasonally and migrates through the CCWD service area between upstream spawning grounds as adults, and the ocean as juveniles.
Invertebrates					
Lange's metalmark butterfly	*Apodemia mormo langei*	E	Associated with inland dune scrub habitats that support its host plant, the naked buckwheat (*Eriogonum nudum*). The species' present range is limited to approximately 15 acres of suitable habitat within the Antioch Dunes National Wildlife Refuge, where it is fully protected.	NO	Within the CCWD service area, this species is fully protected within the Antioch Dunes National Wildlife Refuge. No other populations are known or suspected to occur in the CCWD service area. Project implementation would not impact the Refuge system or this species.
Conservancy fairy shrimp	*Branchinecta conservatio*	E	Vernal pools / swales and ponded seasonal wetlands. Known to occur in Colusa, Napa, Tehama, Solano, Ventura, and Merced counties.	NO	The species is not known to occur in the CCWD service area, and the CCWD service area is outside the species' current range. The CCWD service area is outside of designated critical habitat for this species.
longhorn fairy shrimp	*Branchinecta longiantenna*	E	Inhabit small, clear-water depressions in sandstone and clear-to-turbid clay/grass-bottomed pools in shallow swales. The species is extremely rare, and are only known from three widely separated locations: the Altamont Pass area in Contra Costa and Alameda counties, and one location in San Luis Obispo County and in Merced County.	YES	CNDDB results show two occurrences in the project vicinity, in the following USGS quadrangles: *Byron Hot Springs* and *Altamont*. Although these occurrences are outside of the CCWD service area. The CCWD service area is outside of designated critical habitat for this species.

Table B-1. Special-Status Species Considered in the Analysis for the Contra Costa Water District Proposed Long-Term Water Service Contract, Contra Costa County, California. (North State Resources, Inc., March 2004)

Species		Federal Status[1]	General Habitat and Distribution	Is Species Analyzed Further in the BA[2]?	Occurrence in the Service Area
Common Name	**Scientific Name**				
Invertebrates					
Vernal pool tadpole shrimp	*Lepidurus packardi*	E	Vernal pools, swales, and ephemeral freshwater habitats. Range includes disjunct occurrences in the Central Valley, from Shasta County to north Tulare County, and in the central coast range, from Solano County to Alameda County.	YES	CNDDB results show one known occurrence in the project vicinity, in the following USGS quadrangles: *Honker Bay* and *Antioch North*. The CCWD service area is outside of the designated critical habitat for this species.
callippe silverspot butterfly	*Speyeria callippe callippe*	E	Inhabits native grasslands and associated habitats. This species' current known range is limited to San Mateo County and a city park in Alameda County.	NO	CCWD service area is outside the species' current known range. A location in Solano County recorded in the CNDDB is outside of the CCWD service area (CNDDB 2003). No other populations are known or suspected to occur in the CCWD service area.
California freshwater shrimp	*Syncaris pacifica*	E	Historically, the shrimp was probably common in low elevation, perennial freshwater streams in Marin, Sonoma, and Napa counties. Today, it is found in sixteen stream segments within these counties. Found only in low-elevation (less than 53-foot) and low-gradient (generally less than 1 percent) streams.	NO	The species is not known to occur in the CCWD service area, and the CCWD service area is outside the species' current range.
Vernal pool fairy shrimp	*Branchinecta lynchi*	T	Vernal pools, swales, and ephemeral freshwater habitats. Range includes disjunct occurrences in the Central Valley, from Shasta County to Tulare County, and in the central and southern coast ranges, from northern Solano County to Ventura County. Additional occurrences have been identified in southern California and in Oregon.	YES	CNDDB results show nine known occurrence in the project vicinity, in the following USGS quadrangles: *Altamont, Livermore, Clifton Court Forebay, Woodward Island, Brentwood, Antioch South,* and *Antioch North*. The CCWD service area is outside of designated critical habitat for this species.

Table B-1. Special-Status Species Considered in the Analysis for the Contra Costa Water District Proposed Long-Term Water Service Contract, Contra Costa County, California. (North State Resources, Inc., March 2004)

Species		Federal Status[1]	General Habitat and Distribution	Is Species Analyzed Further in the BA[2]?	Occurrence in the Service Area
Common Name	**Scientific Name**				
Invertebrates					
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	T	Inhabits elderberry trees or shrubs associated with riparian forests along rivers and streams. Current distribution is patchy throughout the remaining riparian forests of the Central Valley, from Redding, Shasta County, to Bakersfield, Kern County.	YES	The CCWD service area is outside the species' known range and there are no records of this species from the CCWD service area. However, suitable habitat for the species (i.e., elderberry shrubs) has been recorded in the CCWD service area (i.e., north and east of Mount Diablo and east of Pittsburg) and could occur elsewhere along perennial and intermittent streams, levees, stockponds, and foothill seeps.
Delta green ground beetle	*Elaphrus viridis*	T	Species has been detected around the margins of vernal pools and in bare areas along trails and roadsides in central Solano County. The species' cryptic coloration, small size, and habit of hiding under low-growing vegetation can hinder detection. Adults may also occur in the surrounding grasslands. It is presently known to occur only in Solano County, northeast of the San Francisco Bay Area.	NO	The species is not known to occur in the CCWD service area, and the CCWD service area is outside the species' current range.
Plants					
large-flowered fiddleneck	*Amsinckia grandiflora*	E	Inhabits cismontane woodland and valley and foothill grassland on a variety of soils, from 902 to 1,805 feet in elevation. At present, two natural populations exist. One consists of two colonies in the hills east of Livermore in Alameda and San Joaquin counties. The other is a recently discovered population in San Joaquin County. Besides these extant natural populations, there are also several experimentally reintroduced populations.	NO	CNDDB results show three known occurrences in the project vicinity, in the *Clayton* and *Antioch South* USGS quadrangles. These populations were experimentally reintroduced to the Black Diamond Mines Regional Preserve, but only one has been somewhat successful. No other populations are known or suspected to occur in the CCWD service area. This location is fully protected.

Table B-1. Special-Status Species Considered in the Analysis for the Contra Costa Water District Proposed Long-Term Water Service Contract, Contra Costa County, California. (North State Resources, Inc., March 2004)

Species		Federal Status[1]	General Habitat and Distribution	Is Species Analyzed Further in the BA[2]?	Occurrence in the Service Area
Common Name	**Scientific Name**				
Plants					
soft bird's-beak	*Cordylanthus mollis* ssp. *mollis*	E	Inhabits coastal salt marshes and brackish marshes from northern San Francisco Bay to Suisun Bay in Napa, Solano, and Contra Costa counties.	YES	The species is known to occur in the CCWD service area. CNDDB reports eight occurrences in the project vicinity, but four of these have likely been extirpated. Remaining known populations exist in the *Vine Hill, Honker Bay,* and *Benicia* USGS quadrangles.
Palmate-bracted bird's-beak	*Cordylanthus palmatus*	E	Grows on seasonally-flooded, saline-alkali soils in lowland plains and basins at elevations of less than 500 feet. Seven populations of palmate-bracted bird's-beak are currently known in Colusa, Yolo, Fresno, Madera, and Alameda counties.	NO	One known location in the project vicinity is present in the Springtown Wetlands Reserve (CNDDB 2003), located north of Livermore in Alameda County. This large and genetically diverse population occurs on lands owned by the Federal Communication Commission, the City of Livermore, and private landowners. No other populations are known or suspected to occur in the CCWD service area.
Contra Costa wallflower	*Erysimum capitatum* ssp. *angustatum*	E	Grows naturally only in sand dune habitat along the San Joaquin River east of Antioch. Areas of suitable habitat (riverine or wind-blown sandy soils near Antioch) that do not contain visible vegetative, reproductive or senescent/dead plants may support viable seed banks.	NO	Within the CCWD service area, this species is fully protected within the Antioch Dunes National Wildlife Refuge. No other populations are known or suspected to occur in the CCWD service area. The Antioch Dunes National Wildlife Refuge protects critical habitat for this species. Project implementation would not impact the Refuge system or this species.
Plants					
Contra Costa goldfields	*Lasthenia conjugens*	E	Inhabits vernal pools within open grassy areas in woodlands and valley grasslands from sea level to 1,500 feet. Currently, 13 populations are known from Napa, Contra Costa, Alameda and Solano counties.	YES	Of the five reported occurrences in the project vicinity, only one has been observed in the last fifteen years (CNDDB 2003). The CCWD service area is outside of designated critical habitat for this species.

Table B-1. Special-Status Species Considered in the Analysis for the Contra Costa Water District Proposed Long-Term Water Service Contract, Contra Costa County, California. (North State Resources, Inc., March 2004)

Species		Federal Status[1]	General Habitat and Distribution	Is Species Analyzed Further in the BA[2]?	Occurrence in the Service Area
Common Name	**Scientific Name**				
Antioch Dunes evening-primrose	*Oenothera deltoides* ssp. *howellii*	E	Endemic to loose sand and stabilized sand dunes near river margins in the vicinity of Antioch. The subspecies occurs in several locations near the confluence of the Sacramento and San Joaquin Rivers. The only natural stand exists within the sand dunes near Antioch in Contra Costa County.	NO	Known highly localized occurrences on protected land. Most of the natural dune habitat is in Antioch Dunes National Wildlife Refuge. PG&E owns the remaining habitat. The area is protected by San Francisco Bay National Wildlife Refuge and PG&E. The Antioch Dunes National Wildlife Refuge protects critical habitat for this species. Project implementation would not impact the Refuge system or this species.
pallid manzanita	*Arctostaphylos pallida*	T	Occurs in Alameda and Contra Costa counties, in manzanita chaparral habitat at elevations from 656 to 1,460.	YES	The two known occurrences of this species in the CCWD service area were artificially reintroduced. However, suitable habitat for the species is present.
Santa Cruz tarplant	*Holocarpha macradenia*	T	Occurs in clay soils in grasslands. Range is now limited to 12 natural occurrences in Santa Cruz and Monterey counties.	NO	In 1982, seed was introduced to 22 sites in Wildcat Canyon Regional Park and onto East Bay Municipal Utilities District (EBMUD) lands. Only one of these sites consistently has over 100 plants, and 13 of the sites have not supported any plants in the past four years. These populations are protected.
Plants					
Colusa grass	*Neostapfia colusana*	T	Occurs in large or deep vernal pools with substrates of high mud content. Sparingly restricted to the Sacramento and San Joaquin Valleys. Approximately 44 populations remain along a 100-mile stretch of the eastern San Joaquin Valley in Merced and Stanislaus counties; 4 populations exist in Yolo and Solano counties.	NO	The species is not known to occur in the CCWD service area, and the CCWD service area is outside the species' current range. The CCWD service area is outside of designated critical habitat for this species.

NOTES: 1 Federal Status Codes: E = Endangered; T = Threatened; P = Proposed; D = Delisted

2 *Final Biological Assessment – Long Term Water Service Contract Renewal, Volume 1* (March 31, 2004)

APPENDIX C

Economic Analysis (November 1999)

Economic Analysis of November 1999 Tiered Pricing Proposal for PEIS Preferred Alternative

Date: October 2, 2000

This submittal presents the results of an Economic Analysis of the application to the PEIS Preferred Alternative of the November 1999 unit rates for CVP water and Tiered Pricing Proposal.

The PEIS Preferred Alternative included assumptions for the tiered pricing of CVP water that were developed during the preparation of the Draft PEIS. Subsequent to completion of the Final PEIS, a different tiered pricing proposal was developed. In addition, the PEIS assumed 1992 CVP water rates. This analysis includes the 1999 water rates. This submittal applies the new water rates and the November 1999 proposal to the Preferred Alternative and compares the results to the impact analysis of the PEIS Preferred Alternative. The level of detail presented in this submittal is consistent with the level of detail presented in the main PEIS document and the technical appendices. Tables are presented in the same format as used in the PEIS.

The economic analysis includes an evaluation of agricultural economics using Central Valley Production Model (CVPM), municipal and industrial water use economics for CVP water using the spreadsheet presented with the PEIS, and regional economics using IMPLAN. This memorandum discusses the new assumptions in the November 1999 proposal. However, this memorandum does not discuss the basic assumptions used in the PEIS models and analytical tools. This memorandum must be used in conjunction with the Draft PEIS and Final PEIS, including the methodology and modeling technical appendices, to explain the overall assumptions for evaluating the Preferred Alternative in the PEIS.

For the Agricultural Land Use and Economics analysis, the methodology used for applying CVP water rates was modified to allow for the new tiered pricing and the use of blended rates to determine a total water rate for all CVP water applied by an irrigation district or agency. These changes result in changes in water use due to the affordability of CVP water supplies, not a change in reliability.

For the Municipal and Industrial Water Use Economics analysis, blended rates had been used in the PEIS analysis. In addition, this analysis assumes that the municipal and industrial users will be able to afford the calculated water costs, as described in the PEIS. Therefore, CVP water deliveries do not change for the municipal and industrial analysis. The Regional Economics analysis reflects only changes to agricultural and municipal and industrial sectors, but not recreation sectors.

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Section 1 Agricultural Land Use and Economics

SECTION 1
AGRICULTURAL LAND USE AND ECONOMICS

CONTRACT RENEWAL PROPOSAL WITH BLENDED WATER RATES

In the November 1999 proposal, Reclamation has proposed that water sold to CVP water service contractors be sold according to tiered water rates as required by CVPIA section 3404. Reclamation has also proposed that two categories of water be identified. Category 1 water would be calculated as the average delivery of the previous five years, and would be split into three tiers according to the 80-10-10 quantities defined in the CVPIA. Category 2 water would be any water available in excess of the 5-year rolling average, up to the total contract amount as defined by the Needs Analysis.

Tier 1 water rates include the cost-of-service component and any applicable Restoration charges and surcharges. Both the Restoration Charge and the capital component of the cost-of-service rate are subject to ability-to-pay limits. These limits are in effect for Bella Vista WD and Clear Creek CSD, contractors on the Corning and Tehama-Colusa Canals, and contractors receiving water from New Melones.

Tier 3 water rates include the full-cost rate (as defined in the Reclamation Reform Act) and any applicable Restoration Charges. No ability-to-pay relief is provided in this Tier. The Tier 2 water rate is the average of the applicable Tier 1 and Tier 3 rates. Category 2 water has the same rate as Tier 3.

For this proposal, it is assumed that water conservation guidelines allow contractors to blend the rate of CVP water delivered in any tier or Category, and that they do blend the rates. This is different from the assumption used to assess alternatives in the PEIS, in which contractors were assumed to sell CVP water to growers at tiered rates. Differences between PEIS pricing assumptions and this analysis are:

- This analysis assumes that contractors blend the price of all CVP water received at tiered rates into a single rate. Tiered rates to growers are assumed in the PEIS.

- The project water portion of Sacramento River water rights settlement contracts are not subject to the new pricing policy in this analysis. In the PEIS it was assumed that it was subject to tiered rates.

- Rates are based on the Irrigation Water Rates spreadsheets provided by Reclamation in November 1999. PEIS rates used the 1994 Irrigation Water Rates manual.

- Ability-to-pay relief is incorporated using the current payment capacity studies for Shasta County irrigation contractors, Corning Canal contractors, Tehama Colusa Canal contractors, and New Melones contractors. In the PEIS, payment capacity was based on a 1992 regional study (PEIS, 1999).

- In this analysis, ability to pay relief is provided in Tier 1, with none in Tier 3 - Tier 2 is the average of Tiers 1 and 3, and so provides 50% relief. In the PEIS, the same dollar amount of ability to pay relief is applied in all pricing tiers.

- A $7.00 per acre-foot Restoration Charge is assumed in this analysis. A $6.50 per acre-foot charge was used in the PEIS. The Friant surcharge was $7.00 per acre-foot in both studies.

- There is no lower bound on the usage of CVP water. In the PEIS each subregion was restricted to using at least the Tier 1 quantity of CVP supplies.

METHODOLOGY

Other than the differences listed above, the modeling approach and underlying data were the same as used for the PEIS. The Central Valley Production Model (CVPM) was used in this analysis, with modifications needed to assess the specific water pricing conditions proposed. Table 1 shows the regions of the CVPM and the corresponding service areas. Groundwater hydrology was not assessed as it was in the PEIS alternatives. Therefore, for purposes of analysis, most regions were assumed to have access to replacement groundwater if needed. Based on groundwater hydrology as described in the PEIS, the following subregions are assumed to be unable to replace any CVP water with groundwater on a long term basis: Shasta County irrigation contractors (subregion 1), Corning Canal contractors (subregion 2), and the Tehama-Colusa service area (subregion 3B).

Water deliveries from the CVPIA Preferred Alternative were used (Reclamation CVPIA PEIS, 1999). These deliveries were allocated on a yearly basis into pricing tiers and categories according to the rules described above. Weighted average (i.e., 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. Throughout this report the following conventions are use: an Average rear represents the average 1922-1990 water delivery from the CVPIA Preferred Alternative (Reclamation CVPIA PEIS, 1999); a Wet year represents the average delivery for the period of 1967-1971 from the CVPIA Preferred Alternative; and a Dry year is the average 1928-1934 delivery from The CVPIA Preferred Alternative.

A total of nine water supply sequences are assessed in this analysis and compared to the CVPIA Preferred Alternative:

Average-Average:	An average water year following a 5-year sequence of average years.
Wet-Average:	An average water year following a 5-year sequence of wet years.
Dry-Average:	An average water year following a 5-year sequence of dry years.
Average-Wet:	A wet water year following a 5-year sequence of average years.
Wet-Wet:	A wet water year following a 5-year sequence of wet years.
Dry-Wet:	A wet water year following a 5-year sequence of dry years.
Average-Dry:	A dry water year following a 5-year sequence of average years.
Wet-Dry:	A dry water year following a 5-year sequence of wet years.
Dry-Dry:	A dry water year following a 5-year sequence of dry years.

The CVP water rates used for each of the nine sequences described above and the CVPIA Preferred Alternative tiered prices are shown in Table 3. Tables 4-12 show the available CVP water service contract supplies by tier and the blended price for each of the 22 subregions under the nine sequences proposed for the Long-Term Contract Renewal analysis.

Results are shown for each of the nine sequences presented as differences compared to the CVPIA Preferred Alternative. When calculating differences from the CVPIA Preferred Alternative, sequences ending in an Average, Wet and Dry years are compared to the Average, Wet and Dry year CVPIA Preferred Alternative results respectively.

IRRIGATED ACRES

Changes in irrigated acres from the Preferred Alternative are summarized by region in Table 13. A complete list of changes by crop and subregion is provided as Table 17.

Both the Average-Average and Wet-Average scenarios show little difference from the Preferred Alternative under the Average hydrology conditions. The Dry-Average sequence shows a larger reduction in irrigated acres almost all of which comes from the Sacramento River region. Compared to the Wet year Preferred Alternative results, there is a similar pattern for the three Long-Term Contract Renewal sequences ending with Wet years. For all three of the Long Term Contract Renewal Sequences ending in a dry year there minimal increases in irrigated acreage compared to the Dry year CPVIA Preferred Alternative results. Irrigated acres remain unchanged under all nine sequences in the San Felipe Division.

The reduction in acreage in Average and Wet years preceded by a series of Dry years is a result of higher CVP water costs. Since the quantity of Category 1 water is based on the average deliveries of the preceding five years, the quantity of water eligible for Category 1 classification shrinks when a sustained drought is experienced. In an average or wet year follows a drought period, water becomes available however a large portion is classified as Category 2 and is priced at the full cost rate. This can be seen in Tables 6 and 9. When this relatively large block of full cost water is incorporated into the blended water price, all CVP supplies become more expensive, and sometimes unaffordable. This result is not seen in the dry-dry sequence because there is not excess water that gets classified as Category 2.

GROSS AND NET REVENUE

Gross revenue (value of production) impacts follow acreage impacts quite closely, and are shown by region in Table 14. Compared to the Average Preferred Alternative, a small reduction of less than $1 million is estimated for the Average-Average and Wet-Average scenarios, and a $39 million reduction is estimated in Dry-Average scenario. Gross revenue also declines compared to the Wet Preferred Alternative with approximately $5 million reductions in Average and Wet years and a larger reduction of $29 million in the Dry-Wet scenario. In dry years preceded by all three hydrologic conditions, gross revenue is slightly higher when compared to the Preferred Alternative Dry year results. There were no changes in gross revenue for the San Felipe Division since there were no changes in irrigated acres compared to the CVPIA preferred Alternative. A complete list of changes in gross revenue by crop and subregion is provided as Table 18.

Net revenue impacts are separated into five components; Fallowed land, Groundwater pumping costs, Irrigation Costs, CVP water costs and higher crop prices. The CVP water cost component represents the impact to net revenue from changes in both the quantity of CVP water used and the price of CVP water. Therefore when the blended CVP water price increases, farmers frequently use less, and the net impact to the CVP water cost component can be positive even when the water price is higher. Table 15 summarizes the net income impacts by component. A negative entry in the table indicates a reduction in net revenue. A complete list of changes in net income by component for each subregion is provided as Table 19.

Relatively small net income impacts are seen in all water supply sequences at the State level. The Average-Average sequence compared to the Average year Preferred Alternative shows a decline of $2 million in net revenue for all of California. The Wet-Average scenario is estimated to have a net increase of approximately $4 million and the Dry-Average sequence a decrease of $12 million.

The net revenue impact in wet years relative to the Preferred Alternative wet results show a pattern similar to the Average year results. Dry years preceded by a series of Average and Wet years both show net decrease in revenue of about $12 million while the Dry-Dry sequence results in a $15 million decrease in State wide net revenue relative the Preferred Alternative Dry results.

Notice that following a series of dry years, the net revenue component associated with crop prices often results in a positive impact to net revenue. This occurs because some subregions are forced to reduce acreage because of higher blended CVP water prices, resulting in higher crop prices received for acreage that remains in production.

There is a negative impact to net revenue from irrigation costs in the Sacramento and San Joaquin River regions in each of the nine Long-Term Contract Renewal sequences. This impact is derived from the irrigation efficiency improvements induced by higher CVP water prices in the Average year sequences. The change in irrigation efficiency is carries through to the Wet and dry year sequences because they are short run analyses and irrigation technology is fixed in the short run. The increase in irrigation efficiency results in a reduction in the total water used in some subregions while irrigated acreage remains constant.

WATER USE

Table 16 summarizes water use changes by region. A complete list of changes in CVP water use and groundwater use by subregion is provided as Table 20. Water supplies other than CVP project water and groundwater are unaffected and not shown. The San Joaquin River region and most of the sequences for the Sacramento River region show the typical response represented by a shift away from CVP supplies to groundwater as CVP water becomes more expensive under the new pricing schemes. The Tulare Lake region and the Sacramento River region during wet years proceeded by a series of Average and Wet years show what would be considered an atypical response.

In the Sacramento River region when five years of Wet and Average conditions are followed by a wet year, the model predicts that both groundwater and CVP water use will decline relative to the Preferred Alternative Wet condition. The decrease in groundwater use is mostly attributed to subregion 3b. In this subregion in a wet year coming out of a series of Average or Wet years the blended price is cheaper than the Preferred Alternative Tier 2 water cost as well as the cost of pumping groundwater. Therefore there is a shift away from groundwater to CVP supplies. In Average years preceded by Average or Wet years, the subregion is prevented from shifting to CVP because they are already using their full CVP supply.

In the Tulare Lake region there is a pattern of shifting from groundwater to CVP water that can be attributed to subregions 17. This subregion shifts because under the blended pricing scheme the CVP water becomes cheaper than pumping groundwater; therefore they maximize their CVP water use.

In average and wet years preceded by a series of dry years, there is a large decrease in CVP water use in both the Sacramento and San Joaquin River regions. This is driven by the relatively high cost of CVP supplies under these conditions. Since many subregions receive less water in dry years, or the water falls into the higher tiers and it becomes unaffordable, and the base from which the blended price tier quantities is calculated shrinks. This sets up a condition where when an Average or Wet year comes along, the additional water is classified as Category 2 and assessed the full cost price. The CVP blended price is a weighted average of all CVP supplies therefore the cost for all CVP water increases and the supplies often become unaffordable.

LOCALIZED IMPACTS

Certain subregions are substantially affected by the proposed water pricing.

- The Tehama-Colusa service area is the most-affected region. Limited groundwater availability and very high full-cost price relative to the value of water in agricultural production result in almost 60,000 acres out of production in the Dry-Average sequence and substantially higher cost for lands remaining in production. This analysis shows a one-year snapshot. Because water pricing is based on historic delivery, a region (such as the Tehama-Colusa region) may never be able to “buy its way” back out from a drought. Looked at over a sequence of dry years such as 1928-34 or 1987-92, many or most of the districts in this area could not survive as CVP contractors.

- The analysis predicts that the Delta subregion will make a complete switch to groundwater supplies in all nine hydrologic sequences, assuming groundwater is available in all parts of the service area.

- The analysis estimates that the once an extended drought is experienced the Delta-Mendota service area would switch from its CVP water service supply to groundwater, assuming groundwater is available in all parts of the service area.

- Westlands Water District and many of the Friant Unit contractors would likely continue purchasing CVP water. Since these areas continue to purchase CVP supplies in all years coming out of drought conditions, they would eventually build their base deliveries up or "buy their way" back to pre-drought tier quantities and prices.

TABLE 1
CVPM SUBREGIONS AND DESCRIPTIONS

CVPM Subregion	Description of Major Water Users
1	CVP Users: Anderson Cottonwood, Clear Creek, Bella Vista, Sacramento River miscellaneous users.
2	CVP Users: Corning Canal, Kirkwood, Tehema, Sacramento River, miscellaneous users.
3	CVP Users: Glenn Colusa ID, Provident, Princeton-Codora, Maxwell, and Colusa Basin Drain MWC.
3B	Tehama Colusa Canal Service Area. CVP Users: Orland-Artois WD, most of County of Colusa, Davis, Dunnigan, Glide Kanawha, La Grande, Westside WD.
4	CVP Users: Princeton-Codora-Glenn, Colusa Irrigation Co., Meridian Farm WC, Pelger Mutual WC, Recl. Dist. 1004, Recl. Dist. 108, Robers Ditch, Sartain M.D., Sutter MWC, Swinford Tract IC, Tisdale Irrigation, Sacramento River miscellaneous users.
5	Most Feather River Region riparian and appropriative users.
6	Yolo, Solano Counties. CVP Users: Conaway Ranch, Sacramento River miscellaneous users.
7	Sacramento Co. north of American River. CVP Users: Natomas Central MWC, Sacramento River miscellaneous users, Pheasant Grove-Verona, San Juan Suburban.
8	Sacramento Co. south of American River, San Joaquin Co.
9	Delta Regions. CVP Users: Banta Carbona, West Side, Plainview.
10	Delta Mendota Canal. CVP Users: Pacheco, Del Puerto, Hospital, Sunflower, West Stanislaus, Mustang, Orestimba, Patterson, Foothill, San Luis WD, Broadview, Eagle Field, Mercy Springs, Pool Exchange Contractors, Schedule II water rights, more.
11	Stanislaus River water rights: Modesto ID, Oakdale ID, South San Joaquin ID.
12	Turlock ID.
13	Merced ID. CVP Users: Madera, Chowchilla, Gravely Ford.
14	CVP Users: Westlands WD.
15	Tulare Lake Bed. CVP Users: Fresno Slough, James, Tranquility, Traction Ranch, Laguna, Real. Dist. 1606.
16	Eastern Fresno Co. CVP Users: Friant-Kern Canal. Fresno ID, Garfield, International.
17	CVP Users: Friant-Kern Canal. Hills Valley, Tri-Valley Orange Cove.
18	CVP Users: Friant-Kern Canal, County of Fresno, Lower Tule River ID, Pixley ID, portion of Rag Gulch, Ducor, County of Tulare, most of Delano Earlimart, Exeter, Ivanhoe, Lewis Cr., Lindmore, Lindsay-Strathmore, Porterville, Sausalito, Stone Corral, Tea Pot Dome, Terra Bella, Tulare.
19	Kern Co. SWP Service Area.
20	CVP Users: Friant-Kern Canal. Shafter-Wasco, S. San Joaquin.
21	CVP Users: Cross Valley Canal, Friant-Kern Canal. Arvin Edison.

TABLE 2

CVP WATER RATES USED FOR LONG TERM CONTRACT RENEWAL ANALYSIS ($)

CVPM Subregion	Tiered Water Rates Used for LTCR analysis			Proposed Blended Water Rates for Water Service Contracts								
				Average	Wet	Dry	Average	Wet	Dry	Average	Wet	Dry
	Tier 1	Tier 2	Tier 3	Followed by Average			Followed by Wet			Followed by Dry		
1	12.01	37.56	63.12	19.67	14.98	14.14	23.91	19.67	18.20	25.19	21.09	19.67
2	10.71	36.40	62.09	18.42	10.71	49.66	29.55	18.42	52.83	10.71	10.71	18.42
3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3B	10.25	40.73	71.21	19.39	10.25	58.15	32.35	19.39	61.42	10.25	10.25	19.39
4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	20.65	23.01	25.36	21.35	21.18	21.77	21.52	21.35	21.92	20.90	20.81	21.35
6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	11.77	12.07	12.37	11.86	11.86	11.86	11.86	11.86	11.86	11.86	11.86	11.86
8	10.00	27.46	44.92	15.24	10.00	30.36	25.64	15.24	35.47	10.00	10.00	15.24
9	24.79	55.14	85.50	33.89	24.79	64.53	55.27	33.89	73.22	24.79	24.79	33.89
10	31.15	40.16	49.16	33.85	31.15	42.94	38.01	33.85	44.63	31.15	31.15	33.85
11	0.00	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	0.00	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	32.16	38.41	44.65	34.04	33.25	37.44	34.77	34.04	37.94	32.16	32.16	34.04
14	32.62	46.48	60.33	36.78	32.62	50.76	43.17	36.78	53.36	32.62	32.62	36.78
15	32.71	41.91	51.10	35.47	34.55	38.10	36.34	35.47	38.82	33.07	32.71	35.47
16	40.48	46.78	53.08	42.37	41.22	45.32	43.40	42.37	46.07	40.48	40.48	42.37
17	34.18	40.49	46.79	36.07	35.15	39.28	36.92	36.07	39.88	34.18	34.18	36.07
18	33.63	40.48	47.33	35.69	34.73	39.16	36.57	35.69	39.78	33.63	33.63	35.69
19	34.58	42.16	49.73	36.86	35.00	41.21	38.84	36.86	42.52	34.58	34.58	36.86
20	34.58	42.16	49.73	36.86	35.70	40.85	37.92	36.86	41.58	34.58	34.58	36.86
21	32.70	39.00	45.31	34.59	32.98	39.01	36.33	34.59	40.03	32.70	32.70	34.59

NOTES:

1. Blended rates used pricing components from the November, 1999 Irrigation Water Rates spreadsheets, Restoration Charge of $7.00
2. PEIS rates used regional estimates of payment capacity and allowed the same ATP relief in all tiers.
3. Blended rates use most recent available payment capacity studies from Reclamation, and allow ATP relief in Tier 1 but not in Tier 3.
4. Only Class 1 rates are shown for Friant Division. Friant surcharge is $7.00 in all rates.

TABLE 3

CVP WATER RATES USED IN PREFERRED ALTERNATIVE ($)

CVPM Subregion	Tiered Water Rates Used in the PEIS Preferred Alternative ($)		
	Tier 1	Tier 2	Tier 3
1	5.91	14.63	23.35
2	11.83	24.7	37.57
3	2.83	5.27	7.71
3B	17.16	36.225	55.29
4	5.32	7.625	9.93
5	4.53	6.965	9.4
6	4.53	6.82	9.11
7	6.63	8.83	11.03
8	4.53	7.095	9.66
9	28.54	35.245	41.95
10	33.46	40.015	46.57
11	0	0	0
12	0	0	0
13	33.65	39.395	45.14
14	39.31	54.385	69.46
15	28.16	34.875	41.59
16	38.25	44.255	50.26
17	35.58	41.905	48.23
18	35.01	41.255	47.5
19	36.68	42.885	49.09
20	36.68	42.885	49.09
21	35.4	42.01	48.62

NOTES:

1. PEIS rates used pricing components from the 1994 Irrigation Water Rates Manual, Restoration Charge of $6.50
2. PEIS rates used regional estimates of payment capacity and allowed the same ATP relief in all tiers.
3. Only Class 1 rates are shown for Friant Division. Friant surcharge is $7.00 in all rates.

TABLE 4

PROJECT WATER APPLIED BY PRICING TIERS
AVERAGE YEAR FOLLOWING AVERAGE 5-YEAR BASE CONDITION

CVPM Subregion	Tier 1	Tier 2	Tier 3	Category 2	Blended Price ($/AF)
	(1000 AF)				
1	9.4	1.2	1.2	-	$ 19.67
2	21.9	2.7	2.7	-	$ 18.42
3	-	-	-	-	NA
3B	159.7	20.0	20.0	-	$ 19.39
4	-	-	-	-	NA
5	16.0	2.0	2.0	-	$ 21.35
6	-	-	-	-	NA
7	12.0	1.5	1.5	-	$ 11.86
8	41.3	5.2	5.2	-	$ 15.24
9	22.5	2.8	2.8	-	$ 33.89
10	231.4	28.9	28.9	-	$ 33.85
11	-	-	-	-	
12	-	-	-	-	
13	153.6	19.2	19.2	-	$ 34.04
14	539.1	67.4	67.4	-	$ 36.78
15	32.3	4.0	4.0	-	$ 35.47
16	18.9	2.4	2.4	-	$ 42.37
17	34.9	4.4	4.4	-	$ 36.07
18	484.2	60.5	60.5	-	$ 35.69
19	13.1	1.6	1.6	-	$ 36.86
20	194.2	24.3	24.3	-	$ 36.86
21	129.7	16.2	16.2	-	$ 34.59

Table 5

PROJECT WATER APPLIED BY PRICING TIERS
AVERAGE YEAR FOLLOWING WET 5-YEAR BASE CONDITION

CVPM Subregion	Tier 1	Tier 2	Tier 3	Category 2	Blended Price ($/AF)
	(1000 AF)				
1	10.4	1.3	0.0	-	$ 14.98
2	27.3	-	-	-	$ 10.71
3	-	-	-	-	NA
3B	199.6	-	-	-	$ 10.25
4	-	-	-	-	NA
5	16.6	2.1	1.2	-	$ 21.18
6	-	-	-	-	NA
7	12.0	1.5	1.5	-	$ 11.86
8	51.6	-	-	-	$ 10.00
9	28.2	-	-	-	$ 24.79
10	289.2	-	-	-	$ 31.15
11	-	-	-	-	NA
12	-	-	-	-	NA
13	165.0	20.6	6.3	-	$ 33.25
14	673.8	-	-	-	$ 32.62
15	34.2	4.3	1.9	-	$ 34.55
16	21.0	2.6	0.1	-	$ 41.22
17	37.9	4.7	1.0	-	$ 35.15
18	523.8	65.5	15.9	-	$ 34.73
19	15.5	0.9	-	-	$ 35.00
20	211.7	26.5	4.6	-	$ 35.70
21	154.9	7.2	-	-	$ 32.98

Table 6

PROJECT WATER APPLIED BY PRICING TIERS
AVERAGE YEAR FOLLOWING DRY 5-YEAR BASE CONDITION

CVPM Subregion	Tier 1	Tier 2	Tier 3	Category 2	Blended Price ($/AF)
	(1000 AF)				
1	10.8	1.0	-	-	$ 14.14
2	6.2	0.8	0.8	19.6	$ 49.66
3	-	-	-	-	NA
3B	40.2	5.0	5.0	149.3	$ 58.15
4	-	-	-	-	NA
5	14.3	1.8	1.8	2.1	$ 21.77
6	-	-	-	-	NA
7	12.0	1.5	1.5	-	$ 11.86
8	20.2	2.5	2.5	26.3	$ 30.36
9	9.2	1.1	1.1	16.7	$ 64.53
10	94.0	11.8	11.8	171.7	$ 42.94
11	-	-	-	-	NA
12	-	-	-	-	NA
13	104.4	13.0	13.0	61.6	$ 37.44
14	219.1	27.4	27.4	400.0	$ 50.76
15	26.8	3.4	3.4	6.8	$ 38.10
16	13.7	1.7	1.7	6.5	$ 45.32
17	24.5	3.1	3.1	13.1	$ 39.28
18	339.7	42.5	42.5	180.6	$ 39.16
19	8.7	1.1	1.1	5.6	$ 41.21
20	133.9	16.7	16.7	75.3	$ 40.85
21	76.2	9.5	9.5	66.8	$ 39.01

Table 7

PROJECT WATER APPLIED BY PRICING TIERS
WET YEAR FOLLOWING AVERAGE 5-YEAR BASE CONDITION

CVPM Subregion	Tier 1	Tier 2	Tier 3	Category 2	Blended Price ($/AF)
	(1000 AF)				
1	9.4	1.2	1.2	1.3	$ 23.91
2	21.9	2.7	2.7	9.4	$ 29.55
3	-	-	-	-	NA
3B	159.7	20.0	20.0	66.6	$ 32.35
4	-	-	-	-	NA
5	16.0	2.0	2.0	0.9	$ 21.52
6	-	-	-	-	NA
7	12.0	1.5	1.5	-	$ 11.86
8	41.3	5.2	5.2	27.8	$ 25.64
9	22.5	2.8	2.8	19.9	$ 55.27
10	231.4	28.9	28.9	107.8	$ 38.01
11	-	-	-	-	NA
12	-	-	-	-	NA
13	153.6	19.2	19.2	14.3	$ 34.77
14	539.1	67.4	67.4	251.2	$ 43.17
15	32.3	4.0	4.0	2.4	$ 36.34
16	18.9	2.4	2.4	2.5	$ 43.40
17	34.9	4.4	4.4	3.8	$ 36.92
18	484.2	60.5	60.5	49.6	$ 36.57
19	13.1	1.6	1.6	3.0	$ 38.84
20	194.2	24.3	24.3	21.9	$ 37.92
21	129.7	16.2	16.2	31.5	$ 36.33

Table 8

PROJECT WATER BY PRICING TIERS
WET YEAR FOLLOWING WET 5-YEAR BASE CONDITION

CVPM Subregion	Tier 1	Tier 2	Tier 3	Category 2	Blended Price ($/AF)
	(1000 AF)				
1	10.4	1.3	1.3	-	$ 19.67
2	29.4	3.7	3.7	-	$ 18.42
3	-	-	-	-	NA
3B	212.9	26.6	26.6	-	$ 19.39
4	-	-	-	-	NA
5	16.6	2.1	2.1	-	$ 21.35
6	-	-	-	-	NA
7	12.0	1.5	1.5	-	$ 11.86
8	63.5	7.9	7.9	-	$ 15.24
9	38.5	4.8	4.8	-	$ 33.89
10	317.6	39.7	39.7	-	$ 33.85
11	-	-	-	-	NA
12	-	-	-	-	NA
13	165.0	20.6	20.6	-	$ 34.04
14	740.0	92.5	92.5	-	$ 36.78
15	34.2	4.3	4.3	-	$ 35.47
16	21.0	2.6	2.6	-	$ 42.37
17	37.9	4.7	4.7	-	$ 36.07
18	523.8	65.5	65.5	-	$ 35.69
19	15.5	1.9	1.9	-	$ 36.86
20	211.7	26.5	26.5	-	$ 36.86
21	154.9	19.4	19.4	-	$ 34.59

Table 9

PROJECT WATER APPLIED BY PRICING TIERS
WET YEAR FOLLOWING DRY 5-YEAR BASE CONDITION

CVPM Subregion	Tier 1	Tier 2	Tier 3	Category 2	Blended Price ($/AF)
	(1000 AF)				
1	10.8	1.3	0.9	-	$ 18.20
2	6.2	0.8	0.8	28.9	$ 52.83
3	-	-	-	-	NA
3B	40.2	5.0	5.0	215.9	$ 61.42
4	-	-	-	-	NA
5	14.3	1.8	1.8	2.9	$ 21.92
6	-	-	-	-	NA
7	12.0	1.5	1.5	-	$ 11.86
8	20.2	2.5	2.5	54.1	$ 35.47
9	9.2	1.1	1.1	36.7	$ 73.22
10	94.0	11.8	11.8	279.5	$ 44.63
11	-	-	-	-	NA
12	-	-	-	-	NA
13	104.4	13.0	13.0	75.9	$ 37.94
14	219.1	27.4	27.4	651.1	$ 53.36
15	26.8	3.4	3.4	9.1	$ 38.82
16	13.7	1.7	1.7	9.1	$ 46.07
17	24.5	3.1	3.1	16.8	$ 39.88
18	339.7	42.5	42.5	230.2	$ 39.78
19	8.7	1.1	1.1	8.5	$ 42.52
20	133.9	16.7	16.7	97.2	$ 41.58
21	76.2	9.5	9.5	98.3	$ 40.03

Table 10

PROJECT WATER APPLIED BY PRICING TIERS
DRY YEAR FOLLOWING AVERAGE 5-YEAR BASE CONDITION

CVPM Subregion	Tier 1	Tier 2	Tier 3	Category 2	Blended Price ($/AF)
	(1000 AF)				
1	9.4	1.2	1.2	1.7	$ 25.19
2	7.8	-	-	-	$ 10.71
3	-	-	-	-	NA
3B	50.3	-	-	-	$ 10.25
4	-	-	-	-	NA
5	16.0	1.9	-	-	$ 20.90
6	-	-	-	-	NA
7	12.0	1.5	1.5	-	$ 11.86
8	25.3	-	-	-	$ 10.00
9	11.5	-	-	-	$ 24.79
10	117.5	-	-	-	$ 31.15
11	-	-	-	-	NA
12	-	-	-	-	NA
13	130.4	-	-	-	$ 32.16
14	273.9	-	-	-	$ 32.62
15	32.3	1.3	-	-	$ 33.07
16	17.1	-	-	-	$ 40.48
17	30.6	-	-	-	$ 34.18
18	424.6	-	-	-	$ 33.63
19	10.9	-	-	-	$ 34.58
20	167.4	-	-	-	$ 34.58
21	95.3	-	-	-	$ 32.70

Table 11

PROJECT WATER APPLIED BY PRICING TIERS
DRY YEAR FOLLOWING WET 5-YEAR BASE CONDITION

CVPM Subregion	Tier 1	Tier 2	Tier 3	Category 2	Blended Price ($/AF)
	(1000 AF)				
1	10.4	1.3	1.3	0.4	$ 21.09
2	7.8	-	-	-	$ 10.71
3	-	-	-	-	NA
3B	50.3	-	-	-	$ 10.25
4	-	-	-	-	NA
5	16.6	1.2	-	-	$ 20.81
6	-	-	-	-	NA
7	12.0	1.5	1.5	-	$ 11.86
8	25.3	-	-	-	$ 10.00
9	11.5	-	-	-	$ 24.79
10	117.5	-	-	-	$ 31.15
11	-	-	-	-	NA
12	-	-	-	-	NA
13	130.4	-	-	-	$ 32.16
14	273.9	-	-	-	$ 32.62
15	33.6	-	-	-	$ 32.71
16	17.1	-	-	-	$ 40.48
17	30.6	-	-	-	$ 34.18
18	424.6	-	-	-	$ 33.63
19	10.9	-	-	-	$ 34.58
20	167.4	-	-	-	$ 34.58
21	95.3	-	-	-	$ 32.70

Table 12

PROJECT WATER BY PRICING TIERS
DRY YEAR FOLLOWING DRY 5-YEAR BASE CONDITION

CVPM Subregion	Tier 1	Tier 2	Tier 3	Category 2	Blended Price ($/AF)
	(1000 AF)				
1	10.8	1.3	1.3	-	$ 19.67
2	6.2	0.8	0.8	-	$ 18.42
3	-	-	-	-	NA
3B	40.2	5.0	5.0	-	$ 19.39
4	-	-	-	-	NA
5	14.3	1.8	1.8	-	$ 21.35
6	-	-	-	-	NA
7	12.0	1.5	1.5	-	$ 11.86
8	20.2	2.5	2.5	-	$ 15.24
9	9.2	1.1	1.1	-	$ 33.89
10	94.0	11.8	11.8	-	$ 33.85
11	-	-	-	-	NA
12	-	-	-	-	NA
13	104.4	13.0	13.0	-	$ 34.04
14	219.1	27.4	27.4	-	$ 36.78
15	26.8	3.4	3.4	-	$ 35.47
16	13.7	1.7	1.7	-	$ 42.37
17	24.5	3.1	3.1	-	$ 36.07
18	339.7	42.5	42.5	-	$ 35.69
19	8.7	1.1	1.1	-	$ 36.86
20	133.9	16.7	16.7	-	$ 36.86
21	76.2	9.5	9.5	-	$ 34.59

TABLE 13

IRRIGATED ACRES BY SUBREGION (1000 ACRES)

CVPM Subregion	Average Preferred Alternative	Change Compared to Average followed by Average			Wet Preferred Alternative	Change Compared to Average followed by Wet			Dry Preferred Alternative	Change Compared to Average followed by Dry		
		Average	Wet	Dry		Average	Wet	Dry		Average	Wet	Dry
Sacramento River	2015.5	-1.7	-0.8	-65.3	2020.0	-4.4	-4.4	-53.0	1984.8	0.1	0.1	0.0
San Joaquin River	2526.6	-0.2	-0.2	-1.2	2529.1	-1.7	-1.6	-1.9	2505.9	-0.1	-0.1	-0.1
Tulare Lake	1992.4	0.0	0.0	-0.2	1996.2	-1.2	-1.2	-1.3	1953.7	0.1	0.1	0.1
San Felipe	50.7	0.0	0.0	0.0	69.5	0.0	0.0	0.0	22.2	0.0	0.0	0.0
California Total	6585.2	-1.9	-1.0	-66.7	6614.8	-7.3	-7.3	-56.2	6466.6	0.1	0.1	0.1

TABLE 14

VALUE OF PRODUCTION BY SUBREGION (Million $)

CVPM Subregion	Average Preferred Alternative	Change Compared to Average followed by Average			Wet Preferred Alternative	Change Compared to Wet followed by Wet			Dry Preferred Alternative	Change Compared to Dry PA followed by Dry		
		Average	Wet	Dry		Average	Wet	Dry		Average	Wet	Dry
Sacramento River	1,825.3	-0.4	-0.2	-37.6	1,828.0	-1.6	-1.6	-26.8	1,810.0	0.4	0.4	0.3
San Joaquin River	4,402.3	-0.1	-0.1	-1.0	4,403.8	-0.9	-0.9	-1.1	4,384.2	-0.2	-0.2	-0.2
Tulare Lake	3,876.3	0.0	0.0	-0.3	3,879.4	-1.0	-1.0	-1.1	3,842.7	0.1	0.1	0.1
San Felipe	68.0	0.0	0.0	0.0	70.0	0.0	0.0	0.0	44.0	0.0	0.0	0.0
California Total	10,172.0	-0.5	-0.4	-38.8	10,181.2	-3.6	-3.6	-28.9	10,080.8	0.3	0.3	0.3

TABLE 15

NET REVENUE CHANGES BY REGION (Million $)

Cause of Net Revenue Change	Compared to Average Year			Compared to Wet Year PA			Compared to Dry Year PA		
	Average	Wet	Dry	Average	Wet	Dry	Average	Wet	Dry
	followed by Average			followed by Wet			followed by Dry		
Sacramento River									
Fallowed Land	-0.1	0.0	-6.7	-0.3	-0.3	-4.6	0.0	0.0	0.0
Groundwater Pumping Cost	-0.3	-0.3	-0.4	1.0	1.0	-4.5	-0.2	-0.2	-0.2
Irrigation Cost	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
CVP Water Cost	-0.3	1.7	3.6	-5.1	-1.0	4.6	-0.1	-0.1	-0.7
Higher Crop Prices	0.0	0.0	1.9	0.1	0.1	1.0	0.0	0.0	0.0
Net Change	**-1.0**	**1.0**	**-1.9**	**-4.6**	**-0.5**	**-3.8**	**-0.6**	**-0.6**	**-1.2**
San Joaquin River									
Fallowed Land	0.0	0.0	-0.1	-0.2	-0.2	-0.2	0.0	0.0	0.0
Groundwater Pumping Cost	0.0	0.0	-10.3	-7.4	0.2	-14.1	-1.0	-1.0	-1.0
Irrigation Cost	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
CVP Water Cost	1.0	4.0	2.3	7.9	6.1	6.2	-5.9	-5.9	-7.5
Higher Crop Prices	0.1	0.0	2.5	0.2	0.2	1.0	0.0	0.0	0.0
Net Change	**0.9**	**3.9**	**-5.7**	**0.4**	**6.1**	**-7.3**	**-7.0**	**-7.0**	**-8.6**
Tulare Lake									
Fallowed Land	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0
Groundwater Pumping Cost	0.1	0.1	0.1	1.0	1.0	1.0	-3.2	-3.2	-3.2
Irrigation Cost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CVP Water Cost	-2.3	-1.2	-5.7	-3.1	-2.1	-6.4	-0.9	-0.9	-2.3
Higher Crop Prices	0.0	0.0	1.4	0.1	0.1	0.4	0.0	0.0	0.0
Net Change	**-2.1**	**-1.1**	**-4.2**	**-2.1**	**-1.1**	**-5.1**	**-4.1**	**-4.1**	**-5.5**
San Felipe									
Fallowed Land	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Groundwater Pumping Cost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Irrigation Cost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CVP Water Cost	-0.2	0.0	-0.6	-0.5	-0.2	-0.9	0.0	0.0	-0.1
Higher Crop Prices	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Change	**-0.2**	**0.0**	**-0.6**	**-0.5**	**-0.2**	**-0.9**	**0.0**	**0.0**	**-0.1**
Total									
Fallowed Land	-0.1	-0.1	-6.9	-0.6	-0.6	-4.9	0.0	0.0	0.0
Groundwater Pumping Cost	-0.2	-0.2	-10.5	-5.3	2.2	-17.6	-4.4	-4.4	-4.4
Irrigation Cost	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
CVP Water Cost	-1.6	4.5	0.2	-0.3	3.1	4.5	-6.9	-6.8	-10.5
Higher Crop Prices	0.1	0.1	5.8	0.4	0.4	2.3	0.0	0.0	0.0
Net Change	**-2.3**	**3.7**	**-11.9**	**-6.3**	**4.6**	**-16.1**	**-11.7**	**-11.7**	**-15.3**

Note: A negative value in a cost category represents an increase in cost that produces a decrease in net revenue

TABLE 16
IRRIGATION WATER APPLIED BY REGION (1000 AF)

Region	Average Preferred Alternative	Change Compared to Average followed by Average			Wet Preferred Alternative	Change Compared to Wet PA Average followed by Wet			Dry Preferred Alternative	Change Compared to Dry Average followed by Dry		
		Average	Wet	Dry		Average	Wet	Dry		Average	Wet	Dry
Sacramento River												
CVP Water*	625.9	-27.6	-23.4	-243.5	694.3	-2.4	-2.6	-305.5	402.1	-20.3	-20.3	-20.4
Groundwater	2,621.3	10.5	10.7	11.2	2,456.9	-24.5	-24.3	114.7	3,261.6	4.1	4.2	4.0
San Joaquin River												
CVP Water*	960.2	-8.7	-9.0	-269.0	1,226.6	-226.3	-21.0	-378.7	506	-17.5	-17.5	-17.5
Groundwater	3,606.2	3.3	3.5	260.0	2,974.2	215.1	10.3	366.8	4723	12.0	12.0	12.0
Tulare Lake												
CVP Water*	919.5	1.9	2.0	2.0	967.3	3.7	3.8	3.6	685.3	0.1	0.1	0.0
Groundwater	3,369.0	-1.8	-2.0	-2.0	2,683.5	-7.7	-7.7	-7.5	4,542.9	0.0400	0.0400	0.0400
San Felipe												
CVP Water*	71.0	0.0	0.0	0.0	71.0	0.0	0.0	0.0	71.0	0.0	0.0	0.0
Groundwater	na	na	na	na	na	na	na	na	na	na	na	na
Total												
CVP Water*	2,505.5	-34.4	-30.4	-510.5	2,888.2	-224.9	-19.9	-680.6	1,593.9	-37.7	-37.8	-37.8
Groundwater	9,596.5	11.9	12.3	269.2	8,114.6	182.8	-21.6	474.0	12,527.1	16.1	16.2	16.1

*CVP water applied is project water only. It excludes exchange contract delivery and the base supply portion of settlement contracts.

TABLE 17
IRRIGATED ACREAGE BY SUBREGION

CVPM Sub-region	Crop Category	Preferred Alternative Average	Changes Compared to Avg. PA			Preferred Alternative Wet	Changes Compared to Wet PA			Preferred Alternative Dry	Changes Compared to Dry PA		
			Average	Wet	Dry		Average	Wet	Dry		Average	Wet	Dry
			Followed by Average				Followed by Wet				Followed by Dry		
1	Pasture	18.3	-1.2	-0.3	-0.1	18.3	-1.5	-1.5	-1.5	18.1	-1.8	-1.8	-1.8
	Alfalfa	0.9	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.9	0.0	0.0	0.0
	Other Field Crops	1.2	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.2	0.0	0.0	0.0
	Deciduous Orchard	3.8	0.0	0.0	0.0	3.8	0.0	0.0	0.0	3.8	0.0	0.0	0.0
	Small Grain	2.4	0.0	0.0	0.0	2.4	0.0	0.0	0.0	2.4	0.0	0.0	0.0
	Subtotal	**26.6**	**-1.3**	**-0.3**	**-0.1**	**26.5**	**-1.6**	**-1.6**	**-1.6**	**26.3**	**-1.9**	**-1.9**	**-1.9**
2	Pasture	34.1	0.0	0.0	-3.6	33.9	0.0	0.0	-5.9	33.1	0.0	0.0	0.0
	Alfalfa	9.5	0.0	0.0	-0.3	9.5	0.0	0.0	-0.6	9.4	0.0	0.0	0.0
	Sugar Beets	4.0	0.0	0.0	0.0	4.0	0.0	0.0	-0.1	4.0	0.0	0.0	0.0
	Other Field Crops	17.3	0.0	0.0	-0.5	17.2	0.0	0.0	-0.7	17.1	0.0	0.0	0.0
	Rice	4.5	0.0	0.0	-0.2	4.5	0.0	0.0	-0.3	4.5	0.0	0.0	0.0
	Truck Crops	15.5	0.0	0.0	0.0	15.5	0.0	0.0	0.0	15.5	0.0	0.0	0.0
	Deciduous Orchard	86.0	0.0	0.0	-0.1	86.0	0.0	0.0	0.0	86.0	0.0	0.0	0.0
	Small Grain	14.0	0.0	0.0	-0.2	13.9	0.0	0.0	-0.6	13.7	0.0	0.0	0.0
	Subtropical Orchard	10.2	0.0	0.0	0.0	10.2	0.0	0.0	0.0	10.2	0.0	0.0	0.0
	Subtotal	**195.0**	**0.0**	**0.0**	**-4.9**	**194.7**	**0.0**	**0.0**	**-8.2**	**193.5**	**0.0**	**0.0**	**0.0**
3	Pasture	7.8	0.0	0.0	0.0	7.9	0.0	0.0	0.0	7.5	0.0	0.0	0.0
	Alfalfa	18.2	0.0	0.0	0.0	18.3	0.0	0.0	0.0	18.0	0.0	0.0	0.0
	Sugar Beets	9.9	0.0	0.0	0.0	9.9	0.0	0.0	0.0	9.8	0.0	0.0	0.0
	Other Field Crops	15.7	0.0	0.0	0.0	15.8	0.0	0.0	0.0	15.5	0.0	0.0	0.0
	Rice	138.9	0.0	0.0	0.0	139.5	0.0	0.0	0.0	136.7	0.0	0.0	0.0
	Truck Crops	25.2	0.0	0.0	0.0	25.2	0.0	0.0	0.0	25.2	0.0	0.0	0.0
	Tomatoes	25.9	0.0	0.0	0.0	25.9	0.0	0.0	0.0	25.8	0.0	0.0	0.0
	Deciduous Orchard	17.8	0.0	0.0	0.0	17.8	0.0	0.0	0.0	17.8	0.0	0.0	0.0
	Small Grain	30.5	0.0	0.0	0.0	30.6	0.0	0.0	0.0	29.8	0.0	0.0	0.0
	Subtotal	**289.8**	**0.0**	**0.0**	**0.0**	**290.7**	**0.0**	**0.0**	**0.0**	**286.2**	**0.0**	**0.0**	**0.0**
3B	Pasture	5.7	0.0	0.0	-5.7	5.8	0.1	0.1	-1.5	4.3	0.0	0.0	0.0
	Alfalfa	10.1	0.0	0.0	-10.1	10.2	0.1	0.1	-2.6	7.6	0.0	0.0	0.0
	Sugar Beets	5.6	0.0	0.0	-5.3	5.6	0.0	0.0	-2.8	5.1	0.0	0.0	0.0
	Other Field Crops	13.4	0.0	0.0	-13.4	13.5	0.0	0.0	-13.5	10.4	0.0	0.0	0.0
	Rice	9.6	0.0	0.0	-9.6	9.7	0.1	0.1	-9.7	6.2	0.0	0.0	0.0
	Truck Crops	0.6	0.0	0.0	-0.1	0.6	0.0	0.0	0.0	0.6	0.0	0.0	0.0
	Tomatoes	6.1	0.0	0.0	-3.8	6.1	0.0	0.0	-1.8	5.7	0.0	0.0	0.0
	Deciduous Orchard	26.9	0.0	0.0	-3.3	26.9	0.0	0.0	0.0	26.9	0.0	0.0	0.0
	Small Grain	8.5	0.0	0.0	-8.5	8.6	0.0	0.0	-8.6	6.2	0.0	0.0	0.0
	Subtropical Orchard	1.0	0.0	0.0	-0.1	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
	Subtotal	**87.6**	**0.0**	**0.0**	**-59.9**	**87.9**	**0.3**	**0.3**	**-40.4**	**74.0**	**0.0**	**0.0**	**0.0**

TABLE 17
IRRIGATED ACREAGE BY SUBREGION

CVPM Sub-region	Crop Category	Preferred Alternative Average	Changes Compared to Avg. PA: Average	Wet	Dry	Preferred Alternative Wet	Changes Compared to Wet PA: Average	Wet	Dry	Preferred Alternative Dry	Changes Compared to Dry PA: Average	Wet	Dry
			Followed by Average				Followed by Wet				Followed by Dry		
4	Pasture	1.2	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.1	0.0	0.0	0.0
	Alfalfa	6.8	0.0	0.0	0.0	6.8	0.0	0.0	0.0	6.8	0.0	0.0	0.0
	Sugar Beets	10.3	0.0	0.0	0.0	10.3	0.0	0.0	0.0	10.3	0.0	0.0	0.0
	Other Field Crops	40.1	0.0	0.0	0.0	40.1	0.0	0.0	0.0	39.8	0.0	0.0	0.0
	Rice	87.8	0.0	0.0	0.0	87.9	0.0	0.0	0.0	87.1	0.0	0.0	0.0
	Truck Crops	17.1	0.0	0.0	0.0	17.1	0.0	0.0	0.0	17.1	0.0	0.0	0.0
	Tomatoes	34.1	0.0	0.0	0.0	34.1	0.0	0.0	0.0	34.0	0.0	0.0	0.0
	Deciduous Orchard	30.6	0.0	0.0	0.0	30.6	0.0	0.0	0.0	30.6	0.0	0.0	0.0
	Small Grain	47.5	0.0	0.0	0.0	47.6	0.0	0.0	0.0	46.8	0.0	0.0	0.0
	Subtotal	**275.3**	**0.0**	**0.0**	**0.0**	**275.7**	**0.0**	**0.0**	**-0.1**	**273.6**	**0.0**	**0.0**	**0.0**
5	Pasture	21.4	0.0	0.0	0.0	21.5	0.0	0.0	0.0	21.0	0.0	0.0	0.0
	Alfalfa	4.7	0.0	0.0	0.0	4.7	0.0	0.0	0.0	4.7	0.0	0.0	0.0
	Sugar Beets	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
	Other Field Crops	15.4	0.0	0.0	0.0	15.4	0.0	0.0	0.0	15.4	0.0	0.0	0.0
	Rice	166.0	0.0	0.0	0.0	166.6	-0.1	-0.1	-0.1	165.2	-0.1	-0.1	-0.1
	Truck Crops	6.6	0.0	0.0	0.0	6.6	0.0	0.0	0.0	6.6	0.0	0.0	0.0
	Tomatoes	1.6	0.0	0.0	0.0	1.6	0.0	0.0	0.0	1.6	0.0	0.0	0.0
	Deciduous Orchard	121.6	0.0	0.0	0.0	121.6	0.0	0.0	0.0	121.6	0.0	0.0	0.0
	Small Grain	22.3	0.0	0.0	0.0	22.4	0.0	0.0	0.0	21.9	0.0	0.0	0.0
	Subtropical Orchard	2.5	0.0	0.0	0.0	2.5	0.0	0.0	0.0	2.5	0.0	0.0	0.0
	Subtotal	**364.1**	**0.0**	**0.0**	**0.0**	**364.9**	**-0.2**	**-0.2**	**-0.1**	**362.4**	**-0.2**	**-0.2**	**-0.2**
6	Pasture	12.1	0.0	0.0	0.0	12.5	-0.4	-0.4	-0.4	11.8	0.0	0.0	0.0
	Alfalfa	28.7	0.0	0.0	0.1	29.0	-0.3	-0.3	-0.3	28.6	0.0	0.0	0.0
	Sugar Beets	21.2	0.0	0.0	0.0	21.2	-0.1	-0.1	-0.1	21.1	0.0	0.0	0.0
	Other Field Crops	59.4	0.0	0.0	0.0	59.9	-0.5	-0.5	-0.5	59.1	0.0	0.0	0.0
	Rice	12.9	0.0	0.0	0.0	13.1	-0.2	-0.2	-0.2	12.8	0.0	0.0	0.0
	Truck Crops	3.4	0.0	0.0	0.0	3.4	0.0	0.0	0.0	3.4	0.0	0.0	0.0
	Tomatoes	45.8	0.0	0.0	0.0	45.9	-0.1	-0.1	-0.1	45.7	0.0	0.0	0.0
	Deciduous Orchard	24.6	0.0	0.0	0.0	24.6	0.0	0.0	0.0	24.6	0.0	0.0	0.0
	Small Grain	64.3	0.0	0.0	0.0	64.6	-0.4	-0.4	-0.4	63.3	0.2	0.2	0.2
	Grapes	8.0	0.0	0.0	0.0	8.0	0.0	0.0	0.0	8.0	0.0	0.0	0.0
	Subtotal	**280.2**	**0.0**	**0.0**	**0.0**	**282.2**	**-1.9**	**-1.9**	**-1.8**	**278.4**	**0.2**	**0.2**	**0.2**
7	Pasture	14.5	0.0	0.0	0.0	14.5	0.0	0.0	0.0	14.2	0.0	0.0	0.0
	Alfalfa	3.1	0.0	0.0	0.0	3.1	0.0	0.0	0.0	3.1	0.0	0.0	0.0
	Sugar Beets	2.5	0.0	0.0	0.0	2.5	0.0	0.0	0.0	2.5	0.0	0.0	0.0
	Other Field Crops	3.8	0.0	0.0	0.0	3.8	0.0	0.0	0.0	3.8	0.0	0.0	0.0
	Rice	48.3	0.0	0.0	0.0	48.3	0.0	0.0	0.0	47.9	0.0	0.0	0.0
	Truck Crops	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0
	Tomatoes	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0
	Deciduous Orchard	8.9	0.0	0.0	0.0	8.9	0.0	0.0	0.0	8.9	0.0	0.0	0.0
	Small Grain	9.4	0.0	0.0	0.0	9.3	0.0	0.0	0.0	9.2	0.0	0.0	0.0
	Grapes	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0
	Subtotal	**91.4**	**0.0**	**0.0**	**0.0**	**91.5**	**0.0**	**0.0**	**0.0**	**90.5**	**0.0**	**0.0**	**0.0**

TABLE 17
IRRIGATED ACREAGE BY SUBREGION

CVPM Sub-region	Crop Category	Preferred Alternative Average	Changes Compared to Avg. PA: Average	Wet	Dry	Preferred Alternative Wet	Changes Compared to Wet PA: Average	Wet	Dry	Preferred Alternative Dry	Changes Compared to Dry PA: Average	Wet	Dry
			Followed by Average				Followed by Wet				Followed by Dry		
	Pasture	47.7	0.0	0.0	0.0	47.6	0.0	0.0	0.0	46.9	0.0	0.0	0.0
	Alfalfa	12.3	0.0	0.0	0.0	12.3	0.0	0.0	0.0	12.2	0.0	0.0	0.0
	Sugar Beets	12.8	0.0	0.0	0.0	12.8	0.0	0.0	0.0	12.8	0.0	0.0	0.0
	Other Field Crops	42.7	0.0	0.0	0.0	42.7	0.0	0.0	0.0	42.5	0.0	0.0	0.0
	Rice	4.5	0.0	0.0	0.0	4.5	0.0	0.0	0.0	4.5	0.0	0.0	0.0
8	Truck Crops	17.1	0.0	0.0	0.0	17.1	0.0	0.0	0.0	17.1	0.0	0.0	0.0
	Tomatoes	12.9	0.0	0.0	0.0	12.9	0.0	0.0	0.0	12.9	0.0	0.0	0.0
	Deciduous Orchard	46.9	0.0	0.0	0.0	46.9	0.0	0.0	0.0	46.9	0.0	0.0	0.0
	Small Grain	29.0	0.0	0.0	0.0	29.1	0.0	0.0	0.0	28.2	0.0	0.0	0.0
	Grapes	58.9	0.0	0.0	0.0	58.9	0.0	0.0	0.0	58.9	0.0	0.0	0.0
	Subtotal	**284.8**	**0.0**	**0.0**	**0.0**	**284.9**	**0.0**	**0.0**	**0.0**	**282.8**	**0.0**	**0.0**	**0.0**
	Pasture	24.6	-0.2	-0.2	-0.1	24.6	-0.4	-0.4	-0.4	23.4	0.7	0.7	0.7
	Alfalfa	43.8	-0.1	-0.1	0.0	43.8	-0.2	-0.2	-0.2	43.1	0.4	0.4	0.4
	Sugar Beets	28.6	0.0	0.0	0.0	28.6	-0.1	-0.1	0.0	28.5	0.1	0.1	0.1
	Other Field Crops	114.9	-0.2	-0.2	-0.2	115.0	-0.4	-0.4	-0.4	113.6	0.7	0.7	0.7
	Rice	0.9	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.9	0.0	0.0	0.0
9	Truck Crops	46.0	0.0	0.0	0.0	46.0	0.0	0.0	0.0	46.0	0.0	0.0	0.0
	Tomatoes	42.5	0.0	0.0	0.0	42.5	0.0	0.0	0.0	42.3	0.1	0.1	0.1
	Deciduous Orchard	21.3	0.0	0.0	0.0	21.3	0.0	0.0	0.0	21.3	0.0	0.0	0.0
	Small Grain	96.8	-0.1	-0.1	-0.1	97.5	-0.3	-0.3	-0.3	93.7	1.0	1.0	1.0
	Grapes	5.8	0.0	0.0	0.0	5.8	0.0	0.0	0.0	5.8	0.0	0.0	0.0
	Subtotal	**425.0**	**-0.6**	**-0.6**	**-0.4**	**425.9**	**-1.5**	**-1.5**	**-1.4**	**418.4**	**3.0**	**3.0**	**3.0**
	Pasture	13.3	0.0	0.0	-0.2	13.3	0.0	0.0	0.0	13.3	0.0	0.0	0.0
	Alfalfa	40.8	0.0	0.0	-0.3	40.9	-0.1	0.0	-0.1	40.8	0.0	0.0	0.0
	Sugar Beets	13.9	0.0	0.0	0.0	13.9	0.0	0.0	0.0	13.9	0.0	0.0	0.0
	Other Field Crops	48.2	0.0	0.0	-0.1	48.2	0.1	0.0	0.0	48.3	0.0	0.0	0.0
	Rice	2.9	0.0	0.0	0.0	2.9	0.0	0.0	0.0	2.9	0.0	0.0	0.0
	Truck Crops	112.9	0.0	0.0	0.0	112.9	0.0	0.0	0.0	113.0	0.0	0.0	0.0
10	Tomatoes	40.2	0.0	0.0	0.0	40.2	0.0	0.0	0.0	40.2	0.0	0.0	0.0
	Deciduous Orchard	36.6	0.0	0.0	0.0	36.6	0.0	0.0	0.0	36.6	0.0	0.0	0.0
	Small Grain	14.0	0.0	0.0	0.0	14.0	0.1	0.0	0.1	14.0	0.0	0.0	0.0
	Grapes	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
	Cotton	103.1	0.0	0.0	-0.5	103.1	-0.1	0.0	-0.1	103.1	0.0	0.0	0.0
	Subtropical Orchard	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
	Subtotal	**427.1**	**0.0**	**0.0**	**-1.1**	**427.2**	**-0.1**	**0.0**	**-0.1**	**427.1**	**0.0**	**0.0**	**0.0**
	Pasture	42.9	0.0	0.0	0.0	43.0	0.0	0.0	0.0	42.7	0.0	0.0	0.0
	Alfalfa	8.4	0.0	0.0	0.0	8.4	0.0	0.0	0.0	8.3	0.0	0.0	0.0
	Sugar Beets	0.4	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.4	0.0	0.0	0.0
	Other Field Crops	17.8	0.0	0.0	0.0	17.9	0.0	0.0	0.0	17.8	0.0	0.0	0.0
	Rice	4.4	0.0	0.0	0.0	4.4	0.0	0.0	0.0	4.4	0.0	0.0	0.0
11	Truck Crops	6.3	0.0	0.0	0.0	6.3	0.0	0.0	0.0	6.3	0.0	0.0	0.0
	Tomatoes	0.8	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.8	0.0	0.0	0.0
	Deciduous Orchard	80.8	0.0	0.0	0.0	80.8	0.0	0.0	0.0	80.8	0.0	0.0	0.0
	Small Grain	1.8	0.0	0.0	0.0	1.8	0.0	0.0	0.0	1.8	0.0	0.0	0.0
	Grapes	10.4	0.0	0.0	0.0	10.4	0.0	0.0	0.0	10.4	0.0	0.0	0.0
	Subtotal	**174.0**	**0.0**	**0.0**	**0.0**	**174.2**	**0.0**	**0.0**	**0.0**	**173.7**	**0.0**	**0.0**	**0.0**

TABLE 17
IRRIGATED ACREAGE BY SUBREGION

CVPM Sub-region	Crop Category	Preferred Alternative Average	Changes Compared to Avg. PA			Preferred Alternative Wet	Changes Compared to Wet PA			Preferred Alternative Dry	Changes Compared to Dry PA		
			Average	Wet	Dry		Average	Wet	Dry		Average	Wet	Dry
			Followed by Average				Followed by Wet				Followed by Dry		
12	Pasture	18.3	0.0	0.0	0.0	18.0	0.0	0.0	0.0	18.0	0.0	0.0	0.0
	Alfalfa	18.2	0.0	0.0	0.0	18.1	0.0	0.0	0.0	18.1	0.0	0.0	0.0
	Sugar Beets	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
	Other Field Crops	41.2	0.0	0.0	0.0	41.0	0.0	0.0	0.0	41.0	0.0	0.0	0.0
	Truck Crops	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
	Deciduous Orchard	94.0	0.0	0.0	0.0	94.0	0.0	0.0	0.0	94.0	0.0	0.0	0.0
	Small Grain	10.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	9.9	0.0	0.0	0.0
	Grapes	14.0	0.0	0.0	0.0	14.0	0.0	0.0	0.0	14.0	0.0	0.0	0.0
	Cotton	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
	Subtropical Orchard	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
	Subtotal	**200.8**	**0.0**	**0.0**	**0.0**	**200.2**	**0.0**	**0.0**	**0.0**	**200.1**	**0.0**	**0.0**	**0.0**
13	Pasture	39.6	0.0	0.0	0.0	39.9	-0.2	-0.2	-0.3	39.5	-0.3	-0.3	-0.3
	Alfalfa	41.8	0.0	0.0	0.1	42.1	-0.2	-0.2	-0.2	41.8	-0.2	-0.2	-0.2
	Sugar Beets	5.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0
	Other Field Crops	54.8	0.0	0.0	0.0	55.0	-0.1	-0.1	-0.2	54.6	-0.1	-0.1	-0.1
	Rice	3.9	0.0	0.0	0.0	3.9	0.0	0.0	0.0	3.9	0.0	0.0	0.0
	Truck Crops	18.0	0.0	0.0	0.0	18.0	0.0	0.0	0.0	18.0	0.0	0.0	0.0
	Tomatoes	7.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0
	Deciduous Orchard	135.0	0.0	0.0	0.0	135.0	0.0	0.0	0.0	135.0	0.0	0.0	0.0
	Small Grain	46.9	0.0	0.0	0.0	47.2	-0.1	-0.1	-0.1	46.4	-0.1	-0.1	-0.1
	Grapes	99.0	0.0	0.0	0.0	99.0	0.0	0.0	0.0	99.0	0.0	0.0	0.0
	Cotton	71.8	0.0	0.0	0.0	72.1	-0.2	-0.2	-0.3	71.6	-0.2	-0.2	-0.2
	Subtropical Orchard	9.9	0.0	0.0	0.0	9.9	0.0	0.0	0.0	9.9	0.0	0.0	0.0
	Subtotal	**532.5**	**0.0**	**0.0**	**0.0**	**534.1**	**-0.9**	**-0.9**	**-1.1**	**531.6**	**-0.9**	**-0.9**	**-0.9**
14	Pasture	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
	Alfalfa	14.0	0.0	0.0	0.0	14.0	0.0	0.0	0.0	13.4	0.0	0.0	0.0
	Sugar Beets	4.8	0.0	0.0	0.0	4.8	0.0	0.0	0.0	4.8	0.0	0.0	0.0
	Other Field Crops	18.4	0.0	0.0	0.0	18.3	0.0	0.0	0.0	17.9	0.0	0.0	0.0
	Truck Crops	136.4	0.0	0.0	0.0	136.4	0.0	0.0	0.0	136.2	0.0	0.0	0.0
	Tomatoes	77.0	0.0	0.0	0.1	77.0	0.0	0.0	0.0	76.2	0.0	0.0	0.0
	Deciduous Orchard	24.9	0.0	0.0	0.0	24.9	0.0	0.0	0.0	24.9	0.0	0.0	0.0
	Small Grain	10.4	0.0	0.0	0.0	10.4	0.0	0.0	0.0	9.7	0.0	0.0	0.0
	Grapes	7.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0
	Cotton	206.5	0.0	0.0	-0.1	206.6	0.0	0.0	0.0	198.8	0.0	0.0	0.0
	Subtropical Orchard	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
	Subtotal	**500.4**	**0.0**	**0.0**	**0.0**	**500.5**	**0.0**	**0.0**	**0.0**	**489.9**	**0.0**	**0.0**	**0.0**

TABLE 17
IRRIGATED ACREAGE BY SUBREGION

CVPM Sub-region	Crop Category	Preferred Alternative Average	Changes Compared to Avg. PA			Preferred Alternative Wet	Changes Compared to Wet PA			Preferred Alternative Dry	Changes Compared to Dry PA		
			Average	Wet	Dry		Average	Wet	Dry		Average	Wet	Dry
			Followed by Average				Followed by Wet				Followed by Dry		
15	Pasture	3.9	0.0	0.0	0.0	3.9	0.0	0.0	0.0	3.7	0.0	0.0	0.0
	Alfalfa	83.1	0.0	0.0	0.2	83.4	0.0	0.0	0.1	80.6	0.0	0.0	0.0
	Sugar Beets	5.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0
	Other Field Crops	86.0	0.0	0.0	0.0	86.1	0.0	0.0	0.0	84.2	0.0	0.0	0.0
	Rice	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
	Truck Crops	12.0	0.0	0.0	0.0	12.0	0.0	0.0	0.0	12.0	0.0	0.0	0.0
	Tomatoes	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
	Deciduous Orchard	38.0	0.0	0.0	0.0	38.0	0.0	0.0	0.0	38.0	0.0	0.0	0.0
	Small Grain	71.0	0.0	0.0	0.0	71.6	0.0	0.0	0.0	67.9	0.0	0.0	0.0
	Grapes	56.0	0.0	0.0	0.0	56.0	0.0	0.0	0.0	56.0	0.0	0.0	0.0
	Cotton	242.1	0.0	0.0	-0.2	242.7	0.0	0.0	-0.1	235.5	0.0	0.0	0.0
	Subtropical Orchard	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
	Subtotal	**600.1**	**0.0**	**0.0**	**-0.1**	**601.7**	**0.0**	**0.0**	**0.0**	**585.9**	**0.0**	**0.0**	**0.0**
16	Pasture	6.2	0.0	0.0	0.0	6.3	-0.2	-0.2	-0.1	6.1	0.0	0.0	0.0
	Alfalfa	5.1	0.0	0.0	0.0	5.2	-0.1	-0.1	-0.1	5.1	0.0	0.0	0.0
	Other Field Crops	6.1	0.0	0.0	0.0	6.1	-0.1	-0.1	-0.1	6.0	0.0	0.0	0.0
	Truck Crops	5.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0
	Deciduous Orchard	16.0	0.0	0.0	0.0	16.0	0.0	0.0	0.0	16.0	0.0	0.0	0.0
	Small Grain	4.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0	4.0	0.0	0.0	0.0
	Grapes	55.0	0.0	0.0	0.0	55.0	0.0	0.0	0.0	55.0	0.0	0.0	0.0
	Cotton	5.0	0.0	0.0	0.0	5.1	0.0	0.0	0.0	5.0	0.0	0.0	0.0
	Subtropical Orchard	9.0	0.0	0.0	0.0	9.0	0.0	0.0	0.0	9.0	0.0	0.0	0.0
	Subtotal	**111.4**	**-0.1**	**-0.1**	**0.0**	**111.8**	**-0.4**	**-0.4**	**-0.4**	**111.3**	**-0.1**	**-0.1**	**-0.1**
17	Pasture	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0
	Alfalfa	5.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0
	Sugar Beets	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
	Other Field Crops	8.0	0.0	0.0	0.0	8.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0
	Truck Crops	10.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0
	Tomatoes	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
	Deciduous Orchard	73.0	0.0	0.0	0.0	73.0	0.0	0.0	0.0	73.0	0.0	0.0	0.0
	Small Grain	6.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	5.3	0.0	0.0	0.0
	Grapes	109.0	0.0	0.0	0.0	109.0	0.0	0.0	0.0	109.0	0.0	0.0	0.0
	Cotton	10.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	8.7	0.0	0.0	0.0
	Subtropical Orchard	35.0	0.0	0.0	0.0	35.0	0.0	0.0	0.0	35.0	0.0	0.0	0.0
	Subtotal	**260.1**	**0.0**	**0.0**	**0.0**	**260.3**	**0.0**	**0.0**	**0.0**	**255.3**	**0.0**	**0.0**	**0.0**
18	Pasture	4.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0	3.7	0.0	0.0	0.0
	Alfalfa	62.2	0.0	0.0	0.1	62.8	-0.3	-0.3	-0.2	59.0	0.0	0.0	0.0
	Sugar Beets	1.9	0.0	0.0	0.0	1.9	0.0	0.0	0.0	1.9	0.0	0.0	0.0
	Other Field Crops	78.1	0.0	0.0	-0.1	78.5	-0.2	-0.2	-0.2	75.3	0.0	0.0	0.0
	Truck Crops	13.0	0.0	0.0	0.0	13.0	0.0	0.0	0.0	13.0	0.0	0.0	0.0
	Tomatoes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Deciduous Orchard	69.0	0.0	0.0	0.0	69.0	0.0	0.0	0.0	69.0	0.0	0.0	0.0
	Small Grain	41.0	0.0	0.0	0.0	41.4	-0.1	-0.1	-0.1	38.8	0.1	0.1	0.1
	Grapes	56.0	0.0	0.0	0.0	56.0	0.0	0.0	0.0	56.0	0.0	0.0	0.0
	Cotton	170.3	0.0	0.0	-0.1	171.2	-0.5	-0.5	-0.5	163.7	0.0	0.0	0.1
	Subtropical Orchard	97.0	0.0	0.0	0.0	97.0	0.0	0.0	0.0	97.0	0.0	0.0	0.0
	Subtotal	**592.5**	**0.0**	**0.0**	**-0.1**	**594.9**	**-1.2**	**-1.2**	**-1.2**	**577.2**	**0.1**	**0.1**	**0.1**

TABLE 17
IRRIGATED ACREAGE BY SUBREGION

CVPM Sub-region	Crop Category	Preferred Alternative Average	Changes Compared to Avg. PA			Preferred Alternative Wet	Changes Compared to Wet PA			Preferred Alternative Dry	Changes Compared to Dry PA		
			Average	Wet	Dry		Average	Wet	Dry		Average	Wet	Dry
			Followed by Average				Followed by Wet				Followed by Dry		
19	Pasture	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Alfalfa	25.8	0.0	0.0	0.0	25.9	0.0	0.0	0.0	25.2	0.0	0.0	0.0
	Sugar Beets	4.9	0.0	0.0	0.0	5.0	0.0	0.0	0.0	4.9	0.0	0.0	0.0
	Other Field Crops	6.7	0.0	0.0	0.0	6.7	0.0	0.0	0.0	6.7	0.0	0.0	0.0
	Truck Crops	24.0	0.0	0.0	0.0	24.0	0.0	0.0	0.0	24.0	0.0	0.0	0.0
	Tomatoes	1.7	0.0	0.0	0.0	1.7	0.0	0.0	0.0	1.7	0.0	0.0	0.0
	Deciduous Orchard	50.9	0.0	0.0	0.0	50.9	0.0	0.0	0.0	50.9	0.0	0.0	0.0
	Small Grain	7.6	0.0	0.0	0.0	7.6	0.0	0.0	0.0	7.2	0.0	0.0	0.0
	Grapes	10.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0
	Cotton	117.9	0.0	0.0	-0.1	117.8	0.0	0.0	0.0	115.1	0.0	0.0	0.0
	Subtropical Orchard	4.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0
	Subtotal	**253.6**	**0.0**	**0.0**	**0.0**	**253.6**	**0.0**	**0.0**	**0.0**	**249.7**	**0.0**	**0.0**	**0.0**
20	Pasture	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Alfalfa	12.0	0.0	0.0	0.0	12.1	0.0	0.0	0.0	11.0	0.0	0.0	0.0
	Sugar Beets	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0
	Other Field Crops	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0
	Truck Crops	41.0	0.0	0.0	0.0	41.0	0.0	0.0	0.0	40.9	0.0	0.0	0.0
	Tomatoes	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0
	Deciduous Orchard	52.0	0.0	0.0	0.0	52.0	0.0	0.0	0.0	52.0	0.0	0.0	0.0
	Small Grain	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0
	Grapes	33.0	0.0	0.0	0.0	33.0	0.0	0.0	0.0	33.0	0.0	0.0	0.0
	Cotton	33.0	0.0	0.0	0.0	33.1	0.0	0.0	0.0	30.8	0.0	0.0	0.0
	Subtropical Orchard	27.0	0.0	0.0	0.0	27.0	0.0	0.0	0.0	27.0	0.0	0.0	0.0
	Subtotal	**202.8**	**0.0**	**0.0**	**0.0**	**203.0**	**0.0**	**0.0**	**0.0**	**199.3**	**0.0**	**0.0**	**0.0**
21	Pasture	0.8	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.8	0.0	0.0	0.0
	Alfalfa	27.6	0.0	0.0	0.0	27.7	0.0	0.0	0.0	27.3	0.0	0.0	0.0
	Sugar Beets	7.4	0.0	0.0	0.0	7.4	0.0	0.0	0.0	7.4	0.0	0.0	0.0
	Other Field Crops	16.1	0.0	0.0	0.0	16.0	0.0	0.0	0.0	16.0	0.0	0.0	0.0
	Rice	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Truck Crops	107.8	0.0	0.0	0.0	107.8	0.0	0.0	0.0	107.8	0.0	0.0	0.0
	Tomatoes	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
	Deciduous Orchard	25.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0
	Small Grain	1.8	0.0	0.0	0.0	1.9	0.0	0.0	0.0	1.8	0.0	0.0	0.0
	Grapes	36.9	0.0	0.0	0.0	36.9	0.0	0.0	0.0	36.9	0.0	0.0	0.0
	Cotton	120.8	0.0	0.0	-0.1	120.8	0.0	0.0	0.0	119.3	0.0	0.0	0.0
	Subtropical Orchard	14.0	0.0	0.0	0.0	14.0	0.0	0.0	0.0	14.0	0.0	0.0	0.0
	Subtotal	**359.2**	**0.0**	**0.0**	**0.0**	**359.2**	**0.0**	**0.0**	**0.0**	**357.2**	**0.0**	**0.0**	**0.0**

NOTES:

1. All acreage values in thousands.
2. A negative value represents a lower acreage in an alternative than in the Preferred Alternative.
3. Not all 12 crops are grown in all subregions.
4. Subregions 3 and 3B should be added together to get the complete subregion 3. 3B represents the area within this subregion served by the Tehama Colusa Canal.

TABLE 18
VALUE OF PRODUCTION BY SUBREGION (Million $)

CVPM Subregion	Crop Category	Preferred Alternative Average	Changes Compared to Avg. PA: Average (Followed by Average)	Changes Compared to Avg. PA: Wet (Followed by Average)	Changes Compared to Avg. PA: Dry (Followed by Average)	Preferred Alternative Wet	Changes Compared to Wet PA: Average (Followed by Wet)	Changes Compared to Wet PA: Wet (Followed by Wet)	Changes Compared to Wet PA: Dry (Followed by Wet)	Preferred Alternative Dry	Changes Compared to Dry PA: Average (Followed by Dry)	Changes Compared to Dry PA: Wet (Followed by Dry)	Changes Compared to Dry PA: Dry (Followed by Dry)
1	Pasture	2.7	-0.2	0.0	0.0	2.6	-0.2	-0.2	-0.2	2.6	-0.3	-0.3	-0.3
	Alfalfa	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0
	Other Field Crops	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0
	Deciduous Orchard	4.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0
	Small Grain	0.7	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.7	0.0	0.0	0.0
	Subtotal	**8.4**	**-0.2**	**-0.1**	**0.0**	**8.3**	**-0.3**	**-0.3**	**-0.3**	**8.3**	**-0.3**	**-0.3**	**-0.3**
2	Pasture	4.9	0.0	0.0	-0.5	4.9	0.0	0.0	-0.8	4.8	0.0	0.0	0.0
	Alfalfa	5.1	0.0	0.0	-0.2	5.1	0.0	0.0	-0.3	5.0	0.0	0.0	0.0
	Sugar Beets	2.9	0.0	0.0	0.0	2.9	0.0	0.0	0.0	2.9	0.0	0.0	0.0
	Other Field Crops	7.8	0.0	0.0	-0.2	7.8	0.0	0.0	-0.3	7.7	0.0	0.0	0.0
	Rice	3.8	0.0	0.0	-0.1	3.8	0.0	0.0	-0.3	3.8	0.0	0.0	0.0
	Truck Crops	55.1	0.0	0.0	-0.1	55.1	0.0	0.0	-0.1	55.1	0.0	0.0	0.0
	Deciduous Orchard	91.3	0.0	0.0	-0.1	91.3	0.0	0.0	0.0	91.3	0.0	0.0	0.0
	Small Grain	4.0	0.0	0.0	-0.1	3.9	0.0	0.0	-0.2	3.9	0.0	0.0	0.0
	Subtropical Orchard	14.6	0.0	0.0	0.0	14.6	0.0	0.0	0.0	14.6	0.0	0.0	0.0
	Subtotal	**189.5**	**0.0**	**0.0**	**-1.3**	**189.4**	**0.0**	**0.0**	**-2.1**	**189.1**	**0.0**	**0.0**	**0.0**
3	Pasture	1.1	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.1	0.0	0.0	0.0
	Alfalfa	9.7	0.0	0.0	0.0	9.7	0.0	0.0	0.0	9.6	0.0	0.0	0.0
	Sugar Beets	7.3	0.0	0.0	0.0	7.3	0.0	0.0	0.0	7.2	0.0	0.0	0.0
	Other Field Crops	7.1	0.0	0.0	0.0	7.1	0.0	0.0	0.0	7.0	0.0	0.0	0.0
	Rice	118.1	0.0	0.0	0.0	118.6	0.0	0.0	0.0	116.2	0.0	0.0	0.0
	Truck Crops	89.6	0.0	0.0	0.0	89.6	0.0	0.0	0.0	89.6	0.0	0.0	0.0
	Tomatoes	37.9	0.0	0.0	0.0	38.0	0.0	0.0	0.0	37.9	0.0	0.0	0.0
	Deciduous Orchard	18.9	0.0	0.0	0.0	18.9	0.0	0.0	0.0	18.9	0.0	0.0	0.0
	Small Grain	8.7	0.0	0.0	0.0	8.7	0.0	0.0	0.0	8.5	0.0	0.0	0.0
	Subtotal	**298.4**	**0.0**	**0.0**	**0.0**	**299.0**	**0.0**	**0.0**	**0.0**	**295.9**	**0.0**	**0.0**	**0.0**
3B	Pasture	0.8	0.0	0.0	-0.8	0.8	0.0	0.0	-0.2	0.6	0.0	0.0	0.0
	Alfalfa	5.4	0.0	0.0	-5.4	5.4	0.0	0.0	-1.4	4.1	0.0	0.0	0.0
	Sugar Beets	4.1	0.0	0.0	-3.9	4.1	0.0	0.0	-2.0	3.8	0.0	0.0	0.0
	Other Field Crops	6.1	0.0	0.0	-6.0	6.1	0.0	0.0	-6.1	4.7	0.0	0.0	0.0
	Rice	8.2	0.0	0.0	-8.2	8.2	0.0	0.0	-8.2	5.2	0.0	0.0	0.0
	Truck Crops	2.0	0.0	0.0	-0.2	2.0	0.0	0.0	-0.1	2.0	0.0	0.0	0.0
	Tomatoes	8.9	0.0	0.0	-5.6	8.9	0.0	0.0	-2.7	8.4	0.0	0.0	0.0
	Deciduous Orchard	28.6	0.0	0.0	-3.5	28.6	0.0	0.0	0.0	28.6	0.0	0.0	0.0
	Small Grain	2.4	0.0	0.0	-2.4	2.4	0.0	0.0	-2.4	1.8	0.0	0.0	0.0
	Subtropical Orchard	1.4	0.0	0.0	-0.1	1.4	0.0	0.0	0.0	1.4	0.0	0.0	0.0
	Subtotal	**67.9**	**0.0**	**0.0**	**-36.2**	**68.1**	**0.1**	**0.1**	**-23.1**	**60.5**	**0.0**	**0.0**	**0.0**
4	Pasture	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0
	Alfalfa	3.6	0.0	0.0	0.0	3.7	0.0	0.0	0.0	3.6	0.0	0.0	0.0
	Sugar Beets	7.5	0.0	0.0	0.0	7.5	0.0	0.0	0.0	7.5	0.0	0.0	0.0
	Other Field Crops	18.0	0.0	0.0	0.0	18.1	0.0	0.0	0.0	17.9	0.0	0.0	0.0
	Rice	74.6	0.0	0.0	0.0	74.8	0.0	0.0	0.0	74.1	0.0	0.0	0.0
	Truck Crops	60.8	0.0	0.0	0.0	60.8	0.0	0.0	0.0	60.8	0.0	0.0	0.0
	Tomatoes	49.9	0.0	0.0	0.0	49.9	0.0	0.0	0.0	49.9	0.0	0.0	0.0
	Deciduous Orchard	32.5	0.0	0.0	0.0	32.5	0.0	0.0	0.0	32.5	0.0	0.0	0.0
	Small Grain	13.5	0.0	0.0	0.0	13.5	0.0	0.0	0.0	13.3	0.0	0.0	0.0
	Subtotal	**260.7**	**0.0**	**0.0**	**0.0**	**260.9**	**0.0**	**0.0**	**0.0**	**259.7**	**0.0**	**0.0**	**0.0**

TABLE 18
VALUE OF PRODUCTION BY SUBREGION (Million $)

CVPM Subregion	Crop Category	Preferred Alternative Average	Changes Compared to Avg. PA: Average	Wet	Dry	Preferred Alternative Wet	Changes Compared to Wet PA: Average	Wet	Dry	Preferred Alternative Dry	Changes Compared to Dry PA: Average	Wet	Dry
			Followed by Average				Followed by Wet				Followed by Dry		
5	Pasture	3.1	0.0	0.0	0.0	3.1	0.0	0.0	0.0	3.0	0.0	0.0	0.0
	Alfalfa	2.5	0.0	0.0	0.0	2.5	0.0	0.0	0.0	2.5	0.0	0.0	0.0
	Sugar Beets	1.5	0.0	0.0	0.0	1.5	0.0	0.0	0.0	1.5	0.0	0.0	0.0
	Other Field Crops	6.9	0.0	0.0	0.0	6.9	0.0	0.0	0.0	6.9	0.0	0.0	0.0
	Rice	141.2	0.0	0.0	0.0	141.7	-0.1	-0.1	-0.1	140.5	-0.1	-0.1	-0.1
	Truck Crops	23.5	0.0	0.0	0.0	23.5	0.0	0.0	0.0	23.5	0.0	0.0	0.0
	Tomatoes	2.3	0.0	0.0	0.0	2.3	0.0	0.0	0.0	2.3	0.0	0.0	0.0
	Deciduous Orchard	129.1	0.0	0.0	0.0	129.1	0.0	0.0	0.0	129.1	0.0	0.0	0.0
	Small Grain	6.3	0.0	0.0	0.0	6.3	0.0	0.0	0.0	6.2	0.0	0.0	0.0
	Subtropical Orchard	3.6	0.0	0.0	0.0	3.6	0.0	0.0	0.0	3.6	0.0	0.0	0.0
	Subtotal	**320.0**	**0.0**	**0.0**	**0.0**	**320.5**	**-0.1**	**-0.1**	**-0.1**	**319.1**	**-0.1**	**-0.1**	**-0.1**
6	Pasture	1.7	0.0	0.0	0.0	1.8	-0.1	-0.1	-0.1	1.7	0.0	0.0	0.0
	Alfalfa	16.8	0.0	0.0	0.0	17.0	-0.2	-0.2	-0.2	16.8	0.0	0.0	0.0
	Sugar Beets	16.2	0.0	0.0	0.0	16.3	-0.1	-0.1	0.0	16.2	0.0	0.0	0.0
	Other Field Crops	28.9	0.0	0.0	0.0	29.2	-0.2	-0.2	-0.2	28.8	0.0	0.0	0.0
	Rice	10.6	0.0	0.0	0.0	10.8	-0.2	-0.2	-0.2	10.5	0.0	0.0	0.0
	Truck Crops	14.1	0.0	0.0	0.0	14.1	0.0	0.0	0.0	14.1	0.0	0.0	0.0
	Tomatoes	70.0	0.0	0.0	0.0	70.2	-0.1	-0.1	-0.1	70.0	0.0	0.0	0.0
	Deciduous Orchard	26.2	0.0	0.0	0.0	26.2	0.0	0.0	0.0	26.2	0.0	0.0	0.0
	Small Grain	21.9	0.0	0.0	0.0	22.0	-0.1	-0.1	-0.1	21.5	0.1	0.1	0.1
	Grapes	13.8	0.0	0.0	0.0	13.8	0.0	0.0	0.0	13.8	0.0	0.0	0.0
	Subtotal	**220.3**	**0.0**	**0.0**	**0.0**	**221.2**	**-0.9**	**-0.9**	**-0.9**	**219.6**	**0.0**	**0.0**	**0.0**
7	Pasture	2.1	0.0	0.0	0.0	2.1	0.0	0.0	0.0	2.1	0.0	0.0	0.0
	Alfalfa	1.8	0.0	0.0	0.0	1.8	0.0	0.0	0.0	1.8	0.0	0.0	0.0
	Sugar Beets	1.9	0.0	0.0	0.0	1.9	0.0	0.0	0.0	1.9	0.0	0.0	0.0
	Other Field Crops	1.8	0.0	0.0	0.0	1.8	0.0	0.0	0.0	1.8	0.0	0.0	0.0
	Rice	39.6	0.0	0.0	0.0	39.7	0.0	0.0	0.0	39.3	0.0	0.0	0.0
	Truck Crops	1.2	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.2	0.0	0.0	0.0
	Tomatoes	0.8	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.8	0.0	0.0	0.0
	Deciduous Orchard	9.5	0.0	0.0	0.0	9.5	0.0	0.0	0.0	9.5	0.0	0.0	0.0
	Small Grain	3.2	0.0	0.0	0.0	3.2	0.0	0.0	0.0	3.1	0.0	0.0	0.0
	Grapes	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0
	Subtotal	**62.3**	**0.0**	**0.0**	**0.0**	**62.4**	**0.0**	**0.0**	**0.0**	**61.9**	**0.0**	**0.0**	**0.0**
8	Pasture	6.9	0.0	0.0	0.0	6.9	0.0	0.0	0.0	6.8	0.0	0.0	0.0
	Alfalfa	7.2	0.0	0.0	0.0	7.2	0.0	0.0	0.0	7.2	0.0	0.0	0.0
	Sugar Beets	9.8	0.0	0.0	0.0	9.8	0.0	0.0	0.0	9.8	0.0	0.0	0.0
	Other Field Crops	20.8	0.0	0.0	0.0	20.8	0.0	0.0	0.0	20.7	0.0	0.0	0.0
	Rice	3.7	0.0	0.0	0.0	3.7	0.0	0.0	0.0	3.7	0.0	0.0	0.0
	Truck Crops	70.9	0.0	0.0	0.0	70.9	0.0	0.0	0.0	70.9	0.0	0.0	0.0
	Tomatoes	19.8	0.0	0.0	0.0	19.8	0.0	0.0	0.0	19.7	0.0	0.0	0.0
	Deciduous Orchard	49.9	0.0	0.0	0.0	49.9	0.0	0.0	0.0	49.9	0.0	0.0	0.0
	Small Grain	9.2	0.0	0.0	0.0	9.2	0.0	0.0	0.0	8.9	0.0	0.0	0.0
	Grapes	101.7	0.0	0.0	0.0	101.7	0.0	0.0	0.0	101.7	0.0	0.0	0.0
	Subtotal	**299.9**	**0.0**	**0.0**	**0.0**	**300.0**	**0.0**	**0.0**	**0.0**	**299.3**	**0.0**	**0.0**	**0.0**
9	Pasture	3.6	0.0	0.0	0.0	3.6	-0.1	-0.1	-0.1	3.4	0.1	0.1	0.1
	Alfalfa	25.6	-0.1	-0.1	0.0	25.7	-0.1	-0.1	-0.1	25.2	0.2	0.2	0.2
	Sugar Beets	22.0	0.0	0.0	0.0	22.0	0.0	0.0	0.0	21.9	0.1	0.1	0.1
	Other Field Crops	55.9	-0.1	-0.1	-0.1	56.0	-0.2	-0.2	-0.2	55.3	0.3	0.3	0.3
	Rice	0.7	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.7	0.0	0.0	0.0
	Truck Crops	190.8	0.0	0.0	0.0	190.8	0.0	0.0	0.0	190.6	0.1	0.1	0.1
	Tomatoes	64.9	0.0	0.0	0.0	65.0	-0.1	-0.1	0.0	64.8	0.1	0.1	0.1
	Deciduous Orchard	22.7	0.0	0.0	0.0	22.7	0.0	0.0	0.0	22.7	0.0	0.0	0.0
	Small Grain	30.7	0.0	0.0	0.0	30.9	-0.1	-0.1	-0.1	29.7	0.3	0.3	0.3
	Grapes	10.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0
	Subtotal	**426.8**	**-0.3**	**-0.3**	**-0.1**	**427.2**	**-0.6**	**-0.6**	**-0.6**	**424.2**	**1.2**	**1.2**	**1.2**

TABLE 18
VALUE OF PRODUCTION BY SUBREGION (Million $)

CVPM Subregion	Crop Category	Preferred Alternative Average	Changes Compared to Avg. PA: Average Followed by Average	Wet Followed by Average	Dry Followed by Average	Preferred Alternative Wet	Changes Compared to Wet PA: Average Followed by Wet	Wet Followed by Wet	Dry Followed by Wet	Preferred Alternative Dry	Changes Compared to Dry PA: Average Followed by Dry	Wet Followed by Dry	Dry Followed by Dry
10	Pasture	3.1	0.0	0.0	0.0	3.1	0.0	0.0	0.0	3.1	0.0	0.0	0.0
	Alfalfa	23.6	0.0	0.0	-0.2	23.6	-0.1	0.0	-0.1	23.6	0.0	0.0	0.0
	Sugar Beets	12.2	0.0	0.0	0.0	12.2	0.0	0.0	0.0	12.2	0.0	0.0	0.0
	Other Field Crops	31.0	0.0	0.0	-0.1	31.0	0.0	0.0	0.0	31.0	0.0	0.0	0.0
	Rice	2.3	0.0	0.0	0.0	2.3	0.0	0.0	0.0	2.3	0.0	0.0	0.0
	Truck Crops	718.0	0.0	0.0	0.0	717.9	0.1	0.0	0.1	718.1	0.0	0.0	0.0
	Tomatoes	60.1	0.0	0.0	0.0	60.1	0.0	0.0	0.0	60.1	0.0	0.0	0.0
	Deciduous Orchard	52.4	0.0	0.0	0.0	52.4	0.0	0.0	0.0	52.4	0.0	0.0	0.0
	Small Grain	7.6	0.0	0.0	0.0	7.5	0.1	0.0	0.1	7.6	0.0	0.0	0.0
	Grapes	1.9	0.0	0.0	0.0	1.9	0.0	0.0	0.0	1.9	0.0	0.0	0.0
	Cotton	102.6	0.0	0.0	-0.5	102.7	-0.1	0.0	-0.1	102.6	0.0	0.0	0.0
	Subtropical Orchard	0.4	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.4	0.0	0.0	0.0
	Subtotal	**1015.1**	**0.0**	**0.0**	**-0.8**	**1015.1**	**0.0**	**0.0**	**0.0**	**1015.2**	**0.0**	**0.0**	**0.0**
11	Pasture	10.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	9.9	0.0	0.0	0.0
	Alfalfa	4.8	0.0	0.0	0.0	4.8	0.0	0.0	0.0	4.8	0.0	0.0	0.0
	Sugar Beets	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0
	Other Field Crops	11.5	0.0	0.0	0.0	11.5	0.0	0.0	0.0	11.4	0.0	0.0	0.0
	Rice	3.5	0.0	0.0	0.0	3.6	0.0	0.0	0.0	3.5	0.0	0.0	0.0
	Truck Crops	40.1	0.0	0.0	0.0	40.1	0.0	0.0	0.0	40.0	0.0	0.0	0.0
	Tomatoes	1.2	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.2	0.0	0.0	0.0
	Deciduous Orchard	115.8	0.0	0.0	0.0	115.8	0.0	0.0	0.0	115.8	0.0	0.0	0.0
	Small Grain	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
	Grapes	19.4	0.0	0.0	0.0	19.4	0.0	0.0	0.0	19.4	0.0	0.0	0.0
	Subtotal	**207.6**	**0.0**	**0.0**	**0.0**	**207.6**	**0.0**	**0.0**	**0.0**	**207.5**	**0.0**	**0.0**	**0.0**
12	Pasture	4.2	0.0	0.0	0.0	4.2	0.0	0.0	0.0	4.2	0.0	0.0	0.0
	Alfalfa	10.5	0.0	0.0	0.0	10.4	0.0	0.0	0.0	10.5	0.0	0.0	0.0
	Sugar Beets	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
	Other Field Crops	26.5	0.0	0.0	0.0	26.4	0.0	0.0	0.0	26.3	0.0	0.0	0.0
	Truck Crops	19.1	0.0	0.0	0.0	19.1	0.0	0.0	0.0	19.1	0.0	0.0	0.0
	Deciduous Orchard	134.7	0.0	0.0	0.0	134.7	0.0	0.0	0.0	134.7	0.0	0.0	0.0
	Small Grain	5.4	0.0	0.0	0.0	5.4	0.0	0.0	0.0	5.3	0.0	0.0	0.0
	Grapes	26.2	0.0	0.0	0.0	26.2	0.0	0.0	0.0	26.2	0.0	0.0	0.0
	Cotton	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
	Subtropical Orchard	3.5	0.0	0.0	0.0	3.5	0.0	0.0	0.0	3.5	0.0	0.0	0.0
	Subtotal	**231.2**	**0.0**	**0.0**	**0.0**	**230.9**	**0.0**	**0.0**	**0.0**	**230.8**	**0.0**	**0.0**	**0.0**
13	Pasture	9.2	0.0	0.0	0.0	9.3	-0.1	-0.1	-0.1	9.2	-0.1	-0.1	-0.1
	Alfalfa	24.2	0.0	0.0	0.0	24.3	-0.1	-0.1	-0.1	24.2	-0.1	-0.1	-0.1
	Sugar Beets	4.4	0.0	0.0	0.0	4.4	0.0	0.0	0.0	4.4	0.0	0.0	0.0
	Other Field Crops	35.2	0.0	0.0	0.0	35.4	-0.1	-0.1	-0.1	35.1	-0.1	-0.1	-0.1
	Rice	3.1	0.0	0.0	0.0	3.1	0.0	0.0	0.0	3.1	0.0	0.0	0.0
	Truck Crops	114.4	0.0	0.0	0.0	114.4	0.0	0.0	0.0	114.4	0.0	0.0	0.0
	Tomatoes	10.5	0.0	0.0	0.0	10.5	0.0	0.0	0.0	10.5	0.0	0.0	0.0
	Deciduous Orchard	193.4	0.0	0.0	0.0	193.4	0.0	0.0	0.0	193.4	0.0	0.0	0.0
	Small Grain	25.3	0.0	0.0	0.0	25.4	0.0	0.0	-0.1	25.0	0.0	0.0	0.0
	Grapes	184.9	0.0	0.0	0.0	184.9	0.0	0.0	0.0	184.9	0.0	0.0	0.0
	Cotton	71.4	0.0	0.0	-0.1	71.8	-0.2	-0.2	-0.3	71.2	-0.2	-0.2	-0.2
	Subtropical Orchard	34.7	0.0	0.0	0.0	34.7	0.0	0.0	0.0	34.7	0.0	0.0	0.0
	Subtotal	**710.6**	**0.0**	**0.0**	**0.0**	**711.5**	**-0.5**	**-0.5**	**-0.7**	**709.9**	**-0.6**	**-0.6**	**-0.6**

TABLE 18
VALUE OF PRODUCTION BY SUBREGION (Million $)

CVPM Subregion	Crop Category	Preferred Alternative Average	Changes Compared to Avg. PA: Average (Followed by Average)	Changes Compared to Avg. PA: Wet (Followed by Average)	Changes Compared to Avg. PA: Dry (Followed by Average)	Preferred Alternative Wet	Changes Compared to Wet PA: Average (Followed by Wet)	Changes Compared to Wet PA: Wet (Followed by Wet)	Changes Compared to Wet PA: Dry (Followed by Wet)	Preferred Alternative Dry	Changes Compared to Dry PA: Average (Followed by Dry)	Changes Compared to Dry PA: Wet (Followed by Dry)	Changes Compared to Dry PA: Dry (Followed by Dry)
14	Pasture	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Alfalfa	8.6	0.0	0.0	0.0	8.6	0.0	0.0	0.0	8.2	0.0	0.0	0.0
	Sugar Beets	3.9	0.0	0.0	0.0	4.0	0.0	0.0	0.0	3.9	0.0	0.0	0.0
	Other Field Crops	11.0	0.0	0.0	0.0	10.9	0.0	0.0	0.0	10.7	0.0	0.0	0.0
	Truck Crops	817.9	0.0	0.0	0.0	817.8	0.0	0.0	0.0	816.9	0.0	0.0	0.0
	Tomatoes	114.6	0.0	0.0	0.1	114.6	0.0	0.0	0.0	113.3	0.0	0.0	0.0
	Deciduous Orchard	38.5	0.0	0.0	0.0	38.5	0.0	0.0	0.0	38.5	0.0	0.0	0.0
	Small Grain	5.2	0.0	0.0	0.0	5.2	0.0	0.0	0.0	4.9	0.0	0.0	0.0
	Grapes	15.1	0.0	0.0	0.0	15.1	0.0	0.0	0.0	15.1	0.0	0.0	0.0
	Cotton	234.6	0.0	0.0	-0.1	234.7	0.0	0.0	0.0	225.8	0.0	0.0	0.0
	Subtropical Orchard	3.7	0.0	0.0	0.0	3.7	0.0	0.0	0.0	3.7	0.0	0.0	0.0
	Subtotal	**1253.1**	**0.0**	**0.0**	**0.0**	**1253.1**	**0.0**	**0.0**	**0.0**	**1241.1**	**0.0**	**0.0**	**0.0**
15	Pasture	0.9	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.9	0.0	0.0	0.0
	Alfalfa	51.3	0.0	0.0	0.1	51.4	0.0	0.0	0.0	49.7	0.0	0.0	0.0
	Sugar Beets	4.1	0.0	0.0	0.0	4.1	0.0	0.0	0.0	4.0	0.0	0.0	0.0
	Other Field Crops	51.2	0.0	0.0	0.0	51.3	0.0	0.0	0.0	50.2	0.0	0.0	0.0
	Rice	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
	Truck Crops	72.0	0.0	0.0	0.0	72.0	0.0	0.0	0.0	71.9	0.0	0.0	0.0
	Tomatoes	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
	Deciduous Orchard	58.7	0.0	0.0	0.0	58.7	0.0	0.0	0.0	58.7	0.0	0.0	0.0
	Small Grain	41.6	0.0	0.0	0.0	41.9	0.0	0.0	0.0	39.7	0.0	0.0	0.0
	Grapes	121.7	0.0	0.0	0.0	121.7	0.0	0.0	0.0	121.7	0.0	0.0	0.0
	Cotton	275.0	0.0	0.0	-0.2	275.7	0.0	0.0	-0.1	267.5	0.0	0.0	0.0
	Subtropical Orchard	3.7	0.0	0.0	0.0	3.7	0.0	0.0	0.0	3.7	0.0	0.0	0.0
	Subtotal	**683.2**	**0.0**	**0.0**	**-0.1**	**684.5**	**0.0**	**0.0**	**0.0**	**671.1**	**0.0**	**0.0**	**0.0**
16	Pasture	1.4	0.0	0.0	0.0	1.5	0.0	0.0	0.0	1.4	0.0	0.0	0.0
	Alfalfa	3.1	0.0	0.0	0.0	3.2	0.0	0.0	0.0	3.1	0.0	0.0	0.0
	Other Field Crops	3.6	0.0	0.0	0.0	3.6	0.0	0.0	0.0	3.6	0.0	0.0	0.0
	Truck Crops	30.0	0.0	0.0	0.0	30.0	0.0	0.0	0.0	30.0	0.0	0.0	0.0
	Deciduous Orchard	24.7	0.0	0.0	0.0	24.7	0.0	0.0	0.0	24.7	0.0	0.0	0.0
	Small Grain	2.4	0.0	0.0	0.0	2.4	0.0	0.0	0.0	2.3	0.0	0.0	0.0
	Grapes	119.6	0.0	0.0	0.0	119.6	0.0	0.0	0.0	119.6	0.0	0.0	0.0
	Cotton	5.7	0.0	0.0	0.0	5.8	-0.1	-0.1	-0.1	5.7	0.0	0.0	0.0
	Subtropical Orchard	33.7	0.0	0.0	0.0	33.7	0.0	0.0	0.0	33.7	0.0	0.0	0.0
	Subtotal	**224.3**	**0.0**	**0.0**	**0.0**	**224.5**	**-0.2**	**-0.2**	**-0.2**	**224.2**	**0.0**	**0.0**	**0.0**
17	Pasture	0.7	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.5	0.0	0.0	0.0
	Alfalfa	3.1	0.0	0.0	0.0	3.1	0.0	0.0	0.0	2.5	0.0	0.0	0.0
	Sugar Beets	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
	Other Field Crops	4.8	0.0	0.0	0.0	4.8	0.0	0.0	0.0	4.2	0.0	0.0	0.0
	Truck Crops	60.0	0.0	0.0	0.0	60.0	0.0	0.0	0.0	59.7	0.0	0.0	0.0
	Tomatoes	1.5	0.0	0.0	0.0	1.5	0.0	0.0	0.0	1.4	0.0	0.0	0.0
	Deciduous Orchard	112.8	0.0	0.0	0.0	112.8	0.0	0.0	0.0	112.8	0.0	0.0	0.0
	Small Grain	3.5	0.0	0.0	0.0	3.5	0.0	0.0	0.0	3.1	0.0	0.0	0.0
	Grapes	236.9	0.0	0.0	0.0	236.9	0.0	0.0	0.0	236.9	0.0	0.0	0.0
	Cotton	11.4	0.0	0.0	0.0	11.4	0.0	0.0	0.0	9.9	0.0	0.0	0.0
	Subtropical Orchard	131.0	0.0	0.0	0.0	131.0	0.0	0.0	0.0	131.0	0.0	0.0	0.0
	Subtotal	**565.7**	**0.0**	**0.0**	**0.0**	**565.7**	**0.0**	**0.0**	**0.0**	**562.0**	**0.0**	**0.0**	**0.0**
18	Pasture	0.9	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.8	0.0	0.0	0.0
	Alfalfa	38.4	0.0	0.0	0.1	38.7	-0.2	-0.2	-0.2	36.4	0.0	0.0	0.0
	Sugar Beets	1.6	0.0	0.0	0.0	1.6	0.0	0.0	0.0	1.5	0.0	0.0	0.0
	Other Field Crops	46.5	0.0	0.0	0.0	46.7	-0.1	-0.1	-0.1	44.8	0.0	0.0	0.0
	Truck Crops	78.0	0.0	0.0	0.0	78.0	0.0	0.0	0.0	77.9	0.0	0.0	0.0
	Tomatoes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Deciduous Orchard	106.6	0.0	0.0	0.0	106.6	0.0	0.0	0.0	106.6	0.0	0.0	0.0
	Small Grain	24.0	0.0	0.0	0.0	24.3	-0.1	-0.1	-0.1	22.7	0.1	0.1	0.1
	Grapes	121.7	0.0	0.0	0.0	121.7	0.0	0.0	0.0	121.7	0.0	0.0	0.0
	Cotton	193.5	0.0	0.0	-0.1	194.6	-0.6	-0.6	-0.6	186.0	0.0	0.0	0.0
	Subtropical Orchard	363.1	0.0	0.0	0.0	363.1	0.0	0.0	0.0	363.1	0.0	0.0	0.0
	Subtotal	**974.2**	**0.0**	**0.0**	**-0.1**	**976.1**	**-1.0**	**-1.0**	**-1.0**	**961.5**	**0.1**	**0.1**	**0.1**

TABLE 18
VALUE OF PRODUCTION BY SUBREGION (Million $)

CVPM Subregion	Crop Category	Preferred Alternative Average	Changes Compared to Avg. PA: Average Followed by Average	Wet Followed by Average	Dry Followed by Average	Preferred Alternative Wet	Changes Compared to Wet PA: Average Followed by Wet	Wet Followed by Wet	Dry Followed by Wet	Preferred Alternative Dry	Changes Compared to Dry PA: Average Followed by Dry	Wet Followed by Dry	Dry Followed by Dry
19	Pasture	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Alfalfa	15.7	0.0	0.0	0.0	15.7	0.0	0.0	0.0	15.3	0.0	0.0	0.0
	Sugar Beets	4.3	0.0	0.0	0.0	4.3	0.0	0.0	0.0	4.2	0.0	0.0	0.0
	Other Field Crops	4.5	0.0	0.0	0.0	4.5	0.0	0.0	0.0	4.5	0.0	0.0	0.0
	Truck Crops	147.1	0.0	0.0	0.0	147.0	0.0	0.0	0.0	147.0	0.0	0.0	0.0
	Tomatoes	2.7	0.0	0.0	0.0	2.7	0.0	0.0	0.0	2.7	0.0	0.0	0.0
	Deciduous Orchard	80.2	0.0	0.0	0.0	80.2	0.0	0.0	0.0	80.2	0.0	0.0	0.0
	Small Grain	3.6	0.0	0.0	0.0	3.6	0.0	0.0	0.0	3.5	0.0	0.0	0.0
	Grapes	33.0	0.0	0.0	0.0	33.0	0.0	0.0	0.0	33.0	0.0	0.0	0.0
	Cotton	125.2	0.0	0.0	-0.1	125.1	0.0	0.0	0.0	122.2	0.0	0.0	0.0
	Subtropical Orchard	17.1	0.0	0.0	0.0	17.1	0.0	0.0	0.0	17.1	0.0	0.0	0.0
	Subtotal	**433.3**	**0.0**	**0.0**	**0.0**	**433.3**	**0.0**	**0.0**	**0.0**	**429.7**	**0.0**	**0.0**	**0.0**
20	Pasture	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Alfalfa	7.3	0.0	0.0	0.0	7.3	0.0	0.0	0.0	6.7	0.0	0.0	0.0
	Sugar Beets	0.4	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.4	0.0	0.0	0.0
	Other Field Crops	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0
	Truck Crops	251.6	0.0	0.0	0.0	251.6	0.0	0.0	0.0	251.2	0.0	0.0	0.0
	Tomatoes	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0
	Deciduous Orchard	81.8	0.0	0.0	0.0	81.8	0.0	0.0	0.0	81.8	0.0	0.0	0.0
	Small Grain	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.4	0.0	0.0	0.0
	Grapes	109.1	0.0	0.0	0.0	109.1	0.0	0.0	0.0	109.1	0.0	0.0	0.0
	Cotton	35.0	0.0	0.0	0.0	35.2	0.0	0.0	0.0	32.7	0.0	0.0	0.0
	Subtropical Orchard	115.6	0.0	0.0	0.0	115.6	0.0	0.0	0.0	115.6	0.0	0.0	0.0
	Subtotal	**603.9**	**0.0**	**0.0**	**0.0**	**604.1**	**0.0**	**0.0**	**0.0**	**600.4**	**0.0**	**0.0**	**0.0**
21	Pasture	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0
	Alfalfa	16.8	0.0	0.0	0.0	16.8	0.0	0.0	0.0	16.6	0.0	0.0	0.0
	Sugar Beets	6.4	0.0	0.0	0.0	6.4	0.0	0.0	0.0	6.3	0.0	0.0	0.0
	Other Field Crops	10.8	0.0	0.0	0.0	10.8	0.0	0.0	0.0	10.8	0.0	0.0	0.0
	Rice	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Truck Crops	661.4	0.0	0.0	0.0	661.3	0.0	0.0	0.1	661.3	0.0	0.0	0.0
	Tomatoes	1.6	0.0	0.0	0.0	1.6	0.0	0.0	0.0	1.6	0.0	0.0	0.0
	Deciduous Orchard	39.3	0.0	0.0	0.0	39.3	0.0	0.0	0.0	39.3	0.0	0.0	0.0
	Small Grain	0.9	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.9	0.0	0.0	0.0
	Grapes	122.1	0.0	0.0	0.0	122.1	0.0	0.0	0.0	122.1	0.0	0.0	0.0
	Cotton	128.3	0.0	0.0	-0.1	128.3	0.0	0.0	0.0	126.7	0.0	0.0	0.0
	Subtropical Orchard	59.9	0.0	0.0	0.0	59.9	0.0	0.0	0.0	59.9	0.0	0.0	0.0
	Subtotal	**1047.6**	**0.0**	**0.0**	**0.0**	**1047.6**	**0.0**	**0.0**	**0.0**	**1045.7**	**0.0**	**0.0**	**0.0**

NOTES:
1. All values in millions of 1992 dollars.
2. A negative value represents a lower gross revenue in an alternative than in the Preferred Alternative.
3. Not all 12 crops are grown in all subregions.
4. Subregions 3 and 3B should be added together to get the complete subregion 3. 3B represents the area within this subregion served by the Tehama Colusa Canal.

TABLE 19
CHANGES IN NET REVENUE BY SUBREGION (Million $)

CVPM Subregion	Cause of Net Revenue Change		Change Compared to Avg.PA				Change Compared to Wet PA				Change Compared to Dry PA		
			Average	Wet	Dry		Average	Wet	Dry		Average	Wet	Dry
			Followed By Average				Followed By Wet				Followed By Dry		
1	Fallowed Land	1.8	-0.1	0.0	0.0	1.8	-0.1	-0.1	-0.1	1.7	-0.1	-0.1	-0.1
	Groundwater Pumping Cost	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	0.1	0.1
	Irrigation Cost	2.3	-0.2	-0.2	-0.2	-2.3	-0.2	-0.2	-0.2	-2.3	-0.2	-0.2	-0.2
	CVP Water Cost	0.6	0.3	0.2	0.1	-0.7	0.4	0.4	0.4	-0.7	0.4	0.4	0.4
	Higher Crop Prices	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Net Change		**0.1**	**0.0**	**0.0**	**-1.2**	**0.2**	**0.2**	**0.2**	**-1.2**	**0.2**	**0.2**	**0.2**
2	Fallowed Land	30.1	0.0	0.0	-0.3	30.1	0.0	0.0	-0.4	30.0	0.0	0.0	0.0
	Groundwater Pumping Cost	20.4	0.0	0.0	0.0	-19.9	0.0	0.0	0.0	-24.6	0.0	0.0	0.0
	Irrigation Cost	22.1	0.0	0.0	0.0	-22.1	0.0	0.0	0.0	-21.9	0.0	0.0	0.0
	CVP Water Cost	0.4	-0.2	0.0	0.1	-0.6	-0.6	-0.2	0.5	-0.1	0.0	0.0	-0.1
	Higher Crop Prices	0.1	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0
	Net Change		**-0.2**	**0.0**	**0.0**	**-12.4**	**-0.6**	**-0.2**	**0.1**	**-16.5**	**0.0**	**0.0**	**-0.1**
3	Fallowed Land	39.3	0.0	0.0	0.0	39.4	0.0	0.0	0.0	38.9	0.0	0.0	0.0
	Groundwater Pumping Cost	9.0	0.0	0.0	0.0	-7.9	0.0	0.0	0.0	-14.5	0.0	0.0	0.0
	Irrigation Cost	21.2	0.0	0.0	0.0	-21.3	0.0	0.0	0.0	-21.0	0.0	0.0	0.0
	CVP Water Cost	1.6	0.0	0.0	0.0	-1.6	-0.2	-0.2	-0.2	-1.4	-0.3	-0.3	-0.3
	Higher Crop Prices	0.2	0.0	0.0	0.3	0.1	0.0	0.0	0.2	0.4	0.0	0.0	0.0
	Net Change		**0.0**	**0.0**	**0.3**	**8.7**	**-0.2**	**-0.2**	**0.0**	**2.4**	**-0.3**	**-0.3**	**-0.3**
3B	Fallowed Land	11.9	0.0	0.0	-6.4	11.9	0.0	0.0	-3.8	10.6	0.0	0.0	0.0
	Groundwater Pumping Cost	3.0	0.0	0.0	0.0	-1.8	1.4	1.4	-4.1	-8.3	0.0	0.0	0.0
	Irrigation Cost	9.0	0.0	0.0	0.0	-9.1	0.0	0.0	0.0	-7.7	0.0	0.0	0.0
	CVP Water Cost	3.7	-0.4	1.4	3.7	-4.2	-4.7	-1.2	4.2	-0.9	0.2	0.2	-0.3
	Higher Crop Prices	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
	Net Change		**-0.4**	**1.4**	**-2.8**	**-3.1**	**-3.3**	**0.2**	**-3.7**	**-6.3**	**0.2**	**0.2**	**-0.3**
4	Fallowed Land	34.3	0.0	0.0	0.0	34.3	0.0	0.0	0.0	34.1	0.0	0.0	0.0
	Groundwater Pumping Cost	9.3	0.0	0.0	0.0	-8.5	0.0	0.0	0.0	-13.5	0.0	0.0	0.0
	Irrigation Cost	20.2	0.0	0.0	0.0	-20.3	0.0	0.0	0.0	-20.1	0.0	0.0	0.0
	CVP Water Cost	1.3	0.0	0.0	0.0	-1.3	-0.1	-0.1	-0.1	-1.1	-0.2	-0.2	-0.2
	Higher Crop Prices	0.2	0.0	0.0	0.3	0.1	0.0	0.0	0.1	0.3	0.0	0.0	0.0
	Net Change		**0.0**	**0.0**	**0.3**	**4.4**	**-0.1**	**-0.1**	**0.0**	**-0.3**	**-0.2**	**-0.2**	**-0.2**
5	Fallowed Land	53.4	0.0	0.0	0.0	53.5	0.0	0.0	0.0	53.2	0.0	0.0	0.0
	Groundwater Pumping Cost	14.9	0.0	0.0	0.0	-13.0	0.0	0.0	0.0	-18.7	0.0	0.0	0.0
	Irrigation Cost	22.5	0.0	0.0	0.0	-22.6	0.0	0.0	0.0	-22.4	0.0	0.0	0.0
	CVP Water Cost	0.2	-0.3	-0.3	-0.3	-0.2	-0.3	-0.3	-0.3	-0.2	-0.3	-0.3	-0.3
	Higher Crop Prices	0.1	0.0	0.0	0.3	0.1	0.0	0.0	0.1	0.2	0.0	0.0	0.0
	Net Change		**-0.3**	**-0.3**	**0.0**	**17.7**	**-0.3**	**-0.3**	**-0.2**	**12.1**	**-0.3**	**-0.3**	**-0.3**
6	Fallowed Land	32.3	0.0	0.0	0.0	32.5	-0.2	-0.2	-0.2	32.2	0.0	0.0	0.0
	Groundwater Pumping Cost	14.9	0.0	0.0	0.0	-14.4	0.3	0.3	0.3	-17.6	-0.1	-0.1	-0.1
	Irrigation Cost	21.6	0.0	0.0	0.0	-21.8	0.0	0.0	0.0	-21.5	0.0	0.0	0.0
	CVP Water Cost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Higher Crop Prices	0.3	0.0	0.0	0.4	0.2	0.0	0.0	0.2	0.5	0.0	0.0	0.0
	Net Change		**0.0**	**0.0**	**0.4**	**-3.6**	**0.1**	**0.1**	**0.3**	**-6.4**	**-0.1**	**-0.1**	**-0.1**

TABLE 19
CHANGES IN NET REVENUE BY SUBREGION (Million $)

7	Fallowed Land	10.5	0.0	0.0	0.0	10.5	0.0	0.0	0.0	10.4	0.0	0.0	0.0
	Groundwater Pumping Cost	7.6	0.0	0.0	0.0	-6.9	0.0	0.0	0.0	-9.1	0.0	0.0	0.0
	Irrigation Cost	4.4	0.0	0.0	0.0	-4.4	0.0	0.0	0.0	-4.3	0.0	0.0	0.0
	CVP Water Cost	0.3	-0.1	-0.1	-0.1	-0.3	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	-0.1
	Higher Crop Prices	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
	Net Change		**-0.1**	**-0.1**	**0.0**	**-1.0**	**-0.1**	**-0.1**	**0.0**	**-3.1**	**-0.1**	**-0.1**	**-0.1**
8	Fallowed Land	46.4	0.0	0.0	0.0	46.5	0.0	0.0	0.0	46.4	0.0	0.0	0.0
	Groundwater Pumping Cost	30.8	0.0	0.0	0.0	-29.1	0.1	0.1	0.1	-35.4	-0.1	-0.1	-0.1
	Irrigation Cost	21.1	0.0	0.0	0.0	-21.1	0.0	0.0	0.0	-21.0	0.0	0.0	0.0
	CVP Water Cost	0.3	-0.8	-0.5	-1.6	-0.5	-2.0	-1.2	-2.8	-0.1	-0.3	-0.3	-0.4
	Higher Crop Prices	0.2	0.0	0.0	0.2	0.2	0.0	0.0	0.1	0.3	0.0	0.0	0.0
	Net Change		**-0.8**	**-0.5**	**-1.3**	**-4.1**	**-1.9**	**-1.0**	**-2.5**	**-9.8**	**-0.3**	**-0.3**	**-0.5**
9	Fallowed Land	52.9	-0.1	-0.1	0.0	52.9	-0.1	-0.1	-0.1	52.4	0.2	0.2	0.2
	Groundwater Pumping Cost	2.5	-0.6	-0.6	-0.6	-2.1	-1.2	-1.2	-1.2	-3.2	-0.4	-0.4	-0.4
	Irrigation Cost	34.4	-0.3	-0.3	-0.3	-34.4	-0.3	-0.3	-0.3	-33.9	-0.3	-0.3	-0.3
	CVP Water Cost	1.2	1.2	1.2	1.2	-2.0	2.0	2.0	2.0	-0.5	0.5	0.5	0.5
	Higher Crop Prices	0.3	0.0	0.0	0.5	0.3	0.0	0.0	0.2	0.6	0.0	0.0	0.0
	Net Change		**0.3**	**0.3**	**0.7**	**14.5**	**0.5**	**0.5**	**0.7**	**15.5**	**0.0**	**0.0**	**0.0**
10	Fallowed Land	97.8	0.0	0.0	-0.1	97.8	0.0	0.0	0.0	97.8	0.0	0.0	0.0
	Groundwater Pumping Cost	15.4	0.0	0.0	-6.8	-12.5	-8.3	-0.8	-8.6	-20.6	0.0	0.0	0.0
	Irrigation Cost	38.9	0.0	0.0	0.0	-38.9	0.0	0.0	0.0	-38.9	0.0	0.0	0.0
	CVP Water Cost	6.3	-0.1	0.4	6.3	-8.1	7.9	0.7	8.1	-3.2	0.2	0.2	-0.1
	Higher Crop Prices	0.5	0.0	0.0	0.4	0.4	0.0	0.0	0.2	0.9	0.0	0.0	0.0
	Net Change		**-0.1**	**0.4**	**-0.1**	**38.7**	**-0.5**	**0.0**	**-0.3**	**36.0**	**0.2**	**0.2**	**-0.1**
11	Fallowed Land	35.5	0.0	0.0	0.0	35.5	0.0	0.0	0.0	35.4	0.0	0.0	0.0
	Groundwater Pumping Cost	1.0	0.0	0.0	0.0	-0.8	0.0	0.0	0.0	-1.1	0.0	0.0	0.0
	Irrigation Cost	16.0	0.0	0.0	0.0	-16.0	0.0	0.0	0.0	-16.0	0.0	0.0	0.0
	CVP Water Cost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Higher Crop Prices	0.1	0.0	0.0	0.3	0.1	0.0	0.0	0.1	0.2	0.0	0.0	0.0
	Net Change		**0.0**	**0.0**	**0.3**	**18.7**	**0.0**	**0.0**	**0.1**	**18.6**	**0.0**	**0.0**	**0.0**
12	Fallowed Land	41.8	0.0	0.0	0.0	41.7	0.0	0.0	0.0	41.7	0.0	0.0	0.0
	Groundwater Pumping Cost	6.1	0.0	0.0	0.0	-4.8	0.0	0.0	0.0	-8.4	0.0	0.0	0.0
	Irrigation Cost	19.9	0.0	0.0	0.0	-19.8	0.0	0.0	0.0	-19.8	0.0	0.0	0.0
	CVP Water Cost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Higher Crop Prices	0.1	0.0	0.0	0.3	0.1	0.0	0.0	0.1	0.2	0.0	0.0	0.0
	Net Change		**0.0**	**0.0**	**0.3**	**17.2**	**0.0**	**0.0**	**0.1**	**13.7**	**0.0**	**0.0**	**0.0**
13	Fallowed Land	112.2	0.0	0.0	0.0	112.3	-0.1	-0.1	-0.1	112.1	-0.1	-0.1	-0.1
	Groundwater Pumping Cost	38.4	0.8	0.7	-2.7	-33.9	1.6	1.6	-4.9	-50.7	0.2	0.2	0.2
	Irrigation Cost	53.6	0.0	0.0	0.0	-53.8	0.0	0.0	0.0	-53.6	0.0	0.0	0.0
	CVP Water Cost	6.8	-0.8	-0.6	2.1	-6.4	-1.7	-1.5	4.3	-5.4	-0.2	-0.2	-0.4
	Higher Crop Prices	0.4	0.0	0.0	0.5	0.4	0.0	0.0	0.2	0.8	0.0	0.0	0.0
	Net Change		**0.0**	**0.1**	**-0.1**	**18.7**	**-0.1**	**0.0**	**-0.5**	**3.3**	**-0.1**	**-0.1**	**-0.3**
14	Fallowed Land	111.5	0.0	0.0	0.0	111.5	0.0	0.0	0.0	110.3	0.0	0.0	0.0
	Groundwater Pumping Cost	81.1	0.0	0.0	0.0	-58.3	0.0	0.0	0.0	-118.6	0.0	0.0	0.0
	Irrigation Cost	62.8	0.0	0.0	0.0	-62.8	0.0	0.0	0.0	-61.1	0.0	0.0	0.0
	CVP Water Cost	32.8	1.3	3.5	-6.0	-45.1	1.8	6.4	-5.5	-14.4	-6.3	-6.3	-7.3
	Higher Crop Prices	0.7	0.0	0.0	0.5	0.6	0.0	0.0	0.2	1.2	0.0	0.0	0.0
	Net Change		**1.3**	**3.5**	**-5.6**	**-53.9**	**1.8**	**6.4**	**-5.3**	**-82.6**	**-6.3**	**-6.3**	**-7.3**

TABLE 19
CHANGES IN NET REVENUE BY SUBREGION (Million $)

15	Fallowed Land	94.1	0.0	0.0	0.0	94.2	0.0	0.0	0.0	92.6	0.0	0.0	0.0
	Groundwater Pumping Cost	81.0	0.0	0.0	0.0	-69.3	0.3	0.3	0.3	-102.9	-1.5	-1.5	-1.5
	Irrigation Cost	61.8	0.0	0.0	0.0	-61.9	0.0	0.0	0.0	-60.3	0.0	0.0	0.0
	CVP Water Cost	1.8	-0.3	-0.2	-0.4	-1.9	-0.2	-0.2	-0.3	-1.5	-0.4	-0.4	-0.5
	Higher Crop Prices	0.7	0.0	0.0	0.4	0.6	0.1	0.0	0.2	1.5	0.0	0.0	0.0
	Net Change		**-0.3**	**-0.2**	**0.1**	**-38.3**	**0.2**	**0.2**	**0.2**	**-70.7**	**-1.9**	**-1.9**	**-1.9**
16	Fallowed Land	37.3	0.0	0.0	0.0	37.3	0.0	0.0	0.0	37.3	0.0	0.0	0.0
	Groundwater Pumping Cost	1.9	-0.6	-0.6	-0.6	0.0	-0.5	-0.5	-0.5	-4.3	-0.5	-0.5	-0.5
	Irrigation Cost	11.0	0.0	0.0	0.0	-11.1	0.0	0.0	0.0	-11.0	0.0	0.0	0.0
	CVP Water Cost	0.7	0.7	0.7	0.7	-0.7	0.7	0.7	0.7	-0.5	0.5	0.5	0.5
	Higher Crop Prices	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0
	Net Change		**0.0**	**0.0**	**0.1**	**25.7**	**0.1**	**0.1**	**0.1**	**21.6**	**0.0**	**0.0**	**0.0**
17	Fallowed Land	95.8	0.0	0.0	0.0	95.8	0.0	0.0	0.0	95.2	0.0	0.0	0.0
	Groundwater Pumping Cost	17.7	0.2	0.2	0.2	-12.7	0.3	0.3	0.3	-25.5	0.0	0.0	0.0
	Irrigation Cost	27.8	0.0	0.0	0.0	-27.8	0.0	0.0	0.0	-27.4	0.0	0.0	0.0
	CVP Water Cost	1.4	-0.1	-0.1	-0.3	-1.2	-0.4	-0.3	-0.5	-1.1	0.0	0.0	-0.1
	Higher Crop Prices	0.2	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0
	Net Change		**0.0**	**0.1**	**0.1**	**54.2**	**0.0**	**0.0**	**-0.1**	**41.5**	**0.0**	**0.0**	**-0.1**
18	Fallowed Land	153.6	0.0	0.0	0.0	153.9	-0.1	-0.1	-0.1	151.9	0.0	0.0	0.0
	Groundwater Pumping Cost	57.9	0.0	0.0	0.0	-46.2	0.2	0.2	0.2	-78.0	0.0	0.0	0.0
	Irrigation Cost	64.9	0.0	0.0	0.0	-65.1	0.0	0.0	0.0	-63.2	0.0	0.0	0.0
	CVP Water Cost	17.7	-1.5	-1.0	-3.3	-17.7	-2.2	-1.7	-3.9	-15.2	0.8	0.8	0.0
	Higher Crop Prices	0.6	0.0	0.0	0.4	0.5	0.0	0.0	0.1	1.1	0.0	0.0	0.0
	Net Change		**-1.5**	**-1.0**	**-2.9**	**25.3**	**-2.1**	**-1.6**	**-3.7**	**-3.4**	**0.8**	**0.8**	**0.0**
19	Fallowed Land	54.3	0.0	0.0	0.0	54.3	0.0	0.0	0.0	53.9	0.0	0.0	0.0
	Groundwater Pumping Cost	31.6	0.0	0.0	0.0	-21.3	0.2	0.2	0.2	-51.5	-1.2	-1.2	-1.2
	Irrigation Cost	28.8	0.0	0.0	0.0	-28.8	0.0	0.0	0.0	-28.3	0.0	0.0	0.0
	CVP Water Cost	0.5	-0.5	-0.5	-0.6	-0.6	-0.5	-0.5	-0.5	-0.4	-0.5	-0.5	-0.5
	Higher Crop Prices	0.3	0.0	0.0	0.2	0.3	0.0	0.0	0.1	0.6	0.0	0.0	0.0
	Net Change		**-0.5**	**-0.5**	**-0.3**	**3.9**	**-0.3**	**-0.3**	**-0.3**	**-25.7**	**-1.8**	**-1.8**	**-1.8**
20	Fallowed Land	81.5	0.0	0.0	0.0	81.5	0.0	0.0	0.0	81.0	0.0	0.0	0.0
	Groundwater Pumping Cost	24.7	0.0	0.0	0.0	-19.7	0.0	0.0	0.0	-36.6	-0.2	-0.2	-0.2
	Irrigation Cost	20.9	0.0	0.0	0.0	-20.9	0.0	0.0	0.0	-20.5	0.0	0.0	0.0
	CVP Water Cost	9.2	-0.1	0.2	-0.9	-9.5	-0.3	-0.1	-1.1	-7.0	-0.2	-0.2	-0.5
	Higher Crop Prices	0.2	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.3	0.0	0.0	0.0
	Net Change		**-0.1**	**0.2**	**-0.8**	**31.5**	**-0.3**	**0.0**	**-1.1**	**17.2**	**-0.3**	**-0.3**	**-0.7**
21	Fallowed Land	112.4	0.0	0.0	0.0	112.4	0.0	0.0	0.0	112.1	0.0	0.0	0.0
	Groundwater Pumping Cost	49.3	0.0	0.0	0.0	-37.6	0.2	0.2	0.2	-68.4	-0.8	-0.8	-0.8
	Irrigation Cost	37.1	0.0	0.0	0.0	-37.1	0.0	0.0	0.0	-36.8	0.0	0.0	0.0
	CVP Water Cost	8.4	0.1	0.3	-0.5	-9.6	0.2	0.5	-0.4	-5.5	-0.7	-0.7	-0.9
	Higher Crop Prices	0.4	0.0	0.0	0.2	0.4	0.0	0.0	0.1	0.7	0.0	0.0	0.0
	Net Change		**0.1**	**0.3**	**-0.3**	**28.5**	**0.4**	**0.7**	**-0.1**	**2.1**	**-1.5**	**-1.5**	**-1.7**
Total	Fallowed Land		-0.1	0.0	-6.8	1100.4	-0.4	-0.3	-4.6	1093.0	-0.2	-0.2	-0.2
	Groundwater Pumping		0.4	0.4	-9.9	-364.0	-4.4	3.1	-16.6	-616.9	-4.0	-4.0	-4.0
	Irrigation Cost		-0.3	-0.3	-0.3	-503.5	-0.3	-0.3	-0.3	-496.0	-0.3	-0.3	-0.3
	CVP Water Cost		-1.3	4.3	2.3	-91.1	0.0	2.9	6.5	-42.5	-8.0	-7.9	-10.7
	Higher Crop Prices		0.1	0.0	4.7	4.1	0.4	0.4	1.9	8.6	0.0	0.0	0.0
	Net Change		**-1.1**	**4.4**	**-10.0**	**146.0**	**-4.6**	**5.8**	**-13.2**	**-53.9**	**-12.4**	**-12.4**	**-15.1**

Notes:
1. All values in millions of 1992 dollars
2. A negative value represents a reduction in net revenue compared to the Preferred Alternative
3. Subregions 3 and 3B should be added together to get the complete subregion 3. 3B represents the area within this subregion served by the Tehama Colusa Canal
4. PA is the Preferred Alternative

TABLE 20
IRRIGATION WATER APPLIED BY SUBREGION

CVPM Subregion	Water Source	Preferred Alternative Average	Changes Compared to Average PA			Preferred Alternative Wet	Changes Compared to Wet PA			Preferred Alternative Dry	Changes Compared to Dry PA		
			Average	Wet	Dry		Average	Wet	Dry		Average	Wet	Dry
			Followed by Average				Followed by Wet				Followed by Dry		
1	CVP Water	19.3	-10.8	-6.4	-5.4	20.5	-13.0	-13.0	-13.0	21.0	-13.5	-13.5	-13.5
	Groundwater	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	-1.5	-1.5	-1.5
2	CVP Water	27.7	0.0	0.0	-21.6	37.1	0.0	0.1	-36.7	8.2	0.0	0.0	0.0
	Groundwater	512.1	0.0	0.0	0.0	506.4	0.0	-0.1	0.0	584.7	0.0	0.0	0.0
3	CVP Water	170.4	0.0	0.0	0.0	174.2	0.0	0.0	0.0	154.3	0.0	0.0	0.0
	Groundwater	248.9	0.0	0.0	0.0	227.0	0.0	0.0	0.0	355.3	0.0	0.0	0.0
3B	CVP Water	199.6	0.1	0.0	-199.6	227.0	39.3	39.1	-227.0	50.3	0.0	0.0	-0.1
	Groundwater	78.7	-0.1	0.0	0.0	50.4	-38.4	-38.2	99.6	191.9	0.0	0.0	0.0
4	CVP Water	129.8	0.0	0.0	0.0	133.1	0.0	0.0	0.0	113.9	0.0	0.0	0.0
	Groundwater	326.6	0.0	0.0	0.0	305.1	0.0	0.0	0.0	442.8	0.0	0.0	0.0
5	CVP Water	19.9	0.1	0.0	0.1	20.8	0.1	0.0	0.0	17.9	0.0	-0.1	0.0
	Groundwater	492.6	-0.1	0.0	-0.1	449.3	-1.1	-1.0	-0.4	588.7	-1.1	-1.0	-1.1
6	CVP Water	2.2	0.0	0.0	0.0	2.4	0.0	0.0	0.0	1.8	0.0	0.0	0.0
	Groundwater	452.8	0.0	0.0	0.0	447.6	-6.4	-6.4	-6.0	521.0	0.0	0.0	0.0
7	CVP Water	22.0	0.0	0.0	0.0	22.6	0.0	0.0	0.0	19.1	0.0	0.0	0.0
	Groundwater	193.2	0.0	0.0	0.0	177.9	0.0	0.0	0.0	217.5	0.0	0.0	0.0
8	CVP Water	51.6	0.1	0.0	-0.1	79.4	0.1	-0.1	-0.1	25.3	0.0	0.0	-0.1
	Groundwater	756.4	-0.1	0.0	0.1	717.3	0.0	0.0	0.0	851.3	-0.2	-0.2	-0.1
9	CVP Water	28.2	-28.2	-28.2	-28.2	48.1	-48.1	-48.1	-48.1	11.5	-11.5	-11.5	-11.5
	Groundwater	80.3	17.9	17.9	18.7	70.2	35.6	35.6	36.0	100.1	11.5	11.5	11.4
10	CVP Water	183.4	0.0	0.0	-183.4	234.4	-228.4	-22.8	-234.4	92.1	0.0	0.0	0.0
	Groundwater	496.2	0.0	0.0	179.4	414.4	227.7	22.7	233.7	632.4	0.0	0.0	-0.1
11	CVP Water	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Groundwater	34.1	0.0	0.0	0.0	26.8	0.0	0.0	0.0	34.5	0.0	0.0	0.0
12	CVP Water	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Groundwater	173.1	0.0	0.0	0.0	141.8	0.0	0.0	0.0	228.2	0.0	0.0	0.0
13	CVP Water	163.6	16.7	16.6	-60.2	159.0	33.2	33.1	-113.1	128.2	0.0	0.0	0.0
	Groundwater	912.5	-16.7	-16.6	60.2	812.0	-36.2	-36.2	109.1	1,181.4	-3.8	-3.8	-3.8
14	CVP Water	524.4	0.1	0.0	0.1	719.0	0.1	0.0	0.0	230.2	0.0	0.0	0.0
	Groundwater	826.3	-0.1	0.0	-0.1	603.6	-0.1	0.0	0.0	1,176.4	0.0	0.0	0.0
15	CVP Water	35.1	0.0	0.1	0.1	38.1	0.0	0.1	0.0	28.6	0.0	0.0	0.0
	Groundwater	1,276.6	0.0	-0.1	-0.1	1,099.1	0.0	0.0	0.0	1,600.7	0.0	0.0	0.0
16	CVP Water	16.2	-16.2	-16.2	-16.2	15.7	-15.7	-15.7	-15.7	12.9	-12.9	-12.9	-12.9
	Groundwater	49.6	14.9	14.8	15.0	0.0	13.2	13.2	13.2	107.3	11.5	11.5	11.5
17	CVP Water	34.6	3.9	3.8	4.0	32.5	7.4	7.3	7.4	27.1	0.0	0.0	0.1
	Groundwater	415.1	-3.8	-3.8	-3.9	303.2	-7.4	-7.2	-7.4	577.4	0.0	0.0	0.0
18	CVP Water	517.3	0.0	0.0	0.1	526.3	0.0	0.0	0.1	399.0	0.0	0.0	0.1
	Groundwater	1,018.0	0.0	0.0	-0.1	821.8	-4.0	-4.0	-3.8	1,334.9	0.0	0.0	0.0
19	CVP Water	13.3	-0.1	0.0	0.1	15.4	-0.1	-0.1	0.0	9.4	0.0	0.0	0.0
	Groundwater	366.8	0.1	0.0	-0.1	250.7	0.0	0.0	0.0	578.4	0.0	0.0	0.0
20	CVP Water	208.7	0.1	0.1	-0.2	219.8	0.1	0.1	-0.1	154.1	0.0	0.0	-0.1
	Groundwater	303.6	-0.1	-0.1	0.1	244.8	0.0	0.0	0.0	437.3	0.0	0.0	0.0
21	CVP Water	138.3	0.0	0.0	-0.1	163.0	0.0	0.1	-0.1	89.3	0.0	0.0	-0.1
	Groundwater	579.4	0.0	0.0	0.1	445.2	0.0	-0.1	0.0	783.1	0.0	0.0	0.0
Total	CVP Water	2,505.5	-34.4	-30.4	-510.5	2,888.2	-224.9	-19.8	-680.6	1,593.9	-37.7	-37.8	-37.8
	Groundwater	9,596.5	11.9	12.3	269.2	8,114.6	182.8	-21.6	474.0	12,527.1	16.1	16.2	16.1

Notes:
1. All quantities in thousands of acre-feet
2. A negative value represents a lower quantitity than in the Preferred Alternative
3. Subregions 3 and 3B should be added together to get the complete subregion 3. 3B represents the area within this subregion served by the Tehama Colusa Canal
4. PA is the Preferred Alternative

TABLE 21
SUBREGION ANALYSIS OF SIGNIFICANT CHANGES IN WATER USE

Subregion	Outcome	Explanation
1	Decrease in CVP use and no GW substitution in all sequences	Less CVP water is used than in the Preferred Alternative because the blended price is 140% to 330% higher than the Preferred Alternative Tier 1 (the only tier of water that was used for this scenario). For hydrologic reasons, subregion 1 is restricted from switching to groundwater.
2	Decrease in CVP use and no GW substitution in Dry to Average and Dry to Wet sequences	Less CVP water is used than in the Preferred Alternative because the blended prices for the Dry to Average and Dry to Wet sequences are 320% and 345% higher than the Preferred Alternative Tier 1 price (the only water tier that was used for this scenario). For hydrologic reasons, subregion 2 is restricted from switching to groundwater.
3B	Decrease CVP and no GW substitution in Dry to Average sequence	Less CVP water is used than in the Preferred Alternative because the blended price is 240% higher than the Tier 1 price from the Preferred Alternative, which is the only tier of water that was used. For hydrologic reasons the region is restricted from switching to groundwater in this long-run scenario.
3B	Decrease in CVP use and GW substitution in Dry to Wet sequence	CVP water use decreases because the blended price is 260% higher than the Preferred Alternative Tier 1 price. The model allowed a shift to groundwater on a short run basis to provide water to permanent crops during the wet year when groundwater would have been recharged.
3B	Shift from Groundwater to CVP water in Average to Wet and Wet to Wet sequences	In the Preferred Alternative wet year analysis subregion 3B has 39 TAF of water that falls in Tiers 2 or 3. Under the LTCR blended pricing mechanism all of the subregions CVP water is prices at a level that is lower than the Preferred Alternative Tier 2. This additional affordable CVP water is used resulting in a less groundwater being pumped.
9	Shift from CVP to Groundwater in all sequences	The blended price of CVP water in subregion 9 is greater than the groundwater pumping cost resulting in the shift from CVP to groundwater.
10	Shift from CVP to Groundwater in Dry to Average and Average, Wet and Dry to Wet sequences	Due to an increase in the CVP price relative to the Preferred Alternative, the depth to which groundwater can be affordable pumped increases resulting in the shift from CVP supplies to groundwater.
13	Shift from groundwater to CVP in Average to Average, Wet to Average, Average to Wet and Wet to Wet sequences	In the Preferred Alternative Average and Wet conditions subregion 13 had water classified as Tier 2 or Tier 3 which was not affordable, and pumped groundwater to supplement it's Tier 1 supply down to a depth at which it was no longer affordable. In the LTCR sequences, the blended price is less expensive than the Preferred Alternative upper Tier price, therefor a shift is made from the deepest groundwater to the now affordable CVP supply.
13	Shift from CVP to Groundwater in Dry to Average and Dry to Wet sequences	Under the LTCR blended price mechanism, when coming out of a drought into a Average or Wet year the blended price increases. In these situations, shallow groundwater is less expensive than the CVP blended price. As more groundwater is pumped the cost increases as the pump lift increases and the cost eventually becomes greater than the CVP blended price. When this happens the remainder of the subregions water supply is taken from the CVP supplies.
16	Shift from CVP to Groundwater in all sequences	The blended price of CVP water in subregion 16 is greater than the groundwater pumping cost resulting in the shift from CVP to groundwater.
17	Shift from groundwater to CVP	In the Preferred Alternative Average and Wet conditions this subregion had water classified as Tier 2 or Tier 3 which was not affordable. The subregion pumped groundwater down to a depth at which it was no longer affordable to supplement the CVP water is was able to afford. In the LTCR sequences, the blended price is less expensive than the least expensive CVP tier that was not used, therefor a shift is made from the deepest groundwater to the now affordable CVP supply.
19	Shift from CVP to Groundwater in Dry to Dry sequence	The blended pricing causes the Dry to Dry CVP water cost to rise higher than the groundwater pumping cost resulting in the shift from CVP to groundwater.

SECTION 2
REGIONAL ECONOMICS

REGIONAL ECONOMICS

This analysis identifies the regional economic impacts of two out of the nine total Long Term Contract Renewal sequences; an Average year following an Average 5-year base condition, and a Average year following a Dry 5-year base condition. The regional economic analysis is restricted to these sequences because they are the only sequences that represent long-run conditions. The Input-Output model used in the regional economic analysis assumes a long run equilibrium is reached, therefore it is inappropriate to model short run responses represented by the Wet and Dry year conditions. While the Average year following the Dry 5-year base condition is not strictly a long-run scenario, as described in the Agricultural and Land Use and Economics section, there are some regions that will be permanently impacted by a five year series of drought years. Because of this, the results can be considered long run.

The assumptions and baseline data used in this analysis are the same as what was used in the Preferred Alternative. Tables 23 and 24 show the results of the Average year following an Average 5-year base condition, Tables 25 and 26 the Average year following an Wet 5-year base condition, and Tables 27 and 28 the Average year following an Dry 5-year base condition. Tables 23, 25, and 27 present the impacts by economic sectors that are aggregations of SIC industries. Tables 24, 26, and 28 present the regional economic impacts broken out by the source of the impact including reduced agricultural output, changes in net farm income, and changes in M&I water costs. Note that regional economic impacts are not reported for the North Coast or the Central and South Coast regions because the rolling five year average tiered pricing mechanism has no impact on these regions.

AVERAGE YEAR FOLLOWING AVERAGE 5-YEAR BASE CONDITION

Table 23 shows the employment, output and income effects on all sectors in each regional economy of the long-term contract renewals. Most of the impacts are felt in the Manufacturing, Trade and Services sectors. These impacts are derived from the impact to net income. The economic impacts by region from each source can be seen in Table 24. Reduction in net income resulting from changes in CVP water cost, groundwater pumping, irrigation costs and changes in crop prices have the greatest impact at the statewide level.

AVERAGE YEAR FOLLOWING DRY 5-YEAR BASE CONDITION

Table 27 shows the employment, output and income effects for each regional economy and the State as a whole broken out by the impacted sectors. Table 28 shows how each of the impact sources contribute to the total impact. The reduction in agricultural output in the Sacramento River region relative to the Preferred Alternative dominates the Statewide impact.

TABLE 22

REGIONAL ECONOMIC IMPACTS ON ALL SECTORS: AVERAGE YEAR FOLLOWING AVERAGE 5-YEAR BASE CONDITION COMPARED TO THE PREFERRED ALTERNATIVE AVERAGE YEAR CONDITION

	Impacts on all Sectors					
	Employment (# of jobs)		Output ($MM)		PoW Income ($MM)	
Region Directly Impacted	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**
Sacramento River						
Agriculture						
Reduced Output	-10	-20	-0.5	-1.2	-0.2	-0.6
Reduced Net Income	-20	-50	-0.9	-2.3	-0.5	-1.3
Total Agriculture	-30	-60	-1.4	-3.5	-0.7	-1.9
M&I Water Costs	-60	-130	-3.9	-8.5	-2.0	-4.7
TOTAL 1/	**-90**	**-190**	-5.3	-12.0	-2.8	-6.6
San Joaquin River						
Agriculture						
Reduced Output	0	0	-0.2	-0.3	-0.1	-0.2
Reduced Net Income	20	40	0.8	1.8	0.5	1.0
Total Agriculture	20	30	0.7	1.5	0.4	0.9
M&I Water Costs	-80	-150	-5.0	-9.4	-2.6	-5.1
TOTAL 1/	**-60**	**-120**	-4.3	-7.9	-2.2	-4.2
Tulare Lake						
Agriculture						
Reduced Output	0	0	0.0	0.0	0.0	0.0
Reduced Net Income	-50	-80	-2.1	-4.1	-1.1	-2.2
Total Agriculture	-50	-80	-2.1	-4.1	-1.1	-2.2
M&I Water Costs	0	0	0.0	0.0	0.0	0.0
TOTAL 1/	**-50**	**-80**	-2.1	-4.1	-1.1	-2.2
Bay Area						
Agriculture						
Reduced Output	0	0	0.0	0.0	0.0	0.0
Reduced Net Income	0	-10	-0.2	-0.4	-0.1	-0.2
Total Agriculture	0	-10	-0.2	-0.4	-0.1	-0.2
M&I Water Costs	-60	-130	-4.4	-9.4	-2.4	-5.4
TOTAL 1/	**-60**	**-130**	-4.6	-9.8	-2.5	-5.6
California Total						
Agriculture						
Reduced Output	-10	-20	-0.7	-1.5	-0.3	-0.8
Reduced Net Income	-50	-100	-2.3	-5.0	-1.2	-2.7
Total Agriculture	-60	-120	-3.0	-6.5	-1.6	-3.5
M&I Water Costs	-200	-410	-13.3	-27.4	-7.0	-15.1
TOTAL 1/	**-260**	**-530**	**-16.3**	**-33.9**	**-8.6**	**-18.6**

Note: (1) May differ from sum of elements due to rounding.

TABLE 23
REGIONAL ECONOMIC IMPACT: AVERAGE YEAR FOLLOWING AVERAGE 5-YEAR BASE CONDITION COMPARED TO THE PREFERRED ALTERNATIVE AVERAGE YEAR CONDITION

	Employment (# of jobs)		Output ($MM)		PoW Income ($MM)	
Region and Affected Sector	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**
Sacramento River						
Agric., Frst., Fish.	-10	-10	-0.4	-0.5	-0.2	-0.3
Mining	0	0	0.0	0.0	0.0	0.0
Construction	0	0	0.0	-0.2	0.0	-0.1
Manufacturing	-10	-20	-1.6	-2.2	-0.6	-0.8
TCU	0	-10	-0.2	-0.9	-0.1	-0.5
Trade	-40	-70	-1.1	-2.1	-0.7	-1.3
FIRE	-10	-20	-0.8	-2.6	-0.5	-1.7
Services	-20	-60	-0.9	-2.8	-0.6	-1.7
Government	0	-10	-0.2	-0.7	-0.1	-0.3
Misc	0	0	0.0	0.0	0.0	0.0
TOTAL/1	**-90**	**-190**	**-5.3**	**-12.0**	**-2.8**	**-6.6**
San Joaquin River						
Agric., Frst., Fish.	0	-10	-0.2	-0.3	-0.1	-0.1
Mining	0	0	-0.1	-0.1	0.0	0.0
Construction	0	0	0.0	-0.1	0.0	-0.1
Manufacturing	-10	-10	-0.8	-1.1	-0.2	-0.3
TCU	0	-10	-0.3	-0.6	-0.2	-0.3
Trade	-10	-30	-0.4	-1.1	-0.2	-0.6
FIRE	-10	-20	-1.1	-2.1	-0.7	-1.3
Services	-30	-50	-1.2	-2.2	-0.7	-1.3
Government	0	0	-0.2	-0.3	-0.1	-0.1
Misc	0	0	0.0	0.0	0.0	0.0
TOTAL/1	**-60**	**-120**	**-4.3**	**-7.9**	**-2.2**	**-4.2**
Tulare Lake						
Agric., Frst., Fish.	0	0	0.0	0.0	0.0	0.0
Mining	0	0	0.0	0.0	0.0	0.0
Construction	0	0	0.0	0.0	0.0	0.0
Manufacturing	-10	-10	-1.0	-1.3	-0.4	-1.3
TCU	0	0	0.0	-0.2	0.0	-0.2
Trade	-40	-50	-1.0	-1.4	-0.7	-1.4
FIRE	0	0	0.0	-0.4	0.0	-0.4
Services	0	-10	0.0	-0.6	0.0	-0.6
Government	0	0	0.0	-0.1	0.0	-0.1
Misc	0	0	0.0	0.0	0.0	0.0
TOTAL/1	**-50**	**-80**	**-2.1**	**-4.1**	**-1.1**	**-4.1**

TABLE 23
REGIONAL ECONOMIC IMPACT: AVERAGE YEAR FOLLOWING AVERAGE 5-YEAR BASE CONDITION COMPARED TO THE PREFERRED ALTERNATIVE AVERAGE YEAR CONDITION

	Employment (# of jobs)		Output ($MM)		PoW Income ($MM)	
Region and Affected Sector	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**
Bay Area						
Agric., Frst., Fish.	0	0	0.0	-0.1	0.0	0.0
Mining	0	0	0.0	0.0	0.0	0.0
Construction	0	0	0.0	-0.1	0.0	-0.1
Manufacturing	-10	-10	-1.2	-1.9	-0.4	-0.7
TCU	0	-10	-0.3	-0.8	-0.2	-0.4
Trade	-20	-40	-0.9	-1.7	-0.5	-1.0
FIRE	-10	-20	-1.0	-2.3	-0.6	-1.5
Services	-20	-50	-1.1	-2.6	-0.7	-1.6
Government	0	0	-0.2	-0.3	-0.1	-0.1
Misc	0	0	0.0	0.0	0.0	0.0
TOTAL/1	**-60**	**-130**	**-4.6**	**-9.8**	**-2.5**	**-5.6**
California Total						
Agric., Frst., Fish.	-10	-20	-0.6	-0.9	-0.3	-0.5
Mining	0	0	-0.1	-0.1	0.0	0.0
Construction	0	-10	0.0	-0.5	0.0	-0.3
Manufacturing	-30	-50	-4.7	-6.5	-1.6	-3.1
TCU	-10	-20	-0.8	-2.5	-0.4	-1.4
Trade	-110	-190	-3.4	-6.3	-2.2	-4.4
FIRE	-20	-60	-2.9	-7.4	-1.8	-4.9
Services	-70	-180	-3.2	-8.1	-1.9	-5.2
Government	0	-10	-0.6	-1.4	-0.3	-0.7
Misc	0	0	-0.1	-0.1	-0.1	-0.1
TOTAL/1	**-260**	**-530**	**-16.3**	**-33.9**	**-8.6**	**-20.5**

Note:(1) May differ from sum of elements due to rounding.

TABLE 24
REGIONAL ECONOMIC IMPACTS ON ALL SECTORS: AVERAGE YEAR FOLLOWING WET 5-YEAR BASE CONDITION COMPARED TO THE PREFERRED ALTERNATIVE AVERAGE YEAR CONDITION

	Impacts on all Sectors					
	Employment (# of jobs)		Output ($MM)		PoW Income ($MM)	
Region Directly Impacted	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**
Sacramento River						
Agriculture						
Reduced Output	0	-10	-0.4	-0.8	-0.2	-0.4
Reduced Net Income	30	50	1.0	2.6	0.5	1.4
Total Agriculture	20	40	0.6	1.8	0.4	1.0
M&I Water Costs	-60	-130	-3.9	-8.5	-2.0	-4.7
TOTAL 1/	**-40**	**-90**	**-3.3**	**-6.7**	**-1.6**	**-3.6**
San Joaquin River						
Agriculture						
Reduced Output	0	0	-0.2	-0.3	-0.1	-0.2
Reduced Net Income	100	170	3.7	8.1	2.1	4.5
Total Agriculture	90	160	3.6	7.8	2.0	4.4
M&I Water Costs	-80	-150	-5.0	-9.4	-2.6	-5.1
TOTAL 1/	**20**	**10**	**-1.4**	**-1.6**	**-0.6**	**-0.7**
Tulare Lake						
Agriculture						
Reduced Output	0	0	0.0	0.0	0.0	0.0
Reduced Net Income	-30	-40	-1.1	-2.1	-0.6	-1.1
Total Agriculture	-30	-40	-1.1	-2.1	-0.6	-1.1
M&I Water Costs	0	0	0.0	0.0	0.0	0.0
TOTAL 1/	**-30**	**-40**	**-1.1**	**-2.1**	**-0.6**	**-1.1**
Bay Area						
Agriculture						
Reduced Output	0	0	0.0	0.0	0.0	0.0
Reduced Net Income	0	0	-0.1	-0.2	0.0	-0.1
Total Agriculture	0	0	-0.1	-0.2	0.0	-0.1
M&I Water Costs	-60	-130	-4.4	-9.4	-2.4	-5.4
TOTAL 1/	**-60**	**-130**	**-4.5**	**-9.6**	**-2.5**	**-5.5**
California Total						
Agriculture						
Reduced Output	0	-10	-0.5	-1.1	-0.2	-0.6
Reduced Net Income	100	180	3.6	8.4	2.0	4.7
Total Agriculture	100	170	3.0	7.3	1.7	4.2
M&I Water Costs	-200	-410	-13.3	-27.4	-7.0	-15.1
TOTAL 1/	**-100**	**-240**	**-10.3**	**-20.1**	**-5.3**	**-11.0**

Note: (1) May differ from sum of elements due to rounding.

TABLE 25
REGIONAL ECONOMIC IMPACT: AVERAGE YEAR FOLLOWING WET 5-YEAR BASE CONDITION COMPARED TO THE PREFERRED ALTERNATIVE AVERAGE YEAR CONDITION

	Employment (# of jobs)		Output ($MM)		PoW Income ($MM)	
Region and Affected Sector	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**
Sacramento River						
Agric., Frst., Fish.	0	-10	-0.2	-0.3	-0.1	-0.2
Mining	0	0	0.0	0.0	0.0	0.0
Construction	0	0	0.0	-0.1	0.0	-0.1
Manufacturing	0	-10	-0.7	-0.9	-0.2	-0.3
TCU	0	0	-0.2	-0.6	-0.1	-0.3
Trade	0	-10	-0.2	-0.7	0.0	-0.3
FIRE	-10	-20	-0.8	-1.8	-0.5	-1.1
Services	-20	-40	-0.9	-1.9	-0.6	-1.1
Government	0	0	-0.2	-0.5	-0.1	-0.2
Misc	0	0	0.0	0.0	0.0	0.0
TOTAL/1	**-40**	**-90**	**-3.3**	**-6.7**	**-1.6**	**-3.6**
San Joaquin River						
Agric., Frst., Fish.	0	0	-0.1	-0.2	-0.1	-0.1
Mining	0	0	-0.1	-0.1	0.0	0.0
Construction	0	0	0.0	-0.1	0.0	0.0
Manufacturing	10	10	0.6	0.8	0.3	0.4
TCU	0	0	-0.3	-0.4	-0.2	-0.2
Trade	60	60	1.0	1.1	0.8	0.9
FIRE	-10	-10	-1.1	-1.2	-0.7	-0.8
Services	-30	-30	-1.2	-1.2	-0.7	-0.7
Government	0	0	-0.2	-0.2	-0.1	-0.1
Misc	0	0	0.0	0.0	0.0	0.0
TOTAL/1	**20**	**10**	**-1.4**	**-1.6**	**-0.6**	**-0.7**
Tulare Lake						
Agric., Frst., Fish.	0	0	0.0	0.0	0.0	0.0
Mining	0	0	0.0	0.0	0.0	0.0
Construction	0	0	0.0	0.0	0.0	0.0
Manufacturing	0	-10	-0.5	-0.7	-0.2	-0.7
TCU	0	0	0.0	-0.1	0.0	-0.1
Trade	-20	-30	-0.5	-0.7	-0.4	-0.7
FIRE	0	0	0.0	-0.2	0.0	-0.2
Services	0	-10	0.0	-0.3	0.0	-0.3
Government	0	0	0.0	0.0	0.0	0.0
Misc	0	0	0.0	0.0	0.0	0.0
TOTAL/1	**-30**	**-40**	**-1.1**	**-2.1**	**-0.6**	**-2.1**
Bay Area						
Agric., Frst., Fish.	0	0	0.0	-0.1	0.0	0.0
Mining	0	0	0.0	0.0	0.0	0.0
Construction	0	0	0.0	-0.1	0.0	-0.1
Manufacturing	-10	-10	-1.2	-1.9	-0.4	-0.7
TCU	0	-10	-0.3	-0.8	-0.2	-0.4
Trade	-20	-40	-0.8	-1.6	-0.5	-1.0
FIRE	-10	-10	-1.0	-2.2	-0.6	-1.5
Services	-20	-50	-1.1	-2.6	-0.7	-1.6
Government	0	0	-0.2	-0.3	-0.1	-0.1
Misc	0	0	0.0	0.0	0.0	0.0
TOTAL/1	**-60**	**-130**	**-4.5**	**-9.6**	**-2.5**	**-5.5**
California Total						
Agric., Frst., Fish.	-10	-10	-0.4	-0.7	-0.2	-0.3
Mining	0	0	-0.1	-0.1	0.0	0.0
Construction	0	0	0.0	-0.3	0.0	-0.2
Manufacturing	-10	-10	-1.7	-2.7	-0.5	-1.2
TCU	-10	-10	-0.8	-1.8	-0.4	-1.0
Trade	20	-20	-0.5	-1.9	-0.1	-1.2
FIRE	-20	-40	-2.9	-5.5	-1.8	-3.6
Services	-70	-130	-3.2	-5.9	-1.9	-3.8
Government	0	-10	-0.6	-1.0	-0.3	-0.5
Misc	0	0	-0.1	-0.1	-0.1	-0.1
TOTAL/1	**-100**	**-250**	**-10.3**	**-20.1**	**-5.3**	**-12.0**

Note:(1) May differ from sum of elements due to rounding.

TABLE 26
REGIONAL ECONOMIC IMPACTS ON ALL SECTORS: AVERAGE YEAR FOLLOWING DRY 5-YEAR BASE CONDITION COMPARED TO THE PREFERRED ALTERNATIVE AVERAGE YEAR CONDITION

	Impacts on all Sectors					
	Employment (# of jobs)		Output ($MM)		PoW Income ($MM)	
Region Directly Impacted	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**
Sacramento River						
Agriculture						
Reduced Output	-700	-2240	-92.1	-194.5	-30.8	-86.9
Reduced Net Income	130	240	4.7	12.4	2.6	6.9
Total Agriculture	-570	-2000	-87.4	-182.1	-28.2	-80.0
M&I Water Costs	-60	-140	0.4	-0.9	-0.2	-0.5
TOTAL 1/	**-630**	**-2140**	**-91.8**	**-191.6**	**-30.5**	**-85.2**
San Joaquin River						
Agriculture						
Reduced Output	-10	-20	-0.7	-1.5	-0.3	-0.7
Reduced Net Income	-140	-240	-5.4	-11.7	-3.0	-6.5
Total Agriculture	-150	-270	-6.1	-13.2	-3.3	-7.3
M&I Water Costs	-80	-150	0.0	0.0	0.0	0.0
TOTAL 1/	**-230**	**-420**	**-11.0**	**-22.7**	**-5.9**	**-12.4**
Tulare Lake						
Agriculture						
Reduced Output	0	-10	-0.2	-0.5	-0.1	-0.2
Reduced Net Income	-100	-170	-3.6	-7.1	-1.9	-3.8
Total Agriculture	-100	-170	-3.8	-7.6	-2.0	-4.0
M&I Water Costs	0	0	0.0	0.0	0.0	0.0
TOTAL 1/	**-100**	**-170**	**-4.4**	**-8.8**	**-2.3**	**-4.6**
Bay Area						
Agriculture						
Reduced Output	0	0	0.0	0.0	0.0	0.0
Reduced Net Income	-10	-20	-0.6	-1.4	-0.3	-0.8
Total Agriculture	-10	-20	-0.6	-1.4	-0.3	-0.8
M&I Water Costs	-60	-130	-0.5	-1.1	-0.3	-0.6
TOTAL 1/	**-70**	**-150**	**-5.0**	**-10.8**	**-2.8**	**-6.2**
California Total						
Agriculture						
Reduced Output	-710	-2270	-93.0	-196.5	-31.2	-87.9
Reduced Net Income	-120	-190	-4.8	-7.8	-2.6	-4.1
Total Agriculture	-830	-2460	-97.8	-204.3	-33.8	-92.0
M&I Water Costs	-200	-420	-0.1	-1.9	-0.5	-1.1
TOTAL 1/	**-1030**	**-2880**	**-112.2**	**-233.8**	**-41.4**	**-108.3**

Note: (1) May differ from sum of elements due to rounding.

TABLE 27
REGIONAL ECONOMIC IMPACT: AVERAGE YEAR FOLLOWING DRY 5-YEAR BASE CONDITION COMPARED TO THE PREFERRED ALTERNATIVE AVERAGE YEAR CONDITION

	Employment (# of jobs)		Output ($MM)		PoW Income ($MM)	
Region and Affected Sector	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**
Region and Affected Sector	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**
Sacramento River						
Agric., Frst., Fish.	-450	-630	-26.1	-33.0	-13.4	-16.6
Mining	0	0	0.0	-0.1	0.0	0.0
Construction	0	-30	0.0	-2.1	0.0	-1.2
Manufacturing	-230	-290	-64.9	-73.1	-16.9	-19.8
TCU	0	-120	-0.2	-16.8	-0.1	-7.5
Trade	90	-310	1.6	-13.8	1.2	-8.1
FIRE	-10	-200	-0.9	-22.7	-0.5	-14.6
Services	-20	-500	-1.0	-22.8	-0.6	-13.8
Government	0	-50	-0.2	-7.2	-0.1	-3.5
Misc	0	0	0.0	0.0	0.0	0.0
TOTAL/1	**-630**	**-2130**	**-91.8**	**-191.6**	**-30.5**	**-85.2**
San Joaquin River						
Agric., Frst., Fish.	-10	-20	-0.8	-1.2	-0.4	-0.5
Mining	0	0	-0.1	-0.1	0.0	0.0
Construction	0	0	0.0	-0.3	0.0	-0.1
Manufacturing	-30	-40	-3.8	-5.1	-1.4	-1.9
TCU	0	-10	-0.3	-1.2	-0.2	-0.6
Trade	-140	-210	-3.6	-5.8	-2.4	-3.7
FIRE	-10	-30	-1.1	-4.2	-0.7	-2.7
Services	-30	-100	-1.2	-4.3	-0.7	-2.6
Government	0	-10	-0.2	-0.5	-0.1	-0.2
Misc	0	0	0.0	0.0	0.0	0.0
TOTAL/1	**-230**	**-420**	**-11.0**	**-22.7**	**-5.9**	**-12.4**
Tulare Lake						
Agric., Frst., Fish.	0	-10	-0.3	-0.4	-0.1	-0.4
Mining	0	0	0.0	0.0	0.0	0.0
Construction	0	0	0.0	-0.1	0.0	-0.1
Manufacturing	-20	-20	-2.1	-2.7	-0.7	-2.7
TCU	0	0	0.0	-0.4	0.0	-0.4
Trade	-80	-110	-2.1	-2.9	-1.5	-2.9
FIRE	0	-10	0.0	-0.9	0.0	-0.9
Services	0	-30	0.0	-1.2	0.0	-1.2
Government	0	0	0.0	-0.2	0.0	-0.2
Misc	0	0	0.0	0.0	0.0	0.0
TOTAL/1	**-100**	**-170**	**-4.4**	**-8.8**	**-2.3**	**-8.8**
Bay Area						
Agric., Frst., Fish.	0	0	0.0	-0.1	0.0	0.0
Mining	0	0	0.0	0.0	0.0	0.0
Construction	0	0	0.0	-0.1	0.0	-0.1
Manufacturing	-10	-10	-1.4	-2.2	-0.5	-0.8
TCU	0	-10	-0.3	-0.8	-0.2	-0.4
Trade	-30	-50	-1.1	-2.0	-0.7	-1.3
FIRE	-10	-20	-1.0	-2.4	-0.6	-1.6
Services	-20	-60	-1.1	-2.8	-0.7	-1.8
Government	0	0	-0.2	-0.3	-0.1	-0.2
Misc	0	0	0.0	0.0	0.0	0.0
TOTAL/1	-70	-150	-5.0	-10.8	-2.8	-6.2
California Total						
Agric., Frst., Fish.	-470	-660	-27.2	-34.6	-13.9	-17.5
Mining	0	0	-0.1	-0.2	0.0	-0.1
Construction	0	-40	0.0	-2.6	0.0	-1.5
Manufacturing	-290	-370	-72.2	-83.1	-19.6	-25.2
TCU	-10	-140	-0.8	-19.3	-0.4	-8.9
Trade	-170	-680	-5.0	-24.5	-3.3	-16.0
FIRE	-20	-260	-2.9	-30.2	-1.8	-19.8
Services	-70	-680	-3.3	-31.1	-2.0	-19.3
Government	0	-60	-0.6	-8.2	-0.3	-4.1
Misc	0	0	-0.1	-0.1	-0.1	-0.1
TOTAL/1	-1030	-2880	-112.2	-233.8	-41.4	-112.5

Note:(1) May differ from sum of elements due to rounding.

SECTION 3

MUNICIPAL AND INDUSTRIAL WATER USE ECONOMICS

MUNICIPAL AND INDUSTRIAL ECONOMICS

The municipal and industrial economics analysis is based upon the Average-Average tiered pricing scenario. This analysis is based upon the impacts to CVP contractors. This is different than the municipal and industrial economic analysis that was included in the PEIS.

The PEIS municipal and industrial water cost analysis primarily evaluated the impacts on the need and cost to transfer water to non-CVP municipalities. Therefore, the analysis included water costs for many non-CVP water users. For example, the municipality in the San Joaquin River Basin was based upon the Cities of Stockton and Fresno water costs which are not based on CVP water, as described in the Municipal Water Costs Methodology and Modeling Technical Appendix to the PEIS.

The analysis included in the following table is based only on CVP contractors in order to define the cost of CVP water under the Tiered Water Pricing proposal.

APPENDIX D

7 Comment Letters (December 2000)

Comment letters were considered in the preparation of the Revised Draft EA

Distribution List for the Revised Draft EA (2004)

SCH Letter

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse

Gray Davis
GOVERNOR

December 4, 2000

Al Candlish
U.S. Bureau of Reclamation
2800 Cottage Way
Sacramento, CA 95825

Subject: Contra Costa Canal Unit Long-Term Contract Renewal
SCH#: 2000114006

Dear Al Candlish:

The State Clearinghouse submitted the above named Environmental Assessment to selected state agencies for review. The review period closed on December 1, 2000, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Terry Roberts

Terry Roberts
Senior Planner, State Clearinghouse

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
916-445-0613 FAX 916-323-3018 WWW.OPR.CA.GOV/CLEARINGHOUSE.HTML

State Clearinghouse Data Base

SCH# 2000114006
Project Title Contra Costa Canal Unit Long-Term Contract Renewal
Lead Agency U.S. Bureau of Reclamation

Type EA Environmental Assessment
Description Long term water service contract renewal with the Contra Costa Canal Unit.

Lead Agency Contact

Name Al Candlish
Agency U.S. Bureau of Reclamation
Phone 916-978-5062 **Fax**
email
Address 2800 Cottage Way
City Sacramento **State** CA **Zip** 95825

Project Location

County Contra Costa
City
Region
Cross Streets
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways
Airports
Railways
Waterways Central Valley Water Project-Contra Costa Canal
Schools
Land Use Central Valley Water Project.

Project Issues Water Supply

Reviewing Agencies Resources Agency; Department of Conservation; Department of Boating and Waterways; Department of Fish and Game, Region 3; Department of Fish and Game, Headquarters; Delta Protection Commission; Department of Parks and Recreation; Reclamation Board; Department of Water Resources; Caltrans, Division of Transportation Planning; State Water Resources Control Board, Division of Water Rights; Regional Water Quality Control Board, Region 2; Regional Water Quality Control Bd., Region 5 (Sacramento); Native American Heritage Commission; State Lands Commission

Date Received 11/02/2000 **Start of Review** 11/02/2000 **End of Review** 12/01/2000

Note: Blanks in data fields result from insufficient information provided by lead agency.

CONTRA COSTA
WATER DISTRICT

1331 Concord Avenue
P.O. Box H20
Concord, CA 94524
(925) 688-8000 FAX (925) 688-8122

December 19, 2000

Judi Tapia, Environmental Specialist
U.S. Bureau of Reclamation
South-Central California Area Office
1243 "N" Street
Fresno, CA 93721-1813

Subject: Clarification of Comments on Environmental Assessment for the Long-Term Contract Renewal, Contra Costa Canal Unit

Dear Judi:

Enclosed please find, as we discussed December 8 on the telephone, revised comments on the above referenced Environmental Assessment. The revisions are provided to provide clarity and facilitate processing by the consultant. Please replace the Contra Costa Water District (CCWD) comments dated December 8 and addressed to Buddy Smith in the Tracy Office, with these dated December 19, 2000.

CCWD would like to meet with you and the consultant to discuss our comments. If you have any questions, please call me at (925) 688-8312 or Gary Darling at (925) 688-8165.

Sincerely,

Frances I. Garland
Principal Planner

cc: Laura Kuh, North State Resources
Gary Darling

Attachment

Letter 2

Specific Comments on the Environmental Assessment for the Long Term Contract Renewal
Contra Costa Canal Unit

Author	Page Reference	Comment
GG	Table of Contents Page1, Line 18	**Universal change** "...Contra Loma Reservoir *Water Quality Improvement* Project" (however, see comment FG: p.1-6, below)
GD	Executive Summary Page ES-1, 1st line	**Universal change**--Eliminate "County" out of CCWD
GG	Executive Summary Page ES-1, Paragraph 5, Bullet #1	"...the needs of *irrigation, municipal and industrial ...*"
GG	Page ES-4, Alternative 1 Bullet #1	Although we concede that this EA does not cover future renewals, it should be noted that M&I contract renewal is guaranteed in the '56 Act.
FG	Page ES-4, Alternative 1 Bullet #4	Add a parenthetical that O&M of the Canal facilities was transferred to CCWD by MOA dated June 28, 1972, as amended May 15, 1995.
GG	Page ES-6, Summary of Previous Environmental Documentation Paragraph 1	"...prepared by *CCWD and certified in February, 1999,...*" "The MPP EIR/EIS, prepared *by CCWD and certified by CCWD on October 3, 1999 and for which reclamation issued a Record of Decision on November 27, 2000...*"
GG	Page ES-6, Summary of Previous Environmental Documentation Paragraph 1, Last Sentence	"These *four (including the CCCGP??)* documents..."
GG	Page ES-8, Table ES-1 Row 2, Socioeconomics, Sentence 1	Need to provide the source of the 155.7 thousand AF, the quantity of non-CVP water assumed and the price assumptions—suggest a footnote
FG	Page ES-8, Table ES-1 Row 2, Socioeconomics	It is not clear why 400 af is used on box 3 while 2,000 af is used in box 4. Is one CVP and the other total? Text on page 4-23 and Table 4-8 are similarly confusing.
GG	Page ES-8, Table ES-1, Row 2, Sentence 4	Need to provide basis for the "over $50 million"—suggest a footnote with quantities and prices
GD	Page 1-3	Drop "County" from CCWD title
GG	Page 1-3 Basis of CCWD Renewals Paragraph 2	CCWD disagrees with this interpretation of the right to renew language. Under the 1956 Act, M&I are guaranteed the right to renew. The CVPIA does not countermand this Act. (see also comment on ES-4 Bullet #1 above)
GG	Page 1-4, Seismic and Reliability	Delete #5, renumber
GG	Page 1-5, Seismic and Reliability	Delete #7 and last sentence in paragraph.
GG	Page 1-5, City of Antioch Pump Project	The City of Antioch pump project was constructed and became operational in 1998
FG	Page 1-6, Contra Loma Reservoir Project	The Contra Loma project is <u>not</u> relevant to CVP contract renewal or CCWD's future water supply implementation program and should be deleted

Author	Page Reference	Comment
		from the EA.
FG	Page 2-10, Table 2-1 Comparison of Contract Provisions	"Water to be made available..." – 1) There appears to be missing language under the first entry for "No-Action Alt." 2) The assumptions regarding operating to minimize impacts are not sufficient to evaluate the project alternatives. Shortage policy and reliability are two of the most critical issues in contract renewal and cannot be glossed over in this way. See also comment for FG: p. 2-11.
FG	Page 2-11, Table 2-1	"Constraints on Availability..." see comment above; these gross assumptions do not lend themselves to impact analysis and are unacceptable relative to such critical issues as reliability and shortage.
FG	Page 2-14, Table 2-2 Summary of Environmental Impacts	4th row, Cultural Resources – "Bethel Island" is not in CCWD service area (although it is in the FWSI study area).
FG	Page 4-2, Contract Service Area Description, first paragraph	"The East County includes Antioch, Bay Point, Pittsburg, *and Oakley.*"
GG	Page 4-2, CCWD Paragraph 2, Sentence 2	"...from others sources *and virtually 100% from the CVP in dry years*". (Note: please provide source of the "11%", it seems high.)
BB	Page 4-5, Surface Water Supplies and Facilities Operations	Note: Spelling – Clair Engle, not Clair Eagle (1st paragraph, 1st sentence)
GG	Page 4-5, Contra Costa Canal Unit Sentences 7-12	Delete starting with "The Canal is the District's only raw water conveyance" to the end of the paragraph-- not relevant here
GG	Figure 2: Project Area Generalized Land Use (Map after Page 4-8)	The map should be revised to show the LV watershed as open space.
FG	Page 4-11, Cumulative Impacts First Paragraph	"CCCWD" – change to CCWD.
FG	Page 4-12, Socioeconomics analysis generally	The analysis only deals with impacts of changes in pricing; the impacts of reliability, particularly on industry, are potentially great and needs to be addressed.
GG	Page 4-13, M&I Water Use and Cost Paragraph 3	Appears to be a math error; the quantities by customer class given do not add up to 108,764 AF.
BB	Page 4-13, M&I Water Use and Cost	Why is 1994 Rate Data being used? The table indicates that the Ag rate is significantly higher than the M&I rate. This may have been true for that brief period of time, but only because the Ag rate was saddled with a large non-interest bearing historical deficit (comprising $28 of the $37 COS

Author	Page Reference	Comment
		Ag rate) that was repaid over a 3 year period. Our M&I rate is significantly higher that the Ag rate currently, and will continue to be so on into the future because of the interest bearing nature of the capital rate (Ag capital is non-interest bearing).
GG	Page 4-14, Table 4-3,	Can the table be updated? The data are almost ten years old. Also, footnotes explaining how output and income POW are measured would be useful.
GG	Page 4-15, Assessment Methodologies Paragraph 4, Sentence 3	Is this the key assumption for the $50 million shown in Table ES-1? See also comments on Table ES-1 above.
BB	Page 4-16, Table 4-4 Comparison of the Alternatives	Alternative 2 - Bureau is no longer considering (except for Westside contractors) two Categories of water when applying the 80-10-10 tiered pricing aspect of the CVPIA. This should lower the cost of water for both Ag and M&I. Use of 5-year average deliveries or some similar averaging method will be implemented in 2002 water rates.
FG	Page 4-17, Agricultural Water Costs Last Paragraph	Text of this paragraph is inconsistent with the rates shown in Table 4-2 where Ag is higher than M&I.
GG	Page 4-17, Agricultural Water Costs Last paragraph, Line 7	"This additional cost is *incorporated into* the District's agricultural *water rates*."
FG	Page 4-18, Agricultural Water Costs Paragraph 1	Text of this paragraph is inconsistent with the rates shown in Table 4-2 where Ag is higher than M&I
GG	Page 4-18, Agricultural Water Costs Paragraph 2, Last Sentence	Add the following: *However, decisions on rates are made by the CCWD Board of Directors and CCWD is not bound by these assumptions.*
GG	Page 4-21, Environmental Consequences Paragraph 1, Last Sentence and Table 4-6, 6th row	Again, need to explain how the $50 million is derived (perhaps by adding a footnote with the $300 per af assumption)
FG	Page 4-21, Table 4-6 Projected M&I Water Cost	To help clarify the table: Add a line for "Other Supplies" under Average CVP Delivery 2026 (taf). Add a line for "Other Supplies" under Dry CVP Delivery 2026 (taf). Also, give the assumed unit costs for CVP and other under both hydrological conditions.
FG	Page 4-22, Alternative 2 First paragraph	Need to see how 3% was derived, and note that the more appropriate measure would be against raw water costs not treated water costs (because CCWD is both a wholesaler and retailer). A 3% increase solely related to increased water costs cannot automatically be assumed to be insignificant.
FG	Page 4-22, Table 4-7,	• Same comment as on Table 4-6, add "Other

Author	Page Reference	Comment
	Costs Impacts, Alternative 2	Supplies..." • Please provide assumptions behind incremental cost increases as they relate to the tiered pricing scheme of Alt. 2
FG	Page 4-23, Agricultural Water Costs First paragraph	The baseline ag #s are not correct; we only use 400 af now, but we could take up to approximately 2,700 af. Revise analysis accordingly.
GG	Page 4-26, Table 4-11	Can the table be updated? The data is almost ten years old. Also, footnotes explaining how output and income POW are measured would be useful.
FG	Page 4-29, Affected Environment	Typo – "preformed" should be "performed."
FG	Page 4-38, Los Vaqueros Project Biological Opinions	"impacts to diversions at buildout...for delivery of up to *188,000* total AF." (the 148k limit was imposed despite analysis of 188k)
GG	Page 5-2, Water System Capacity	1) Delete the language regarding Los Vaqueros. It is a water quality and reliability project ; it does not have a growth inducing component and does not produce new supply. Or, 2) Delete the entire paragraph and move the first two sentences to the section below on growth inducement of the proposed project.
FG	Page 6-2, California Environmental Quality Act Endangered Species Act	CEQA is done; FWSI EIR consultation is done. In general, need conclusion in each of these – as written, there is no indication how they are relevant to CCWD.
FG	Page 6-3, National Historic Preservation Act, second paragraph	State a clear conclusion that there are no NHPA issues related to contract renewal.
FG	Page 6-4, Environmental Justice	Add a conclusion that there are no impacts.
FG	Page 6-5, Farmland Protection Policy Act and Clean Air Act	Although we agree there is no difference between the three alternatives in impacts on prime farmland or air quality, both of these were found to be significant unavoidable impacts in the FWSS EIR and the CCCGP. CCWD made Findings on both. Consider whether this discussion should be augmented with reference to the FWSS EIR and Findings.
GG	Page7-3, Line 8	Check whether this reference should be to the Draft or Final EIR/EIS and revise as needed. (Final in 1999)
GG	Appendix C – Economic Analysis	It needs to be made clear in the text what Appendix C is and how it is used in or relevant to the economic analysis for CCWD.

United States Department of the Interior
OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
600 Harrison Street, Suite 515
San Francisco, California 94107-1376

December 5, 2000

Mr. Al Candlish
Bureau of Reclamation, Mid-Pacific Region
U.S. Department of the Interior
2800 Cottage Way
Sacramento, CA 95825-1898

Dear Mr. Candlish:

Thank you for the opportunity to comment on the Central Valley Project Improvement Act (CVPIA) Long-Term Water Service Contract Renewal Environmental Assessments prepared for the following divisions: West Sacramento Canals, Feather Water District, Delta-Mendota Canal, Friant Division, Cross Valley, San Felipe Division, Shasta/Trinity, and Contra Costa Canal.

We commend the Bureau of Reclamation's ("Reclamation") welcoming and encouraging Federal, State of California, and non-governmental organization (NGO) natural resources trustee agencies and groups to comment on the CVPIA Long-Term Contract Renewal Environmental Assessment (EA) process. We agree it is imperative to include these organizations within the commentary and decision-making processes.

Further, we concur that effects of water transfers and use of varying alternatives may cause indirect effects on biological resources, land use and local economies that may result in minor but unknown impacts that are difficult to conclusively determine in a given Long-Term Contract Renewal EA. We are pleased to note that Reclamation has made diligent efforts to include known or potential impacts to affected environments in the eight EAs involved here, particularly with regard to agricultural, municipal and industrial uses.

We encourage Reclamation to provide updates and coordinate with other regional DOI bureaus and NGOs involved in natural resource protection and enforcement throughout the renewed contract periods as such updates become necessary.

As a general note on these eight EAs, we understand that water costs and economic impacts involved here are critical to Long-Term Contract Renewals and are detailed exhaustively within these EAs. We are concerned that this is done at the expense of greater biological and natural

resource protection options when evaluating direct or indirect impacts considered alternatives are likely to create upon the environments and ecosystems evaluated in these documents.

We further understand that the CVPIA Programmatic Environmental Impact Statement (PEIS) was intended to serve as the primary EIS for these projects from which the EAs grew, and the EAs exist in lieu of creating an EIS document for the CVPIA Long-Term Contract Renewals, as opposed to these eight well-drafted but occasionally inconsistent documents.

While we provide below suggestions for inclusion into the eight EAs, we would prefer that a more detailed and united study of the CVPIA Water Contract areas be conducted and distributed to natural resource trustee agencies for comment. Thus, we recommend that Reclamation seriously consider completing documents that expand upon these EA documents, including a more critical review of the affected natural and biological resource areas and substantive alternatives that encourage more land retirement and less water usage and consumption.

The EA documents, nor any potential EIS documents, must not lose focus on a primary goal of the CVPIA, that is putting Central Valley lands, particularly agricultural lands, into retirement to diminish agricultural runoff, increase water flows for ecosystem replenishment, and to divert water use to storage in preparation for dry years.

Should the creation of a single EIS document be impracticable, we urge Reclamation to include in all eight EAs more specific information on exactly how Reclamation intends to track water use and varying water transfers in the CVPIA Divisions. The EAs as currently drafted state that water levels and increased or decreased water transfers will likely have some direct and indirect effects on biological and land use resources, but these documents lack specifics on how to track and possibly ameliorate the adverse effects water flows and transfers are likely to have upon vital natural resources.

Therefore, due to the interconnected water systems of the Central Valley, all EAs should clearly reflect that they will not draw water resources from nor interfere with the projections of the other projects so the intentions and purpose of these projects will be fully realized. We also recommend including in greater detail within all the EAs involved here explanations as to the likely direct, indirect and cumulative effects of these CVPIA Long-Term Contract Renewals upon the biological and natural resources within the evaluated environments.

Finally, we recommend including within the EAs an adaptive management approach to monitor water levels and, by extension, the overall health of biological resources in all CVPIA Contract Renewal areas. We feel it is essential that a commitment be made and documented to an active adaptive management process in all eight of the CVPIA EAs involved. The Adaptive Management process requires a systematic and continually improving evaluation of natural resource management policies and practices by learning from the outcomes of operational programs. Its most effective form--"active" adaptive management--employs management

programs that are designed to experimentally compare selected policies or practices, by evaluating alternative hypotheses about the system being managed.

We recommend that Reclamation refer to the Glen Canyon Dam Adaptive Management Program, administered by Reclamation's Upper Colorado Regional Office in Salt Lake City, Utah, for guidance, as this program is the most detailed and comprehensive illustration of the adaptive management techniques in use today to manage fish and wildlife resources and overall health of these ecosystems. Note also that the CALFED Bay-Delta Program utilizes an adaptive management approach, which can provide guidance for the language of the program within the final CVPIA Long-Term Contract Renewal drafts, and to which the CVPIA areas may already be legally bound under the programs of CALFED. The affected CVPIA areas will benefit greatly by the inclusion of an adaptive management process that will increase the overall health of the Central Valley, its ecosystems, and its natural resources.

WEST SACRAMENTO CANALS

Reviewing the overall goals of alternatives for the West Sacramento Canals EA, the No Action Alternative and Alternative 1 apparently will have the same impacts. We are concerned about the reductions in CVP deliveries that may lead to increases in ground water use. This may have an adverse effect on nearby projects where their use of surface water, rather than ground water, may affect water quality or biological resources. As mentioned above, a more detailed system of water use and water transfer monitoring may help alleviate adverse water quality and biological resource impacts by balancing the use of surface and ground waters.

Under Alternative 2, it is determined that it would bring in a lower Total Gross Value Production as projected for Alternative 1. The region's agricultural output could decrease by 5%, further lowering potential revenues and could decrease employment by 2.6%. Of the biological species, the food sources of the Aleutian Canada goose and the sandhill crane are threatened under this alternative. Consequently, there is a greater potential for removing land from agricultural production, which may negatively impact the preservation of cultural resources and possibly lead to increased land erosion. From a biological resource perspective, however, this option should seriously be considered in any Preferred Alternative to decrease water usage in the District and allow for more water storage and to limit the effects of agricultural runoff in the District.

FEATHER WATER DISTRICT

Concerning the Feather Water District, the main considerations for other agencies, such as biological considerations, water transfers, and the balance of water distribution among competing demands by CVPIA are not addressed in this EA since they require further documentation. FWS and others should be kept advised of the preparation of these materials. The PEIS reallocated CVP water deliveries from the Feather for fish and wildlife purposes. Thus, Feather's supply of water from CVP has decreased. The EA makes no mention of how the water demand is currently being met.

DELTA-MENDOTA CANAL

In the Delta-Mendota Canal EA, Alternative 1 offers no significantly different impacts from a "no-action" alternative with the exception of geology, groundwater levels, and biological resources. Under Alternative 1, increased groundwater pumping could increase land subsidence, depending on the amount of surface water utilized. The report does not, however, acknowledge the presence of the threatened or endangered species that exist within the Delta-Mendota project area or their critical habitats in the area.

Impacts of Alternative 2 are essentially similar to those in Alternative 1 (including impacts noted above). Additionally, Alternative 2 has a more noticeable effect on agriculture: value of production ranges from -$1.0 million in an average year (following a dry, five-year period) to a +$1.2 million during a dry year. There is also a potential increase in unemployment for the region ranging from 120-420 jobs being lost in the region.

CROSS VALLEY CONTRACTORS

Pertaining to the Cross Valley Contractors EA, the impacts anticipated from Alternative 1 and the No Action Alternative are similar. Water quality and supply will remain relatively unchanged. Potential differences in supply due to conditions in a dry year as compared to a wet year are less than 3% of the current levels. Water quality, however, is questionable. Because the average delivery south of the Delta is projected to decline, this may increase ground water demands and may result in application of water of a lesser quality than surface water. Although existing fisheries and biological habitats are likely to experience minimal direct and indirect impacts under these alternatives, more explanation is suggested in this EA to focus on improving water quality for biological resources and municipal uses. Finally it appears that the socio-economic situation in the region will be unaffected by these alternatives.

Under Alternative 2, less ground water pumping may allow farmers to switch to better-quality surface water. More significant changes under Alternative 2 involve biological "resuscitation," where additional water costs could result in an increase in the amount of land left fallow, thereby improving restoration possibilities in the area and the ability to return fallow lands to their natural non-agricultural condition. However, this could also diminish opportunity to increase wetland habitat in the affected area. Total possible economic changes are less than 1%, which provide ample opportunity to increase critical habitat without adversely affecting the regional economy.

FRIANT DIVISION

The Friant Division EA is particularly complete in its analyses of impacts upon its region's communities, economy and natural resources. We note the painstaking detail used to describe the impacted environments in the Friant area and that well-planned alternatives to address direct and indirect environmental impacts are included. We particularly note Section 3 of this document,

pertaining to Affected Environment and Environmental Consequences of the Friant area. We are pleased to note the burgeoning programs in place for biological resource conservation and habitat restoration, specifically the Anadromous Fish Restoration Program. There are concerns, however, about how issues of water quality, drastically fluctuating water levels, excessive harvesting of fish, limited cover and spawning habitats will be addressed throughout the 25 year contract term. Data on the potential for adverse and positive impacts on these fish populations are provided, but we recommend including more detailed comment on active alternatives to address these natural resource concerns.

In Section 3, Ground Water Resources, there is analysis on possible recharging of already depleted and overused ground water sources, but no concrete program to ensure that ground water will be replenished throughout the Friant Division area. We suggest greater emphasis on recharging and limiting draw on ground water supplies. Further, this section should emphasize what can be done to abstain from excessive groundwater use, including limiting use in wet years, among Friant Division agricultural and industrial water users, particularly when attempting to implement riparian habitat restoration programs that will require additional water resources.

In the section on the Environmental Consequences of the Fisheries Resources commentary in this EA, adverse consequences upon the fisheries are likely to occur whenever CVP water is purchased. We are concerned that these purchases will occur randomly and intermittently, and will likely harm the regeneration and maintenance of the fish populations discussed in this section. We would like to see some mention of how the water purchasing and corresponding flow increases or decreases can be "controlled" or monitored to give the greatest opportunity for these fish populations to regenerate.

Overall, Friant water usage policies, especially those related to ground water levels and usage (Section 3) need to ensure that Friant usage will not interfere with Cross Valley Canal Unit or Delta-Mendota Canal supplies and usage.

SAN FELIPE DIVISION

The San Felipe EA addresses the topic of adaptive management, referring to the Vernalis Adaptive Management Plan, taking into account protective measures for fall-run Chinook salmon. In Chapter 4, Reclamation notes that the existing and projected water demands assume implementation of long-term water conservation programs, thus during periods of drought, the ability to reduce demand for water is limited. San Felipe is not the only project that includes water conservation measures. The hardening of demand especially in dry-dry years is an important consideration for all the projects and for their inter-relatedness. We are also concerned that threatened and endangered species in the area will encounter adverse direct and indirect environmental impacts from the project as currently drafted.

3

CONTRA COSTA CANAL

Contra Costa County's demand for water is expected to grow with continued development, particularly in the eastern portion of the county. The Future Water Supply Study prepared in 1996 calls for the purchase of water transfers, which require separate environmental documentation and therefore were not included in Alternative 1 or Alternative 2. Further analysis of water transfers should be included in the overview assessment of these eight EAs. Moreover, the main difference between alternative 1 and alternative 2 lies in the pricing of water for agricultural needs, while development in the county is mostly coming from the redevelopment of farmland into residential and commercial districts.

SHASTA/TRINITY DIVISIONS

Regarding commentary to specific provisions of the Shasta and Trinity Divisions EA, our analysis primarily focused on Chapter 4, dealing with environmental effects and consequences, however we have a brief comment on earlier sections of this document. In Chapter 2, it is stated that the dispute resolution provisions in the Shasta/Trinity Contract Renewal are only included in Alternative 1. Noting the currently tumultuous state of California water policy, we suggest this be a provision included within the final Contract Renewals, and not simply limited to Alternative 1. Regarding Chapter 4, Reclamation has completed a thorough and well-planned assessment of the impacts to this region, particularly in the areas of water usage, pricing, costs, and the effects upon the local economies.

Among the given contract renewal alternatives, it appears alternative 2 provides greater opportunity to allow for land fallowing to divert water to other municipal and industrial uses that are expected to increase in the evaluated area for the next 25 years as agriculture will decline. Consequently, options for use of the water saved from land fallowing for habitat and ecosystem restoration should be clearly delineated within Sections 4.4 and 4.5.

In 4.5.1, Affected Environment, the EA explains that there are "vegetation and wildlife resources that potentially may be affected by" the CVPIA within the Redding Basin area involved in the Shasta and Trinity Divisions. Exactly how these natural resources are affected by the project is not clear in this EA's analysis. The species affected are well detailed in the EA, but how their habitats are impacted by the project is not sufficiently detailed in this section or in the following Environmental Consequences section.

Thus, we recommend more detail on how the CVPIA Contract Renewals impact these flora and fauna. Pertaining to drafting edits in the same section, Table 4.5-1 repeats the Woodland Habitat Type three times, and the explanation of the Aquatic Habitat Type is cut off in mid-sentence (page 4.5-3). Otherwise, Chapters 4 and 5 appear to have complete analyses of the potential impacts the CVPIA Contract Renewals may have upon Shasta and Trinity Division-area resources.

We again thank Reclamation for the opportunity to provide comment on the eight CVPIA Long-Term Contract Renewal EAs, and urge Reclamation to seriously consider the suggestions made above and include them within the final CVPIA Contracts. Please feel free to contact us at (415) 427-1477 if you have any questions or require clarification on the above comments to the CVPIA Long-Term Contract Renewal Environmental Assessments.

Sincerely,

Patricia Sanderson Port
Regional Environmental Officer

cc:
Laura Fujii, U.S. Environmental Protection Agency, Federal Activities Office
Dr. Theresa Presser, U.S. Geological Survey, Western Regional Office
Joy Winckel, U.S. Fish and Wildlife Service, Sacramento Office

3

NATURAL RESOURCES DEFENSE COUNCIL

December 7, 2000

Bureau of Reclamation
Attention: Mr. Al Candlish
2800 Cottage Way
Sacramento, CA 95825-1898

Dear Mr. Candlish:

On the behalf of its more than 400,000 members, the Natural Resources Defense Council ("NRDC") hereby files its comments on the draft environmental assessments ("EAs") on long-term renewal of Central Valley Project water service contracts prepared by the Bureau of Reclamation ("the Bureau").

We are deeply disappointed by the Bureau's inadequate attempts to comply with the National Environmental Policy Act ("NEPA"), 42 U.S.C. § 4321 et seq., in its proposed long-term renewal of CVP contracts. First, we strongly object to the Bureau's failure to prepare an environmental impact statement on these proposed agency actions that would have significant, far-reaching and fundamental effects. Second, the EAs themselves fail to meet the requirements of NEPA and cannot possibly support a finding of no significant impact by the Bureau. We urge the Bureau in the strongest possible terms to prepare NEPA documentation on long-term contract renewal which comports with the law, as these EAs emphatically do not.

I. The Bureau Must Prepare an Environmental Impact Statement on the Proposed Long-Term Contract Renewals.

NEPA requires federal agencies to prepare a detailed environmental impact statement ("EIS") on all "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). The purpose of this mandatory requirement is to ensure that detailed information concerning potential environmental impacts is made available to agency decisionmakers and the public before the agency makes a decision. Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 349 (1989).

Under NEPA's procedures, an agency may prepare an EA in order to decide whether the environmental impacts of a proposed agency action are significant

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enough to warrant preparation of an EIS. 40 C.F.R. § 1501.4(b), (c). An EA must "provide sufficient evidence and analysis for determining whether to prepare an [EIS] ..." 40 C.F.R. § 1508.9(a)(1). The U.S. Court of Appeals for the Ninth Circuit has specifically cautioned that "[i]f an agency decides not to prepare an EIS, it must supply a convincing statement of reasons to explain why a project's impacts are insignificant." Blue Mountains Biodiversity Project v. Blackwood, 161 F.3d 1208, 1212 (9th Cir. 1998) (internal quotation marks omitted), cert. denied, 527 U.S. 1003 (1999). To successfully challenge an agency decision not to prepare an EIS, a plaintiff need not show that significant effects will in fact occur. So long as the plaintiff raises "substantial questions whether a project may have a significant effect on the environment," an EIS must be prepared. Id. (emphasis added, internal quotation marks omitted).

The long-term renewal contracts proposed by the Bureau are virtually certain to have a significant effect on the environment if they are executed. Collectively they cause the diversion of millions of acre-feet of water each year from the natural environment to (primarily) agricultural water users in the Central Valley, for use (primarily) in irrigated agriculture that itself has significant environmental impacts. The Bureau simply cannot, consistent with NEPA, allow these environmental impacts to escape full analysis in an EIS on long-term contract renewals.

A. There is Ample Evidence That Long-Term Renewal Contracts Would Have Significant Environmental Effects.

The Bureau has failed to meet its duty under governing Ninth Circuit precedent to supply a convincing statement of reasons why the execution of long-term renewal contracts would have insignificant environmental effects. By contrast, there is ample reason to believe that executing contracts for delivery of millions of acre-feet of water annually for an effective duration of 50 years would have a significant impact on the environment.

The U.S. Fish and Wildlife Service has recently completed a biological opinion on, among other things, the continued operation and maintenance of the Central Valley Project ("CVP"). U.S. Fish and Wildlife Service, Biological Opinion on Implementation of the CVPIA and Continued Operation of the CVP (November 2000).[1] This biological opinion describes in some detail the adverse environmental consequences that have been caused by the Central Valley Project, consequences that include harm to fish and wildlife from actions such

[1] We incorporate by reference this biological opinion in these comments. We also incorporate the documents referenced in that biological opinion, including the prior biological opinions on the Central Valley Project listed in section 1 of the November 2000 biological opinion.

as water diversion, impoundment, pumping and conveyance; from habitat conversion; from the effects of agricultural drainwater; and from urbanization. All of these effects constitute effects of CVP water service contracts, since they are the consequences of the provision of water under these contracts. See 40 C.F.R. § 1508.8 (defining effects required to be analyzed under NEPA to include indirect as well as direct effects). Because these effects on the environment are significant, they and other effects of signing long-term renewal contracts for the provision of CVP water must be analyzed in an EIS.

Other evidence of significant environmental effects from long-term water service contracts include the evidence submitted by the plaintiffs in NRDC v. Patterson, No. Civ. S-88-1658 LKK (E.D. Cal.), which we also incorporate in these comments by reference. The main point here is an obvious one: Through the proposed contracts, the Bureau is proposing to commit to the diversion of millions of acre-feet of water from the natural environment and to the delivery of that water to farms and cities for a nominal period of 25 years and an effective period of 50 years (given the right of renewal contained in the contracts). Activities of this scale and type cannot help but have significant environmental impacts, particularly in light of the significant impacts that have occurred to date under the current and previous CVP water service contracts. Moreover, the scale and duration of the activities that would be committed to under the proposed contracts threaten to cause a deterioration in the current state of the environment, as the environmental effects of the activities mandated under the proposed contracts are added to the environmental harm that has been caused to date under the current and previous contracts. For all these reasons, the Bureau must prepare an EIS on long-term contract renewal.

B. NEPA's Regulations Make Clear That an EIS Must Be Prepared Here.

NEPA's implementing regulations list a variety of factors that federal agencies are required to consider in determining whether a proposed action may significantly affect the environment and hence must be the subject of an EIS. 40 C.F.R. § 1508.27. While the Bureau has failed to undertake an adequate evaluation of these factors here, nearly all of the factors (any one of which is sufficient to require preparation of an EIS) are satisfied in the case of the proposed long-term contracts. For example:

- Water pollution from agricultural drainwater, which is triggered and would be made possible by the delivery of water under the proposed contracts, "affects public health" in a substantial way. See 40 C.F.R. § 1508.27(b)(2).

- The area to be served under the proposed contracts is in "proximity" to "prime farmlands," "wetlands" (including riparian wetlands), and "ecologically critical areas" (such as the Sacramento-San Joaquin Delta). See id. at 1508.27(b)(3).
- The effects of the water diversions, impoundments and deliveries required under the proposed contracts, and the consequences of the irrigated agriculture made possible by deliveries pursuant to the contracts, "are likely to be highly controversial." See id. at 1508.27(b)(4).
- The "possible effects" of the activities and actions made possible by the proposed contracts "are highly uncertain or involve unique or unknown risks," especially in light of the lengthy duration of the contracts. See id. at § 1508.27(b)(5).
- Since numerous CVP contractors are not prepared to sign long-term renewal contracts at the present time and will negotiate such contracts in the future, executing the proposed contracts would "establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration." See id. at § 1508.27(b)(6).
- In light of the environmental effects that have occurred from CVP operations to date, and in light of the long duration of the proposed contracts (during which many additional actions will necessarily be taken), the proposed contracts are related to other actions with "cumulatively significant impacts." See id. at § 1508.27(b)(7).
- In light of the well-established adverse effects of CVP activities on threatened and endangered species and their habitat, as shown by the biological opinions cited previously in this letter, the proposed contracts "may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973." See id. at § 1508.27(b)(8).

The evidence in favor of an EIS being required here is overwhelming – particularly since "the threshold for requiring an EIS is quite low." NRDC v. Duvall, 777 F. Supp. 1533, 1538 (E.D. Cal. 1991). In that same case, Chief Judge Emeritus Karlton further held that:

> only in those obvious circumstances where no effect on the environment is possible, will an EA be sufficient for the environmental review required by NEPA. Under such circumstances, the conclusion reached must be close to self-evident ...

Id. We urge the Bureau in the strongest terms to prepare the required EIS on the proposed long-term contract renewals, in order to comply with the requirements of NEPA.

II. The Environmental Assessments Fail to Meet the Requirements of NEPA.

Even if an EIS were not clearly required here, the EAs prepared by the Bureau are so inadequate as to violate NEPA on their own. They fall far short of the analysis that is necessary to meet NEPA's requirements and to support a finding of no significant impact.

A. The EAs Fail to Consider a Reasonable Range of Alternatives.

NEPA's implementing regulations call analysis of alternatives "the heart of the environmental impact statement," 40 C.F.R. § 1502.14, and they specifically require an alternatives analysis within an EA, id. at § 1508.9. The statute itself specifically requires federal agencies to:

> study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning available uses of resources.

42 U.S.C. § 4332(2)(E). Because the Bureau's EAs on long-term contract renewals look only at a narrow range of alternatives and fail to evaluate numerous reasonable alternatives, the EAs violate NEPA.

The caselaw makes clear that an adequate alternatives analysis is an essential element of an EA, in order to allow the decisionmaker and the public to compare the environmental consequences of the proposed action with the environmental effects of other options for accomplishing the agency's purpose. In a leading NEPA case in which it overturned an EA for failure to consider alternatives adequately, the Ninth Circuit pointedly held that "[i]nformed and meaningful consideration of alternatives ... is ... an integral part of the statutory scheme." Bob Marshall Alliance v. Hodel, 852 F.2d 1223, 1228 (9th Cir. 1988), cert. denied, 489 U.S. 1066 (1989). To meet NEPA's requirements an EA must consider a reasonable range of alternatives, and courts have not hesitated to overturn EAs that omit consideration of a reasonable and feasible alternative. See People ex rel. Van de Kamp v. Marsh, 687 F. Supp. 495, 499 (N.D. Cal. 1988); Sierra Club v. Watkins, 808 F. Supp. 852, 870-75 (D.D.C. 1991).

Each of the contract-renewal EAs considers only two alternatives, in addition to the no-action alternative. Given the scope and importance of the proposed agency action under review, this small number of alternatives is by itself a violation of NEPA's requirement to consider a reasonable range of alternatives. What makes matters worse is the similarity

between the alternatives that the EAs do consider. For example, each of the alternatives, the two action alternatives and the no-action alternative, specify exactly the same quantities of water under contract. The similarities between the alternatives, though, do not stop with water quantity. The summary tables that compare the alternatives repeatedly use the phrases "Same as NAA [No Action Alternative]," "Similar to NAA" and "minor changes" to describe the components of the alternatives. See, e.g., Draft Friant Division Long-Term Contract Renewal Environmental Assessment ("Friant EA"), at Table DA-1.[2] See also id. at 3-57 ("The impacts of EA Alternative 1 are assumed to be identical to the impacts to [sic] the NAA because the water supply and pricing scenarios are identical in both alternatives. The only differences in the alternatives are administrative."), 3-58 ("the NAA and Alternative 1 are assumed to have the same environmental consequences because of their similarities and the fact that the only differences are contractual arrangements among the parties to the contracts").

In addition to considering too few alternatives that are too similar to each other, the EAs reject or ignore several obvious and reasonable alternatives. These unexamined or rejected reasonable alternatives include:

- Alternatives that decrease the water quantities under contract. Each of the alternatives in the EAs contains the exact same water quantities that are currently under contract. It plainly is reasonable for the Bureau to consider and evaluate the option of changing those quantities. The Bureau should consider changing the contract quantities to (a) a level that matches the actual level of deliveries in recent, normal water years, and (b) a level that would leave a meaningfully larger amount of water in the environment compared with current use, so that the EAs can illustrate the choices and consequences between consumptive and nonconsumptive uses of water. The EAs' rejection of the alternative of reducing water quantities, see, e.g., Delta-Mendota Canal Unit Environmental Assessment, Long-Term Contract Renewal, at 2-9, ignores the fact that such an alternative is reasonable and accords with the purpose and need for the agency action under evaluation. See also 40 C.F.R. § 1502.14(a) (agencies must "[r]igorously explore and objectively evaluate all reasonable alternatives").
- An alternative that increases the cost of water to full market rates. Each of the action alternatives in the EAs charges the minimum price for water under the contract. The Bureau should evaluate at least one alternative that prices water at the level the water

[2] The EAs are all very similar. Thus, each of the comments contained in this letter applies equally to each of the EAs. Each citation to a specific EA is intended as an illustration and in no way suggests that the comment is restricted to that particular EA.

would receive on the open market.[3] At a minimum, the Bureau must consider price increases that would "encourage the full consideration and incorporation of prudent and responsible water conservation measures." Reclamation Reform Act of 1982, Sec. 210(a), 43 U.S.C. 390jj(a).

- An alternative that does not give the contractor a specific right to renew the contract. (While it is possible that there is no right of renewal contained in Alternative 2, the EAs do not make this clear and do not analyze the environmental consequences of this difference, if it does exist in the alternative.)
- Alternatives that affirmatively mandate or encourage increased water conservation by water users, through (a) aggressive, prescriptive requirements for water conservation and (b) through financial incentives for water conservation.

Each of the above reasonable alternatives can and should be analyzed and considered for contracts in each of the CVP divisions. In addition, for contracts in each individual division the Bureau should consider at least one strongly environmentally protective alternative that is tailored to the leading environmental problem relating to the operation of that division. So, for example, the Bureau's NEPA analysis for long-term renewal contracts for the Friant Division should consider at least one alternative that conditions the provision of water service on effective restoration of the San Joaquin River and/or creates specific incentives in the contract for restoration of the river.[4] As a further example, the NEPA analysis for the Delta-Mendota Canal Unit should consider at least one alternative that conditions the provision of water service on discrete improvements in protection and restoration of the Sacramento-San Joaquin Delta and/or creates specific incentives in the contract for such increased environmental protection and restoration of the Delta.

The EAs prepared by the Bureau fail to evaluate a reasonable range of alternatives and hence violate NEPA. We urge the Bureau to prepare NEPA documentation for long-term contract renewals that meets NEPA's requirements for alternatives analysis and that, at a minimum, fully analyzes the alternatives described above.

---

[3] The Bureau clearly has discretion to consider higher prices. See, e.g., Reclamation Project Act of 1939, sec. 9(e), 43 U.S.C. 495h(e) (rates shall be "at least sufficient to cover an appropriate share of the annual operation and maintenance cost..."); Reclamation Reform Act of 1982, sec. 208(a), 43 U.S.C. 390hh(a) ("the price...shall be at least sufficient to recover all operation and maintenance charges..."); see also NRDC v. Houston, 146 F.3d 1118, 1125-26 (9th Cir. 1998) (Bureau has discretion over terms of renewal contracts, including price and quantity).

[4] The Friant EA fails to conduct an adequate analysis of the effect of the proposed contracts on the San Joaquin River and on restoration of the river.

B. The EAs Fail to Disclose and Analyze Adequately the Environmental Impacts of the Proposed Action.

NEPA's implementing regulations require that an EA "provide sufficient evidence and analysis for determining whether to prepare an [EIS]." 40 C.F.R. § 1508.9(a). For the reasons discussed above, the EAs fail to discuss and analyze adequately the environmental effects of long-term contract renewals. Courts have not hesitated to overturn EAs that fail to contain an adequate discussion of the environmental consequences of a proposed agency action, e.g., Foundation on Economic Trends v. Heckler, 756 F.2d 143 (D.C. Cir. 1985), and the EAs prepared by the Bureau here deserve that same fate.

The discussion and analysis of environmental impact contained in the EAs is cursory and inadequate, and it falls far short of NEPA's requirements. As an example, the discussion of water-quality impacts contained in the Friant EA shows the cursory and conclusory "analysis" contained in all of the EAs. First, the analysis is breathtakingly brief, occupying a single page with considerable space between the short paragraphs – a plainly inadequate treatment in light of the great importance of water quality to public health and the environment. Friant EA at 3-34. Second, the analysis essentially says that there will be no change in water quality impacts under the No Action Alternative and Alternative 1 – without describing in any meaningful way what the qualitative impacts of existing water quality is on human health and the environment and why those impacts will not change for better or for worse. Id. The six-sentence analysis of the effect of Alternative 2 appears to say that this alternative would cause some changes, but the EA fails to describe what those changes would mean for human health and environment. Id.

This plainly inadequate discussion of environmental impacts is, sadly, far from an isolated example. For example, the same document's discussion of fishery impacts occupies approximately a page and a half and concludes (with no analysis), for the no-action alternative and for Alternative 1, that there would be "no impacts to fishery resources" – a conclusion based apparently on the logic that no changes in environmental impacts from the current effects equals no environmental impacts at all. Id. at 3-48. On the next page, the EA presents the amazing, thoroughly unsupported statement that "Alternative 1 and 2 have little or no effect on surface water quantities and flows," id. at 3-49, despite the fact that both alternatives would result in the diversion and delivery to irrigated agriculture of more than a million acre-feet of water each year for 25 or 50 years. Elsewhere in the same document, the Bureau presents the astonishing and unsupported statement that "Alternative 1 is assumed to have similar effects to the NAA. Therefore, there are no impacts to biological resources under this alternative." Id. at 3-76.

In addition to failing to disclose or to analyze adequately the environmental effects of the proposed contracts, the EAs impermissibly restrict the timeframe of their analyses. None of the study periods extends forward more than 25 years, e.g., Friant EA at 1-4, despite the fact that each of the contracts contains an easily satisfied conditional right of renewal that means that the likely and effective duration of these contracts would be 50 years. By failing to analyze the environmental effects of the contracts in the likely event that they are renewed under the right of renewal contained in the contracts, the Bureau has violated NEPA.

We urge the Bureau to prepare NEPA documentation that adequately discloses and analyzes the environmental effects of the contracts over the full lifetime of the contracts, including the renewal period, as the draft EAs do not.

C. The EAs Fail to Analyze Cumulative Impacts Adequately.

These proposed long-term renewal contracts do not exist in a vacuum but instead add to more than half a century of environmental impacts from the construction, operation and maintenance of the CVP. The fact that these contracts would operate for at least a quarter century, and likely then would be renewed for another quarter century, means that their environmental effects will also be added to additional actions that will take place over the next 50 years. These facts make an adequate analysis of cumulative impacts especially important for these proposed contracts.

The Ninth Circuit has made clear that NEPA mandates "a useful analysis of the cumulative impacts of past, present and future projects." Muckleshoot Indian Tribe v. U.S. Forest Service, 177 F.3d 800, 810 (9th Cir. 1999). That Court has further directed that "[d]etail is required in describing the cumulative effects of a proposed action with other proposed actions." Id. The very cursory cumulative-effects discussions contained in the EAs plainly fail to meet these standards of adequacy.

The cumulative-effects discussions contained in the EAs are cursory, unanalytic, unenlightening, and often illogical. Here, in full, is the Friant EA's cumulative effects "analysis" of the proposed contracts' cumulative effects on surface water:

> The cumulative effects of all foreseeable projects will be to place additional demands on the available water supply. Also, the restoration projects may result in additional flows in local rivers for habitat restoration. Implementation of Alternative 1 or 2 will not influence the cumulative effects of other projects to surface water resources.

Friant EA, at 3-12. In addition to being almost entirely uninformative, this three-sentence discussion asks more questions than it answers. What are the foreseeable projects, and what are their additional demands likely to be? What impact would the proposed contracts have on the opportunities to restore the San Joaquin River? What other cumulative impacts might occur over the life of the project? How is it possible to conclude that the diversion of more than a million acre-feet of water every year, for 25 or 50 years, "will not influence cumulative effects" on surface water?

The Ninth Circuit has not hesitated to reject cumulative-impact statements that are "too general and one-sided to meet the NEPA requirements" and that fail to provide the "useful analysis" mandated by the caselaw. Muckleshoot, 177 F.3d at 811. The inadequate cumulative effects discussions contained in the contract renewals EAs fail these tests and deserve rejection here.

III. Conclusion.

The contract-renewals EAs prepared by the Bureau fall well short of NEPA's established requirements. We urge the Bureau to prepare NEPA documentation on the proposed contracting actions which complies with all requirements of the law.

Sincerely,

Drew Caputo
Senior Attorney

Hamilton Candee
Senior Attorney

cc: Hon. David Hayes, Deputy Secretary of the Interior
Hon. John Leshy, Solicitor
Hon. George Frampton, Chairman, CEQ

Golden Gate Audubon Society
2530 San Pablo Avenue, Suite G • Berkeley, California 94702
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Americans Committed to Conservation • A Chapter of the National Audubon Society

December 8, 2000

Al Candlish
Bureau of Reclamation
2800 Cottage Way
Sacramento, CA 95825
Sent by FAX: 916-978-5094

Dear Mr. Candlish:

The Golden Gate Audubon Society appreciates the opportunity to comment on the Bureau of Reclamation's draft Environmental Assessments (EAs) on the proposed long-term renewal of Central Valley Project (CVP) water service contracts.

We believe the draft EAs are inadequate and violate NEPA. We believe the long-term renewal contracts for each CVP division require an Environmental Impact Statement (EIS) that fully analyzes a broader range of alternatives. We also wish to incorporate by reference the comments dated December 7, 2000 filed by the Natural Resources Defense Council on the draft EAs.

Thank you for considering our comments.

Sincerely yours,

Arthur Feinstein
Executive Director

Letter 5

From: Tom Stokely <tstokely@trinityalps.net>
To: <acandlish@mp.usbr.gov>
Date: 12/8/00 2:37PM
Subject: Comments on Draft EA for CVP Contract Renewals

Dear Mr. Candlish,

Please accept this on behalf of the County of Trinity. A hard copy letter should have already arrived or will arrive shortly. I will also fax you the letter below.

Sincerely,

Tom Stokely,
Senior Planner
Trinity County Planning Dept.
PO Box 158
Hayfork, CA 96041
530-628-5949

****

TRINITY COUNTY BOARD OF SUPERVISORS
P.O. BOX 1258
WEAVERVILLE, CA 96093-1258

December 6, 2000

Bureau of Reclamation
Mid-Pacific Division
Attn: Al Candlish
2800 Cottage Way
Sacramento, CA 95825-1898

Re: Draft Environmental Assessments (EAs) for Renewal of Existing Long-term Water Service Contracts for Central Valley Project (CVP)

Dear Mr. Candlish:

The Board of Supervisors recommends that the Draft Environmental Assessments for renewal of CVP long-term water service contracts not be approved. The impacts of this proposed federal action are significant and cannot be approved under a Finding of No Significant Impact. A comprehensive CVP-wide EIS for water contract renewals should be prepared.

The cumulative impacts of renewing 25 long-term water service contracts is a significant cumulative impact which requires preparation of an EIS.

As demonstrated in Table ES -1 from the "Trinity River Mainstem Fishery Restoration EIS/EIR" (USFWS, Trinity County, Hoopa Valley Tribe and BOR, November, 2000), there are significant impacts from blanket renewal of long-term CVP water service contracts. This can be seen in the

Letter 6

difference between the "Existing Conditions (1995) base year and the No Action Alternative in the year 2020. In particular, renewal of contracts from the American River Division will increase CVP demand by 320,000 acre-feet per year by the year 2020. This significant impact will manifest itself with reduced carryover storage in Shasta and Trinity reservoirs, with resultant impacts to recreation, as well as listed species in the Trinity River such as coho and steelhead, and impacts to the Sacramento River listed species such as winter and spring chinook. This is evidenced by increases in violation of Trinity and Sacramento river temperature compliance, and Shasta Lake carryover storage requirements per the 1993 NMFS Biological Opinion.

As a result of the October 20, 2000 ESA consultation by NMFS on the Trinity River Mainstem Fishery Restoration EIS, Trinity Lake carryover storage should not go below 600,000 acre-feet. A comprehensive EIS on CVP contract renewals should evaluate impacts to this Trinity Lake carryover storage requirement for protection of the Trinity River's fishery.

We are extremely disappointed that without adequate public review and input, Interior reversed its contract negotiation position very recently and changed contract terms so that the "contract total" for water quantities would be unchanged from existing contracts even though historic deliveries have been far less. Renewal of these contracts which includes this "paper water" will continue to result in contracts for water delivery well beyond available CVP supplies. As a county of origin for the CVP, we believe the citizens and resources of Trinity County will be significantly harmed by this overcommitment of water.

We are also extremely disappointed that Interior reversed its position, again without adequate public review and input, of the tiered pricing provisions of the Central Valley Project Improvement Act (CVPIA) so that these provisions would apply only to the "contract total," not the "base" water supply. Such a position will not encourage water conservation, nor will it assure long-term repayment of the CVP by water contractors.

The EA's do not adequately analyze the above impacts in a singular or cumulative sense with other ongoing actions CVP-wide. A Finding of No Significant Impact would not be justifiable in this case. In addition, the EAs do not analyze adequately the cumulative effect of applying these policies to remaining CVP water service delivery contracts which have not yet expired -- in other words, all CVP water service contracts.

The contracts should be renegotiated to reflect the legal requirements of CVPIA, then a CVP-wide contract renewal EIS should be prepared to deal with the above issues cumulatively. A Finding of No Significant Impacts is not justifiable.

Sincerely,
out

December 6, 2000

provisions of the Central Valley Project Improvement Act (CVPIA) so that these provisions would apply only to the "contract total," not the "base" water supply. Such a position will not encourage water conservation, nor will it assure long-term repayment of the CVP by water contractors.

The EA's do not adequately analyze the above impacts in a singular or cumulative sense with other ongoing actions CVP-wide. A Finding of No Significant Impact would not be justifiable in this case. In addition, the EAs do not analyze adequately the cumulative effect of applying these policies to remaining CVP water service delivery contracts which have not yet expired – in other words, all CVP water service contracts.

The contracts should be renegotiated to reflect the legal requirements of CVPIA, then a CVP-wide contract renewal EIS should be prepared to deal with the above issues cumulatively. A Finding of No Significant Impacts is not justifiable.

Sincerely,

TRINITY COUNTY BOARD OF SUPERVISORS

_____

Ralph Modine, Chairman

TRINITY COUNTY BOARD OF SUPERVISORS

FRIENDS OF THE TRINITY RIVER

DEDICATED TO RESTORING A GREAT RIVER

December 5, 2000

Bureau of Reclamation
Mid-Pacific Division
Attn: Al Candlish
2800 Cottage Way
Sacramento, CA 95825-1898

Ladies and Gentlemen:

This letter is to offer our comments on the draft Environmental Assessments (EAs) for the renewal of existing long-term contracts for Central Valley Project (CVP) water service.

First, let me say that the proposed contracts are a great disappointment given the contract parameters set forth by the Interior Department at its initial public session in Sacramento. These proposals honor those guidelines in the breach.

EAs for contracts that run for a 25-year period, with the promise of additional contract renewals thereafter, are inadequate as environmental documents. A comprehensive Environmental Impact Statement (EIS) should be completed to comply with the law.

Interior reversed its position, at the eleventh hour and without adequate public review and input, and changed contract terms so that the "contract total" for water quantities would be unchanged from existing contracts. Existing contracts that include this "paper water" has resulted in contracts for water delivery well beyond available CVP supplies.

Interior also reversed its position at the eleventh hour, again without adequate public review and input, of the tiered pricing provisions of the Central Valley Project Improvement Act (CVPIA) so that these provisions would apply only to the "contract total," not the "base" water supply.

The EAs do not adequately analyze the effects of either of the two draft policies in the paragraphs above. In addition, the EAs do not analyze adequately the cumulative effect of applying these policies to remaining CVP water service delivery contracts not yet the subject of renewal – in other words, all CVP water service contracts.

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In addition, the failure to analyze a full range of alternatives, especially alternatives with reduced water quantities, renders all of the EAs inadequate.

The effect of the contracts upon endangered species is a critical environmental impact that must be analyzed. However, the public has received inadequate information about those impacts. This omission includes impacts upon the endangered Trinity River Coho salmon, as well as its threatened Steelhead. The public also has not received adequate information about the extent to which the Bureau of Reclamation (Bureau) is in compliance with previous Endangered Species Act (ESA) requirements applicable to existing contracts.

The contracts should be renegotiated with reduced water quantities that better reflect both reality and competing water needs, and at higher prices that implement CVPIA tiered pricing requirements properly, and in the spirit of that law, as well as CALFED's "beneficiary pays" requirements.

Yours very truly,

Byron W. Leydecker
Chair

BWL/mw

cc: The Hon. Dianne Feinstein
The Hon. Barbara Boxer
The Hon. George Miller
The Hon. Mike Thompson
The Hon. Ellen Tauscher
Ms. Mary Nichols
Ms. Felicia Marcus
Mr. Mike Spear

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Revised DEA/Draft FONSI - December 2004

Office of Planning and Research-State Clearinghouse (SCH)
1400 Tenth Street
P.O. Box 3044
Sacramento, CA 95812-3044
(Refer to letter dated January 13, 2005 and list of 14 agencies provided the opportunity to review)

Contra Costa Water District
Attention: Mr. Jeff Quimby
1331 Concord Avenue
P.O. Box H20
Concord, CA 94524

U.S. EPA
Environment Review Office
Attention: Laura Fuji
Compliance and Ecosystem Division
75 Hawthorn Street
San Francisco, CA 94105-3901

U. S. Department of Interior
Office of Environmental Policy & Compliance
1111 Jackson Street, Suite 520
Oakland, CA 94607

Natural Resources Defense Council
111 Sutter Street, FL 20
San Francisco, CA 94104

Golden Gate Audubon Society
2530 San Pablo Avenue, Suite G
Berkeley, CA 94702

Trinity County Planning Department
P.O. Box 156
Hayfork, CA 96041

Friends of Trinity River
P.O. Box 2327
Mill Valley, CA 94942-2327

U.S. Bureau of Reclamation
Water Rights and Contracts Branch
ATTN: Dick Stevenson, MP-400
2800 Cottage Way
Sacramento, CA 95825

U.S. Bureau of Reclamation
Tracy Field Office
ATTN: Eileen Jones
16650 Kelso Road
Byron, CA 94514-1909

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Jan Boel
Acting Director

F10018

January 13, 2005

Joe Thompson
U.S. Bureau of Reclamation
1243 N Street
Fresno, CA 93721-1813

Subject: Contra Costa Canal Unit Long-Term Contract Renewal
SCH#: 2000114006

Dear Joe Thompson:

The State Clearinghouse submitted the above named Joint Document to selected state agencies for review. The review period closed on January 12, 2005, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2000114006
Project Title Contra Costa Canal Unit Long-Term Contract Renewal
Lead Agency U.S. Bureau of Reclamation

Type JD Joint Document

Description Project is the proposed renal/replacement of long-term water service contract for the Contra Costa Canal system, operated by the Contra Costa Water District (CCWD). The U.S. Bureau of Reclamation and CCWD proposed to execute the new long-term water service contract in a manner consistent with the provisions of CVPIA.

Lead Agency Contact

Name Joe Thompson
Agency U.S. Bureau of Reclamation
Phone 559.487-5179 **Fax**
email
Address 1243 N Street
City Fresno **State** CA **Zip** 93721-1813

Project Location

County Contra Costa
City
Region
Cross Streets
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways
Airports
Railways
Waterways Central Valley Water Project-Contra Costa Canal
Schools
Land Use Central Valley Water Project.

Project Issues Population/Housing Balance; Water Supply; Wildlife; Landuse

Reviewing Agencies Resources Agency; Department of Fish and Game, Region 3; Department of Parks and Recreation; Reclamation Board; Department of Water Resources; Caltrans, District 4; Department of Health Services; Native American Heritage Commission; State Lands Commission; Regional Water Quality Control Board, Region 2; Regional Water Quality Control Bd., Region 5 (Sacramento); State Water Resources Control Board, Clean Water Program; State Water Resources Control Board, Division of Water Quality; State Water Resources Control Board, Division of Water Rights

Date Received 12/14/2004 **Start of Review** 12/14/2004 **End of Review** 01/12/2005

Note: Blanks in data fields result from insufficient information provided by lead agency.