MUNICIPAL AND INDUSTRIAL WATER SHORTAGE POLICY
CENTRAL VALLEY PROJECT, CALIFORNIA

Environmental Assessment

October 2005

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INTRODUCTION

This Environmental Assessment (EA) was prepared to evaluate alternatives considered by the U.S. Bureau of Reclamation (Reclamation) to implement a Municipal and Industrial (M&I) Water Shortage Policy for the Central Valley Project (CVP). The purposes of the policy are to: (1) define water shortage terms and conditions applicable to all CVP M&I contractors, as appropriate; (2) establish CVP water supply levels that, together with the M&I contractors' drought water conservation measures and other water supplies, (a) would sustain urban areas during droughts, and (b) during severe or continuing droughts would assist the M&I contractors in their efforts to protect public health and safety; and (3) provide information to M&I contractors for development of drought contingency plans.

STUDY AREA

The Study Area for this EA includes areas with CVP facilities, CVP water users, or water rights holders that could be affected by the action alternatives. These areas are located throughout the Central Valley, and in Trinity, Contra Costa, Alameda, Santa Clara, and San Benito counties in the Shasta and Trinity River, Sacramento River, American River, Eastside, Delta, West San Joaquin, and San Felipe divisions.

The CVP water service contractors included in this analysis are the contractors with a water service contract that is expected to reference the proposed policy upon renewal. As described in the June 30, 2004 Long-Term Central Valley Project and State Water Project Operations Criteria and Plan Biological Assessment (OCAP 2004 biological assessment), "Reclamation expects the proposed policy [M&I Water Shortage Policy] will not be referenced in contracts for the (1) Friant Division, (2) New Melones interim supply, (3) Hidden and Buchanan Units, (4) Cross Valley contractors, (5) Sugar Pine Units (subject of title transfer legislation) [this unit was transferred to Foresthills Public Utilities District]; (6) San Joaquin settlement contractors, and (7) Sacramento River settlement contractors."

STUDY PERIOD

The analysis period for this EA is the term of the long-term contracts being considered under separate environmental documentation for M&I water users. For the long-term contract renewals, the contract term for agricultural-irrigation contracts is 25 years, or to the Year 2030. The contract term for mixed agricultural-irrigation and M&I contracts is 25 years, or to the Year 2030. The analysis period for the M&I-only contracts is a 40-year term, or to the Year 2045.

FREQUENCY OF SHORTAGE CONDITIONS FOR CENTRAL VALLEY PROJECT M&I WATER SERVICE CONTRACTORS IN THE NO ACTION ALTERNATIVE AND ACTION ALTERNATIVES

Reclamation uses the CALSIM II model to simulate operations of the CVP, as described in OCAP 2004. This model uses generalized rules to operate the CVP and SWP systems. The CALSIM II model uses historical hydrologic records for the system from 1922 through 1994 which represents 72 consecutive years to reflect the impacts of critical dry to wet periods and associated carryover storage conditions. The

CALSIM II model for Year 2020 Level of Development under OCAP 2004 indicated that M&I CVP water service contract allocations would be less than 75 percent in 13 of the 72 years. There are no allocations to Irrigation CVP water service contractors in 4 of the 13 years. In addition, the allocations are very small in two additional years when allocations to Irrigation CVP water service contractors are 2 to 3 percent.

PREVIOUS PROPOSALS CONCERNING THE M&I WATER SHORTAGE POLICY FOR CENTRAL VALLEY PROJECT WATER SERVICE CONTRACTORS

In response to related actions and concerns of M&I CVP water service contractors concerning allocations of CVP water, Reclamation initiated development of an M&I Water Shortage Policy in 1992. There were several proposals prepared by Reclamation in 1993, 1996, 1997, 2000, and 2001. Portions of these proposals and responses to the proposals were used by Reclamation in the development of the alternatives considered in this EA.

The most recent proposal was developed in September 2001 and stated that the shortage allocation should be based upon historical M&I water use adjusted for growth, extraordinary water conservation measures, and use of non-CVP water sources. The draft proposal also indicated that the M&I allocation would be based upon the M&I demand projected as of September 30, 1994 (as shown in Schedule A-12 of the 1996 Municipal and Industrial Water Rates book for the year 2030). Water converted or transferred after September 30, 1994 would be subject to the agricultural water allocation. The transferred water may become eligible for M&I water allocation following a separate analysis of impacts to agricultural water supplies and mitigation of all adverse impacts to agricultural water supplies; converted water may become eligible for M&I water allocation following a separate analysis of impacts to agricultural water supplies and to other water supplies and mitigation of all of those impacts.

The draft proposal indicates that when the Governor declares a water shortage emergency applicable to a specific contractor or contractors, or when Reclamation in consultation with the contractor determines a water shortage emergency exists, Reclamation would deliver CVP water to M&I contractors at not less than a public health and safety water supply level if CVP water is available. At that time the public health and safety level would be determined by the contractor and reviewed by Reclamation. The draft proposal does indicate that Reclamation would provide a water supply to all M&I contractors (including those with water converted or transferred to M&I purposes after September 30, 1994) with a water supply at public health and safety levels, if CVP water is available.

This draft proposal required each M&I water service contractor to develop and implement a water conservation plan and a water measuring plan consistent with the requirements of CVPIA. Each M&I contractor also must provide a drought contingency plan to protect public health and safety.

SOURCE OF WATER TO INCREASE WATER ALLOCATIONS TO M&I WATER SERVICE CONTRACTORS FOR ACTION ALTERNATIVES

In years when allocations to Irrigation and M&I CVP water service contractors are less than Contract Totals, there are no surplus flows. It is also not possible to reduce deliveries to water rights holders, environmental commitments, or Level 2 refuge water supplies. These demands must be met prior to deliveries under water service contracts, as described in OCAP 2004.

As part of this analysis, several methods were considered to provide the additional water to the M&I CVP water service contractors. During the 13 drier years of the 72 years when M&I CVP water service contract allocations are less than 75 percent, 10 of the 13 years are considered "Critical (Dry)" and 3 years are considered "Dry."

To increase M&I CVP water service contract deliveries, concepts would include: 1) storage of additional water during wet years, 2) reduction of deliveries to Irrigation CVP water service contractors in all years with storage of the non-delivered water in CVP reservoirs, or 3) reduction of deliveries to Irrigation CVP water service contractors in the years when deliveries to M&I CVP water service contractors are less than 75 percent. However, increasing storage quantities was not possible with existing facilities and commitments with higher priorities than CVP water service contractors. Therefore, this analysis assumed that the additional water for deliveries to the M&I water service contractors in the 13 years would be made available by reducing deliveries to Irrigation CVP water service contractors within the shortage year considered.

In the American River Division, it is not possible to convey water from the Sacramento River to users that divert from the American River. The American River Division is not projected to include any Irrigation CVP water service contracts under the No Action Alternative. Therefore, it is not possible to increase M&I CVP water service contract allocations to the American River Division unless new conveyance facilities are constructed. Reclamation has initiated an evaluation of these types of facilities in a separate study. If those facilities are approved, increasing CVP water allocations to American River Division M&I CVP water service contractors could be implemented. However, for the purposes of this EA, increased allocations to American River Division water service contractors are identified but not evaluated.

DEVELOPMENT OF NO ACTION ALTERNATIVE AND ACTION ALTERNATIVES

Alternatives to the M&I Water Shortage Policy were developed based upon information compiled during the review of previous proposals and information collected during the scoping process. Two main alternatives, each with two sub-alternatives, were considered in addition to the No Action Alternative.

Alternative 1A is identical to the September 2001 draft water shortage policy. Implementation of Alternative 1B is similar in nature, but would require modification of the September 2001 draft water shortage policy. The September 2001 draft water shortage policy did not include provisions that are presented in Alternatives 2A and 2B. Therefore, implementation of Alternatives 2A or 2B would require modification of the September 2001 draft water shortage policy.

No Action Alternative

The No Action Alternative is defined by the operational criteria presented in the OCAP 2004. Allocations of CVP water service contract water would be in accordance with the current allocation process, as presented in Table ES-1.

Under the No Action Alternative, allocations would be based upon historical use adjusted for growth, extraordinary water conservation measures, and use of non-CVP water sources.

The water demands assumed in the No Action Alternative are the values developed by the water service contractors and Reclamation for the Water Needs Assessment prepared as part of the Long-Term Contract Renewal process. It is anticipated that most of these demands would occur prior to 2030 and would be applied to 40-year M&I water service contracts and to 25-year Irrigation/M&I water service contracts.

TABLE ES-1

NO ACTION ALTERNATIVE WATER SHORTAGE ALLOCATIONS

Allocation Step	Allocation to Irrigation Users	Allocation to M&I Users
1	100 percent	100 percent
2	100 to 75 percent	100 percent
3	75 to 70 percent	100 to 95 percent
4	70 to 65 percent	95 to 90 percent
5	65 to 60 percent	90 to 85 percent
6	60 to 55 percent	85 to 80 percent
7	55 to 50 percent	80 to 75 percent
8	50 to 25 percent	75 percent
9	25 to 20 percent	75 to 70 percent
10	20 to 15 percent	70 to 65 percent
11	15 to 10 percent	65 to 60 percent
12	10 to 5 percent	60 to 55 percent
13	5 to 0 percent	55 to 50 percent
14	0 percent	50 percent

Alternative 1

Under Alternative 1, the allocation methodology for M&I CVP water service contractors would be the same as under the No Action Alternatives when the M&I CVP allocations are greater or equal to 75 percent. In years when the M&I CVP allocations are less than 75 percent, water would be re-allocated from the Irrigation CVP water service contractors to provide at least the public health and safety water quantity up to 75 percent of the CVP water service contract total and up to the total amount allocated to the Irrigation CVP water service contractors, if and when the water is available. There are some years in which allocations to Irrigation CVP water service contractors are at or near zero. In those years, the increased allocations to M&I CVP contractors would not be fully realized.

There are two sub-alternatives for Alternative 1. Alternative 1A would apply M&I Allocation of the M&I Water Shortage Policy to the quantity of CVP water identified for M&I uses as of September 30, 1994, as shown on Schedule A-12 of the 1996 Municipal and Industrial Water Ratebook, and for those contract quantities specified in section 206 of Public Law 101-514. Alternative 1A is identical to the September 2001 draft proposal. Alternative 1B would apply the M&I allocation of the M&I Water Shortage Policy to quantity of CVP water identified for M&I uses under the Water Needs Assessment.

Alternative 2

Alternative 2 provides a two-tier level of water supply allocations to M&I CVP water service contractors when M&I CVP allocations are less than 75 percent.

- First Tier: A portion of the M&I contract amount would be provided in a similar manner as defined in Alternative 1B.

- Second Tier: A portion of the M&I contract amount that when added to the First Tier provides up to 100 percent of industrial demand under Alternative 2A or 100 percent of total M&I demand under Alternative 2B, up to 75 percent of Contract Total. The second tier would be priced every year at a higher level than cost of service M&I water service contract rates. For the purpose of this EA, it is assumed that the second tier would be priced at 10 times the M&I cost of service rate shown in the 2003 CVP M&I Water Service Contract Ratebook as a "worst-case" scenario.

The M&I Water Shortage Policy would apply to that amount of M&I water identified under the Water Needs Assessment.

Under Alternative 2A, the second tier would only be offered to M&I water service contractors that provide water to a portion of the manufacturing sector for which nearly no reduction in water use can be tolerated as part of the manufacturing process, such as electronic industries. For the purposes of this EA, it was assumed that 100 percent allocations would be provided for industrial water demand when M&I CVP contract allocations are less than 75 percent. However, the maximum allocations would be limited to 75 percent of the CVP Contract Total. Allocations for the remaining M&I demands would be provided as described under Alternative 1B.

Under Alternative 2B, the second tier would be offered to all M&I water service contractors. For the purposes of this EA, it was assumed that Alternative 2B would attempt to provide up to 100 percent allocation of M&I water demands when M&I CVP contract allocations are less than 75 percent. However, the maximum allocations would be limited to 75 percent of CVP Contract Total. Allocations for the remaining M&I demands would be provided as described under Alternative 1B.

DEVELOPMENT OF PUBLIC HEALTH AND SAFETY WATER QUANTITIES TO BE USED IN THE ACTION ALTERNATIVES

The M&I Water Shortage Policy refers to the allocation of CVP water based upon "public health and safety" criteria. However, these quantities are not currently available for use in this analysis but are expected to be developed by Reclamation and the contractors. As part of this evaluation, information developed by Reclamation, water service contractors, and by other non-CVP water users was reviewed. Most studies acknowledged that the communities had implemented long-term conservation measures to reduce water demands. Therefore, the incremental savings for emergency conservation measures were limited. A limited number of reports included specific reduction targets for overall water system demand. Using this information, a definition of "public health and safety value" was developed as follows:

- Residential = 50 gallons/capita/day
- Commercial = 80 percent of average commercial water demand
- Industrial = 90 percent of average industrial water demand
- System Losses = 80 percent of identified system losses

The public health and safety water criteria have been developed for use in this EA to estimate adequate water for consumption, operation of necessary water and wastewater facilities, and to avoid economic disruption.

ENVIRONMENTAL CONSEQUENCES AND SELECTION OF PROPOSED ACTION

The alternatives were evaluated with respect to the following resources: surface water resources and Central Valley Project operations, groundwater, municipal and industrial land use and Central Valley Project water supply costs, agricultural land use and economics, fishery and wildlife resources, recreation, cultural resources, Indian Trust Assets, air quality, soils, visual resources, power resources, social conditions, environmental justice, and secondary growth issues. The results of the evaluation of impacts on CVP water service contract allocations are summarized in Tables ES-2 and ES-3.

Based upon this analysis, Alternative 1B was identified as the proposed action. Alternative 1B is consistent with proposed provisions of the long-term contract renewal contracts and would improve CVP water service contract allocations with less impacts to Irrigation CVP water service contractors than Alternatives 2A and 2B. Under Alternative 1B, reductions to Irrigation CVP water service contractors would range from 0 to 3 percent and years with no deliveries would increase from 4 to 6 of 72 years.

TABLE ES-2

PERCENT ALLOCATIONS TO CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT DELIVERIES FOR M&I AND IRRIGATION WATER SERVICE CONTRACTORS

Frequency	Allocations for No Action Alternative		Allocations to CVP Water Service Contractors in Action Alternatives							
			Alternative 1A		Alternative 1B		Alternative 2A		Alternative 2B	
	M&I	Irrig.	M&I	Irrig.	M&I	Irrig.	M&I	Irrig.	M&I	Irrig.
4 of 72 years	50%	0%	50%	0 [a]	50%	0 [a]	50%	0 [a]	50%	0 [a]
1 of 72 years	52%	2%	62%	0 [b]	62%	0 [b]	61%	0 [b]	61%	0 [b]
1 of 72 years	53%	3%	66%	0 [b]	68%	0 [b]	68%	0 [b]	68%	0 [b]
2 of 72 years	54%	4%	66%	1%	69%	1%	72%	0 [b]	72%	0 [b]
1 of 72 years	57%	7%	67%	5%	71%	4%	77%	3%	82%	2%
1 of 72 years	63%	13%	70%	12%	74%	11%	78%	10%	82%	9%
1 of 72 years	66%	17%	72%	15%	76%	15%	78%	14%	82%	14%
1 of 72 years	70%	20%	74%	19%	78%	19%	79%	18%	82%	18%
1 of 72 years	74%	23%	76%	23%	79%	22%	79%	22%	82%	22%
59 of 72 years	Same as in Table ES-1									

"Irrig." = Irrigation

[a] Under the No-Action Alternative for 50 percent M&I Allocation years, deliveries to Irrigation CVP water service contractors are equal to zero. Therefore, there are no changes in deliveries to M&I or Irrigation water users.

[b] Re-allocation of water to increase M&I CVP water service contract water in these alternatives will result in zero deliveries to Irrigation CVP water service contractors

TABLE ES-3

IMPACT ASSESSMENT RESULTS

	No Action Alternative	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B
Surface Water Resources	CVP water supply allocations in the future will be slightly less than under existing conditions. M&I CVP water service contractors deliveries are less than 75 percent in 13 of the 72 years analyzed in the CALSIM II model used for this EA. Zero deliveries would occur to Irrigation CVP water service contractors in four of the 72 years.	Reductions to Irrigation CVP water service contractors would be from 0 to 3 percent. Two additional year with zero deliveries to Irrigation CVP water service contractors for a total of six of the 72 years.	Reductions to Irrigation CVP water service contractors would be from 0 to 3 percent. Two additional years with zero deliveries to Irrigation CVP water service contractors for a total of six of the 72 years.	Reductions to Irrigation CVP water service contractors would be from 0 to 4 percent. Four additional year with zero deliveries to Irrigation CVP water service contractors for a total of eight of the 72 years.	Reductions to Irrigation CVP water service contractors would be from 0 to 5 percent. Four additional year with zero deliveries to Irrigation CVP water service contractors for a total of eight of the 72 years.
Groundwater	It is anticipated that groundwater withdrawals will be increased as municipal growth occurs to directly use groundwater or reduce availability of irrigation water supplies.	Groundwater withdrawals by M&I CVP water service contractors may be reduced in 9 of 72 years under this alternative. Groundwater withdrawals by Irrigation CVP water service contractors may increase unless other water supplies are available or fields are fallowed more frequently in the short-term.	Similar to Alternative 1A	Similar to Alternative 1A	Similar to Alternative 1A

TABLE ES-3

IMPACT ASSESSMENT RESULTS

	No Action Alternative	**Alternative 1A**	**Alternative 1B**	**Alternative 2A**	**Alternative 2B**
Municipal and Industrial Land Use and CVP Water Cost	Growth would continue in M&I communities, as described in the county general plans and associated environmental documentation.	No increase in Contract Totals, therefore, no change in land use. Slightly higher allocations of CVP water in drier years. Water supply costs similar to those under the No Action Alternative.	Similar to Alternative 1A	Similar to Alternative 1A with slightly higher allocations of CVP water in drier years.	Similar to Alternative 1A with slightly higher allocations of CVP water in drier years.
Agricultural Land Use and Economics	Increased groundwater withdrawals may increase costs. Cropping patterns of may be modified if adequate water supplies are not available.	Land use would be similar to No Action Alternative. Water supply costs may be higher if additional groundwater or other water supplies are used in drier years. Reduction in farm income during drier years due to more frequent short-term fallowing if additional groundwater is not available	Similar to Alternative 1A.	Similar to Alternative 1A, with higher water supply costs and more frequent occurrence of reduced Irrigation CVP water allocations.	Similar to Alternative 2A.
Fisheries and Wildlife Resources	Growth would continue in M&I communities, as described in the county general plans and associated environmental documentation. The general plans include protection measures for biological resources.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.

TABLE ES-3

IMPACT ASSESSMENT RESULTS

	No Action Alternative	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B
Recreation	CVP operations would be similar to those under existing conditions. Therefore, recreational opportunities related to CVP operations would be similar to those under existing conditions.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.
Cultural Resources	CVP operations would be similar to those under existing conditions.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.
Indian Trust Assets	Indian Trust Assets would be the same as under the existing conditions.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.
Air Quality	Growth would continue in M&I communities, as described in the county general plans and associated environmental documentation. The general plans include air quality improvement and protection measures.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.
Soils	Soil conditions would be similar to existing conditions.	Similar to the No Action Alternative for M&I CVP water service contractors. Potential increase in soil salinity in irrigated areas due to increased frequency of short-term fallowing	Similar to Alternative 1A.	Similar to Alternative 1A.	Similar to Alternative 1A.
Visual Resources	Conditions would be similar to existing conditions.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.

TABLE ES-3

IMPACT ASSESSMENT RESULTS

	No Action Alternative	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B
Power Resources	Reservoir and power generation operations will continue as described in OCAP 2004.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.
Social Conditions	In the future, M&I communities will continue to grow and agricultural activities may be reduced as lands are converted to accommodate the growth as compared to existing conditions.	Increased deliveries of M&I CVP water supplies may encourage industries to continue to operate in the urban areas. If other water supplies are used by irrigation users, there may be no change in employment. If the frequency of short-term fallowing is increased, employment may be reduced in 9 of 72 years.	Similar to Alternative 1A.	Similar to Alternative 1A	Similar to Alternative 1A.
Environmental Justice	Projections by U.S. Census Bureau and the State of California were used to develop the basis of comparison for Environmental Justice.	Increased deliveries of M&I CVP water supplies may encourage industries to continue to operate in the urban areas. If other water supplies are used by irrigation users, there may be no change in employment. If the frequency of short-term fallowing is increased, employment may be reduced in 9 of 72 years.	Similar to Alternative 1A.	Similar to Alternative 1A	Similar to Alternative 1A.
Secondary Growth Impacts	Growth would continue in M&I communities, as described in the county general plans and associated environmental documentation.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.

CHAPTER 1
PURPOSE AND NEED

CHAPTER 1
Purpose and Need

INTRODUCTION

This Environmental Assessment (EA) was prepared to evaluate alternatives considered by the U.S. Bureau of Reclamation (Reclamation) to implement a Municipal and Industrial (M&I) Water Shortage Policy for the Central Valley Project (CVP). The purposes of the policy are to: (1) define water shortage terms and conditions applicable to all CVP M&I contractors, as appropriate; (2) establish CVP water supply levels that, together with the M&I contractors' drought water conservation measures and other water supplies, (a) would sustain urban areas during droughts, and (b) during severe or continuing droughts would assist the M&I contractors in their efforts to protect public health and safety; and (3) provide information to M&I contractors for development of drought contingency plans.

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).

BACKGROUND OF CENTRAL VALLEY PROJECT ALLOCATIONS

The CVP is operated as an integrated system with reservoirs on the Trinity, Sacramento, American, Stanislaus, and San Joaquin rivers. The June 2004 "Long-Term Central Valley Project Operations Criteria and Plan, CVP-OCAP" (OCAP 2004) described the authorizations for the CVP under the Rivers and Harbors Act of August 26, 1937, which act, provided that the CVP 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." The OCAP 2004 described recent changes, in accordance with the Central Valley Project Improvement Act (CVPIA) that "modified the 1937 act and specified that the dams and reservoirs of the CVP should now be used first, for river regulation, improvement of navigation, and flood control; second for irrigation and domestic uses and fish and wildlife mitigation, protection and restoration purposes; and third for power and fish and wildlife enhancement."

The OCAP 2004 also described constraints to the operations of the CVP. The OCAP 2004 stated that:

> "State Water Resources Control Board (SWRCB) decisions and orders and the biological opinions for endangered species largely determine Delta regulatory requirements for water quality, flow, and operations. SWRCB Water Quality Control Plan (WQCP) and applicable water rights decisions, as well as other agreements, [were] considered in determining the operations of the Central Valley Project (CVP) and the State Water Project (SWP)."

The applicable water rights decisions and orders include satisfaction of senior water rights and riparian water rights, requirements of water right settlement and exchange contracts with the CVP, water rights agreements with the CVP, as well as water quality requirements established by the State Water Resources Control Board. The CVPIA also requires the CVP to provide water for refuge water supplies and for implementation of fish and wildlife requirements under Section 3406(b)(2) of the CVPIA.

The OCAP 2004 also described the allocation of CVP water supply for the 253 water service contracts and Sacramento River Settlement Contracts, as described in the following manner. "Those water service contracts had many varying water shortage provisions. In some contracts, M&I and agricultural use shared shortages equally. In most of the larger M&I contracts, agricultural water was shorted 25 percent of its contract entitlement before M&I water was shorted, and then both shared shortages equally."

As the CVP system was being developed, there were no shortage allocations because the actual water demands were less than the water supply each year. The first drought occurred in 1977-1978 when severe hydrologic conditions resulted in extremely restricted water supplies. The second drought occurred in 1987-1992. Following adoption of the CVPIA and subsequent changes of the SWRCB orders and decisions related to operations of the CVP, water supplies also were reduced due to regulatory conditions as well as hydrologic reductions. For example, limitations on the CVP ability to convey water across the Delta in accordance with SWRCB orders and decisions can result in lower allocations for CVP water users located south of the Delta as compared to CVP water users located north of the Delta.

PURPOSE AND NEED FOR A MUNICIPAL AND INDUSTRIAL WATER SHORTAGE POLICY

In January 1993, many M&I CVP water service contractors were concerned about the future allocations of water supplies provided by the CVP. Reclamation subsequently initiated an effort to develop an M&I water shortage policy that would be incorporated into long-term water service contracts during the contract renewal process implemented under the CVPIA.

As part of the process to develop the M&I Water Shortage Policy, the M&I water service contractors identified the following reasons for the need for increased water supply allocations: (1) M&I long-term planning processes and facilities construction for M&I users require long-term knowledge of water supply allocations; (2) CVP M&I water service rates are higher than agricultural water service contract rates and therefore should coincide with increased allocations; (3) agricultural users have more flexibility for water shortages; and (4) urban areas must have a good understanding of the allocations of each supply to manage other supplies.

During this process, the agricultural water service contractors commented that changes to the CVP allocation process could reduce agricultural water supplies and that increased M&I allocations should be implemented through willing seller/willing buyer water transfers. Agricultural water service contractors also indicated that if higher water rates were used as justification of increased allocations, then agricultural users should be allowed to also pay higher water rates for greater allocations.

In response to these concerns and the need to more fully define water shortage criteria allocations following adoption of CVPIA, Reclamation initiated development of the M&I Water Shortage Policy. Involved stakeholders submitted language for the M&I Water Shortage Policy as part of several proposed policies, as summarized in Chapter 2. Portions of the proposed language were used by Reclamation in the development of the alternatives considered in the EA.

Thus, given the above discussion and background the purpose and need of the proposed action is to develop an M&I shortage policy recognizing the needs of various segments of the water user community and how those needs could be addressed in times of water shortages.

RELEVANT ACTIONS AND DECISIONS TO BE MADE

The long-term renewals of M&I water service contracts are currently being evaluated in separate environmental documents. The renewal contracts with M&I water service contractors are expected to include provisions referring to the then existing M&I water shortage policy. This EA is being prepared to support the final decision on a M&I water shortage policy.

This EA has been developed based upon information presented in other environmental documents prepared by Reclamation and other public agencies. Those documents include the Programmatic Environmental Impact Statement (PEIS) for the CVPIA and the associated Biological Opinion; NEPA documents completed by Reclamation for CVP amendatory contracts, contract assignments, and interim contract renewals and the related biological opinions; and the Long-Term CVP Operations Criteria and Plan and biological assessment.

STUDY AREA

The Study Area for this EA includes areas with CVP facilities, CVP water users, or water rights holders that could be affected by the action alternatives. These areas are located throughout the Central Valley, and in Trinity, Contra Costa, Alameda, Santa Clara, and San Benito counties, as shown in Figure 1-1.

The CVP water service contractors included in this analysis are the contractors with a water service contract that is expected to reference the proposed policy upon renewal. As described in the June 30, 2004 Long-Term Central Valley Project and State Water Project Operations Criteria and Plan Biological Assessment (OCAP 2004 biological assessment), "Reclamation expects the proposed policy [M&I Water Shortage Policy] will not be referenced in contracts for the (1) Friant Division, (2) New Melones interim supply, (3) Hidden and Buchanan Units, (4) Cross Valley contractors, (5) Sugar Pine Units (subject of title transfer legislation) [this unit was transferred to Foresthills Public Utilities District]; (6) San Joaquin settlement contractors, and (7) Sacramento River settlement contractors."

STUDY PERIOD

The analysis period for this EA is the term of the long-term contracts being considered under separate environmental documentation for M&I water users. For the long-term contract renewals, the contract term for agricultural-irrigation contracts is 25 years, or to the Year 2030. The contract term for mixed agricultural-irrigation and M&I contracts is 25 years, or to the Year 2030. The analysis period for the M&I-only contracts is a 40-year term, or to the Year 2045.

Water Needs Assessments were performed for each long-term CVP contractor. Each Water Needs Assessment was predicated on the amount of water that would be beneficially used by the year 2025, and was used to determine the long-term Contract Total. The Water Needs Assessments showed that contractor’s future water demand equaled or exceeded their full Contract Total at year 2025. No interim time period conditions were considered or evaluated with respect to build-out conditions or changes in the CVP contract. Thus, all environmental impacts associated with use of the full Contract Total would be manifested at the end of the 25-year Water Needs Assessment period (2025). Therefore, the initial analysis of impacts in this EA covers a 25-year period from 2004 through 2030 and is extended to 2045.

If there are changes in actual amount of CVP water delivered after full build-out in year 2030, those are anticipated to be a result of allocations reflecting future CVP-wide demands, hydrology, or reductions in the allocations of CVP water supply because existing water rights holders are more fully using their water rights. Resulting changes would be further reductions in allocations. Any decrease in the actual amount of water allocated would not result in additional development of M&I service areas following 2030. Changes due to currently unforeseen conversion of irrigation water demands to M&I water demands would be subject to evaluation in separate environmental documentation.

PUBLIC INVOLVEMENT PROCESS

As described in Chapter 2, a public process was initiated in 1993 by Reclamation to develop an M&I Water Shortage Policy. Reclamation initiated the public process and continued the process as part of the Administrative Proposal efforts to implement CVPIA. Reclamation issued draft policies in 1994, 1996, 1997, 2000, and 2001. Public comments received on these drafts and at other public meetings were used to develop the range of alternatives considered in this EA. A draft EA and draft FONSI were made available for a 30-day public review and comment period in March, 2005; comments and responses to comments are found in Attachment E of this EA.

OTHER RELATED DOCUMENTS OR ACTIVITIES

There are several activities being implemented by Reclamation as part of the obligation to manage and operate the CVP. Related studies and projects that have been conducted recently or are reaching completion, are summarized in Table 1-1.

TABLE 1-1
RELATED ACTIVITIES

Project or Study and Lead Agency	Summary
Long-Term Contract Renewal of Existing CVP Water Service Contracts - Reclamation	Reclamation is in negotiation with CVP water contractors for renewal of long-term contracts.
Long-Term Renewal of Sacramento River Settlement Contracts - Reclamation	Reclamation has reached an agreement with all Sacramento River Settlement Contractors.
Implementation of CVPIA - Reclamation and U.S. Fish and Wildlife Service (Service)	Reclamation and Service are proceeding with implementation of other provisions of CVPIA, including stream restoration, refuge water supplies, and further analysis of yield replacement.
CALFED Bay-Delta Program - CALFED	Established in May 1995, the consortium of federal and state agencies is charged with the development of a long-term solution to the Delta water concerns. CALFED completed an Environmental Impact Report (EIR) and Environmental Impact Statement (EIS) as part of this process. Renewal of Long-Term CVP Contracts and existing CVP allocation policies are assumed in the CALFED EIR/EIS and Record of Decision.
Coordinated Operating Agreement (COA) - Reclamation and California Department of Water Resources	Provisions and requirements of the CVPIA, SWRCB Decision 1641, the CALFED Bay-Delta Program, and other agency regulations will lead to the need of evaluating operational roles and responsibilities of the SWP and CVP.
Operations Criteria and Plan (OCAP) Update - Reclamation	Operational criteria are periodically reviewed by the Service in accordance with the Endangered Species Act. CALSIM modeling used for OCAP Update was used as basis for the No Action Alternative in this EA.
Sacramento River Water Reliability Study - Reclamation, Placer County Water Agency, Sacramento Suburban Water District, City of Roseville, and City of Sacramento	The goal of the Sacramento River Water Reliability Study is to develop a water supply plan that involves a Sacramento River diversion to meet future water supply needs of the Placer and Sacramento counties region and to promote ecosystem preservation along the Lower American River
Trinity River Mainstem Fishery Restoration Environmental Impact Statement/Report - Service and Trinity County	Final EIS/EIR and Record of Decision were completed in 2001. Ensuing litigation prevented full implementation. Resolution of essentially all litigation has been achieved and the Trinity River restoration flows will be implemented.

CHAPTER 2

BACKGROUND OF THE MUNICIPAL AND INDUSTRIAL WATER SHORTAGE POLICY

CHAPTER 2
Background of the Municipal and Industrial Water Shortage Policy

INTRODUCTION

This chapter describes previous analyses that were used in the development of the alternatives that are described in Chapter 3.

CURRENT WATER SHORTAGE POLICY FOR CENTRAL VALLEY PROJECT WATER SERVICE CONTRACTORS

Water deliveries to CVP water service contractors are based primarily on the following six variables.

- Forecasted reservoir inflows to CVP reservoirs and Central Valley hydrologic water supply conditions
- Current amounts of storage in upstream reservoirs and San Luis Reservoir
- Projected water demands in the Sacramento Valley
- Instream and Delta regulatory requirements
- Annual management of 3406(b)(2) resources.

In many years, the combination of carryover storage and runoff into the CVP reservoirs is not sufficient to provide water Contract Totals to CVP water service contractors. Each CVP storage reservoir must be operated to provide water and to provide reasonable assurance that minimum storage, instream flows, diversion pools, and hydroelectric power pools can be sustained.

Since 1992, increasing constraints placed on operations by legislative and Endangered Species Act requirements have removed some of the capability of operations flexibility required to deliver water to CVP water service contractors. Water allocations to contractors located south of the Delta have been most affected by changes in operations by the legislative and regulatory changes. Even in above normal runoff years, it may not be possible to meet all competing needs for CVP water, especially south of the Delta. During prolonged droughts, all beneficial uses of CVP water are adversely affected.

In wetter years, CVP water service contract allocations are based upon the availability of water for users located both north and south of the Delta. In addition, allocations for users located south of the Delta may be further restricted due to regulatory and capacity limitations of the Delta export pumping facilities and, sometimes, by capacity limitations in San Luis Reservoir. Therefore, in wet, above normal, and below normal contract year types, allocations for irrigation and M&I CVP water service contractors may be greater for users located north of the Delta than users located south of the Delta.

In drier years, the maximum volume of water allowed by regulations to be diverted by Delta export pumping facilities is usually higher than the available volume of water for CVP water users. Therefore, deliveries to users located south of the Delta generally are not limited by Delta export restrictions in dry and critical dry years, and CVP water service contract allocations are similar for users located north of the Delta and south of the Delta users. In these years, allocations to all CVP water service contract users are limited by hydrologic conditions, rather than by regulatory and capacity limitations of the Delta export pumping facilities.

Allocation steps are determined for the contractors considered in this EA by availability of carry-over storage and inflow into CVP reservoirs on the Trinity, Sacramento, American, and Stanislaus rivers. The allocation steps, as described in OCAP 2004, are presented in Table 2-1.

TABLE 2-1

CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT EXISTING WATER SHORTAGE ALLOCATIONS

Allocation Step	Allocation to Irrigation Users	Allocation to M&I Users
1	100 percent	100 percent
2	100 to 75 percent	100 percent
3	75 to 70 percent	100 to 95 percent
4	70 to 65 percent	95 to 90 percent
5	65 to 60 percent	90 to 85 percent
6	60 to 55 percent	85 to 80 percent
7	55 to 50 percent	80 to 75 percent
8	50 to 25 percent	75 percent
9	25 to 20 percent	75 to 70 percent
10	20 to 15 percent	70 to 65 percent
11	15 to 10 percent	65 to 60 percent
12	10 to 5 percent	60 to 55 percent
13	5 to 0 percent	55 to 50 percent
14	0 percent	50 percent

CURRENT WATER CONSERVATION PROVISIONS AND PROGRAMS

The 1982 Reclamation Reform Act established the need for water service contractors to prepare water conservation plans.

The 1985 California Urban Water Management Planning Act required M&I users with more than 3,000 connections or use of more than 3,000 acre-feet/year to prepare an urban water management plan (UWMP). The UWMP must include existing and projected water supplies and demands, water supply allocations, comparison of supplies and demands, water demand management program (conservation), wastewater recycling, and water shortage contingency plans.

The 1988 SWRCB draft Water Quality Control Plan included specific water efficiency requirements. Although this plan was not adopted, these efforts led to the formation of the California Urban Water Conservation Council in 1992 through a Memorandum of Understanding. There are currently 178 voluntary signatories to this Memorandum of Understanding to implement water conservation plans. Agricultural users formed Agricultural Water Suppliers in California and also developed a memorandum of understanding for water use efficiency. There are currently 68 signatories to this Memorandum of Understanding, including many CVP water service contractors.

The CVPIA, adopted in 1992, included criteria that were consistent with Section 210(b) of the 1982 Reclamation Reform Act. Such criteria addressed cost-effective Best Management Practices (BMPs) that are economical and appropriate. The Urban BMPs are similar to the requirements in the California Urban Water Conservation Council's Memorandum of Understanding that was signed by many urban M&I users. Reclamation provided criteria in 2002 for BMPs so that "[urban] contractors will implement each BMP ... unless the Contractor provides adequate documentation for an exemption. BMP Number four, Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections, is the only BMP which is not exemptible."

In 1990 and 1991, Reclamation provided "hardship" water to some agricultural water service contractors to sustain permanent crops and to some M&I contractors to meet demands that could not be met from other sources during a year when contract allocations were reduced. In 1994, Reclamation provided "critical need" water for some agricultural and M&I contractors that had water conservation plans approved by Reclamation. This water was provided to the extent that water was available. Only 150,000 acre-feet were provided as compared to requests for more than 800,000 acre-feet.

In 2000, the California Governor's Drought Advisory Panel described a Critical Water Shortage Reduction Marketing Plan. The Plan suggested criteria for participation in a statewide water transfer program, including a plan to minimize the impacts of critical water shortages.

Reclamation prepared a Water Shortage Contingency/Drought Planning Handbook in 2003. The handbook includes worksheets to meet the requirements of Reclamation-wide water conservation policies and drought financial assistance from California Department of Water Resources and California Department of Health Services.

PREVIOUS PROPOSALS CONCERNING THE M&I WATER SHORTAGE POLICY FOR CENTRAL VALLEY PROJECT WATER SERVICE CONTRACTORS

In response to related actions and concerns of M&I CVP water service contractors concerning allocations of CVP water, Reclamation initiated development of an M&I Water Shortage Policy in 1992. There were several proposals prepared by Reclamation, as summarized below. Portions of these proposals and responses to the proposals were used by Reclamation in the development of the alternatives considered in the EA.

1993 Proposal

A 1993 draft M&I water shortage policy was released on February 17, 1994 as a draft interim policy until the CVPIA PEIS was completed. This draft interim policy identified three levels of water supply.

- Under shortages caused by regulations, such as SWRCB regulations or biological opinions: The minimum deliveries to M&I water service contractors would be either 75 percent of M&I contract amount or 85 percent M&I historic useage, whichever was greater.
- Under a hydrologic shortage: Minimum deliveries of 75 percent of M&I historic use
- In severe emergencies: Public health and safety water supply levels would be delivered. However, specific public health and safety levels were not identified in this proposal.

Comments received on this draft interim policy were used in the development of the 1996 and 1997 Administrative Proposals.

1996 and 1997 Administrative Proposals

In 1996, as part of the implementation process for CVPIA, Reclamation prepared draft administrative proposals on several issues that were of concern to stakeholders and required issue-specific analysis. One of those proposals was the Urban Water Supply Reliability Proposal. The initial draft was developed with input from an Urban Reliability Team. This team included representatives of water users, regulatory agencies, and environmental stakeholder organizations. The 1996 Administrative Proposal addressed (1) minimum level of allocations to urban water contractors; (2) consideration/protection of other water supplies in urban shortage allocations; and (3) allocations of converted or transferred CVP water from agricultural to M&I use. Reclamation responded in the administrative proposal that these issues would be considered in a future Urban Water Supply Reliability proposal.

Comments received on the draft administrative proposal were used in the development of the 1997 Administrative Proposal.

The 1997 Administrative Proposal suggested using the following two levels of shortage allocations.

- Under shortages caused by regulations and/or hydrology: Minimum deliveries of 75 percent of M&I historic useage adjusted for growth, supplemental water supply status, and conservation practices.
- In severe emergencies: Water would be provided for public health and safety levels. Public health and safety levels were not identified in this proposal.

The 1997 Administrative Proposal also stated that the M&I shortage policy would only apply to that portion of the CVP water used historically for M&I purposes and projected for M&I purposes as of September 30, 1994 (as shown in Schedule A-12 of the 1996 Municipal and Industrial Water Rates book for the year 2030). Two levels of allocations were considered: (1) minimum allocations regardless of the presence of other water supplies; and (2) higher allocations if an M&I contractor would pay a higher M&I CVP water service contract rate, but not to a level that would jeopardize deliveries of public health and safety levels in severe emergencies.

March 2000 Proposal

Reclamation incorporated comments on the administrative proposal and other information collected in public outreach efforts to prepare a Draft M&I Water Shortage Policy in March 2000. This draft policy required each M&I water service contractor to prepare a water management plan in coordination with the water conservation management plan required by the Reclamation Reform Act and CVPIA.

The draft policy stated that the shortage allocation should be based upon historical M&I water use adjusted for growth and extraordinary water conservation measures. The draft policy also indicated that the M&I allocation would be based upon the M&I demand projected as of September 30, 1994 (as shown in Schedule A-12 of the 1996 Municipal and Industrial Water Rates book for the year 2030) and did not include water converted or transferred after September 30, 1994.

This proposal recommended using Steps 1 through 8, as listed in Table 2-1. When agricultural allocations were below 25 percent, M&I water allocations would depend upon CVP water supply availability and possibly consider the availability of other water supplies available to CVP contractors. However, the proposal stated that Reclamation would consider public health and safety to be a priority. The draft policy indicated that it may be necessary to reduce Level 2 refuge water supplies or Section 3406(b)(2) water minimum allocations to less than CVPIA-mandated levels to provide public health and safety allocations.

Following the publication of the March 2000 Proposal, Reclamation published a position paper, "Position #2: Criteria for the Public Health and Safety as the term will be used in the M&I Water Shortage Policy." This position paper stated "Reclamation does not have specific criteria for public health and safety levels during a period of such severe water shortage. In times of such severe water shortage, Reclamation will work with the Contractors, the California State Department of Health Services and other appropriate State agencies to determine public health and safety levels. Currently, Reclamation considers the public health and safety level to be based on interior residential use, sanitation, and fire protection. Reclamation estimates on the average interior residential use would be at 50 gallons/capita/day."

March 2001 Proposal

Comments received on the March 2000 Proposal and several position papers published in 2000 were used in the development of the March 2001 Proposal. This proposal had the following modifications to the March 2000 policy.

This draft proposal required each M&I water service contractor to provide a copy of the Urban Water Management Plan or similar water management plan that includes a drought contingency plan to protect public health and safety and a water conservation plan as required by CVPIA. This proposal did not include a specific public health and safety level.

The March 2001 Proposal stated that the shortage allocation should be based upon historical M&I water use adjusted for growth and extraordinary water conservation measures. The March 2001 Proposal also indicated that the M&I allocation would be based upon the M&I demand projected as of September 30, 1994 (as shown in Schedule A-12 of the 1996 Municipal and Industrial Water Rates book for the year 2030). Water converted or transferred after September 30, 1994 would be subject to the agricultural water allocation.

During shortages, CVP water would be allocated using Steps 1 through 8, as described in Table 2-1. When agricultural allocations are below 25 percent, M&I water allocations would depend upon CVP water supply availability and possibly consider the availability of other water supplies available to CVP contractors. However, the proposal stated that Reclamation would consider public health and safety to be a priority. The proposal indicated that the M&I water allocations may be reduced below 75 percent and does not include reductions to Level 2 refuge water supplies or Section 3406(b)(2) water minimum allocations to less than CVPIA-mandated levels.

The proposal stated that Reclamation would provide all M&I contractors (including those with water converted or transferred to M&I purposes after September 30, 1994) with a water supply at public health and safety levels. The proposal did not identify specific quantities of water needed for public health and safety levels, but Reclamation had assumed that such levels were less than 75 percent of M&I water service contract quantities.

September 2001 Proposal

Following review of comments received on the March 2001 Proposal, Reclamation prepared a draft proposal for M&I Water Shortage Policy in September 2001. The September 2001 Proposal was published in the October 30, 2001 Federal Register, Volume 66, No. 210 for a 30-day public review and comment period. The proposal was similar to the March 2001 proposal. However, several provisions were significantly different.

The draft proposal stated that the shortage allocation should be based upon historical M&I water use adjusted for growth, extraordinary water conservation measures, and use of non-CVP water sources. The draft proposal also indicated that the M&I allocation would be based upon the M&I demand projected as of September 30, 1994 (as shown in Schedule A-12 of the 1996 Municipal and Industrial Water Rates book for the year 2030). Water converted or transferred after September 30, 1994 would be subject to the agricultural water allocation. The transferred water may become eligible for M&I water allocation following a separate analysis of impacts to agricultural water supplies and mitigation of all adverse impacts to agricultural water supplies; converted water may become eligible for M&I water allocation following a separate analysis of impacts to agricultural water supplies and to other water supplies and mitigation of all of those impacts.

During shortages, CVP water would be allocated using Steps 1 through 8, as described in Table 2-1. When agricultural allocations are below 25 percent, M&I water allocations would depend upon CVP water supply availability and possibly consider the availability of other water supplies available to CVP contractors. However, the proposal stated that Reclamation would consider public health and safety to be a priority. For an M&I contractor to be eligible for the “minimum shortage allocation” of 75 percent of adjusted historical use, the contractor’s water service contract must reference M&I water shortage policy. In addition, the water service contractor must (1) have developed and be implementing a water conservation plan that meets CVPIA criteria and (2) be measuring such water consistent with section 3405(b) of the CVPIA. Reclamation intends to incorporate in all new, renewed, and amended water service contracts, a provision that references the CVP M&I water shortage policy.

The proposal indicated that M&I water allocations may be reduced below 75 percent and does not include reductions to Level 2 refuge water supplies or Section 3406(b)(2) water minimum allocations to less than CVPIA-mandated levels.

The draft proposal indicates that when the Governor declares a water shortage emergency applicable to a specific contractor or contractors, or when Reclamation in consultation with the contractor determines a water shortage emergency exists, Reclamation would deliver CVP water to M&I contractors at not less than a public health and safety water supply level if CVP water is available. At that time the public health and safety level would be determined by the contractor and reviewed by Reclamation. The draft proposal does indicate that Reclamation would provide a water supply to all M&I contractors (including those with water converted or transferred to M&I purposes after September 30, 1994) with a water supply at public health and safety levels, if CVP water is available.

This draft proposal required each M&I water service contractor to develop and implement a water conservation plan and a water measuring plan consistent with the requirements of CVPIA. Each M&I contractor also must provide a drought contingency plan to protect public health and safety. This requirement may be met if a contractor provides a copy of the Urban Water Management Plan or similar water conservation plan that includes a drought contingency plan to protect public health and safety.

CHAPTER 3

DESCRIPTION OF ALTERNATIVES

CHAPTER 3
Description of Alternatives

INTRODUCTION

This chapter describes the frequency of shortage conditions when M&I CVP water service contract allocations would be less than 75 percent, assumptions for providing water to increase M&I CVP water allocations, methodology to calculate public health and safety water quantities, and alternatives considered in this EA.

FREQUENCY OF SHORTAGE CONDITIONS FOR CENTRAL VALLEY PROJECT M&I WATER SERVICE CONTRACTORS IN THE NO ACTION ALTERNATIVE

Reclamation uses the CALSIM II model to simulate operations of the CVP, as described in OCAP 2004. This model uses generalized rules to operate the CVP and SWP systems. Therefore, the results are a gross estimate and may not reflect how actual operations occur. The model can be used only in a comparative manner to reflect how changes in facilities and operations may affect the CVP-SWP system.

The CALSIM II model uses historical hydrologic records for the system from 1922 through 1994. The modeled system is operated for 72 consecutive years to reflect the impacts of critical dry to wet periods and associated carryover storage conditions. Reclamation has developed model assumptions with projected level of development and associated water demands for non-CVP water users for Existing Conditions and the Year 2020. The CALSIM II model for Year 2020 Level of Development indicated that M&I CVP water service contract allocations would be less than 75 percent in 13 years, as shown in Table 3-1.

SOURCE OF WATER TO INCREASE WATER ALLOCATIONS TO M&I WATER SERVICE CONTRACTORS FOR ACTION ALTERNATIVES

In years when allocations to Irrigation and M&I CVP water service contractors are less than Contract Totals, there are no surplus flows. It is also not possible to reduce deliveries to water rights holders, environmental commitments, or Level 2 refuge water supplies. These demands must be met prior to deliveries under water service contracts, as described in OCAP 2004.

As shown in Table 3-1, there are no allocations to Irrigation CVP water service contractors in 4 of the 13 years. In addition, the allocations are very small in two additional years when allocations to Irrigation CVP water service contractors are 2 to 3 percent.

As part of this analysis, several methods were considered to provide the additional water to the M&I CVP water service contractors. During the 13 drier years of the 72 years considered in the CALSIM II model runs when M&I CVP water service contract allocations are less than 75 percent, 10 of the 13 years are considered "Critical (Dry)" and 3 years are considered "Dry." Except for 2 years, these years occur following "Dry" or "Below Normal" years when the CVP reservoir volumes are extremely low; no flood control spills occur, and deliveries to Sacramento River Settlement Contractors, San Joaquin River

Exchange Contractors, and Central Valley refuges are reduced to 75 percent of Contract Total in accordance with contract agreements and federal law.

TABLE 3-1

CONTRACT YEARS WITH M&I CENTRAL VALLEY PROJECT WATER ALLOCATIONS LESS THAN 75 PERCENT BASED ON CALSIM II MODEL RESULTS FOR 2020 LEVEL OF DEVELOPMENT

Contract Year	M&I CVP Water Allocation based on CALSIM II 2020 Model Run	Irrigation CVP Water Allocation based on CALSIM II 2020 Model Run
1924	50 percent	0 percent
1933	50 percent	0 percent
1934	50 percent	0 percent
1990	50 percent	0 percent
1988	52 percent	2 percent
1929	53 percent	3 percent
1926	54 percent	4 percent
1977	54 percent	4 percent
1931	57 percent	7 percent
1991	63 percent	12 percent
1976	66 percent	17 percent
1932	70 percent	22 percent
1960	74 percent	23 percent

The CVP is operated in a manner to provide flood protection and to provide water for water rights holders, refuges in accordance with federal law, and instream flows and Delta outflow in accordance with the requirements of state and federal agencies. Therefore, to increase M&I CVP water service contract deliveries, concepts would include: 1) storage of additional water during wet years, 2) reduction of deliveries to Irrigation CVP water service contractors in all years with storage of the non-delivered water in CVP reservoirs, or 3) reduction of deliveries to Irrigation CVP water service contractors in the years when deliveries to M&I CVP water service contractors are less than 75 percent.

In all years, the CVP reservoirs are operated to maximize storage while providing storage space for flood control to protect downstream communities. Water stored in wetter years would probably be spilled to provide flood control space in the reservoirs. Therefore, it is very difficult to increase the amount of stored water in wetter years or in other years if deliveries to Irrigation water service contractors were reduced. Therefore, this analysis assumed that the additional water for deliveries to the M&I water service contractors in the 13 years would be made available by reducing deliveries to Irrigation CVP water service contractors within the shortage year considered.

In the American River Division, it is not possible to convey water from the Sacramento River to users that divert from the American River. The American River Division is not projected to include any Irrigation CVP water service contracts under the No Action Alternative. Therefore, it is not possible to increase M&I CVP water service contract allocations to the American River Division unless new conveyance facilities are constructed. Reclamation has initiated an evaluation of these types of facilities in a separate study. If those facilities are approved, increasing CVP water allocations to American River Division M&I CVP water service contractors could be implemented. However, for the purposes of this EA, increased allocations to American River Division water service contractors are identified but not evaluated.

MUNICIPAL AND INDUSTRIAL CENTRAL VALLEY PROJECT WATER SERVICE CONTRACTORS

To evaluate the alternatives, it is necessary to identify the M&I CVP water service contractors subject to the M&I Water Shortage Policy. The M&I CVP water service contractors that are subject to the M&I Water Shortage Policy and CVP Contract Totals are shown in Table 3-2. Also shown in Table 3-2 are the M&I Needs as determined by the 2004 Water Needs Assessment; and the projected M&I deliveries for year 2030 as of September 30, 1994 (1996 CVP M&I Ratebook Schedule A-12 Year 2030 Figure) and Contract Totals derived from Public Law 101-514, or amendatory contracts. Details about the assumptions used in the development of these values are described in Chapter 4.

TABLE 3-2

MUNICIPAL AND INDUSTRIAL CENTRAL VALLEY PROJECT WATER SERVICE CONTRACTORS CONSIDERED IN EVALUATION OF THE SHORTAGE POLICY

CVP Division	CVP Contractor	CVP Contract Total (acre-feet)	Total M&I Need (acre-feet) [a] (includes Needs met by CVP and other supplies)	1996 CVP M&I Ratebook Schedule A-12 Year 2030 Figure (acre-feet) [b]
Trinity River	Shasta Community Services District	1,000	1,000	1,000
	Shasta County Service Area - Keswick #25	500	500	500
	Bella Vista Water District (not including 140 acre-feet delivered by Shasta County Water Agency service area)	24,000	17,774	7,000
	Clear Creek Community Services District	15,300	8,283	10,300
	Centerville Community Services District (assignment from Shasta County Water Agency)	2,900	2,900	2,900
	Subtotal	**43,700**	**30,457**	**21,700**
Shasta	Shasta County Water Agency (after assignment to Centerville Community Services District)	2,100	2,100	2,100
	Mountain Gate Community Services District	350	350	350
	City of Shasta Lake	4,400	5,347	4,400 (based upon amended contract)
	City of Redding - Buckeye Contract	6,140	33,200	3,760
	U.S. Forest Service - Centimundi Boat Ramp	10	10	10
	Subtotal	**13,000**	**41,007**	**10,620**

TABLE 3-2

MUNICIPAL AND INDUSTRIAL CENTRAL VALLEY PROJECT WATER SERVICE CONTRACTORS CONSIDERED IN EVALUATION OF THE SHORTAGE POLICY

CVP Division	CVP Contractor	CVP Contract Total (acre-feet)	Total M&I Need (acre-feet) [a] (includes Needs met by CVP and other supplies)	1996 CVP M&I Ratebook Schedule A-12 Year 2030 Figure (acre-feet) [b]
Sacramento River	Colusa County Water District	62,200	150	0
	County of Colusa - Stonyford	40	40	40
	Whitney Construction	25	25	25
	Elk Creek Community Services District	15	100	15
	U.S. Forest Service - campground	45	45	0
	Subtotal	**62,325**	**360**	**80**
American River	El Dorado Irrigation District - El Dorado Hills and Lake Hills Estate, only (does not include PL 101-514 contract because NEPA not complete)	7,550	7,500	7,500
	City of Roseville	32,000	54,900	32,000
	San Juan Water District	24,200	76,632	10,800
	Sacramento Municipal Utility District - Rancho Seco (assumes 30,000 acre-feet assigned to Sacramento County Water Agency and 7,000 acre-feet to be subcontracted to the City of Folsom)	30,000	33,942	15,000
	Sacramento County Water Agency (includes 30,000 acre-feet assigned from Sacramento Municipal Utility District)	52,000	93,554	52,000
	Placer County Water Agency	35,000	74,500	133,000
	East Bay Municipal Utility District (per amendatory contract) [c]	150,000	193,200	150,000
	Subtotal	**330,750**	**534,228**	**298,750**
Eastside	Tuolumne Utilities District	9,000	9,000	not included

TABLE 3-2

MUNICIPAL AND INDUSTRIAL CENTRAL VALLEY PROJECT WATER SERVICE CONTRACTORS CONSIDERED IN EVALUATION OF THE SHORTAGE POLICY

CVP Division	CVP Contractor	CVP Contract Total (acre-feet)	Total M&I Need (acre-feet) [a] (includes Needs met by CVP and other supplies)	1996 CVP M&I Ratebook Schedule A-12 Year 2030 Figure (acre-feet) [b]
Delta	Broadview Water District	27,000	20	20
	Del Puerto Water District	140,210	200	200
	Byron Bethany Irrigation District	20,600	800	420
	City of Tracy	17,500	46,000	10,000
	Patterson Irrigation District	16,500	1,000	0
	Contra Costa Water District	195,000	207,200	194,000
	U.S. Department of Veterans Affairs - Cemetery	450	450	450
	Subtotal	**409,760**	**230,475**	**205,090**
West San Joaquin	Westlands Water District	1,150,000	4,938	11,000
	San Luis Water District	125,080	2,000	578
	Pacheco Water District	10,080	80	175
	Panoche Water District	94,000	100	
	City of Avenal	3,500	3,891	3,500
	City of Coalinga	10,000	9,018	10,000
	City of Huron	3,000	2,266	3,000
	California Department of Fish and Game	10	10	10
	Subtotal	**1,395,670**	**22,303**	**16,510**
San Felipe	San Benito County Water Conservation and Flood Control District	43,800	16,273	8,250
	Santa Clara Valley Water District	152,500	549,995	130,000
	Subtotal	**196,300**	**566,268**	**138,250**
TOTAL		**2,460,505**	**1,440,923**	**691,000**

TABLE 3-2

MUNICIPAL AND INDUSTRIAL CENTRAL VALLEY PROJECT WATER SERVICE CONTRACTORS CONSIDERED IN EVALUATION OF THE SHORTAGE POLICY

CVP Division	CVP Contractor	CVP Contract Total (acre-feet)	Total M&I Need (acre-feet) [a] (includes Needs met by CVP and other supplies)	1996 CVP M&I Ratebook Schedule A-12 Year 2030 Figure (acre-feet) [b]

[a] Projected M&I Need for Year 2025 based upon 2004 Water Needs Assessment and information from local agency reports for contractors without detailed M&I Water Needs Assessment. Includes demands to be served by CVP water service contract water and all other water supplies for the service area; therefore, value may be greater than CVP water service contract

[b] Based upon M&I contract amounts as determined as of September 30, 1994 and first published in Schedule A-12 of the 1996 M&I Ratebook, or contract amounts in Public Law 101-514, or contract amounts in amendatory contracts completed since 1994.

[c]Up to 133,000 acre-feet/year and 165,000 acre-feet over three consecutive dry years per the Amendatory Contract

DEVELOPMENT OF PUBLIC HEALTH AND SAFETY WATER QUANTITIES TO BE USED IN THE ACTION ALTERNATIVES

The M&I Water Shortage Policy refers to the allocation of CVP water based upon "public health and safety" criteria when the allocation to CVP agricultural water service contractors would be less than 25 percent and the allocation to M&I CVP water service contractors would be less than 75 percent. CVP contractors are required to develop water conservation plans that will include the identification of public health and safety water quantities for each M&I contractor. However, these quantities are not currently available for use in this analysis but are expected to be available under the terms and conditions of the CVP M&I Shortage Policy once that policy is finalized and implemented.

As part of this evaluation, information developed by Reclamation, water service contractors, and by other non-CVP water users was reviewed. A literature search was conducted to identify studies that either developed public health and safety criteria or extended water supply emergency criteria. Criteria used for short-term emergencies (such as a pipeline break) were not included in this analysis because those values generally were considered to be used for a period of less than a week and did not consider methods to maintain local economies or long-term changes in behavior.

Many studies identified BMPs to be implemented within the communities and incremental savings that could be achieved through these actions. Most studies acknowledged that the communities had implemented long-term measures to reduce water demands. Therefore, the incremental savings for emergency conservation measures were limited. Only a limited number of reports included specific reduction targets for overall water system demand. The results of these reports are summarized in Table 3-3.

TABLE 3-3

SUMMARY OF PUBLIC HEALTH AND SAFETY CRITERIA DEVELOPED BY WATER AGENCIES TO BE USED IN ACTION ALTERNATIVES

Study	Water Condition	Suggested Values for Residential Use	Suggested Values for Commercial and Industrial Use	Suggested Values for Overall M&I Use
U.S. Bureau of Reclamation Drought Handbook - Section 2.B, April 2003	Drought Stage 4: Critical 35 to 50 percent reduction in water supply	50 gallons/capita/day (200 cubic feet/month/person)	65 percent of average use	Not included
U.S. Bureau of Reclamation Letter to City of Shasta Lake - March 31, 1994	Public Health and Safety Requirements	50 gallons/capita/day	80 percent of average use	Not included
Alameda County Water District Urban Water Management Plan, Section 7, 2001	30 to 50 percent reduction in water supply	64 gallons/capita/day at 30 percent reduction and 52 gallons/capita/day at 50 percent reduction	Commercial: 85 percent of average use at 30 percent reduction and 45 percent of average use at 50 percent reduction Industrial: 85 percent of average use at 30 percent reduction and 75 percent of average use at 50 percent reduction	Not included
Contra Costa Water District Urban Water Management Plan, 2000	Public Health and Safety Requirements occurring during droughts	68 gallons/capita/day	Large industrial: 90 percent of average use	65 percent of average use based upon suggestions from California Department of Water Resources
Marin Municipal Water District (based upon Perspectives on Water, 1988)	Water rationing program during 1976-77 drought	50 gallons/capita/day	Not included	Not included
Tuolumne Utilities District Urban Water Management Plan 2000 Update	Stage 3 Water Conservation Lifeline Usage	3,740 gallons/dwelling unit/month (38 gallons/capita/day if 3.2 people/unit)	Not included	Not included
California Urban Water Association, Drought Management Measures Compendium of Results, 1991	Summary of measures adopted by California water agencies by June 1, 1991	87.5 to 62.5 gallons/household assuming 4 persons/household	Not included	Not included
State of Pennsylvania Guidelines for the Development of a Local Water Rationing Plan, August 2001	Public Health and Safety within Emergency Service Area	40 gallons/capita/day	Not included	Not included

TABLE 3-3

SUMMARY OF PUBLIC HEALTH AND SAFETY CRITERIA DEVELOPED BY WATER AGENCIES TO BE USED IN ACTION ALTERNATIVES

Study	Water Condition	Suggested Values for Residential Use	Suggested Values for Commercial and Industrial Use	Suggested Values for Overall M&I Use
Morris County, New Jersey Local Water Emergency Regulations, March 2000	Public Health, Safety, and Welfare under Phase 2. Further rationing under Phase 3. Disaster stage in Phase 4 and does not guarantee public health and safety	40 gallons/capita/day	Not included	Not included
Cash (Texas) Water Supply Corporation, Water Conservation Plan	Public Health and Safety Requirements	8,000 gallons/dwelling unit/month (83 gallons/capita/day if 3.2 people/unit)	Not included	Not included
Evaluations of Alternatives for Middle Rio Grande Regional Water Plan (Texas)	Drought Emergency	45 gallons/capita/day	Not included	90 gallons/capita/day
Rockland County, New York	Severe Drought Emergency	50 gallons/capita/day	Commercial: 75 percent of average use	Not included

Public Health and Safety Criteria for M&I Central Valley Project Water Service Contracts

This EA recognizes that specific values would be developed by each water service contractor following execution of the long-term contract renewals. However, for the purposes of the evaluations in this EA, it is assumed that the "public health and safety residential water use" value would be:

- **Residential = 50 gallons/capita/day**
- **Commercial = 80 percent of average commercial water demand**
- **Industrial = 90 percent of average industrial water demand**
- **System Losses = 80 percent of identified system losses**

The residential criteria is consistent with criteria presented in Reclamation reports. The commercial criteria can be accomplished by reducing landscape irrigation at commercial complexes. Many commercial establishments, such as retail stores and restaurants, cannot further reduce water use without major changes in business hours or other actions that could effect local economies. The industrial criteria reflects recent efforts by industries to implement water conservation, especially for manufacturing facilities. System water losses usually occur due to leakage at pipeline joints and at reservoirs and are difficult to reduce except with major construction projects. Many communities will consider implementation of some construction projects during extreme droughts. Therefore, for the purpose of this EA, it is assumed that system losses can feasibly be reduced to 80 percent of system losses.

In summary, the public health and safety water quantities have been developed for use in this EA to estimate adequate water for consumption, operation of necessary water and wastewater facilities, and to avoid economic disruption.

Specific public health and safety water quantities for the M&I CVP water service contractors developed for use in this EA are described for each contractor in Chapter 4. These values will be eventually replaced by public health and safety water quantities to be developed by CVP contractors under the terms and conditions of the CVP M&I Shortage Policy once that policy is finalized and implemented.

DEVELOPMENT OF NO ACTION ALTERNATIVE AND ACTION ALTERNATIVES

Alternatives to the M&I Water Shortage Policy were developed based upon information compiled during the review of previous proposals as described in Chapter 2 and information collected during the scoping process. Two main alternatives, each with two sub-alternatives, were considered in addition to the No Action Alternative.

Alternative 1A is identical to the September 2001 draft water shortage policy. Implementation of Alternative 1B is similar in nature, but would require modification of the September 2001 draft water shortage policy. The September 2001 draft water shortage policy did not include provisions that are presented in Alternatives 2A and 2B. Therefore, implementation of Alternatives 2A or 2B would require modification of the September 2001 draft water shortage policy.

No Action Alternative

The No Action Alternative is defined by the operational criteria presented in the OCAP 2004. Allocations of CVP water service contract water would be in accordance with the current allocation process, as presented in Table 3-4. Some of the contractors are fully utilizing their M&I water service contracts. However, other contractors have not taken delivery of their full Contract Total at this time and will not fully utilize the contracts until expected build-out occurs. Specific water demands are described for each M&I water service contractor considered in this EA in Chapter 4.

Under the No Action Alternative, allocations would be based upon historical use adjusted for growth, extraordinary water conservation measures, and use of non-CVP water sources.

The water demands assumed in the No Action Alternative are the values developed by the water service contractors and Reclamation for the Water Needs Assessment prepared as part of the Long-Term Contract Renewal process. It is anticipated that these demands would occur prior to 2030 and would be applied to 40-year M&I water service contracts and to 25-year Irrigation/M&I water service contracts.

Alternative 1

Under Alternative 1, the allocation methodology for M&I CVP water service contractors would be the same as under the No Action Alternatives when the M&I CVP allocations are greater or equal to 75 percent, as described in Table 3-5. In years when the M&I CVP allocations are less than 75 percent, water would be re-allocated from the Irrigation CVP water service contractors to provide at least the public health and safety water quantity up to 75 percent of the CVP water service contract total and up to the total amount allocated to the Irrigation CVP water service contractors, if and when the water is available. There are some years in which allocations to Irrigation CVP water service contractors are at or near zero. In those years, the increased allocations to M&I CVP contractors would not be fully realized.

TABLE 3-4

NO ACTION ALTERNATIVE WATER SHORTAGE ALLOCATIONS

Allocation Step	Allocation to Irrigation Users	Allocation to M&I Users
1	100 percent	100 percent
2	100 to 75 percent	100 percent
3	75 to 70 percent	100 to 95 percent
4	70 to 65 percent	95 to 90 percent
5	65 to 60 percent	90 to 85 percent
6	60 to 55 percent	85 to 80 percent
7	55 to 50 percent	80 to 75 percent
8	50 to 25 percent	75 percent
9	25 to 20 percent	75 to 70 percent
10	20 to 15 percent	70 to 65 percent
11	15 to 10 percent	65 to 60 percent
12	10 to 5 percent	60 to 55 percent
13	5 to 0 percent	55 to 50 percent
14	0 percent	50 percent

TABLE 3-5

ALTERNATIVE 1 WATER SHORTAGE ALLOCATIONS

Allocation Step	Allocation to Irrigation Users	Allocation to M&I Users
1	100 percent	100 percent
2	100 to 75 percent	100 percent
3	75 to 70 percent	100 to 95 percent
4	70 to 65 percent	95 to 90 percent
5	65 to 60 percent	90 to 85 percent
6	60 to 55 percent	85 to 80 percent
7	55 to 50 percent	80 to 75 percent
8	50 to 25 percent	75 percent
9	25 to 20 percent[a]	The Maximum of: (1) 75 to 70 percent of M&I CVP contract total (2) Public health and safety water quantities up to 75 percent of Contract Total
10	20 to 15 percent[a]	The Maximum of: (1) 70 to 65 percent of M&I CVP contract total (2) Public health and safety water quantities up to 75 percent of Contract Total
11	15 to 10 percent[a]	The Maximum of: (1) 65 to 60 percent of M&I CVP contract total (2) Public health and safety water quantities up to 75 percent of Contract Total
12	10 to 5 percent[a]	The Maximum of: (1) 60 to 55 percent of M&I CVP contract total (2) Public health and safety water quantities up to 75 percent of Contract Total
13	5 to 0 percent[a]	The Maximum of: (1) 55 to 50 percent of M&I CVP contract total (2) Public health and safety water quantities up to 75 percent of Contract Total
14	0 percent[a]	The Maximum of: (1) 50 percent of M&I CVP contract total (2) Public health and safety water quantities up to 75 percent of Contract Total

[a]Allocations to Irrigation CVP contractors will be further reduced within the Contract Year to provide public health and safety water quantities to M&I CVP contractors within the same Contract Year, provided CVP water is available.

Allocations methodologies identical for Alternatives 1A and 1B.

Some of the contractors are fully utilizing their M&I water service contracts. However, other contractors have not taken delivery of their full Contract Total at this time and will not fully utilize the contracts until build-out occurs. Specific water demands are described for each M&I water service contractor considered in this EA in Chapter 4. Under Alternative 1, allocations would be based upon historical use adjusted for growth, extraordinary water conservation measures, and use of non-CVP water sources. An example of how the allocation is calculated for a contractor whose unadjusted historical use figure is less than Contract Total is presented in Exhibit 3-1.

There are two sub-alternatives for Alternative 1. Alternative 1A would apply M&I Allocation of the M&I Water Shortage Policy to the quantity of CVP water identified for M&I uses as of September 30, 1994, as shown on Schedule A-12 of the 1996 Municipal and Industrial Water Ratebook, and for those contract quantities specified in section 206 of Public Law 101-514. Alternative 1A is identical to the September 2001 draft proposal described in Chapter 2. Alternative 1B would apply the M&I allocation of the M&I Water Shortage Policy to quantity of CVP water identified for M&I uses under the Water Needs Assessment. The definition of water quantities that would be subject to public health and safety criteria would be defined in the M&I Water Shortage Policy. Figures 3-1 and 3-2 provide flow charts showing how M&I allocations are calculated under Alternatives 1A and 1B, respectively. Exhibits 3-2 and 3-3 provide examples of applications of Alternatives 1A and 1B, respectively. Under Alternatives 1A and 1B, a M&I contractor could request, following completion of separate environmental documentation, an M&I allocation for CVP water transferred or converted that would not otherwise be eligible for the M&I allocation under either Alternatives 1A or 1B (ie, for quantities over and above the maximum quantity of water to which the M&I allocation under the M&I Water Shortage Policy is applied under Alternatives 1A and 1B as described above).

Alternative 2

Alternative 2 provides a two-tier level of water supply allocations to M&I CVP water service contractors when M&I CVP allocations are less than 75 percent.

- First Tier: A portion of the M&I contract amount would be provided in a similar manner as defined in Alternative 1B.

- Second Tier: A portion of the M&I contract amount that when added to the First Tier provides up to 100 percent of industrial demand under Alternative 2A or 100 percent of total M&I demand under Alternative 2B, up to 75 percent of Contract Total. The second tier would be priced every year at a higher level than cost of service M&I water service contract rates. For the purpose of this EA, it is assumed that the second tier would be priced at 10 times the M&I cost of service rate shown in the 2003 CVP M&I Water Service Contract Ratebook as a "worst-case" scenario.

The M&I Water Shortage Policy would apply to that amount of M&I water identified under the Water Needs Assessment. Under Alternative 2, a M&I contractor could request, following completion of separate environmental documentation, an M&I allocation for CVP water transferred or converted that would not otherwise be eligible for the M&I allocation under either Alternatives 2A or 2B (ie, for quantities over and above the maximum quantity of water to which the M&I allocation under the M&I Water Shortage Policy is applied under Alternatives 2A and 2B as described above).

EXHIBIT 3-1
EXAMPLE CALCULATION OF ADJUSTED HISTORICAL USE

In 2004, Contractor X is an M&I CVP water service contractor located north of the Delta. Contractor X has a contract total of 100,000 acre-feet and a Year 2025 projected M&I CVP need of 100,000 acre-feet. Reclamation will calculate adjusted historical use in consultation with Contractor X in the following manner.

Year	Hydrologic Year Type	CVP M&I Allocation (Water Made Available to Contractor X)	CVP M&I Water Delivery to (Diversion by) Contractor X (acre-feet)
2003	Above Normal	100 percent	100,000
2002	Dry	100 percent	100,000
2001	Dry	85 percent	83,000
2000	Above Normal	100 percent	90,000
1999	Wet	95 percent	95,000

Calculations Not Adjusted for Historical Use

Assume that the last three years of water deliveries that are unconstrained by availability of CVP water were 2000, 2002, and 2003; and that Contractor X put all water to beneficial use the same year that it was diverted. Then, the unadjusted historical use is the average of deliveries for these years:

(100,000 + 100,000 + 90,000) / 3 = <u>96,667 acre-feet.</u>

Calculations Adjusted for Growth

Assume that the population served by Contractor X increased by five percent in 2003 over and above that population level which would have been determined from an examination of Contractor X's Water Needs Assessment prepared by Reclamation. Assume similarly, that in 2003, the demand for CVP water for commercial and industrial activity was 15,000 acre-feet, and that the percentage of increased commercial and industrial water demand not attributable to population increase is 10 percent over the 2003 level. Contractor X submits supporting documentation for all increases. Then, the adjustment for growth is calculated as follows.

(.05)(100,000 – 15,000) + (.10)(15,000) = 4,250 + 1,500 = <u>+5,750 acre-feet.</u>

This adjustment is not applicable to the maximum portion of contract total amount to which the M&I Allocation is applied under Alternative 1B.

Calculations Adjusted for Extraordinary Water Conservation Measures

It is expected that implementation of the minimum existing standards (as defined by the California Urban Water Conservation Council Best Management Practices) by Contractor X yields approximately one percent/year in demand reduction. Implementation of further extraordinary conservation measures each year by Contractor X is estimated to yield a demand reduction of approximately two percent/year savings.

EXHIBIT 3-1 - continued

EXAMPLE CALCULATION OF ADJUSTED HISTORICAL USE

Then, the adjustment for implementation of extraordinary water conservation measures begun in 2003 (one year ago) would be as follows.

(.02)(1)(100,000) = 2,000 = + 2,000 acre-feet above the minimum conservation baseline.

There is no additional adjustment to account for the one percent savings/year in demand reduction achieved through implementation of the minimum existing standards. The one percent demand reduction is already incorporated into the unadjusted historical use figure since it is already reflected in the actual M&I deliveries.

Calculation Adjusted for Use of Non-CVP Water

Assume that in year 2000, Contractor X purchased and beneficially used 5,000 acre-feet of non-CVP supply. As a result, an additional 5,000 acre-feet of CVP supply remained available in carryover storage into year 2001. Contractor X submitted to Reclamation documentation showing that in year 2001 it had beneficially used 83,000 acre-feet of CVP supply instead of the full 85,000 acre-feet of CVP supply allocated to it by Reclamation for that year. The extent of the reduction by Contractor X in use of CVP water that resulted in CVP water being made available in other years is:

85,000 – 83,000 = +2,000 acre-feet out of the 5,000 acre-feet of non-CVP purchased supply.

This adjustment does not include all 5,000 acre-feet of non-CVP supply. Use of non-CVP supply has reduced use of CVP water by only 2,000 acre-feet below the CVP allocation. All 5,000 acre-feet were beneficially used in 2001 and are not available for reducing CVP use in later years.

Calculation Adjusted for Historical Use

Therefore, the adjusted historical use for Contractor X prior to subsequent limitations explained below, would be:

96,667 + 5,750 + 2,000 + 2,000 = 106,417 acre-feet.

Under the proposed alternative, CVP M&I shortage policy, when the irrigation allocation drops to 50 percent the M&I allocation for Contractor X would be as follows.

(.75) x 100,000 acre-feet = 75,000 acre-feet.

Only 3,333 acre-feet of the sum of the adjustments to historical use are applied because the adjusted historical use quantity utilized for the M&I allocation shall not exceed the Year 2025 projected M&I CVP need.

FIGURE 3-1
CALCULATION OF WATER ALLOCATIONS
UNDER ALTERNATIVE 1A FOR
M&I CVP WATER ALLOCATIONS OF LESS THAN 75 PERCENT

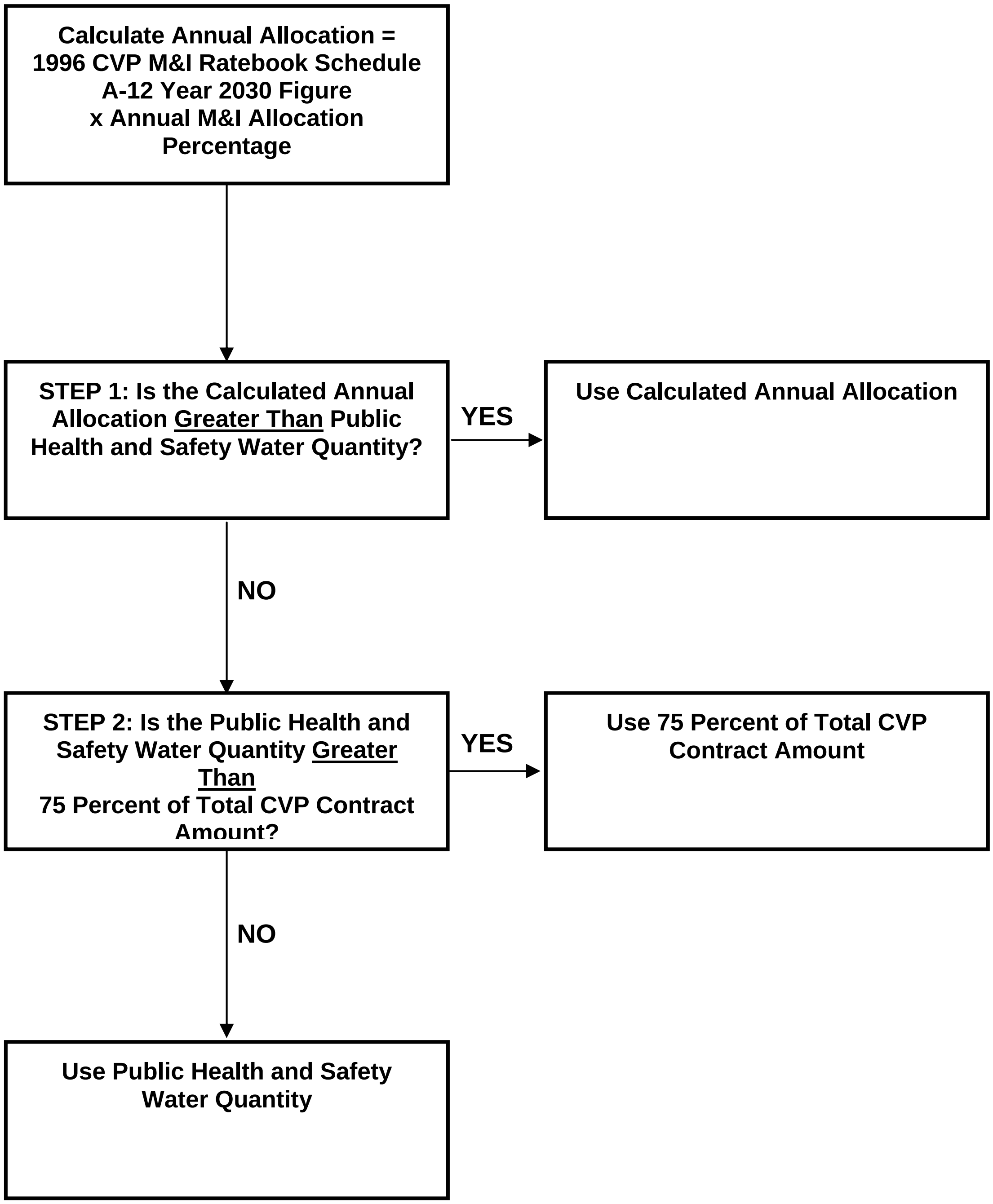

FIGURE 3-2
CALCULATION OF WATER ALLOCATIONS
UNDER ALTERNATIVE 1B FOR
M&I CVP WATER ALLOCATIONS OF LESS THAN 75 PERCENT

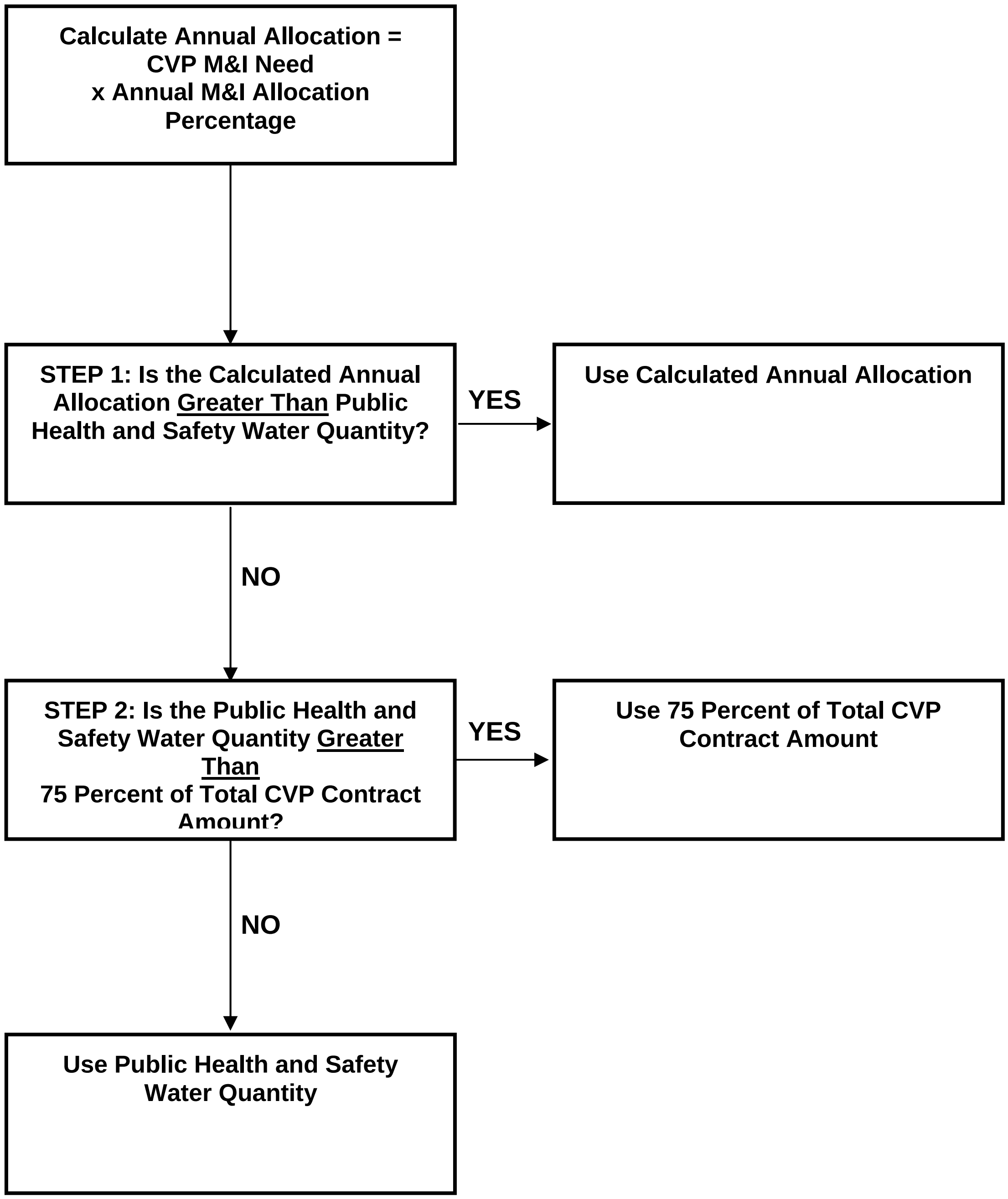

EXHIBIT 3-2
EXAMPLE APPLICATION OF ALTERNATIVE 1A

Three M&I CVP water service contractors were selected for this example to illustrate several scenarios. First, Santa Clara Valley Water District represents a contractor with multiple water sources and a M&I/Irrigation water service contract. The City of Avenal represents a contractor that only uses CVP water and has a M&I water service contract. Clear Creek Community Services District represents a contractor that only uses CVP water and has a M&I/Irrigation water service contract.

EXAMPLE OF ALTERNATIVE 1A FOR CONTRACT YEAR WITH 60 PERCENT M&I CVP WATER ALLOCATION

Items	Santa Clara Valley Water District	City of Avenal	Clear Creek Community Services District
CVP Contract Total	152,500	3,500	15,300
1996 M&I 2030 Ratebook	130,000	3,500	10,300
Total Public Health and Safety Water Quantity (details presented in Chapter 4 of this EA)	340,609	2,438	3,063
75 percent of CVP Contract Total	114,375	2,625	11,475
60 percent M&I Allocation (applied to 1996 M&I 2030 Ratebook quantity)	78,000	2,100	6,180
Step 1: Greater of Total Public Health and Safety quantity OR 60 percent Allocation	340,609 Public Health and Safety	2,438 Public Health and Safety	6,180 60 Percent Allocation
Step 2: Lesser of Result of Step 1 OR 75 percent of CVP Contract Total	114,375 75 Percent CVP Contract Total	2,438 Public Health and Safety	6,180 60 Percent Allocation
Maximum Delivery during Contract Year with 60 percent M&I Allocation	114,375	2,438	6,180
Comments	Public health and safety water quantity is greater than M&I allocation in this contract year, however, maximum delivery limited to 75 percent of CVP Contract Total	Public health and safety water quantity is greater than M&I allocation in this contract year and less than 75 percent of CVP Contract Total	M&I allocation in this contract year is greater than public health and safety water quantity

All values in acre-feet

EXHIBIT 3-3

EXAMPLE APPLICATION OF ALTERNATIVE 1B

Three M&I CVP water service contractors were selected for this example to illustrate several scenarios. First, Santa Clara Valley Water District represents a contractor with multiple water sources and a M&I/Irrigation water service contract. The City of Avenal represents a contractor that only uses CVP water and has a M&I water service contract. Broadview Water District represents a contractor that only uses CVP water and has a M&I/Irrigation water service contract.

EXAMPLE OF ALTERNATIVE 1B FOR CONTRACT YEAR WITH 60 PERCENT M&I CVP WATER ALLOCATION

Items	Santa Clara Valley Water District	City of Avenal	Broadview Water District
CVP Contract Total	152,500	3,500	27,000
Total M&I Need from CVP (based on Water Needs Assessment)	130,000	3,500	20
Total Public Health and Safety Water Quantity (details presented in Chapter 4 of this EA)	340,609	2,438	6
75 percent of CVP Contract Total	114,375	2,625	20,250
60 percent M&I Allocation (applied to M&I Need from CVP)	78,000	2,100	12
Step 1: Greater of Total Public Health and Safety quantity OR 60 percent Allocation	340,609 Public Health and Safety	2,438 Public Health and Safety	12 60 Percent Allocation
Step 2: Lesser of Result of Step 1 OR 75 percent of CVP Contract Total	114,375 75 Percent CVP Contract Total	2,438 Public Health and Safety	12 60 Percent Allocation
Maximum Delivery during Contract Year with 60 percent M&I Allocation	114,375	2,438	12
Comments	Public health and safety water quantity is greater than M&I allocation in this contract year, however, maximum delivery limited to 75 percent of CVP Contract Total	Public health and safety water quantity is greater than M&I allocation in this contract year and less than 75 percent of CVP Contract Total	M&I allocation in this contract year is greater than public health and safety water quantity

All values in acre-feet

In years when the M&I CVP allocations are less than 75 percent, water would be re-allocated from the Irrigation CVP water service contractors to provide the additional water to M&I users. There are some years in which allocations to Irrigation CVP water service contractors at or near zero. In those years, the increased allocations to M&I CVP contractors would not be fully realized.

Under Alternative 2A, the second tier would only be offered to M&I water service contractors that provide water to a portion of the manufacturing sector for which nearly no reduction in water use can be tolerated as part of the manufacturing process, such as electronic industries. For the purposes of this EA, it was assumed that 100 percent allocations would be provided for industrial water demand when M&I CVP contract allocations are less than 75 percent. However, the maximum allocations would be limited to 75 percent of the CVP Contract Total. Allocations for the remaining M&I demands would be provided as described under Alternative 1B. This allocation method is summarized in Table 3-6. Figure 3-3 provides a flow chart showing how M&I allocations are calculated under Alternative 2A. Exhibit 3-4 provides examples of applications of Alternatives 2A.

Under Alternative 2B, the second tier would be offered to all M&I water service contractors. For the purposes of this EA, it was assumed that Alternative 2B would attempt to provide up to 100 percent allocation of M&I water demands when M&I CVP contract allocations are less than 75 percent. However, the maximum allocations would be limited to 75 percent of CVP Contract Total. Allocations for the remaining M&I demands would be provided as described under Alternative 1B. This allocation method is summarized in Table 3-7. Figure 3-4 provides a flow chart showing how M&I allocations are calculated under Alternative 2B. Exhibit 3-5 provides examples of applications of Alternative 2B.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATION

During the preparation of this EA, three other alternatives were considered. One of the alternatives would include historical policies based upon provisions in M&I CVP water service contracts that were negotiated in the 1970s. The language in these M&I contracts provided that during a shortage the quantity of water available to CVP contractors would be apportioned among water users capable of receiving water from the same project water supply in a manner that Reclamation deemed equitable and physically possible, provided that the M&I water supplies were not reduced until CVP agricultural water allocations were reduced to 75 percent. At that time, allocations would be reduced in consistent steps between agricultural and M&I water users. This concept could be implemented in the 1970s because several water service contractors had not completely constructed diversion and distribution facilities, and therefore; could not fully utilize the contract water. This alternative is not considered in detail because the alternatives considered in this EA do apportion the water among users that can receive water with a more detailed shortage policy in furtherance of policy purposes.

Another alternative would provide for irrigation and M&I allocations to be reduced concurrently and at the same levels. The minimum M&I allocations would be equivalent to public health and safety levels. This alternative is not considered in detail because the alternatives considered in this EA incorporate this concept to the extent possible in furtherance of policy purposes.

The third alternative provides a minimum water supply level for all existing CVP water service contractors, including agricultural and M&I users, that agree to water rates that are higher than cost of service rates. This alternative is not considered in detail because of the lack of CVP water availability and because this concept was considered and eliminated during the CVPIA Administrative Proposal process.

TABLE 3-6

ALTERNATIVE 2A WATER SHORTAGE ALLOCATIONS

Allocation Step	Allocation to Irrigation Users	Allocation to M&I Users
1	100 percent	100 percent
2	100 to 75 percent	100 percent
3	75 to 70 percent	100 to 95 percent
4	70 to 65 percent	95 to 90 percent
5	65 to 60 percent	90 to 85 percent
6	60 to 55 percent	85 to 80 percent
7	55 to 50 percent	80 to 75 percent
8	50 to 25 percent	75 percent
9	25 to 20 percent[a]	FIRST TIER: The Maximum of: (1) 75 to 70 percent of M&I CVP contract total (2) Public health and safety water quantities up to 75 percent of Contract Total SECOND TIER: Increment of water that when added to the First Tier provides 100 percent of industrial demand **MAXIMUM DELIVERY: 75 percent of Contract Total**
10	20 to 15 percent[a]	FIRST TIER: The Maximum of: (1) 70 to 65 percent of M&I CVP contract total (2) Public health and safety water quantities up to 75 percent of Contract Total SECOND TIER: Increment of water that when added to the First Tier provides 100 percent of industrial demand **MAXIMUM DELIVERY: 75 percent of Contract Total**
11	15 to 10 percent[a]	FIRST TIER: The Maximum of: (1) 65 to 60 percent of M&I CVP contract total (2) Public health and safety water quantities up to 75 percent of Contract Total SECOND TIER: Increment of water that when added to the First Tier provides 100 percent of industrial demand **MAXIMUM DELIVERY: 75 percent of Contract Total**
12	10 to 5 percent[a]	FIRST TIER: The Maximum of: (1) 60 to 55 percent of M&I CVP contract total (2) Public health and safety water quantities up to 75 percent of Contract Total SECOND TIER: Increment of water that when added to the First Tier provides 100 percent of industrial demand **MAXIMUM DELIVERY: 75 percent of Contract Total**
13	5 to 0 percent[a]	FIRST TIER: The Maximum of: (1) 55 to 50 percent of M&I CVP contract total (2) Public health and safety water quantities up to 75 percent of Contract Total SECOND TIER: Increment of water that when added to the First Tier provides 100 percent of industrial demand **MAXIMUM DELIVERY: 75 percent of Contract Total**
14	0 percent[(a)]	FIRST TIER: The Maximum of: (1) 50 percent of M&I CVP contract total (2) Public health and safety water quantities up to 75 percent of Contract Total SECOND TIER: Increment of water that when added to the First Tier provides 100 percent of industrial demand **MAXIMUM DELIVERY: 75 percent of Contract Total**

[a]Allocations to Irrigation CVP contractors will be further reduced within the Contract Year to provide public health and safety water quantities to M&I CVP contractors within the same Contract Year, provided CVP water is available.

FIGURE 3-3
CALCULATION OF WATER ALLOCATIONS
UNDER ALTERNATIVE 2A FOR
M&I CVP WATER ALLOCATIONS OF LESS THAN 75 PERCENT

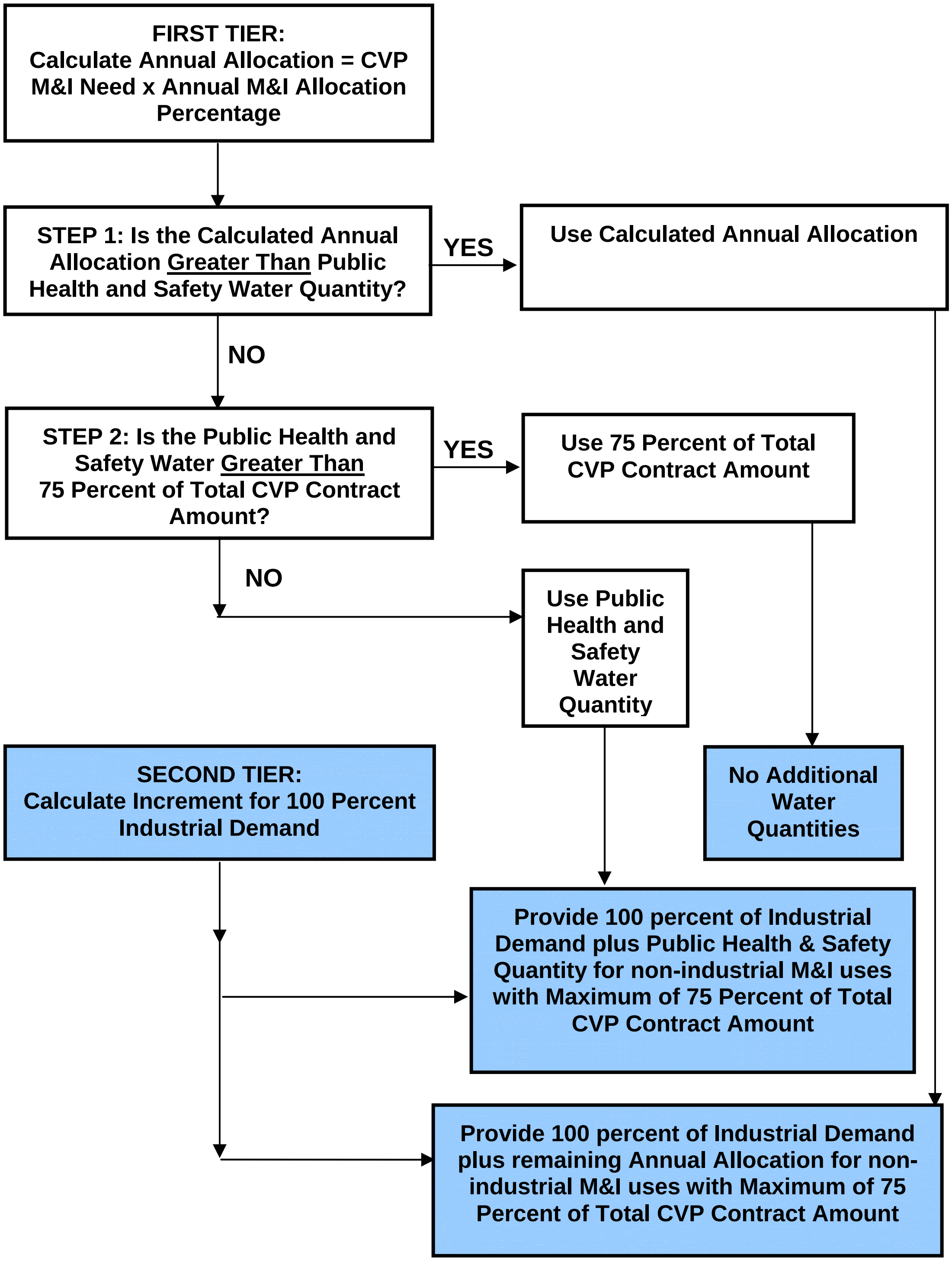

EXHIBIT 3-4

EXAMPLE APPLICATION OF ALTERNATIVE 2A

Three M&I CVP water service contractors were selected for this example to illustrate several scenarios.

EXAMPLE OF ALTERNATIVE 2A FOR CONTRACT YEAR WITH 60 PERCENT M&I CVP WATER ALLOCATION

Items	Santa Clara Valley Water District	City of Avenal	Contra Costa Water District
CVP Contract Total	152,500	3,500	195,000
Total M&I Need from CVP (based on Water Needs Assessment)	130,000	3,500	207,200
Industrial Demand	75,428	57	57,000
Total Public Health and Safety Water Quantity (details presented in Chapter 4 of this EA)	340,609	2,438	107,914
75 percent of CVP Contract Total	114,375	2,625	146,250
60 percent M&I Need	78,000	2,100	117,000
FIRST TIER			
<u>Step 1:</u> Greater of Total Public Health and Safety quantity OR 60 percent Allocation	340,609 Public Health and Safety	2,438 Public Health and Safety	117,000 60 Percent Allocation
<u>Step 2:</u> Lesser of Result of Step 1 OR 75 percent of CVP Contract Total	114,375 75 percent of CVP Contract Total	2,438 Public Health and Safety	117,000 60 Percent Allocation
SECOND TIER			
Additional Water towards 100 percent Industrial Demand	0 75 percent of CVP Contract Total	6 Additional to provide 100 percent of Industrial Demand	22,800 Additional to provide 100 percent of Industrial Demand
TOTAL DELIVERY	114,375	2,444	139,800
Comments	Tier 1: M&I Allocation limited to 75 percent of CVP Contract Total; public health and safety quantity exceeds 75 percent of Contract Total No additional water because maximum delivery limited to 75 percent of CVP Contract Total	Tier 1: Public health and safety quantity is greater than M&I allocation in this contract year and less than 75 percent of CVP Contract Total Tier 2 would provide water for 100 percent of industrial demand	Tier 1: M&I Allocation provides 60 percent of M&I Contract Total, including 60 percent of Industrial demand Tier 2 would provide water for 100 percent of industrial demand up to 75 percent of CVP Contract Total

All values in acre-feet

TABLE 3-7

ALTERNATIVE 2B WATER SHORTAGE ALLOCATIONS

Allocation Step	Allocation to Irrigation Users	Allocation to M&I Users
1	100 percent	100 percent
2	100 to 75 percent	100 percent
3	75 to 70 percent	100 to 95 percent
4	70 to 65 percent	95 to 90 percent
5	65 to 60 percent	90 to 85 percent
6	60 to 55 percent	85 to 80 percent
7	55 to 50 percent	80 to 75 percent
8	50 to 25 percent	75 percent
9	25 to 20 percent[a]	FIRST TIER: The Maximum of: (1) 75 to 70 percent of M&I CVP contract amount (2) Public health and safety water quantities up to 75 percent of Contract Total SECOND TIER: Increment of water that when added to First Tier provides 100 percent of total M&I demand **MAXIMUM DELIVERY: 75 percent of Contract Total**
10	20 to 15 percent[a]	FIRST TIER: The Maximum of: (1) 70 to 65 percent of M&I CVP contract amount (2) Public health and safety water quantities up to 75 percent of Contract Total SECOND TIER: Increment of water that when added to First Tier provides 100 percent of total M&I demand **MAXIMUM DELIVERY: 75 percent of Contract Total**
11	15 to 10 percent[a]	FIRST TIER: The Maximum of: (1) 65 to 60 percent of M&I CVP contract amount (2) Public health and safety water quantities up to 75 percent of amount contract SECOND TIER: Increment of water that when added to First Tier provides 100 percent of M&I demand **MAXIMUM DELIVERY: 75 percent of Contract Total**
12	10 to 5 percent[a]	FIRST TIER: The Maximum of: (1) 60 to 55 percent of M&I CVP contract total (2) Public health and safety water quantities up to 75 percent of total amount SECOND TIER: Increment of water that when added to First Tier provides 100 percent of total M&I demand **MAXIMUM DELIVERY: 75 percent of Contract Total**
13	5 to 0 percent[a]	FIRST TIER: The Maximum of: (1) 55 to 50 percent of M&I CVP contract total (2) Public health and safety water quantities up to 75 percent of total amount SECOND TIER: Increment of water that when added to First Tier provides 100 percent of M&I demand **MAXIMUM DELIVERY: 75 percent of Contract Total**
14	0 percent[a]	FIRST TIER: The Maximum of: (1) 50 percent of M&I CVP contract amount (2) Public health and safety water quantities up to 75 percent of Contract Total SECOND TIER: Increment of water that when added to First Tier provides 100 percent of total M&I demand **MAXIMUM DELIVERY: 75 percent of Contract Total**

[a]Allocations to Irrigation CVP contractors will be further reduced within the Contract Year to provide public health and safety water quantities to M&I CVP contractors within the same Contract Year, provided CVP water is available.

FIGURE 3-4
CALCULATION OF WATER ALLOCATIONS
UNDER ALTERNATIVE 2B FOR
M&I CVP WATER ALLOCATIONS OF LESS THAN 75 PERCENT

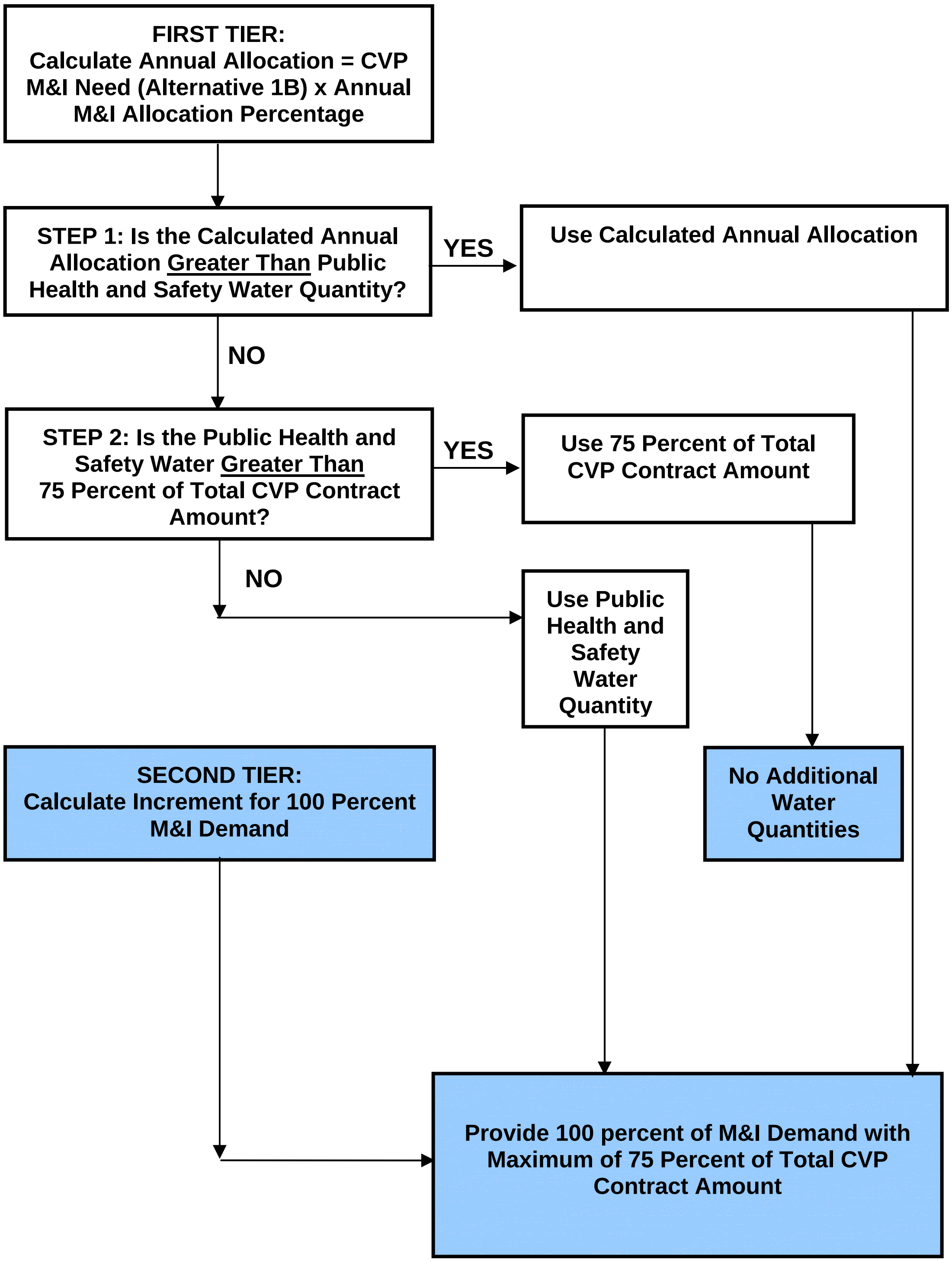

EXHIBIT 3-5
EXAMPLE APPLICATION OF ALTERNATIVE 2B

Three M&I CVP water service contractors were selected for this example to illustrate several scenarios.

EXAMPLE OF ALTERNATIVE 2B FOR CONTRACT YEAR WITH 60 PERCENT M&I CVP WATER ALLOCATION

Items	Santa Clara Valley Water District	Broadview Water District	Contra Costa Water District
CVP Contract Total	152,500	27,000	195,000
Total M&I Need from CVP (based on Water Needs Assessment)	130,000	20	207,200
Total Public Health and Safety Water Quantity (details presented in Chapter 4 of this EA)	340,609	6	107,914
75 percent of CVP Contract Total	114,375	20,250	146,250
60 percent M&I Need	78,000	12	117,000
FIRST TIER			
<u>Step 1:</u> Greater of Total Public Health and Safety quantity OR 60 percent Allocation	340,609 Public Health and Safety	12 Public Health and Safety	117,000 60 Percent Allocation
<u>Step 2:</u> Lesser of Result of Step 1 OR 75 percent of CVP Contract Total	114,375 75 percent of CVP Contract Total	12 75 percent of CVP Contract Total	117,000 60 Percent Allocation
SECOND TIER			
Additional Water towards 100 percent M&I Demand	0	8	29,250
TOTAL DELIVERY	114,375	20	146,250
Comments	Tier 1 M&I Allocation limited to 75 percent of CVP Contract Total; public health and safety quantity exceeds 75 percent of Contract Total No additional water because maximum delivery limited to 75 percent of CVP Contract Total	Tier 1 M&I Allocation is greater than public health and safety water quantity Additional water for M&I demand is equal to 40 percent of M&I demand Delivery less than 75 percent of Total CVP Contract Total	Tier 1 M&I Allocation provides 60 percent of M&I Contract Total Tier 2 would provide water for 100 percent of M&I demand up to 75 percent of CVP Contract Total

All values in acre-feet

SUMMARY OF IMPACT ASSESSMENTS

The alternatives considered in this EA were analyzed to determine the potential for adverse and beneficial impacts associated with their implementation as compared to continuation of the No Action Alternative conditions. The results of this analysis are presented in Chapter 5 of this EA. Changes that would occur during implementation of the alternatives as compared to the No Action Alternative conditions are summarized in Table 3-8.

The Proposed Action, Alternative 1B, represents an alternative that balances environmental benefits, affordability, and technical feasibility. All of the alternatives affect physical and biological resources in a similar manner. The alternatives cause different impacts to economic resources of CVP agricultural water service contractors. Alternative 2B causes the most adverse impacts to agricultural economics.

An effects determination for Alternative 1B with respect to special status species is presented in Attachment D.

TABLE 3-8

IMPACT ASSESSMENT RESULTS

	No Action Alternative	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B
Surface Water Resources	CVP water supply allocations in the future will be slightly less than under existing conditions. M&I CVP water service contractors deliveries are less than 75 percent in 13 of the 72 years analyzed in the CALSIM II model used for this EA. Zero deliveries would occur to Irrigation CVP water service contractors in four of the 72 years.	Reductions to Irrigation CVP water service contractors would be from 0 to 3 percent. Two additional year with zero deliveries to Irrigation CVP water service contractors for a total of six of the 72 years.	Reductions to Irrigation CVP water service contractors would be from 0 to 3 percent. Two additional years with zero deliveries to Irrigation CVP water service contractors for a total of six of the 72 years.	Reductions to Irrigation CVP water service contractors would be from 0 to 4 percent. Four additional year with zero deliveries to Irrigation CVP water service contractors for a total of eight of the 72 years.	Reductions to Irrigation CVP water service contractors would be from 0 to 5 percent. Four additional year with zero deliveries to Irrigation CVP water service contractors for a total of eight of the 72 years.
Groundwater	It is anticipated that groundwater withdrawals will be increased as municipal growth occurs to directly use groundwater or reduce availability of irrigation water supplies.	Groundwater withdrawals by M&I CVP water service contractors may be reduced in 9 of 72 years under this alternative. Groundwater withdrawals by Irrigation CVP water service contractors may increase unless other water supplies are available or fields are fallowed more frequently in the short-term.	Similar to Alternative 1A	Similar to Alternative 1A	Similar to Alternative 1A

TABLE 3-8

IMPACT ASSESSMENT RESULTS

	No Action Alternative	**Alternative 1A**	**Alternative 1B**	**Alternative 2A**	**Alternative 2B**
Municipal and Industrial Land Use and CVP Water Cost	Growth would continue in M&I communities, as described in the county general plans and associated environmental documentation.	No increase in Contract Totals, therefore, no change in land use. Slightly higher allocations of CVP water in drier years. Water supply costs similar to those under the No Action Alternative.	Similar to Alternative 1A	Similar to Alternative 1A with slightly higher allocations of CVP water in drier years.	Similar to Alternative 1A with slightly higher allocations of CVP water in drier years.
Agricultural Land Use and Economics	Increased groundwater withdrawals may increase costs. Cropping patterns of may be modified if adequate water supplies are not available.	Land use would be similar to No Action Alternative. Water supply costs may be higher if additional groundwater or other water supplies are used in drier years. Reduction in farm income during drier years due to more frequent short-term fallowing if additional groundwater is not available	Similar to Alternative 1A.	Similar to Alternative 1A, with higher water supply costs and more frequent occurrence of reduced Irrigation CVP water allocations.	Similar to Alternative 2A.
Fisheries and Wildlife Resources	Growth would continue in M&I communities, as described in the county general plans and associated environmental documentation. The general plans include protection measures for biological resources.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.

TABLE 3-8

IMPACT ASSESSMENT RESULTS

	No Action Alternative	**Alternative 1A**	**Alternative 1B**	**Alternative 2A**	**Alternative 2B**
Recreation	CVP operations would be similar to those under existing conditions. Therefore, recreational opportunities related to CVP operations would be similar to those under existing conditions.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.
Cultural Resources	CVP operations would be similar to those under existing conditions.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.
Indian Trust Assets	Indian Trust Assets would be the same as under the existing conditions.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.
Air Quality	Growth would continue in M&I communities, as described in the county general plans and associated environmental documentation. The general plans include air quality improvement and protection measures.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.
Soils	Soil conditions would be similar to existing conditions.	Similar to the No Action Alternative for M&I CVP water service contractors. Potential increase in soil salinity in irrigated areas due to increased frequency of short-term fallowing	Similar to Alternative 1A.	Similar to Alternative 1A.	Similar to Alternative 1A.
Visual Resources	Conditions would be similar to existing conditions.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.

TABLE 3-8

IMPACT ASSESSMENT RESULTS

	No Action Alternative	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B
Power Resources	Reservoir and power generation operations will continue as described in OCAP 2004.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.
Social Conditions	In the future, M&I communities will continue to grow and agricultural activities may be reduced as lands are converted to accommodate the growth as compared to existing conditions.	Increased deliveries of M&I CVP water supplies may encourage industries to continue to operate in the urban areas. If other water supplies are used by irrigation users, there may be no change in employment. If the frequency of short-term fallowing is increased, employment may be reduced in 9 of 72 years.	Similar to Alternative 1A.	Similar to Alternative 1A	Similar to Alternative 1A.
Environmental Justice	Projections by U.S. Census Bureau and the State of California were used to develop the basis of comparison for Environmental Justice.	Increased deliveries of M&I CVP water supplies may encourage industries to continue to operate in the urban areas. If other water supplies are used by irrigation users, there may be no change in employment. If the frequency of short-term fallowing is increased, employment may be reduced in 9 of 72 years.	Similar to Alternative 1A.	Similar to Alternative 1A	Similar to Alternative 1A.
Secondary Growth Impacts	Growth would continue in M&I communities, as described in the county general plans and associated environmental documentation.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.	No impacts as compared to the No Action Alternative.

CHAPTER 4

CENTRAL VALLEY PROJECT MUNICIPAL AND INDUSTRIAL WATER SERVICE CONTRACTORS WATER DEMANDS AND PUBLIC HEALTH AND SAFETY WATER QUANTITIES

CHAPTER 4

Central Valley Project Municipal and Industrial Water Service Contractors Water Demands and Public Health and Safety Water Quantities

INTRODUCTION

This chapter describes the characteristics of the M&I contractors considered in this EA, including existing and projected M&I water demands. This chapter also describes the values and calculations used to identify the public health and safety water quantities used in the impact assessment described in Chapter 5.

The contractors are organized by division starting in the north with the Shasta and Trinity Divisions. A summary of the calculations for the public health and safety water quantities are presented at the end of the descriptions for each water service contractors.

Public Health and Safety Water Quantities for Central Valley Project M&I Water Service Contracts

Residential, commercial, and industrial demands for 2030 were identified through the Water Needs Assessment if detailed analyses were completed. However, detailed analyses were not completed for users with relatively small amounts of M&I water demand, especially for combined irrigation/M&I users. For contractors without detailed Needs Analyses, information from local agency reports was used to define population projections and water demands for residential, commercial, and industrial users. The local agency reports included urban water management plans, general plans, long-term contract renewal draft environmental documentation and draft biological assessments, and studies by Local Area Formation Commission (LAFCO). The assumptions used in the development of public health and safety water quantities are described in Chapter 3 and summarized below.

- **Residential = 50 gallons/capita/day**
- **Commercial = 80 percent of average commercial water demand**
- **Industrial = 90 percent of average industrial water demand**
- **System Losses = 80 percent of identified system losses**

SHASTA AND TRINITY DIVISIONS

The Shasta and Trinity divisions include nine water service contractors, as described below.

Shasta Community Services District

Shasta Community Services District encompasses 6,400 acres west of Redding. This district provides water for municipal uses and fire protection for the town of Shasta and surrounding areas. This district also delivers 10 acre-feet of water to another CVP water service contractor, U.S. Forest Service Centimundi Boat Ramp. CVP water is supplied to the district from Whiskeytown Lake from the Spring Creek Conduit. Due to geological characteristics of this area, groundwater is not available.

The CVP water services contract for this district is for 1,000 acre-feet and is classified as an M&I contract. Reclamation did not complete a detailed Water Needs Assessment for this contract as the quantity of CVP water under contract is below the 2,000 acre-foot threshold established for conducting a Water Needs Assessment. The following information was used to determine the future water demands for this district.

The 2001 "Draft Environmental Assessment for the Long-Term Contract Renewals of Shasta and Trinity Divisions" (Shasta-Trinity LTCR EA) identified 710 connections in the district. The 1998 "Shasta County General Plan, Housing Element" assumed that there were 2.67 persons/household in unincorporated areas of Shasta County. Using these values, it could be calculated that population was about 1,896 in 2000. The 2003 "Redding Basin Water Management Plan, Phase 2C Report" projects a population increase of 206 percent for this district between 2000 and 2025. Using these values, it could be calculated that population would be about 3,905 in 2025.

The CVP water service contract is the only water supply for this district. Unit water rates have not been calculated for this rural residential area. Due to the rural nature of this community, unit water rates may be less than in Bella Vista Water District where unit water rates were calculated by Reclamation as part of the Water Needs Assessment at 257 gallons/capita/day. Unit water rates for this area were calculated assuming complete use of the CVP water in 2025, or 229 gallons/capita/day for residential uses.

Shasta Community Services District CVP Contract: 1,000 acre-feet for M&I
(all values in acre-feet/year unless noted)

2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	3,905	229	1,000	0	0	0	1,000
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	219	0	0	0	219	750	219

[a] Based on local agency reports

Shasta County Service Area #25 - Keswick County Service Area

Keswick County Service Area encompasses 5,500 acres and provides water for municipal uses and fire protection for the town of Keswick and surrounding areas. Older single-family dwellings on small lots, a fire hall, and very limited commercial development are served by this agency. Newer homes on large lots are located in the eastern area along Rock Creek Road. Water also is provided to a lumber operation on Iron Mountain Road. CVP water is supplied from Whiskeytown Lake from the Spring Creek Conduit. Due to geological characteristics of this area, groundwater is not available.

The CVP water services contract for this district is for 500 acre-feet and is classified as an M&I contract. Reclamation did not complete a detailed Water Needs Assessment for this contract as the quantity of CVP water under contract is below the 2,000 acre-foot threshold established for conducting a Water Needs Assessment. The following information was used to determine the future water demands for this district.

The Shasta-Trinity LTCR EA identified 191 connections in the district. The 1998 "Shasta County General Plan, Housing Element" assumed that there were 2.67 persons/household in unincorporated areas of Shasta County. Using these values, it could be calculated that population was about 510 in 2000. The 2003 "Redding Basin Water Management Plan, Phase 2C Report" projects a population increase of 150 percent for this district between 2000 and 2025. Using these values, it could be calculated that population would be about 765 in 2025.

The CVP water service contract is the only water supply for this district. Unit water rates have not been calculated for this rural residential area. Due to the nature of this community, unit water rates may be similar to those calculated for Bella Vista Water District by Reclamation as part of the Water Needs Assessment, or 257 gallons/capita/day. Therefore, in 2025, the annual water demands for this district would be 220 acre-feet for residential users and 280 acre-feet for commercial users. It is assumed that the industrial water demand is included in the commercial demands.

Shasta County Service Area #25 - Keswick County Service Area CVP Contract: 500 acre-feet for M&I (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	765	257	220	280	0	0	500
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	43	224	0	0	267	375	267
[a] Based on local agency reports							

Bella Vista Water District - not including areas served by Shasta County Water Agency

Bella Vista Water District encompasses 34,016 acres and is located east of Redding and south of Shasta Lake and includes areas around Little Cow Creek, Bella Vista, Palo Cedro, and eastern portions of the community of Redding. The district was formed to provide agricultural water. However, municipal areas are located in the southeast corner of the district. Two colleges in the service area have large irrigation and municipal demands. Agricultural areas are located along Stillwater and Cow creeks. CVP water also is used for fire protection water. CVP water is provided to the district from the Sacramento River through the Wintu Pump Station. The district also uses groundwater wells for about 1,500 acre-feet/year, however the aquifer capacity is limited. The CVP water services contract for this district is for 24,000 acre-feet and is classified as an Irrigation/M&I contract. Bella Vista Water District also obtains up to 578 acre-feet through a CVP water service contract served by Shasta County Water Agency, as described in a subsequent subsection of this chapter

Population projections, water demands, and unit water rates were calculated by the district and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2025 population would be 52,500 including 488 in the Palo Cedro area served by Shasta County Water Agency, as described below. The 2025 population that can be served directly by the CVP water service contract with Bella Vista Water District would be 52,012 with a unit water rate would be 257 gallons/capita/day and a 2025 demand of 14,974 acre-feet. The Palo Cedro area served by the CVP water service contract with Shasta County Water Agency has a demand of 240 acre-feet. It is assumed that the CVP water service contract with the district can serve 2,000 acre-feet for commercial uses and no water for industrial uses. The Water Needs Assessment also includes 800 acre-feet of system losses for this contract. The M&I demand is 17,774 acre-feet for the area served by the contract with Bella Vista Water District.

The district also has 12,646 acre-feet of water demand for agricultural users. It is assumed that 12,207 acre-feet of this demand can be provided by the CVP contract with Bella Vista Water District. The remaining 439 acre-feet of water demand is located in the Palo Cedro area and can be served by the CVP water service contract with Shasta County Water Agency. Approximately 25 acre-feet/year is transferred out of the Bella Vista Water District.

Bella Vista Water District CVP Contract: 24,000 acre-feet for Irrigation/M&I

(all values in acre-feet/year unless noted)

2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	52,012	257	14,974	2,000	0	800	17,774
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	2,913	1,600	0	640	5,153	18,000	5,153

[a] Based on local agency reports

Clear Creek Community Services District

Clear Creek Community Services District encompasses 14,314 acres located southwest of Redding and west of the town of Anderson. However only 4,000 acres receives CVP municipal and industrial water. The district serves the rural Happy Valley area, including Olinda and Cloverdale. CVP water is provided to the district from Whiskeytown Lake. The district has one well for emergency and drought purposes.

The CVP water services contract for this district is for 15,300 acre-feet and is classified as an Irrigation/M&I contract. Population projections, water demands, and unit water rates were calculated by the district and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2025 population would be 20,721 with a unit water rate of 254 gallons/capita/day. The residential water demand for 2025 would be 5,905 acre-feet plus 1,028 acre-feet for commercial uses and no water for industrial uses. The Water Needs Assessment also includes 1,350 acre-feet of system losses for this contract. Clear Creek Community Services District total M&I demand served with the CVP contract is 8,223 acre-feet. The district also has 26,550 acre-feet of water demand for agricultural users.

Clear Creek Community Services District CVP Contract: 15,300 acre-feet for Irrigation/M&I (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population**	**Gallons/ capita/day**	**Total Residential Water Demand**	**Commercial Water Demand**	**Industrial Water Demand**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	20,721	254	5,905	1,028	0	1,350	8,283
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	1,161	822	0	1,000	3,063	11,475	3,063

Centerville Community Services District

Shasta County Water Agency assigned 2,900 acre-feet to Centerville Community Services District. Centerville is located along the southwestern border of the City of Redding and consists of residential and commercial connections. The Water Needs Assessment indicates that the 2025 population for this district would be 7,965 with a unit water rate of 357 gallons/capita/day. The residential water demand for 2025 would be 3,185 acre-feet with no water for commercial or industrial uses or system losses.

Centerville Community Services District CVP Contract: 2,900 acre-feet for M&I
(all values in acre-feet/year unless noted)

2025 Water Demand	**Population**	**Gallons/ capita/day**	**Total Residential Water Demand**	**Commercial Water Demand**	**Industrial Water Demand**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	7,965	357	3,185	0	0	0	3,185
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	446	0	0	0	446	2,175	446

Shasta County Water Agency - Subcontracts with Bella Vista Water District, Mountain Gate Community Services District, Jones Valley County Service Area #6, Crag View County Service Area #23, Castella County Service Area #3, and Silverthorn/French Gulch School/Shasta Holiday Municipal Water Company

Shasta County Water Agency provides water through wholesale subcontracts to Bella Vista Water District (578 acre-feet), Mountain Gate Community Services District (1,000 acre-feet), Jones Valley County Service Area #6 (190 acre-feet), Crag View County Service Area #23 (119 acre-feet), Castella County Service Area #3 (77 acre-feet), and Silverthorn development/French Gulch School/Shasta Holiday Municipal Water Company (135 acre-feet).

CVP water is directly used by Bella Vista Water District, Mountain Gate Community Services District, Centerville Community Services District, and Silverthorn development/French Gulch School/Shasta Holiday Municipal Water Company. CVP water is purchased by Jones Valley County Service Area #6, Crag View County Service Area #23, and Castella County Service Area #3 to replace water diverted upstream of Shasta Dam in accordance with water rights provisions.

Reclamation did not complete a detailed Water Needs Assessment for this contract as the quantity of CVP water under contract is below the 2,000 acre-foot threshold established for conducting a Water Needs Assessment. The following information includes the results of the Water Needs Assessment and calculated water demands for the other members. CVP water is used for fire protection by most of these agencies.

Bella Vista Water District - Palo Cedro Estates County Service Area No. 8. Palo Cedro Estates uses CVP water from Shasta County Water Agency. This area was initially a separate agency and then annexed to Bella Vista Water District. The service area includes several schools, churches, shopping center, restaurants, and other businesses. The portion of Palo Cedro served by CVP water from Shasta County Water Agency includes 116 parcels, of which 69 were connected in 2003. The estimated population was reported to be 290 in 2003 in a Local Area Formation Commission report. This would be equivalent to 4.2 persons/connection. Using these values, it could be calculated that population would be 488 at build-out which is assumed to occur prior to 2025.

The CVP water service contract is the only water supply for this district. Unit water rates have not been calculated for this rural residential area. Due to the nature of this community, unit water rates may be similar to those calculated for Bella Vista Water District by Reclamation as part of the Water Needs Assessment, or 257 gallons/capita/day. Therefore, the annual water demand for this district would be 140 acre-feet for residential users in 2025. A portion of the water would be used for commercial purposes, however this has not been quantified. The CVP water is also used for fire protection.

Mountain Gate Community Services District. Shasta County Water Agency delivers 1,000 acre-feet of CVP water to a portion of Mountain Gate Community Services District. The district has a separate CVP contract, as described below. Because there does not appear to be specific areas served by Mountain Gate Community Services District with CVP water provided by Shasta County Water Agency, this analysis proportionately allocated needs between the two contracts.

Water demand calculations for Mountain Gate Community Services District are described below. It is assumed that the CVP water service contract water provided by Shasta County Water Agency would be used for a population of 1,000 in 2025. Due to the nature of this community, unit water rates may be similar to those calculated for Bella Vista Water District by Reclamation as part of the Water Needs Assessment, or 257 gallons/capita/day. Therefore, the annual water demand for this district would be 288 acre-feet for residential in 2025. It is also assumed that 500 acre-feet would be used for commercial users and 200 acre-feet for industrial users.

Jones Valley County Service Area No. 6. Jones Valley is located northeast of Redding downstream of Shasta Lake, and is surrounded by National Forest lands and land with extremely steep slopes. This area is located south of the Silverthorn Summer Homes and Silverthorn Resort developments. Jones Valley is a residential community with a fire hall and limited commercial uses. The estimated 2003 population is 950 persons with 581 parcels of which 378 are connected to the water system. Assuming the same density of persons/connection, the build-out population would be 1,460. Due to the nature of this community, unit water rates may be similar to those calculated for Bella Vista Water District by Reclamation as part of the Water Needs Assessment, or 257 gallons/capita/day. Therefore the annual water demand for this district would be 420 acre-feet for residential in 2025.

The sphere of influence also includes Shasta Lake Ranchos with 132 connections. However, this area is not connected to the water system at this time.

Jones Valley also has an appropriative water right for 270 acre-feet on the Sacramento River, for year-round diversion. However, diversions between June 16 and August 31 can only occur if replacement water is made available to downstream water rights holders. Jones Valley uses the 190 acre-feet of CVP water service contract water purchased through Shasta County Water Agency for the replacement water to meet a portion of the 420 acre-feet of water demand.

Crag View County Service Area No. 23. Crag View is located near the Siskiyou County line on the Sacramento River near Castella. Crag View includes 73 parcels, of which 69 were connected to the water system in 2003. The estimated population in this area was reported to be 180 in a Local Area Formation Commission report in 2003. Assuming the same density of persons/connection, the build-out population would be 190. Due to the nature of this community, unit water rates may be similar to those calculated for Bella Vista Water District by Reclamation as part of the Water Needs Assessment, or 257 gallons/capita/day. Therefore, the annual water demand for this district would be 55 acre-feet for residential in 2025.

Crag View County Service Area No. 23 has an appropriative water right on Castle Creek, a tributary of the Sacramento River, for year-round diversion. However, diversions can only occur if replacement water is made available to downstream water rights holders. The Crag View County Service Area No. 23 purchases up to 119 acre-feet of CVP water through Shasta County Water Agency for the replacement water.

Castella County Service Area No. 3. Castella is located 50 miles north of Redding near Siskiyou County. The community includes seasonal (summer) residences, year-round residences, two small grocery stores, a tavern, a beauty shop, an elementary school, and a fire station. There are 111 parcels with 90 connections to the water system. The 2003 population was estimated at 230 by a Local Area Formation Commission report. Assuming the same density of persons/connection, the build-out population would be 284. Due to the nature of this community, unit water rates may be similar to those calculated for Bella Vista Water District by Reclamation as part of the Water Needs Assessment, or 257 gallons/capita/day. Therefore, the annual water demand for this district would be 82 acre-feet for residential use in 2025.

Castella has an appropriative water right for 157 acre-feet on Castle Creek, a tributary of the Sacramento River, for year-round diversion. However, diversions between June 16 and August 31 can only occur if replacement water is made available to downstream water rights holders. Castella purchases 77 acre-feet of CVP water service contract water through Shasta County Water Agency for the replacement water.

Silverthorn, French Gulch School, and Shasta Holiday Mutual Water Company. The Silverthorn Resort area near Jones Valley, French Gulch School in Anderson, and Shasta Holiday mobile home park near Shasta Lake are served CVP water from Shasta County Water Agency. These entities subcontract with Shasta County Water Agency for 135 acre-feet/year of CVP water primarily to serve commercial/institutional users. The water is provided from Shasta Lake or the Sacramento River.

Shasta County Water Agency CVP Contract: 2,100 acre-feet for M&I

(all values in acre-feet/year unless noted)

2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	3,422	257	986	635	200	0	1,821
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	192	508	180	0	880	1,575	880

[a] Based on local agency reports

Mountain Gate Community Services District

Mountain Gate Community Services District encompasses 4,160 acres. The district provides water to residential areas and the Bay Bridge Resort. The district serves over 593 residential connections, recreational vehicle parks, a cement plant that uses about 200 acre-feet/year, and a rock company that uses about 20 acre-feet/year based upon information provided in the 2001 Shasta-Trinity LTCR EA. CVP water also is used for fire protection. CVP water is provided to the district from Shasta Lake. The district also uses groundwater wells for about 600 acre-feet/year. However the aquifer capacity is limited.

The CVP water services contract for this district is for 350 acre-feet and is classified as an M&I contract. The district also obtains up to 1,000 acre-feet through a CVP water service contract held by Shasta County Water Agency, as described above.

The 2001 Shasta-Trinity LTCR EA identified 593 connections in the district. The 1998 "Shasta County General Plan, Housing Element" assumed that there were 2.67 persons/household in unincorporated areas of Shasta County. Using these values, it could be calculated that population was about 510 in 2000. The 2003 "Redding Basin Water Management Plan, Phase 2C Report" projects a population increase of 140 percent for this district between 2000 and 2025. Using these values, it could be calculated that the population would be about 2,217 in 2025

Because there does not appear to be specific areas served by Mountain Gate Community Services District and Shasta County Water Agency, this analysis proportionately allocated needs to the two contracts. It is assumed that in 2025 1,217 persons would be served by the CVP water service contract with the district and 1,000 persons would be served by the CVP water service contract with Shasta County Water Agency.

The CVP water service contract is the only water supply for this district. Unit water rates have not been calculated for this rural residential area. Due to the nature of this community, unit water rates may be similar to those calculated for Bella Vista Water District by Reclamation as part of the Water Needs Assessment, or 257 gallons/capita/day. The annual water demand for this district would be 350 acre-feet for residential users in 2025. It is assumed that the commercial and industrial users and the remaining residential users are served by water from the CVP contract under Shasta County Water Agency.

Mountain Gate Community Services District CVP Contract: 350 acre-feet for M&I

(all values in acre-feet/year unless noted)

2025 Water Demand	**Population**[a]	**Gallons/ capita/day**[a]	**Total Residential Water Demand**	**Commercial Water Demand**[a]	**Industrial Water Demand**[a]	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	1,217	257	350	0	0	0	350
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	68	0	0	0	68	263	68

[a] Based on local agency reports

City of Shasta Lake

The City of Shasta Lake encompasses 7,785 acres. Water users in the city include residential and commercial uses and several industrial parks with industries such as Knauf Fiber Glass. One of the industries, the lumber mill, relies upon groundwater and does not use CVP water service contract water. The CVP water service contract water is delivered from Shasta Lake.

The city also delivers a portion of the water under CVP water service contract to the Buckeye portion of the City of Redding. Groundwater is not considered a reliable source. Therefore, during periods of shortage, the City of Shasta Lake has purchased up to 240 acre-feet of water from Centerville Community Services District for short-term uses.

The CVP water services contract for the city is for 4,400 acre-feet and is classified as an M&I contract. Population projections, water demands, and unit water rates were calculated by the city and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2025 population would be 14,720 with a unit water rate of about 182 gallons/capita/day. The residential water demand for 2025 would be 3,007 acre-feet plus 1,035 acre-feet/year for commercial uses and 475 acre-feet/year for industrial uses. The Water Needs Assessment also includes 830 acre-feet of system losses for this contract. The total M&I demand that can be served with the CVP contract with the city is 5,347 acre-feet in 2025.

City of Shasta Lake CVP Contract: 4,400 acre-feet for M&I (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population**	**Gallons/ capita/day**	**Total Residential Water Demand**	**Commercial Water Demand**	**Industrial Water Demand**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	14,720	182	3,007	1,035	475	830	5,347
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	824	828	428	664	2,744	3,300	2,744

City of Redding

In 1967, the City of Redding annexed Buckeye County Water District. The district had a CVP water service contract for 6,140 acre-feet to serve the Buckeye and Summit City zones. The Buckeye Zone encompasses 17,220 acres. The Summit City Zone encompasses 640 acres. The Buckeye and Summit City zones are located where there is no groundwater.

The overall City of Redding service area includes 59,044 acres. The California Department of Water Resources data for 1994 indicated that there were 18,643 single family and 456 multiple family connections in Redding with a population of about 72,000. Using these values, there were approximately 3.8 persons/ water connection.

The water is diverted from the Sacramento River. The city also diverts up to 21,000 acre-feet of water under a water rights settlement contract with Reclamation. Wellfields in the city provide up to 6,608 acre-feet of groundwater, as calculated by the city and Reclamation as part of the Water Needs Assessment.

The CVP water services contract for the city is for 6,140 acre-feet and is classified as an M&I contract. Population projections, water demands, and unit water rates were calculated by the city and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2020 population for the city would be 108,326 with a unit water rate of about 158.7 gallons/capita/day. The residential water demand for 2020 would be 19,260 acre-feet/year for all of the City of Redding. The Water Needs Assessment indicated that the commercial and industrial water demands in 2020 would be 12,280 acre-feet/year and 660 acre-feet/year, respectively, and there would be 1,000 acre-feet/year in system losses. The total M&I water demand is projected to be 33,200 acre-feet for all of the City of Redding for 2020.

The Buckeye and Summit City zones have 4,179 and 58 connections, respectively. These zones are not anticipated by the City planning documents to support extensive growth. Assuming 3.8 persons/water connection, as described above, the CVP water service contract water would serve about 16,100 persons in 2020.

City of Redding CVP Contract: 6,140 acre-feet for M&I

(all values in acre-feet/year unless noted)

2025 Water Demand	**Population**[a]	**Gallons/ capita/day**[a]	**Total Residential Water Demand**	**Commercial Water Demand**[a]	**Industrial Water Demand**[a]	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	108,326	158.7	19,260	12,280	660	1,000	33,200
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	6,067	9,824	594	800	17,285	4,605	4,605

[a] Based on local agency reports

U.S. Forest Service - Centimundi Boat Ramp

The U.S. Forest Service uses 10 acre-feet/year for the Centimundi Boat Ramp. This water is delivered by Shasta Community Services District, as described above. The CVP water services contract for the U.S. Forest Service is for 10 acre-feet and is classified as an M&I contract. Reclamation did not complete a detailed Water Needs Assessment for this contract as the quantity of CVP water under contract is below the 2,000 acre-foot threshold established for conducting a Water Needs Assessment.

U.S. Forest Service - Centimundi Boat Ramp CVP Contract: 10 acre-feet for M&I (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population** [a]	**Gallons/capita/day** [a]	**Total Residential Water Demand**	**Commercial Water Demand** [a]	**Industrial Water Demand** [a]	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	0	0	0	10	0	0	10
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	0	8	0	0	8	8	8
[a] Based on local agency reports							

SACRAMENTO RIVER DIVISION

The Sacramento River Division includes five water service contractors. The surface water operations for the contractors are described below.

Colusa County Water District

Colusa County Water District encompasses 40,661 acres north of Dunnigan in Colusa and Yolo counties. The district primarily serves agricultural lands. The primary crops are almonds and field crops. Municipal water use is primarily for the Arbuckle Golf Course and 36 acres of nurseries.

The district obtains water from the Tehama-Colusa Canal under a 62,200 acre-foot CVP water service contract for irrigation/M&I. The district also has a subcontract with the County of Colusa for delivery up to 5,965 acre-feet. About 22,000 acre-feet of groundwater is used within the district. The district also anticipates purchasing 25,000 acre-feet from Westside Water District each year.

Due to the relative small volume of water for M&I users, the district and Reclamation only completed the Water Needs Assessment for the agricultural users. It is assumed that there is no CVP water service contract water used for populations and 150 acre-feet/year is used for nurseries and other commercial uses.

Colusa County Water District CVP Contract: 62,200 acre-feet for Irrigation/M&I
(all values in acre-feet/year unless noted)

2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	0	0	0	0	150	0	150
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	0	0	120	0	120	46,650	120

[a] Based on local agency reports

County of Colusa

County of Colusa provides water to Stonyford for restaurants, a gas station, associated residential units, and a timber industry. The primary activity in this town is to support recreational activities in the area. Therefore, the peak water use occurs during the summer months beginning with Memorial Day through and including Labor Day.

Water is delivered from Black Butte Reservoir to Stonyford under a 40 acre-foot CVP water service contract for M&I uses. Reclamation did not complete a detailed Water Needs Assessment for this contract as the quantity of CVP water under contract is below the 2,000 acre-foot threshold established for conducting a Water Needs Assessment. The following information was used to determine the future water demands for this district.

The 2001 "Draft Environmental Assessment for the Long-Term Contract Renewals of West Sacramento Canals Water Districts" (Sacramento LTCR EA) identified a population of 20 in Stonyford. It is assumed that there would not be significant growth by 2025.

The CVP water service contract is the only water supply for the County of Colusa. Unit water rates have not been calculated for Stonyford. Due to the nature of this community, unit water rates may be similar to those calculated for Bella Vista Water District by Reclamation as part of the Water Needs Assessment, or 257 gallons/capita/day. Therefore, in 2025, the annual water demands for this community would be six acre-feet for residential users. It is anticipated that one acre-foot would be used for commercial users and the remaining 33 acre-feet would be used by the industry.

County of Colusa CVP Contract: 40 acre-feet for M&I

(all values in acre-feet/year unless noted)

2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	20	257	6	1	33	0	40
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	1	1	30	0	32	30	30

[a] Based on local agency reports

Whitney Construction

Whitney Construction (formerly Louisiana-Pacific) is located in Glenn County and is a forestry industry. Water is delivered from Black Butte Reservoir under a 25 acre-foot CVP water service contract for M&I uses. Reclamation did not complete a detailed Water Needs Assessment for this contract as the quantity of CVP water under contract is below the 2,000 acre-foot threshold established for conducting a Water Needs Assessment. The CVP water service contract is the only water supply for this contractor. The water supply is for industrial uses only.

Whitney Construction CVP Contract: 23 acre-feet for M&I (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	0	0	0	0	25	0	25
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	0	0	23	0	23	19	19
[a] Based on local agency reports							

Elk Creek Community Services District

The Elk Creek Community Services District provides water to Elk Horn Lodge, Elk Creek School, and a gas station. Water is delivered from Black Butte Reservoir under a 100 acre-foot CVP water service contract for M&I uses. Reclamation did not complete a detailed Water Needs Assessment for this contract as the quantity of CVP water under contract is below the 2,000 acre-foot threshold established for conducting a Water Needs Assessment. It is assumed that the need is 15 acre-feet based on information provided by the district in 1994. It also is assumed that the entire Contract Total is used for commercial users.

Elk Creek Community Services District CVP Contract: 100 acre-feet for M&I
(all values in acre-feet/year unless noted)

2025 Water Demand	**Population**[a]	**Gallons/ capita/day**[a]	**Total Residential Water Demand**	**Commercial Water Demand**[a]	**Industrial Water Demand**[a]	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	0	0	0	15	0	0	15
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	0	12	0	0	12	75	12

[a] Based on local agency reports

U.S. Forest Service

The CVP water service contract water is used in Glenn County for a conservation camp. Water is delivered from Black Butte Reservoir under a 45 acre-foot CVP water service contract for M&I uses. Reclamation did not complete a detailed Water Needs Assessment for this contract as the quantity of CVP water under contract is below the 2,000 acre-foot threshold established for conducting a Water Needs Assessment. It is assumed that the entire Contract Total is used for commercial users.

U.S. Forest Service CVP Contract: 45 acre-feet for M&I

(all values in acre-feet/year unless noted)

2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	0	0	0	0	45	0	45
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	0	0	36	0	36	34	34

[a] Based on local agency reports

AMERICAN RIVER DIVISION

The American River Division includes eight water service contractors. The surface water operations for the contractors are described below.

El Dorado Irrigation District

El Dorado Irrigation District serves water to 139,000 acres of El Dorado County. El Dorado Irrigation District serves CVP water in some areas and local water rights water in other areas. The CVP water service contract water is provided for El Dorado Hills and Lake Hills Estate near Folsom Lake. The El Dorado Hills and Lake Hills Estate areas are primarily residential with some commercial and office parks.

Until 2004, water from Jenkinson Lake was provided by the CVP. However, this facility and the water rights have been transferred to El Dorado Irrigation District. Water rights from Folsom Lake are used in El Dorado Hills, Cameron Park, Shingle Springs, and Monte Vista near Folsom Lake. In the future, the district will receive water under a CVP contract authorized for El Dorado County Water Agency under PL 101-514. However, the environmental documentation for this contract are being developed and are not evaluated in this EA.

The CVP water services contract for the district is 7,550 acre-feet and is classified as an M&I contract. Population projections, water demands, and unit water rates were calculated by the district and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2025 population for the entire district would be 177,802 with a unit water rate of about 170.1 gallons/capita/day. The residential water demand for 2025 would be 26,811 acre-feet/year for all of the district. The Water Needs Assessment indicated that the commercial and industrial water demands in 2025 would be 33,870 acre-feet/year and 335 acre-feet/year, respectively, and there would be 7,484 acre-feet/year in system losses. The total M&I water demand would be 40,956 acre-feet for all of the district for 2025. The total agricultural water demand for the district would be 19,071 acre-feet/year. The total water demand for the district would be 24,466 acre-feet/year in 2025.

El Dorado Hills and Lake Hills Estates is projected to include a population of 39,633 in 2025 based upon information developed for the 2004 El Dorado County General Plan. Assuming the unit water rate developed for the district, the residential water demand would be 7,550 acre-feet. The commercial water demand is assumed to be 7,903 acre-feet based upon information presented in the General Plan. There are no industrial water uses in this area and system losses are assumed to be included in the other water demands.

El Dorado Irrigation District CVP Contract: 7,550 acre-feet for M&I (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	39,633	170.1	7,550	7,903	0	0	15,453
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	2,220	6,322	0	0	8,542	5,663	5,663
[a] Based on local agency reports							

City of Roseville

The City of Roseville extends over approximately 19,789 acres. A 1990 land use inventory indicated that about 21 percent of the land that uses water was residential, four percent was commercial, six percent was industrial, 12 percent was urban reserve, and 57 percent was public lands and vacant lands. The Roseville 1992 General Plan Update projected land use in 2010 for the land that uses water to be 34 percent residential, 13 percent commercial, 15 percent industrial, 22 percent urban reserve, and 16 percent public lands and vacant lands.

The City of Roseville has CVP water contract for up to 32,000 acre-feet/year for M&I purposes. Groundwater supplies are extremely limited in Roseville due to the geological formations. However, during emergencies, such as drought periods, groundwater may be used for a limited time period. Roseville also contracts with Placer County Water Agency to deliver 10,000 acre-feet.

Population projections, water demands, and unit water rates were calculated by the city and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2025 population would be 120,000 with a unit water rate of about 207 gallons/capita/day. The residential water demand for 2025 would be 27,779 acre-feet/year. The Water Needs Assessment indicated that the commercial and industrial water demands in 2025 would be 16,163 acre-feet/year and 6,566 acre-feet/year, respectively, and there would be 4,392 acre-feet/year in system losses. The total M&I water demand would be 54,900 acre-feet in 2025. There are no agricultural water demands projected for 2025.

City of Roseville CVP Contract: 32,000 acre-feet for M&I (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	120,000	207	27,779	16,163	6,566	4,392	54,900
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	6,721	12,930	5,900	3,514	29,066	24,000	24,000
[a] Based on local agency reports							

San Juan Water District

San Juan Water District provides water for Fair Oaks Water District, the Orange Vale Water Company, Citrus Heights Water District, the Ashland area of Folsom, and adjacent unincorporated areas.

The district has a CVP water service contract for 24,200 acre-feet for M&I users. The district also has a water right of 33,000 acre-feet. San Juan Water District also conveys 25,000 acre-feet for Placer County Water Agency to portions of Placer County that cannot be easily served through Placer County Water Agency facilities. Groundwater resources are not adequate for water supply within the San Juan Water District near the City of Folsom. However, groundwater resources are located within the boundaries of Orange Vale Water Company, Fair Oaks Water District, Citrus Heights Water District, and Northridge Water District. The district uses about 5,700 acre-feet/year for groundwater recharge.

The portion of Sacramento County served by San Juan Water District extends over approximately 20,420 acres. A 1991 land use inventory indicated that of the land that uses water 71 percent was residential, six percent was commercial, less than 0.5 percent was industrial, 10.5 percent was urban reserve, and 12 percent was public lands and vacant lands.

Population projections, water demands, and unit water rates were calculated by the district and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2025 population would be 214,234 with a unit water rate of about 244 gallons/capita/day. The residential water demand for 2025 would be 58,616 acre-feet/year. The Water Needs Assessment indicated that the commercial water demands in 2025 would be 11,896 acre-feet/year, and there would be 6,120 acre-feet/year in system losses. There would be no industrial water demands. The total M&I water demand would be 76,632 acre-feet in 2025. There are no agricultural water demands projected for 2025.

San Juan Water District CVP Contract: 24,200 acre-feet for M&I

(all values in acre-feet/year unless noted)

2025 Water Demand	**Population**	**Gallons/ capita/day**	**Total Residential Water Demand**	**Commercial Water Demand**	**Industrial Water Demand**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	214,234	244	58,616	11,896	0	6,120	76,632
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	11,999	9,517	0	4,896	26,412	18,150	18,150

Sacramento County Water Agency

Sacramento County Water Agency provides CVP water as authorized under PL 101-514 to Zone 40 and through a subcontract with the City of Folsom. Both areas are characterized by extensive residential and commercial areas with specific industrial users.

Zone 40 has historically relied upon groundwater to serve municipal users in an unincorporated area located south of the City of Sacramento. The CVP contract provides up to 15,000 acre-feet of CVP water for M&I uses. Water is currently provided through an exchange agreement with the City of Sacramento through a diversion at the Fairbairn Water Treatment Plant on the American River. In the future, water will be diverted from the Sacramento River near Freeport. An additional 30,000 acre-feet of CVP water service contract water is planned to be assigned to Zone 40 from Sacramento Municipal Utility District, as described below. During drier years, Sacramento County Water Agency would increase groundwater use based upon a future conjunctive use program.

The City of Folsom provides water rights water to municipal users throughout the city. The CVP water is for 7,000 acre-feet of M&I uses in the southeastern portion of the city. All water for Folsom is delivered from the American River at Folsom Lake. Groundwater resources are not readily available in the Folsom area.

Population projections, water demands, and unit water rates were calculated by the agency and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2025 population for Sacramento County Water Agency's use of CVP water (including Zone 40 and the City of Folsom) would be 411,815 with a unit water rate of about 204 gallons/capita/day. The residential water demand for 2025 would be 63,605 acre-feet/year. The Water Needs Assessment indicated that the commercial and industrial water demands in 2025 would be 17,076 and 9,200 acre-feet/year, respectively, and there would be 3,673 acre-feet/year in system losses. The total M&I water demand would be 93,554 acre-feet in 2025. There are no agricultural water demands projected for 2025.

Sacramento County Water Agency CVP Contract: 52,000 acre-feet for M&I
(all values in acre-feet/year unless noted)

2025 Water Demand	**Population**	**Gallons/ capita/day**	**Total Residential Water Demand**	**Commercial Water Demand**	**Industrial Water Demand**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	411,815	204	63,605	17,076	9,200	3,673	93,554
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	23,066	13,661	8,280	2,938	47,945	39,000	39,000

Placer County Water Agency

Placer County Water Agency provides water service to municipal users in western and central Placer County. The agency has 220,400 acre-feet in water rights on the American River. Approximately 84,000 acre-feet of water rights is either delivered by other agencies due to proximity of facilities or sold to other agencies to serve users within or adjacent to Placer County. The agency signed a recent CVP Amendatory Contract for water service contract water from the American River for 35,000 acre-feet of water for M&I purposes. This water is not currently delivered but will be used prior to 2025.

Population projections, water demands, and unit water rates were calculated by the agency and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2025 population for the agency would be 199,569 with a unit water rate of about 204 gallons/capita/day. The residential water demand for 2025 would be 45,500 acre-feet/year. The Water Needs Assessment indicated that the commercial and industrial water demands in 2025 would be 14,000 and 10,000 acre-feet/year, respectively, and there would be 5,000 acre-feet/year in system losses. The total M&I water demand would be 74,500 acre-feet in 2025. The agricultural water demands would be 81,867 acre-feet for 2025. The total water demand for the agency in 2025 would be 156,187 acre-feet.

Placer County Water Agency CVP Contract: 35,000 acre-feet for M&I (all values in acre-feet/year unless noted)								
2025 Water Demand	**Population**	**Gallons/ capita/day**	**Total Residential Water Demand**	**Commercial Water Demand**	**Industrial Water Demand**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	199,569	204	45,500	14,000	10,000	5,000	74,500
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	11,178	11,200	9,000	4,000	35,378	26,250	26,250

Sacramento Municipal Utility District

Sacramento Municipal Utility District uses the CVP water service contract water at the Rancho Seco Power Plant site. The power plant site initially was planned to use 75,000 acre-feet/year. The water demand was to be provided by 15,000 acre-feet of water rights provided from the City of Sacramento and a 60,000 acre-foot CVP water service contract water. However, the power plant site is being modified to eliminate the nuclear generation plant and utilize fossil fuel. The projected 2025 water demand is 33,942 acre-feet in 2025 and 46,186 acre-feet in 2040 to be use by the new Cosumnes Power Plant and other future power plants. The water rights will continue to be used to provide 15,000 acre-feet. 30,000 acre-feet is to be assigned to Sacramento County Water Agency. Groundwater resources are not adequate for water supply for the Rancho Seco site.

Water demands and unit water rates were calculated by the district and Reclamation as part of the Water Needs Assessment.

Sacramento Municipal Utility District CVP Contract: 30,000 acre-feet for M&I

(all values in acre-feet/year unless noted)

2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	0	0	0	0	33,942 (46,186 in 2040)	0	33,942 (46,186 in 2040)
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	0	0	30,548 (41,567 in 2040)	0	30,548 (41,567 in 2040)	22,500	22,500

[a] Based on local agency reports

East Bay Municipal Utility District

Under the terms of the current CVP Amendatory Contract for East Bay Municipal Utility District, the CVP water service Contract Total would 150,000 acre-feet to be delivered below the confluence of the American and Sacramento rivers near Freeport, in accordance with the limitations described below. This is considered a dry year water supply and is provided with the following specific conditions under Reclamation's water rights for the American River near Freeport.

> "At Freeport on the Sacramento River, their contract shall be entitled to take delivery of up to a total of 133,000 acre-feet of Project Water for M&I purposes in any Year in which the Contractor's March 1 forecast of its October 1 Total System Storage, as revised monthly through May 1 is less than 500,000 acre-feet based on a 50 percent (50 %) exceedance, or any different reasonable exceedance used by the Contractor to declare rationing within the Contractor's Water Service Area, or as otherwise agreed to by the parties (referred to as the TSS forecast). Said entitlement shall not exceed a total of 165,000 acre-feet of Water delivered in any three consecutive Year period that the Contractor's Total System Storage forecast remains below 500,000 acre-feet."

The CVP water service contract is a dry year supply to improve water supply allocations for the district from the primary water supply, the Mokelumne River. In critical dry years, there is approximately 80,000 acre-feet of water available on the Mokelumne River for the district.

Population projections, water demands, and unit water rates were calculated by the district and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2025 population for the district would be 1,317,000 with a unit water rate of about 72 gallons/capita/day. The residential water demand for 2025 would be 106,100 acre-feet/year. The Water Needs Assessment indicated that the commercial and industrial water demands in 2025 would be 40,300 and 25,700 acre-feet/year, respectively, and there would be 21,000 acre-feet/year in system losses. The total M&I water demand would be 193,200 acre-feet in 2025. There are no agricultural water demands.

East Bay Municipal Utility District CVP Contract: 133,000 acre-feet for M&I (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population**	**Gallons/ capita/day**	**Total Residential Water Demand**	**Commercial Water Demand**	**Industrial Water Demand**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	1,317,000	72	106,100	40,300	25,700	21,000	193,200
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	73,766	32,240	23,130	16,880	146,016	99,750 if contract allowed delivery	Limited by contract - as described above

EASTSIDE DIVISION

Only one contractor in the Eastside Division, that for Tuolumne Utilities District, is expected to reference the CVP M&I Water Shortage Policy. However, the contract would be subject to additional constraints on the availability of project water beyond those provided in the policy and that specifically relate to a project supply from New Melones Reservoir. A new contract with Tuolumne Utilities District is expressly authorized under Section 3404(b) of the CVPIA.

Tuolumne Utilities District

Tuolumne Utilities District provides water to several municipal areas in western and central Tuolumne County. Water rights of 21,870 acre-feet from the Stanislaus River are used to meet most of the demands. As part of the implementation program for the New Melones Reservoir on the Stanislaus River, Reclamation included provisions for a water service contract to serve areas in the upper watershed of the Stanislaus River. Recently, Tuolumne Utilities District constructed a pump station on the New Melones Reservoir to serve residential communities near Columbia. This contract would be executed in accordance with an agreement negotiated prior to completion of the New Melones Reservoir, and in accordance with State and Federal law. It would also be subject to verification of Contract Total by means of a completed Water Needs Assessment by Reclamation. About 260 acre-feet of groundwater is available in limited portions of the district.

The CVP water services contract for this district is for 9,000 acre-feet and is classified as an M&I contract. Due to the nature of this contract, Reclamation did not complete a detailed Water Needs Assessment at this time. The following information was used to determine the future water demands for this district.

The 2000 "Urban Water Management Plan Update for Tuolumne Utility District" identified a total population of 47,500 for the entire district in 2020 with a unit water demand of 151 gallons/capita/day for a total residential water demand of 8,035 acre-feet. The plan also projects a commercial and industrial demand of 200 and 530 acre-feet, respectively, with system losses of 7,050 acre-feet for the entire services area. The total M&I demand would be 15,815 acre-feet in 2020. The projected agricultural demand would be 3,200 acre-feet. The total demand is projected to be 19,015 acre-feet in 2020. However, this area is larger than the area served by the CVP.

Tuolumne Utilities District: CVP Contract: Potentially up to 9,000 acre-feet for M&I
(all values in acre-feet/year unless noted)

2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	47,500	151	8,035	200	530	7,050	15,815
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	2,661	160	477	5,640	8,938	6,750	6,750

[a] Based on local agency reports

DELTA DIVISION

The Delta Division includes seven water service contractors. The surface water operations for the contractors are described below.

Broadview Water District

Broadview Water District is an agricultural district that encompasses 9,515 acres. The district is within the Grasslands drainage area and implements strict water conservation and other measures to reduce drainage flows or seepage to the groundwater.

The district receives CVP water service contract water from the Delta Mendota Canal for agricultural uses. The M&I uses have historically included 20 acre-feet to serve the district headquarters and neighboring residences, as reported in the 2001 "Draft Environmental Assessment for Long-Term Contract Renewal for the Delta Division" (Delta Division LTCR EA). The M&I water is diverted and conveyed by Westlands Water District to the Broadview Water District. There are no operable groundwater wells in the area.

The CVP water services contract for this district is for 26,000 acre-feet and is classified as an Irrigation/M&I contract. Due to the limited use of M&I water under this contract, Reclamation did not include the M&I component details in the Water Needs Assessment. The following information was used to determine the future water demands for this district.

It was assumed that the water demand for the district office and commercial and institutional users would be four acre-feet in 2025. The remaining 16 acre-feet would be residential demand for 58 persons assuming 250 gallons/capita/day. The Water Needs Assessment identified an agricultural water demand in 2025 of 25,100 acre-feet. Therefore, the total district water demand would be 25,120 acre-feet in 2025. The Water Needs Assessment also indicates that the district sells about 1,880 acre-feet/year.

Broadview Water District CVP Contract: 27,000 acre-feet for Irrigation/M&I

(all values in acre-feet/year unless noted)

2025 Water Demand	**Population**[a]	**Gallons/ capita/day**[a]	**Total Residential Water Demand**	**Commercial Water Demand**[a]	**Industrial Water Demand**[a]	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	58	250	16	4	0	0	20
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	3	3			6	20,250	6

[a] Based on local agency reports

Del Puerto Water District

Del Puerto Water District was reorganized in 1995 to incorporate eleven water districts located along both sides of the Delta Mendota Canal. The consolidated districts included Del Puerto, Hospital, Kern Canyon, Salado, Sunflower, Orestimba, Foothill, Davis, Mustang, Quinto, and Romero water districts. The new district includes about 47,400 acres along the western boundary of Stanislaus, San Joaquin, and Merced counties. The district is primarily located in Stanislaus County.

The district is located near the communities of Tracy and Patterson. However, the Delta Division LTCR EA indicates that land owners want to maintain an agricultural area and would de-annex land to municipal areas. The historic municipal use of about 12 acre-feet/year is used for dust control at the municipal landfill.

The district receives CVP water from the Delta Mendota Canal. Groundwater use is limited from shallow groundwater and is balanced with recharge operations. The Water Needs Assessment assumes that there is no net use of groundwater. There are no other sources of water supply for the district.

The CVP water service contract for this district is for 140,120 acre-feet and is classified as an Irrigation/M&I contract. Due to the limited use of M&I water under this contract, Reclamation did not include the M&I component details in the Water Needs Assessment. The following information was used to determine the future water demands for this district.

The majority of the population in the district is located in the Santa Nella area. It is assumed that 12 acre-feet would continue to be used for dust control as an industrial water demand and the remaining 188 acre-feet would be used to serve residential users near Santa Nella.

The Water Needs Assessment identified an agricultural water demand in 2025 of 142,735 acre-feet. Therefore, the total district water demand would be 142,935 acre-feet in 2025.

Del Puerto Water District CVP Contract: 140,210 acre-feet for Irrigation/M&I

(all values in acre-feet/year unless noted)

2025 Water Demand	Population[a]	Gallons/ capita/day[a]	Total Residential Water Demand	Commercial Water Demand[a]	Industrial Water Demand[a]	System Loss per Needs Assessment	Total M&I Water Demand
	670	250	188	0	12	0	200
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	38		11		48	105,158	48

[a] Based on local agency reports

Byron-Bethany Irrigation District

Byron-Bethany Irrigation District acquired the Plainview Water District. This area is located near Tracy. Crops in the district are primarily alfalfa, row crops, almonds, and cherries. About 500 acres of land has been converted to M&I use. M&I water is delivered to this area by the City of Tracy. The district plans to transfer a portion of the land in the district and about 12,000 acre-feet of water to the City of Tracy by 2025. The district also plans to transfer water to other users.

The CVP water services contract for this district is for 20,600 acre-feet and is classified as an Irrigation/M&I contract. The Water Needs Assessment identified an agricultural water demand in 2025 of 7,995 acre-feet and an industrial water demand of 800 acre-feet in 2025.

Byron-Bethany Irrigation District CVP Contract: 20,600 acre-feet for Irrigation/M&I (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population**	**Gallons/ capita/day**	**Total Residential Water Demand**	**Commercial Water Demand**	**Industrial Water Demand**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
			0	0	800	0	800
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
			720		720	15,450	720

City of Tracy

The City of Tracy provides water to a growing municipal area in San Joaquin County. In addition to the existing areas in the city, there are plans to expand into areas currently served by Byron-Bethany Irrigation District, Widren Water District, Banta-Carbona Irrigation District, and The West Side Irrigation District. The agricultural districts have initiated or are planning to initiate the process to transfer water for these lands to the City of Tracy. The projected water supply to be transferred from agricultural districts would be 32,000 acre-feet in 2025, including 5,000 acre-feet from Banta-Carbona Irrigation District, 2,500 acre-feet from The West Side Irrigation District, and transfers from other water districts. The city also relies upon 5,000 acre-feet/year of groundwater. The CVP water service contract is for 17,500 acre-feet to be used for M&I uses.

Population projections, water demands, and unit water rates were calculated by the city and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2025 population for the city would be 160,000 with a unit water rate of about 256.7 gallons/capita/day. The residential water demand for 2025 would be 46,000 acre-feet/year. The Water Needs Assessment did not include values for commercial or industrial uses. However, for the purposes of this analysis, information from 2003 and 2004 reports by the City of Tracy was used to further define the water demands. Assuming a unit water rate of 186 gallons/capita/day with the population projection from the Water Needs Assessment would result in a projected residential water demand of 33,000 acre-feet in 2025. The Tracy Urban Water Management Plan indicated that the commercial and industrial uses would be 9,000 and 3,700 acre-feet, respectively. The total M&I water demand would continue to be 46,000 acre-feet.

City of Tracy CVP Contract: 17,500 acre-feet for M&I

(all values in acre-feet/year unless noted)

2025 Water Demand	**Population**[a]	**Gallons/ capita/day**[a]	**Total Residential Water Demand**	**Commercial Water Demand**[a]	**Industrial Water Demand**[a]	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	160,000	186	33,000	9,000	3,700	0	46,000
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	8,962	7,200	3,300	0	19,492	13,125	19,492

[a] Based on local agency reports

Patterson Irrigation District

The Patterson Irrigation District is an agricultural district in Stanislaus County encompassing 13,225 acres. The primary crops in the district are alfalfa, apricots, beans, almonds, and row crops. Historically, users that require M&I water have been required by the district to de-annex from the district. Future growth is anticipated to occur near Tracy.

The district also holds 23,000 acre-feet of water rights on the San Joaquin River of which 2,465 acre-feet are used for groundwater recharge.

The CVP water services contract for this district is for 16,500 acre-feet and is classified as an Irrigation/M&I contract. Due to the limited use of M&I water under this contract, Reclamation did not include the M&I component details in the Water Needs Assessment. The following information was used to determine the future water demands for this district.

The projected population of the district in 2025 is anticipated to be 3,750 in 2025 based upon information included in the Water Needs Assessment. It is assumed that the unit water rate for residential use is 250 gallons/capita/day. Using these values, the projected residential water demand would be 1,000 acre-feet in 2025. It is anticipated that there would not be any additional commercial and industrial water demands. The Water Needs Assessment identified an agricultural water demand in 2025 of 53,242 acre-feet. Therefore, the total district water demand would be 54,242 acre-feet in 2025.

Patterson Irrigation District CVP Contract: 16,500 acre-feet for Irrigation/M&I

(all values in acre-feet/year unless noted)

2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	3,570	250	1,000	0	0	0	1,000
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	200	0	0	0	200	12,375	200

[a] Based on local agency reports

Contra Costa Water District

The Contra Costa Water District is comprised of a raw water service area and a treated water service area. Raw water is provided to the cities of Antioch, Martinez, and Pittsburg; 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. Treated water is provided to Clayton, Clyde, Concord, Pacheco, Port Costa; portions of Pleasant Hill, Martinez, and Walnut Creek; and other unincorporated areas of Contra Costa County.

The district has a CVP water service contract for 195,000 acre-feet for M&I purposes. The district also obtains 8,200 acre-feet from water rights held by East Contra Costa Irrigation District and 3,000 acre-feet of groundwater in the eastern portion of Contra Costa County. Groundwater is of poor quality throughout most of the district and is of limited availability.

Population projections, water demands, and unit water rates were calculated by the district and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2025 population for the district would be 568,000 with a unit water rate of about 220 gallons/capita/day. The residential water demand for 2025 would be 140,200 acre-feet/year. The Water Needs Assessment did not include separate values for commercial uses. The Water Needs Assessment indicated that the industrial water demand would be 57,000 acre-feet in 2025 and system losses would be 10,000 acre-feet. The total M&I water demand would be 207,200 acre-feet in 2025. The Water Needs Assessment did not specifically identify agricultural water demands.

Contra Costa Water District CVP Contract: 195,000 acre-feet for M&I

(all values in acre-feet/year unless noted)

2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	568,000	190	119,200	21,000	57,000	10,000	207,200
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	31,814	16,800	51,300	8,000	107,914	146,250	107,914

[a] Based on local agency reports

Department of Veteran Affairs - San Joaquin National Cemetery

The San Joaquin National Cemetery is located near O'Neill Forebay for San Luis Reservoir. Water use is primarily for irrigation and use at the associated buildings.

The cemetery has a CVP water service contract for 450 acre-feet for M&I purposes. The cemetery has no other water supplies. Current and future water demands are 450 acre-feet.

Department of Veteran Affairs - San Joaquin National Cemetery CVP Contract: 450 acre-feet for M&I (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	0	0	0	450	0	0	450
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	0	360	0	0	360	338	338
[a] Based on local agency reports							

WEST SAN JOAQUIN DIVISION

The West San Joaquin Division includes eight water service contractors. The surface water operations for the contractors are described below.

Westlands Water District

Westlands Water District is an agricultural district in Fresno, Merced, and Kings counties encompassing over 605,648 acres. The primary crops in the district are alfalfa, cotton field crops, almonds, and row crops.

The CVP water services contract for this district is for 1,150,000 acre-feet and is classified as an Irrigation/M&I contract. The district also uses an average of 175,000 acre-feet/year of groundwater. Water is purchased during many years to replace CVP water service contract water that is not delivered due to availability.

The district receives CVP water service contract water from the Delta Mendota Canal and San Luis Canal. The M&I uses have historically included Lemore Naval Air Station (2,599 acre-feet) and food processing industries throughout the district (1,839 acre-feet).

Due to the limited use of M&I water under this contract, Reclamation did not include the M&I component details in the Water Needs Assessment. The following information was used to determine the future water demands for this district.

It was assumed that existing water demands would continue and additional commercial uses would be established along Interstate 5. Therefore, it was assumed that the industrial water demand would be 1,839 acre-feet. The commercial water demand would be 3,099 acre-feet, including continued service to Lemore Naval Air Station and an additional 500 acre-feet for new commercial uses. The total M&I water use would be 4,938 acre-feet in 2025. The Water Needs Assessment identified an agricultural water demand in 2025 of 1,394,349 acre-feet. Therefore, the total district water demand would be 1,409,287 acre-feet in 2025.

Westlands Water District CVP Contract: 1,150,000 acre-feet for Irrigation/M&I (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	0	0	0	3,099	1,839	0	4,938
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	0	2,479	1,655	0	4,134	862,500	4,134
[a] Based on local agency reports							

San Luis Water District

San Luis Water District is an agricultural district in Fresno and Merced counties encompassing over 64,668 acres. The primary crops in the district are alfalfa, cotton field crops, almonds, and row crops.

The CVP water services contract for this district is for 125,080 acre-feet and is classified as an Irrigation/M&I contract. The district also uses an average of 5,000 acre-feet/year of groundwater. The district sells an average of 2,894 acre-feet/year.

The district receives CVP water service contract water from the San Luis Canal. The M&I uses have historically been located in and near Santa Nella and along Interstate 5. Water Needs Assessment indicated that total M&I water demand in 2025 would be 2,000 acre-feet. However, specific uses of the water were not identified. The following information was used to determine the future water demands for this district.

It was assumed that existing water demands would continue and additional commercial uses would be established along Interstate 5. It was assumed that the district would provide about 60 percent of the water supply in the Santa Nella area based upon information in the 1995 "Draft Santa Nella Community Specific Plan Program Environmental Impact Report." It also is assumed that the unit water rate for residential use is 250 gallons/capita/day. Using these values, the projected residential water demand would be 1,200 acre-feet in 2025. The remaining 800 acre-feet considered for M&I water demands is assumed to be used by commercial users located along Interstate 5. The Water Needs Assessment identified an agricultural water demand in 2025 of 119,356 acre-feet. Therefore, the total district water demand would be 121,360 acre-feet in 2025.

San Luis Water District CVP Contract: 125,080 acre-feet for Irrigation/M&I (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	4,300	250	1,200	800	0	0	2,000
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	241	640	0	0	881	93,810	881
[a] Based on local agency reports							

Pacheco Water District

Pacheco Water District is an agricultural area located in Merced and Fresno counties. Historically, users that require M&I water have been required by the district to de-annex from the district.

The CVP water services contract for this district is for 10,080 acre-feet and is classified as an Irrigation/M&I contract. The district also uses an average of 4,399 acre-feet of water rights delivered by Central California Irrigation District. The district sells an average of 2,837 acre-feet/year to other users.

The district receives CVP water service contract water from the San Luis Canal. The M&I uses are assumed to be located in the future along Interstate 5. Due to the limited use of M&I water under this contract, Reclamation did not include the M&I component details in the Water Needs Assessment. The following information was used to determine the future water demands for this district.

It was assumed that the projected population of the district in 2025 would be 200. It is assumed that the unit water rate for residential use is 250 gallons/capita/day. Using these values, the projected residential water demand would be 56 acre-feet in 2025. It is anticipated that the existing commercial water demand of 24 acre-feet would remain and that there would be no industrial water demand. The Water Needs Assessment identified an agricultural water demand in 2025 of 11,630 acre-feet. Therefore, the total district water demand would be 11,710 acre-feet in 2025.

Pacheco Water District CVP Contract: 10,080 acre-feet for Irrigation/M&I

(all values in acre-feet/year unless noted)

2025 Water Demand	**Population**[a]	**Gallons/ capita/day**[a]	**Total Residential Water Demand**	**Commercial Water Demand**[a]	**Industrial Water Demand**[a]	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	200	250	56	24	0	0	80
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	11	19	0	0	30	7,560	30

[a] Based on local agency reports

Panoche Water District

Panoche Water District is an agricultural area located in Merced and Fresno counties. The CVP water services contract for this district is for 94,000 acre-feet and is classified as an Irrigation/M&I contract. The district has no other sources of water.

The district receives CVP water service contract water from the San Luis Canal. The M&I uses are assumed to be located in the future along Interstate 5. Due to the limited use of M&I water under this contract, Reclamation did not include the M&I component details in the Water Needs Assessment. The following information was used to determine the future water demands for this district.

It was assumed that the projected population of the district in 2025 would be 250. It is assumed that the unit water rate for residential use is 250 gallons/capita/day. Using these values, the projected residential water demand would be 70 acre-feet in 2025. It is assumed that the commercial water demand would be 30 percent of the total M&I water demand, or 30 acre-feet and there would be no industrial water demand. The Water Needs Assessment identified an agricultural water demand in 2025 of 92,916 acre-feet. Therefore, the total district water demand would be 92,916 acre-feet in 2025.

Panoche Water District CVP Contract: 94,000 acre-feet for Irrigation/M&I (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	250	250	70	30	0	0	100
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	14	24	0	0	38	70,500	38
[a] Based on local agency reports							

City of Avenal

The City of Avenal is located in Kings County. Recent rapid growth has occurred due to the completion of the Avenal State Prison. The Avenal Urban Water Management Plan indicates that the prison employs about 1,300 and is projected to have a prison population of 9,000 in 2030. Other larger employers in Avenal include Paramount Farms, the Reef Sunset Unified School District, and the Pacific Gas & Electric Company natural gas compressor plant. There are about 300 acres of land within the city limits and near Interstate 5 that are designated for future industrial.

The CVP water service contract is for 3,500 acre-feet to be used for M&I uses. The city has no other sources of water.

Population projections, water demands, and unit water rates were calculated by the city and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2025 population for the city would be 12,000 with a unit water rate of about 97 gallons/capita/day. The residential water demand for 2025 would be 1,300 acre-feet/year. The Water Needs Assessment identified projected commercial and industrial uses as 2,143 and 57 acre-feet, respectively. The total M&I water demand is projected to be 3,500 acre-feet in 2025.

City of Avenal CVP Contract: 3,500 acre-feet for M&I

(all values in acre-feet/year unless noted)

2025 Water Demand	**Population**	**Gallons/ capita/day**	**Total Residential Water Demand**	**Commercial Water Demand**	**Industrial Water Demand**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	12,000	97	1,300	2,143	57	0	3,500
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	672	1,714	51	0	2,438	2,625	2,438

City of Coalinga

The City of Coalinga is located along Interstate 5 in Fresno County. Major employers include the Pleasant Valley State Prison, the future Coalinga State Hospital, community college, airport, regional hospital, Harris Ranch Inn-Restaurant, Harris Farms, Harris Feeding Co., West Hills College District, and the City of Coalinga.

The CVP water service contract is for 10,000 acre-feet to be used for M&I uses. The city has no other sources of water.

Population projections, water demands, and unit water rates were calculated by the city and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2025 population for the city would be 27,000 with a unit water rate of about 280 gallons/capita/day. The residential water demand for 2025 would be 8,455 acre-feet/year. At this time, no documentation was found to separately identify the commercial and industrial water uses. Therefore, these values are considered to be included in the total residential water demand. System losses are projected to be 563 acre-feet in 2025. The total M&I water demand is projected to be 9,018 acre-feet in 2025.

City of Coalinga CVP Contract: 10,000 acre-feet for M&I (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population**	**Gallons/ capita/day**	**Total Residential Water Demand**	**Commercial Water Demand**	**Industrial Water Demand**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	27,000	280	8,455	0	0	563	9,081
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	1,512	0	0	450	1,963	7,500	1,963

City of Huron

The City of Huron is located in Fresno County. The city provides support services for agricultural activities in the surrounding area. Seasonal workers increase the population by 50 percent during the summer and early fall months. Local industries include a tomato-processing plant, pistachio processing plant, and farm equipment service center.

The CVP water service contract is for 3,000 acre-feet to be used for M&I uses. The city has no other sources of water.

Population projections, water demands, and unit water rates were calculated by the city and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2025 population for the city would be 12,810 with a unit water rate of about 76 gallons/capita/day. The residential water demand for 2025 would be 1,090 acre-feet/year. The Water Needs Assessment identified projected commercial and industrial uses as 260 and 710 acre-feet, respectively. System losses are projected to be 206 acre-feet in 2025. The total M&I water demand is projected to be 2,266 acre-feet in 2025.

City of Huron CVP Contract: 3,000 acre-feet for M&I (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population**	**Gallons/ capita/day**	**Total Residential Water Demand**	**Commercial Water Demand**	**Industrial Water Demand**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	12,810	76	1,090	260	710	206	2,266
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	718	208	639	165	1,729	2,250	1,729

California Department of Fish and Game

The California Department of Fish and Games uses CVP water in the vicinity of the San Luis Reservoir. CVP water is delivered from the San Luis Reservoir complex. Reclamation did not complete a detailed Water Needs Assessment for this contract as the quantity of CVP water under contract is below the 2,000 acre-foot threshold established for conducting a Water Needs Assessment. It is assumed that the entire Contract Total of 10 acre-feet is used for commercial/institutional purposes.

California Department of Fish and Game CVP Contract: 10 acre-feet for M&I

(all values in acre-feet/year unless noted)

2025 Water Demand	**Population**[a]	**Gallons/ capita/day**[a]	**Total Residential Water Demand**	**Commercial Water Demand**[a]	**Industrial Water Demand**[a]	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	10	0	0	10	0	0	10
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	0	8	0	0	8	8	8

[a] Based on local agency reports

SAN FELIPE DIVISION

The San Felipe Division includes two contractors, Zone 6 of San Benito County Flood Control and Water Conservation District and Santa Clara Valley Water District.

San Benito County Flood Control and Water Conservation District

CVP water is used in Zone 6 of San Benito County Flood Control and Water Conservation District. Zone 6 is primarily an agricultural area that surrounds the cities of San Juan Bautista and Hollister. Water is also provided to these communities within Zone 6. Zone 6 also uses CVP water for groundwater recharge operations.

The CVP water service contract is for 43,800 acre-feet to be used for Irrigation/M&I uses. Zone 6 also uses 22,500 acre-feet of water.

Population projections, water demands, and unit water rates were calculated by the district and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2025 population for the city would be 72,000 with a unit water rate of about 177 gallons/capita/day. The residential water demand for 2025 would be 14,276 acre-feet/year. The Water Needs Assessment identified projected commercial and industrial uses as 1,000 and 1,000 acre-feet, respectively. System losses are included in these projections. The total M&I water demand is projected to be 16,276 acre-feet in 2025. The Water Needs Assessment identified an agricultural water demand in 2025 of 43,885 acre-feet in Zone 6. Therefore, the total Zone 6 water demand would be 60,161 acre-feet in 2025.

San Benito County Water Conservation and Flood Control District CVP Contract: 43,800 acre-feet for Irrigation/M& (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	72,000	177	14,276	1,000	1,000	0	16,276
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	4,033	800	900	0	5,733	32,850	5,733
[a] Based on local agency reports							

Santa Clara Valley Water District

The district's service area, which differs from the CVP service area for Santa Clara Valley Water District (as shown in Figure 1-1), encompasses all of Santa Clara County. Urban users are located throughout the county and agricultural users are primarily located in the southern portion of the county. CVP water is used for municipal, industrial, and irrigation uses and for groundwater recharge. The district's water supply includes a range of water sources, however, conveyance constraints limit the flexibility to use the water sources throughout the district service area. About 50 percent of the supply is from local surface water and groundwater and 50 percent from imported water supplies. Several of the municipalities in the district have individual contracts with the City and County of San Francisco.

The CVP water service contract is for 152,500 acre-feet to be used for Irrigation/M&I uses. The district also has an entitlement contract with the State Water Project for 100,000 acre-feet. Groundwater basins in Santa Clara County provide water supply for potable use and irrigation through pumping by retail water agencies and individual well owners. The district does not operate any of the water supply wells. The estimated groundwater use is about 160,000 acre-feet. Municipalities in the county also use about 168,500 acre-feet of water from other sources including City and County of San Francisco.

The district and the San Luis Water District and Delta Mendota Water Authority entered into an agreement in 1997 to allow for transfer of water between the entities. The agreement expired in 2002.

Population projections, water demands, and unit water rates were calculated by the district and Reclamation as part of the Water Needs Assessment. The Water Needs Assessment indicates that the 2025 population for the city would be 2,175,800 with a unit water rate of about 117 gallons/capita/day. The residential water demand for 2025 would be 285,998 acre-feet/year. The Water Needs Assessment identified projected commercial and industrial uses as 188,569 and 75,428 acre-feet, respectively. System losses are included in these projections. The total M&I water demand is projected to be 549,995 acre-feet in 2025 as identified in the Water Needs Assessment and the Santa Clara Valley Water District Urban Water Management Plan. The Water Needs Assessment identified an agricultural water demand in 2025 of 45,579 acre-feet. Therefore, the total water demand would be 595,574 acre-feet in 2025.

Santa Clara Valley Water District CVP Contract: 152,500 acre-feet for Irrigation/M&I (all values in acre-feet/year unless noted)							
2025 Water Demand	**Population[a]**	**Gallons/ capita/day[a]**	**Total Residential Water Demand**	**Commercial Water Demand[a]**	**Industrial Water Demand[a]**	**System Loss per Needs Assessment**	**Total M&I Water Demand**
	2,175,800	117	285,998	188,569	75,428	0	549,995
Public Health and Safety	**Total Residential @ 50 gallons/ capita/day**	**80% of Commercial**	**90% of Industrial**	**80% of System Loss**	**Total Public Health and Safety water quantity for M&I Demand**	**75% of CVP Contract Total**	**Public Health and Safety water quantity for this EA**
	121,869	150,855	67,885	0	340,609	114,375	114,375
[a] Based on local agency reports							

APPLICATION OF M&I WATER SHORTAGE POLICY FOR THE AMERICAN RIVER DIVISION

During recent droughts on the American River, CVP water allocations for the American River Division were less than allocations in the majority of the CVP system because of the relative small storage volume in Folsom Lake as compared to the water rights commitments on the Lower American River. CVP water users on the American River cannot physically receive water from the Sacramento River without the construction of new facilities, and therefore have limited benefit from the integrated operations of the CVP. In addition, there are no agricultural water suppliers that can be subjected to shortage allocations to increase deliveries for M&I water users.

In response to the limited water availability, and a recognition that unless adequate water supplies are made available, many existing residents, businesses, and agricultural users will suffer shortages during future periodic droughts, the majority of water rights holders and CVP water service contractors on the American River participated along with representatives from local environmental, businesses, and citizens organizations in the development of the Sacramento Area Water Forum (Water Forum) Agreement. A result of the Water Forum process was an agreement by the water users who take delivery of water from, or upstream of, Folsom Lake to limit their total diversion from the American River in drought periods. However, as discussed below, the delivery amounts for American River Division CVP water service contractors resulting from the CVP water service contract allocation methods evaluated in this EA are generally less than the quantities assumed in the development of the Water Forum Agreement.

The Water Forum approach to dry-year allocations has been used as the most likely future condition in the modeling methods used to represent the proposed action and the No Action Alternative scenarios for previous environmental documents, including evaluation of the American River Pump Station, East Bay Municipal Utility District amendatory contract, and Freeport Regional Water Project. In addition, the OCAP 2004 study for future conditions includes the Water Forum Agreement in the assumptions. This subsection describes the Water Forum Agreement.

Sacramento Area Water Forum

The Water Forum, a diverse group of water agencies, business groups, agricultural interests, environmentalists, citizen groups, and local governments, has been engaged in a collaborative planning process to address future water use on the American River since the fall of 1993. The Water Forum formulated the Water Forum Agreement for the effective long-term management of the regional water resources based on the two co-equal objectives: (1) provide a reliable and safe water supply for the region’s economic health and planned development through the year 2030; and (2) preserve the fishery, wildlife, recreational, and aesthetic values of the Lower American River. The comprehensive approach to future water management presented in the Water Forum Agreement contains seven complementary elements, each of which is necessary for a solution to work: 1) increased surface water diversions, 2) actions to meet customer needs while reducing diversion impacts in drier years, 3) an improved pattern of fishery flow releases from Folsom Lake, 4) a lower American River habitat management element that also addresses recreation, 5) a water conservation element, 6) a groundwater management element, and 7) a Water Forum Successor effort.

To provide a more diverse dry-year allocation of water, the Water Forum signatories agreed to a process that allowed senior water rights holders and CVP water service contractors to re-allocate their water supplies in a cooperative manner through "dry year agreements." These agreements integrated with the management of local conjunctive use projects, water conservation, and sharing of recycled water opportunities would provide the basis for meeting their goal of increased water supply. A groundwater conjunctive use program in areas located north of the American River has been initiated and a similar program will be initiated in Zone 40 of Sacramento County Water Agency following the completion of the Freeport Regional Water Authority facilities.

The Water Forum approach establishes a sliding scale of limits to dry-year diversions based on an index that considers conditions only within the American River Basin. Wet/Average Years are defined when the projected March through November unimpaired flow into Folsom Lake is greater than 950,000 acre-feet. Drier Years are defined when the projected March through November unimpaired flow into Folsom Lake is 950,000 to 400,000 acre-feet. Driest Years are defined when the projected March through November unimpaired flow into Folsom Lake is less than 400,000 acre-feet. The projections are based on the addition of calculated quantities for the remaining portion of the contract year (March through September) plus 60,000 acre-feet as an estimate for the October through November period.

Based upon results of the OCAP 2004 CALSIM II model runs, Contract Years 1931, 1934, 1939, 1959, 1961, 1976, 1981, 1987, 1988, 1990, 1992, and 1994 are considered to be Drier Years. Contract Years 1924 and 1977 were considered to be Driest Years. During most of these years, water allocations for the CVP North of Delta CVP water service contractors are also less than 100 percent; however, the magnitude of the allocation reductions may be different on the American River than on the Sacramento River due to basic problems with patterns and quantities of locally available water supplies.

During the Drier and Driest Years, Sacramento County Water Agency (Zone 40 and City of Folsom), San Juan Water District, Sacramento Municipal Utility District, City of Roseville, Placer County Water Agency, and El Dorado Irrigation District will reduce diversions from the American River. This reduction will be a combination of reduced CVP water service contract water and senior water rights water. The Water Forum Agreement also includes releases from Placer County Water Agency during the Drier and Driest Years to provide water for instream flows and diverters. However, this water will only be released if Placer County Water Agency can successfully negotiate associated power generation contracts and water purchase contracts for the released water.

Comparison of Water Forum Proposal Allocations to Central Valley Project Water Service Contracts Allocations

This comparison considers three possible allocations for American River Division M&I water service contractors based on: 1) the CVP water service methodology as described in Table 3-1, 2) allocations modified to provide at least public health and safety water quantities as limited to 75 percent of the CVP water service Contract Totals, and 3) Water Forum Agreement allocations, as summarized in Table 4-1. Because the Water Forum Agreement re-allocates both CVP water and water rights water, the values in Table 4-1 include both types of water.

Nineteen of the 72 years considered in the CALSIM II model simulation are characterized by M&I water service allocations of less than 75 percent and/or Water Forum Agreement Drier or Driest years. During the Drier and Driest years, water is re-allocated among the users with CVP water service contracts and water rights holders rely upon conjunctive use to avoid diverting over 123,500 acre-feet of water. The 19 years are characterized as follows.

- In the 13 years with M&I CVP water service contract allocations less than 75 percent.
- 6 years are categorized as Drier Years - Water Forum Allocations are greater than M&I CVP Allocations with or without public health and safety water quantities.
- 2 years are categorized as Driest Years - Water Forum Allocations are less than M&I CVP Allocations with or without public health and safety water quantities. However, the public

health and safety water quantities would not be delivered in these years because there are no Irrigation CVP water service contractors on the American River from which to obtain water, and therefore, as described under Alternatives 1 and 2, public health and safety water quantities could only be provided if and when available.

- 5 years are categorized as Wet to Average - Water Forum Allocations are identical to M&I CVP water service contract allocations. During these years the M&I CVP water allocations are 50, 53, 54, 63 and 70 percent. However, the public health and safety water quantities would not be delivered in these years because there are no Irrigation CVP water service contractors on the American River from which to obtain water, and therefore, as described under Alternatives 1 and 2, public health and safety water quantities could only be provided if and when available.

- In the 6 years with M&I CVP water service contract allocations equal to or greater than 75 percent

- 4 years are categorized as Drier - Water Forum Allocations are greater than M&I CVP Allocations. During these years the M&I CVP water allocations are 75, 80, and 86 percent.

- 2 years also are categorized as Drier - Water Forum Allocations are less than M&I CVP Allocations. During these years the M&I CVP water allocations are 100 percent. However, 100 percent of the CVP water service contracts may not be delivered in these years because of limited supplies on the American River.

In summary, public health and safety water quantities cannot be provided on the American River even under the Water Forum proposal because there are no facilities to convey water from Irrigation CVP water service contractors to the M&I water service contractors in the American River Division. It should be noted that Reclamation and others are evaluating new conveyance facilities to allow for transfer of allocations and diversion from the Sacramento River for delivery to the American River Division CVP water service contractors and other water users. If and when those facilities are constructed and become operational, then it will be physically possible to deliver public health and safety water quantities to American River Division water service contractors. This possibility could be included in the environmental analyses for the new conveyance facilities.

East Bay Municipal Utility District

The American River Division also includes East Bay Municipal Utility District. Diversions by this district are not affected by the Water Forum Proposal re-allocations under the Amendatory Contract. However, the Amendatory Contract includes a provision that limits total water diversions to dry years only. The allocations under the Amendatory Contract were compared to allocations that could occur considering minimum levels of public health and safety water quantities, as summarized in Table 4-2.

As shown in Table 4-2, 13 years of the 72 years considered in the model simulations in this EA have M&I CVP water service contract allocations less than 75 percent. Of those 13 years, two years have no deliveries to East Bay Municipal Utility District under the Amendatory Contract definitions. Deliveries are limited in two years because deliveries in the current plus previous years exceed 165,000 acre-feet (a maximum limit for three consecutive years in the Amendatory Contract). In the remaining nine years, if deliveries were increased, deliveries in the following year would be decreased because the total amount over a three-year period would be greater than 165,000 acre-feet. Therefore, increasing deliveries as considered in Alternatives 1A, 1B, 2A, and 2B would not be feasible due to the limitations under the Amendatory Contract. Of the remaining 11 years that deliveries are provided to the district, deliveries are limited as described above in nine years.

TABLE 4-1

COMPARISON OF WATER DELIVERIES OF CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT WATER AND SENIOR WATER RIGHTS WATER TO AMERICAN RIVER DIVISION CONTRACTORS WITH CENTRAL VALLEY PROJECT WATER ALLOCATIONS, PUBLIC HEALTH AND SAFETY WATER QUANTITIES, OR WATER FORUM PROPOSAL

Contract Year Allocations for M&I Water Service Contractors	Contract Year	Water Forum Year Designation	Standard Annual Deliveries without Water Forum [a] (acre-feet)	Annual Deliveries Assuming Public Health & Safety Water Quantities [b] (acre-feet)	Annual Deliveries with Water Forum only [c] (acre-feet)
50 percent	1924	Driest	272,875 [d]	314,313 [d]	267,050
	1933	Wet to Average	272,875	314,313 [d]	272,875
	1934	Drier	272,875 [d]	314,313 [d]	341,250
	1990	Drier	272,875	314,313 [d]	341,250
52 percent	1988	Drier	276,190	314,313 [d]	341,250
53 percent	1929	Wet to Average	277,848 [d]	314,313 [d]	277,848
54 percent	1926	Wet to Average	279,505 [d]	314,313 [d]	279,505
	1977	Driest	279,505 [d]	314,313 [d]	267,050
57 percent	1931	Drier	284,478[d]	314,313 [d]	341,250
63 percent	1991	Wet to Average	294,423	314,313 [d]	294,423
66 percent	1976	Drier	299,295	314,313 [d]	341,250
70 percent	1932	Wet to Average	301,053 [d]	314,313 [d]	301,053
74 percent	1960	Drier	312,655	314,313	341,250
75 percent	1987	Drier	314,313	314,313 [d]	341,250
	1992	Drier	314,313	314,313 [d]	341,250
80 percent	1939	Drier	322,600	322,600[d]	341,250
86 percent	1961	Drier	332,545	332,545	341,250
100 percent	1959	Drier	355,750[d]	355,750[d]	341,250
	1981	Drier	355,750[d]	355,750[d]	341,250
100 percent	53 other years in model	Wet to Average	355,750	355,750	355,750

TABLE 4-1

COMPARISON OF WATER DELIVERIES OF CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT WATER AND SENIOR WATER RIGHTS WATER TO AMERICAN RIVER DIVISION CONTRACTORS WITH CENTRAL VALLEY PROJECT WATER ALLOCATIONS, PUBLIC HEALTH AND SAFETY WATER QUANTITIES, OR WATER FORUM PROPOSAL

[a] Water deliveries include CVP water service contract water for M&I water uses plus total senior water rights. CVP water service contract deliveries limited by M&I percentages shown in first column. These values do not include East Bay Municipal Utility District.

[b] Water deliveries include CVP water service contract water for M&I water uses plus total senior water rights. CVP water service contract deliveries limited by M&I allocation amounts shown in first column and public health and safety water quantities presented in previous section. These values do not include East Bay Municipal Utility District.

[c] Water deliveries as described in Water Forum Proposal for Dry and Driest Contract Years. Allocations are equivalent to deliveries shown in "Annual Deliveries without Water Forum" for Wet to Average Contract Years. These values do not include East Bay Municipal Utility District.

[d] Public health and safety values and Standard Annual Deliveries in excess of the Water Forum values cannot be delivered unless facilities are provided to convey water from the Sacramento River to all of the CVP water service contractors. CALSIM model runs used for the No Action Alternative, as described in Chapter 5, assumes delivery of the Water Forum values in these years.

TABLE 4-2

COMPARISON OF WATER DELIVERIES OF CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT WATER TO EAST BAY MUNICIPAL UTILITY DISTRICT WITH THE AMENDATORY CONTRACT OR IMPLEMENTATION OF PUBLIC HEALTH AND SAFETY WATER QUANTITIES

Contract Year Allocations for M&I Water Service Contractors	Contract Year	Annual Deliveries Based upon CVP Water Service Contract Allocations (acre-feet)	Annual Deliveries under Amendatory Contract of 133,000 acre-feet/year and up to 165,000 acre-feet in three consecutive years (acre-feet)	Annual Deliveries Assuming Public Health and Safety Water Quantities [a] (acre-feet)
50 %	1924	66,500	68,900 [c]	99,750
	1933	66,500	72,100 [c]	99,750
	1934	66,500	83,800 [c]	99,750
	1990	66,500	66,500 [c]	99,750
52%	1988	69,160	65,300 [b]	99,750
53%	1929	70,490	73,000 [c]	99,750
54%	1926	71,820	85,900 [c]	99,750
	1977	71,820	76,600 [c]	99,750
57%	1931	75,810	0 [d]	99,750
63%	1991	83,790	78,300 [c]	99,750
66%	1976	87,780	82,400 [c]	99,750
70%	1932	93,100	0 [d]	99,750
74%	1960	98,420	52,900 [b]	99,750

[a] CVP water service contract deliveries limited by M&I allocation percentages are shown in the first column and public health and safety water quantities are presented in the previous portion of this chapter.

[b] The Amendatory Contract limits total deliveries to East Bay Municipal Utility District to 133,000 acre-feet/year and 165,000 acre-feet over three consecutive dry years per the Amendatory Contract

[c] Deliveries in this year will reduce or eliminate deliveries in the following year because total of deliveries would exceed the total of 165,000 acre-feet over three consecutive years per the Amendatory Contract.

[d] This year type does not meet the criteria to deliver water to East Bay Municipal Utility District under the Amendatory Contract

SUMMARY OF PUBLIC HEALTH AND SAFETY WATER QUANTITIES FOR M&I WATER SERVICE CONTRACTORS

The public health and safety water quantities that will be used in the impact assessment presented in Chapter 5 are summarized for the M&I water service contractors considered in this EA in Table 4-3.

TABLE 4-3

MUNICIPAL AND INDUSTRIAL CENTRAL VALLEY PROJECT WATER SERVICE CONTRACTORS PUBLIC HEALTH AND SAFETY WATER QUANTITIES

CVP Division	CVP Contractor	Public Health & Safety water quantity to be Used in Impact Assessment (acre-feet)	Total CVP Contract (acre-feet)
Trinity River	Shasta Community Services District	219	1,000
	Shasta County Service Area - Keswick #25	267	500
	Bella Vista Water District (Not including areas served Shasta County Water Agency Service Area)	5,153	24,000
	Clear Creek Community Services District	3,063	15,300
	Centerville Community Services District	446	2,900
	Subtotal	**9,148**	**43,700**
Shasta	Shasta County Water Agency (including a portion of Bella Vista Water District)	880	2,100
	Mountain Gate Community Services District (Not Shasta County Water Agency Service Area)	68	350
	City of Shasta Lake	2,744	4,400
	City of Redding	4,605 [a]	6,140
	U.S. Forest Service - Centimundi Boat Ramp	8	10
	Subtotal	**4,613**	**13,000**
Sacramento River	Colusa County Water District	120	62,200
	Colusa County	30 [a]	40
	Whitney Construction	19 [a]	25
	Elk Creek Community Services District	12	100
	U.S. Forest Service - campground	34 [a]	45
	Subtotal	**215**	**62,410**

TABLE 4-3

MUNICIPAL AND INDUSTRIAL CENTRAL VALLEY PROJECT WATER SERVICE CONTRACTORS PUBLIC HEALTH AND SAFETY WATER QUANTITIES

CVP Division	CVP Contractor	Public Health & Safety water quantity to be Used in Impact Assessment (acre-feet)	Total CVP Contract (acre-feet)
Eastside	Tuolumne Utility District	6,750 [a]	9,000
	Subtotal	**6,750**	**9,000**
Delta	Broadview Water District	6	27,000
	Del Puerto Water District	48	140,210
	Byron-Bethany Irrigation District	720	20,600
	City of Tracy	13,125 [a]	17,500
	Patterson Irrigation District	200	16,500
	Contra Costa Water District	107,914	195,000
	U.S. Department of Veterans Affairs - Cemetery	338 [a]	450
	Subtotal	**23,032**	**409,760**
West San Joaquin	Westlands Water District	4,134	1,150,000
	San Luis Water District	881	125,080
	Pacheco Water District	30	10,080
	Panoche Water District	38	94,000
	City of Avenal	2,438	3,500
	City of Coalinga	1,963	10,000
	City of Huron	1,729	3,000
	California Department of Fish and Game	8	10
	Subtotal	**11,408**	**1,395,670**
San Felipe	San Benito County Water Conservation and Flood Control District	5,733	43,800
	Santa Clara Valley Water District	114,375 [a]	152,500
	Subtotal	**120,108**	**196,300**
TOTAL		**261,535**	**1,821,090**

TABLE 4-3

MUNICIPAL AND INDUSTRIAL CENTRAL VALLEY PROJECT WATER SERVICE CONTRACTORS PUBLIC HEALTH AND SAFETY WATER QUANTITIES

CVP Division	CVP Contractor	Public Health & Safety water quantity to be Used in Impact Assessment (acre-feet)	Total CVP Contract (acre-feet)

[a] Public health and safety water quantities reflect the 75 percent of contract total limitation because, in these cases, the total public health and safety water quantities for M&I demand exceeds 75 percent of contract total.

American River Division water service contractors are not included in this analysis because it is not feasible to provide additional water to these contractors without construction of conveyance facilities and Water Forum proposal provides a re-allocation of available American River water supplies.

CHAPTER 5

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

CHAPTER 5
Affected Environment and Environmental Consequences

INTRODUCTION

This section describes the affected environment and the environmental consequences associated with all alternatives described in Chapter 2 as compared to the No Action Alternative. This chapter also describes cumulative impacts.

The resources and issues described in this chapter are as follows.

- Surface Water Resources and Central Valley Project Operations
- Groundwater
- Municipal and Industrial Land Use and Central Valley Project Water Supply Costs
- Agricultural Land Use and Economics
- Fishery and Wildlife Resources
- Recreation
- Cultural Resources
- Indian Trust Assets
- Air Quality
- Soils
- Visual Resources
- Power Resources
- Social Conditions
- Environmental Justice

The descriptions of the affected environment are organized by issue and within each issue by CVP-wide resources followed, if appropriate, by division areas including Shasta-Trinity, West Sacramento, American River, Delta, West San Joaquin, and San Felipe divisions. The analyses are based upon information presented in environmental documentation for the concurrent long-term contract renewal process.

SURFACE WATER RESOURCES AND CENTRAL VALLEY PROJECT OPERATIONS

This section describes surface water resources and CVP operations and specific issues associated with delivery of water to M&I users in each division considered in this EA. The description of the Affected Environment has been developed from information presented in previous projects prepared by and for Reclamation, including the OCAP 2004. Surface water impacts are presented at a divisional level in this EA.

Affected Environment

The Affected Environment description of surface water is limited to major streams and water supply facilities that are directly affected by the alternatives. The CVP is operated as an integrated system with reservoirs on the American, Sacramento, Trinity, Stanislaus, and San Joaquin rivers. Water from the Trinity, Sacramento, and American rivers flow into the Sacramento River. These flows are mixed with flows diverted and stored by the State Water Project (SWP) in Oroville Reservoir on the Feather River and other local water rights holders on Sacramento River tributaries. The combined flows are conveyed in the Sacramento River to the Delta and either become part of the Delta outflow or are diverted by the Delta export pumps. The CVP Delta export occurs at Tracy Pumping Plant in the southern Delta which conveys water into the Delta Mendota Canal, San Luis Reservoir, and/or San Luis Canal for delivery to users located south of the Delta. Water from New Melones Reservoir on the Stanislaus River also flows into the Delta upstream of the Delta export pumps.

The SWRCB decisions and orders and biological opinions issued by the National Oceanic and Atmospheric Administration Fisheries and U.S. Fish and Wildlife Service are the primary factors that determine regulatory requirements for water quality, and flow and operations.

Both the CVP and the SWP use the Sacramento River for conveyance and both divert surface water from the southern Delta export pumps. Therefore, the operations of the CVP and the SWP are regulated in a cooperative manner by Reclamation and the California Department of Water Resources through an agreement entitled "Agreement Between the United States of America and State of California for Coordinated Operations Agreement (COA)of the Central Valley Project and State Water Project." These requirements and others that are used to operate the CVP are described in detail in OCAP 2004.

As a result of these cooperative agreements and the integration of the regulatory requirements, changes in CVP operations must be considered in relationship to both changes for all CVP water users and changes for SWP and other non-CVP users that rely upon the Sacramento River watershed, Delta, and water facilities located south of the Delta.

Environmental Consequences

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

No Action Alternative. The No Action Alternative represents the future conditions without implementation of the September 2001 Draft CVP M&I Water Shortage Policy. Projected CVP water supply allocations are described in the OCAP baseline model runs developed for the 2020 conditions which are considered in this EA to be indicative of conditions in 2030 and in 2045.

Alternative 1A. Under Alternative 1A, the allocations identified in the No Action Alternative were applied to the projected Year 2030 water deliveries identified as of September 30, 1994, as shown on Schedule A-12 of the 1996 Municipal and Industrial Water Rates book, and for those contract quantities specified in section 206 of Public Law 101-514. If the allocation amounts were less than the public health and safety water quantities for each of the contractors, the deliveries were increased to meet the public health and safety water quantities as limited to 75 percent of the CVP water service Contract Total.

As part of this analysis, several methods were considered to provide the additional water to the M&I CVP water service contractors. During the 13 drier years of the 72 years considered in the CALSIM II model runs when M&I CVP water service contract allocations are less than 75 percent, 10 of the 13 years are considered "Critical (Dry)" and 3 years are considered "Dry." Except for 2 years, these years occur following "Dry" or "Below Normal" years when the CVP reservoir volumes are extremely low; no flood control spills occur, and deliveries to Sacramento River Settlement Contractors, San Joaquin River Exchange Contractors, and Central Valley refuges are reduced to 75 percent of Contract Total in accordance with contract agreements and federal law.

The CVP is operated in a manner to provide flood protection and to provide water for water rights holders, refuges in accordance with federal law, and instream flows and Delta outflow in accordance with the requirements of state and federal agencies. Therefore, to increase M&I CVP water service contract deliveries, concepts would include storage of additional water during wet years, reduction of deliveries to Irrigation CVP water service contractors in all years and storage of the water in CVP reservoirs, or reduction of deliveries to Irrigation CVP water service contractors in the years when deliveries to M&I CVP water service contractors are less than 75 percent. In all years, the CVP reservoirs are operated to maximize storage while providing storage for flood flows to protect downstream communities. Water stored in wetter years would probably be spilled to provide flood control space in the reservoirs. In a similar manner, water provided by reduced deliveries to Irrigation CVP water service contractors in other years, frequently would spill in sequences of wetter years preceding the 1924 through 1934 period, 1959 through 1960 period, 1975 through 1977 period, and 1987 through 1991 period. Therefore, this analysis assumed that the additional water for deliveries to the M&I water service contractors in the 13 years would be made available by reducing deliveries to Irrigation CVP water service contractors within the shortage year considered.

In the American River Division, it is not possible to convey water from the Sacramento River to users that divert from the American River. The American River Division is not projected to include any Irrigation CVP water service contracts under the No Action Alternative. Therefore, it is not possible to increase M&I CVP water service contract allocations to the American River Division unless new conveyance facilities are constructed. Reclamation has initiated an evaluation of these types of facilities in a separate study. If those facilities are approved, increasing CVP water allocations to American River Division M&I CVP water service contractors could be implemented. However, for the purposes of this EA, increased allocations to American River Division water service contractors are not evaluated in this EA.

The results were compared to the No Action Alternative to determine the extent of additional water supplies that would be needed to meet the M&I water shortage policy goals under Alternative 1A, as shown in Table 5-1.

The additional water supplies that would be needed to improve allocations to M&I water service contractors under Alternative 1A can only be obtained from deliveries to Irrigation CVP water service contractors during the same contract year. Because most the years in this analysis are part of a series of dry years, it is not possible to re-allocate carryover storage over a series of contract years without adversely impacting supplies used by non-CVP users or causing spills during wet weather periods, as shown in Table 5-2.

TABLE 5-1

CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT DELIVERIES UNDER ALTERNATIVE 1A THAT WOULD PROVIDE PUBLIC HEALTH AND SAFETY WATER QUANTITIES FOR M&I CONTRACTORS UP TO 75 PERCENT OF CONTRACT TOTAL

	Divisions						
	Shasta and Trinity	**Sacramento River**	**Eastside**	**Delta**	**West San Joaquin**	**San Felipe**	**Total**
50 PERCENT ALLOCATION YEARS - Not Feasible, Water not available to increase deliveries							
Occurs for 4 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative CVP M&I Deliveries	16,341	138	4,500	107,485	10,956	73,138	212,558
Alternative 1A M&I CVP Deliveries	21,102	61	0	122,207	15,644	120,108	279,122
Difference in M&I CVP deliveries	4,761	-77	-4,500	14,722	4,688	46,970	66,564
52 PERCENT ALLOCATION YEARS - Not Completely Feasible, Water not available to totally meet needs							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	16,995	143	4,680	111,784	11,394	76,064	221,060
Alternative 1A M&I CVP Deliveries	21,435	57	0	122,207	16,067	120,108	279,874
Difference in M&I CVP deliveries	4,440	-86	-4,680	10,423	4,673	44,044	58,814
53 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	17,322	146	4,770	113,934	11,613	77,526	225,311
Alternative 1A M&I CVP Deliveries	21,602	61	0	122,213	16,279	120,108	280,263
Difference in M&I CVP deliveries	4,280	-85	-4,770	8,279	4,666	42,582	54,952
54 PERCENT ALLOCATION YEARS							
Occurs for 2 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	17,649	149	4,860	116,084	11,832	78,989	229,563
Alternative 1A M&I CVP Deliveries	21,771	61	0	122,215	16,491	120,108	280,646
Difference in M&I CVP deliveries	4,122	-88	-4,860	6,131	4,659	41,119	51,083

TABLE 5-1

CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT DELIVERIES UNDER ALTERNATIVE 1A THAT WOULD PROVIDE PUBLIC HEALTH AND SAFETY WATER QUANTITIES FOR M&I CONTRACTORS UP TO 75 PERCENT OF CONTRACT TOTAL

	Divisions						
	Shasta and Trinity	**Sacramento River**	**Eastside**	**Delta**	**West San Joaquin**	**San Felipe**	**Total**
57 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	18,629	157	5,130	122,533	12,490	83,377	242,316
Alternative 1A M&I CVP Deliveries	22,286	61	0	124,888	17,126	120,108	284,469
Difference in M&I CVP deliveries	3,657	-96	-5,130	2,355	4,636	36,731	42,153
63 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	20,590	173	5,670	135,431	13,805	92,154	267,823
Alternative 1A M&I CVP Deliveries	22,571	61	0	136,541	18,557	120,108	297,838
Difference in M&I CVP deliveries	1,981	-112	-5,670	1,110	4,752	27,954	30,015
66 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	21,571	182	5,940	141,880	14,462	96,542	280,577
Alternative 1A M&I CVP Deliveries	23,829	61	0	142,368	19,282	120,108	305,648
Difference in M&I CVP deliveries	2,258	-121	-5,940	488	4,820	23,566	25,071
70 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	22,878	193	6,300	150,479	15,338	102,393	297,581
Alternative 1A M&I CVP Deliveries	24,515	61	0	150,137	20,261	120,150	315,124
Difference in M&I CVP deliveries	1,637	-132	-6,300	-342	4,923	17,757	17,543

TABLE 5-1

CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT DELIVERIES UNDER ALTERNATIVE 1A THAT WOULD PROVIDE PUBLIC HEALTH AND SAFETY WATER QUANTITIES FOR M&I CONTRACTORS UP TO 75 PERCENT OF CONTRACT TOTAL

	Divisions						
	Shasta and Trinity	**Sacramento River**	**Eastside**	**Delta**	**West San Joaquin**	**San Felipe**	**Total**
74 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	24,185	204	6,600	159,078	16,215	108,244	314,586
Alternative 1A M&I CVP Deliveries	25,228	61	0	157,905	21,368	120,480	325,042
Difference in M&I CVP deliveries	1,043	-143	-6,660	-1,173	5,153	12,236	10,456

NOTES:

All values as acre-feet/year

No Action Alternative Values are based on values presented in Chapter 4 and aggregated into summary values for CVP divisions or units

Alternative 1A Values are based on calculations described in Figure 3-1

Difference values are based on the subtraction of the Alternative 1A value from the No Action Alternative value

American River Division values are not included in this table because there are no physical facilities to convey alternative water supplies to most of the American River Division. It is assumed that the American River Division would receive water under the Water Forum Proposal, as included in the OCAP 2004 model runs.

TABLE 5-2

SUMMARY OF CHANGES IN CENTRAL VALLEY PROJECT ALLOCATIONS FOR M&I AND IRRIGATION WATER SERVICE CONTRACTORS UNDER ALTERNATIVE 1A

50 PERCENT ALLOCATION YEARS **Occurs for 4 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1924, 1933, 1934, 1990)**							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 1A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
212,558	50%	0	0%	212,558	50%	0	0%
The M&I allocation is calculated to be 279,122 acre-feet. However, because there are no Irrigation CVP water service contract allocations to provide to the M&I CVP Contractors, there is no increase in M&I CVP allocations							
52 PERCENT ALLOCATION YEARS **Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1988)**							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 1A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
221,060	52%	40,200	2%	261,260	61%	0	0%
The M&I allocation is calculated to be 279,874 acre-feet. However, because there are only 40,200 acre-feet of Irrigation CVP water service contract allocations to provide to the M&I CVP Contractors, with Alternative 1A cannot be fully implemented.							
53 PERCENT ALLOCATION YEARS **Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1929)**							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 1A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
225,311	53%	62,225	3%	280,263	66%	7,274	0%
54 PERCENT ALLOCATION YEARS **Occurs for 2 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1926, 1977)**							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 1A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
229,563	54%	77,300	4%	280,646	66%	26,217	1%
57 PERCENT ALLOCATION YEARS **Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1931)**							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 1A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
242,316	57%	150,225	7%	284,469	67%	108,073	5%
63 PERCENT ALLOCATION YEARS **Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1991)**							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 1A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
267,823	63%	282,375	13%	297,838	70%	252,360	12%

TABLE 5-2

SUMMARY OF CHANGES IN CENTRAL VALLEY PROJECT ALLOCATIONS FOR M&I AND IRRIGATION WATER SERVICE CONTRACTORS UNDER ALTERNATIVE 1A

66% PERCENT ALLOCATION YEARS Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1976)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 1A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
280,577	66%	358,150	17%	305,648	72%	333,079	15%
70% PERCENT ALLOCATION YEARS Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1932)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 1A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
297,581	70%	435,250	20%	315,124	74%	417,707	19%
74% PERCENT ALLOCATION YEARS Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1960)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 1A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
314,586	74%	499,350	23%	325,042	76%	488,894	23%

NOTES:

All values as acre-feet/year

% Allocation for M&I is equal to the M&I allocation value as compared to 425,116 acre-feet, or 100 percent allocation for M&I as defined in the No Action Alternative.

% Allocation for Irrigation is equal to the Irrigation allocation value as compared to 2,156,000 acre-feet, or 100 percent allocation for Irrigation as defined in the No Action Alternative.

No Action Alternative and Alternative 1A values for M&I Allocations are values presented in Table 5-1

No Action Alternative values for Irrigation Allocations are values of Irrigation CVP water service contract allocations in the OCAP 2004 model run for the years with the specific M&I Allocation characteristics. These values take into account that allocation of Irrigation CVP water service contract water could be less in areas located south of the Delta than north of the Delta. Alternative 1A values for Irrigation Allocations are based upon the subtraction of additional water to be provided to M&I CVP water service contractors from the No Action Alternative value.

American River Division values are not included in this table because there are no physical facilities to convey alternative water supplies to most of the American River Division. It is assumed that the American River Division would receive water under the Water Forum Proposal, as included in the OCAP 2004 model runs.

As shown in Table 5-2, additional water supplies would be required under Alternative 1A in all 13 years. However, in 4 of the 13 years, the allocations to Irrigation CVP water service contractors are zero and the M&I CVP water service contract allocations remain at 50 percent. During the 1 year that M&I CVP water service contract allocations are 52 percent, Irrigation CVP water service contract allocations are 2 percent and are not adequate to fully meet the M&I CVP water service contract demand under Alternative 1A. The additional water for M&I CVP water service contractors is available in the remaining 8 of the 13 years. Allocations of 5 percent or less to Irrigation CVP water service contractors would occur in 9 of 13 years as compared to 8 of 13 years in the No Action Alternative. The reduction in allocation percentages to Irrigation CVP water service contractors in the remaining 4 years would be no more than 1 percent.

Because Delta exports are not limited due to capacity limitations during the contract years with M&I CVP water service contract allocations less than 75 percent, there would be no adverse impacts to availability of Delta export capacity for other users.

Because the water is re-allocated between CVP M&I and irrigation water users in the same contract year, there is no change to storage in CVP reservoirs or to allocation of water to refuge water supplies, instream flows, or senior water rights holders.

Alternative 1B. Under Alternative 1B, the allocations identified in the No Action Alternative were applied to the water amounts identified in the Water Needs Assessment as M&I need. If the allocation amounts were less than the public health and safety water quantities for each of the contractors, the deliveries were increased to meet the public health and safety water quantities as limited to 75 percent of the CVP water service Contract Total. The results were compared to the No Action Alternative to determine the extent of additional water supplies that would be needed to meet the M&I water shortage policy goals under Alternative 1B, as shown in Table 5-3. As described in Chapter 3 and in the discussion under Alternative 1A, additional water supplies would be provided by reductions in water supplies to Irrigation CVP water service contractors.

As shown in Table 5-4, additional water supplies would be required under Alternative 1B in all 13 years. However, in 4 of the 13 years, the allocations to Irrigation CVP water service contractors are zero, and the M&I CVP water service contract allocations remain at 50 percent. During the 1 year that M&I CVP water service contract allocations is 52 percent, Irrigation CVP water service contract allocations is 2 percent and not adequate to fully meet the M&I CVP water service contract demand under Alternative 1B. The additional water for M&I CVP water service contractors is available in the remaining 8 of the 13 years. Allocations of 5 percent or less to Irrigation CVP water service contractors would occur in 9 of 13 years as compared to 8 of 13 years in the No Action Alternative. The reduction in allocation percentages to Irrigation CVP water service contractors in the remaining 4 years would be no more than 2 percent.

Because Delta exports are not limited due to capacity limitations during the contract years with M&I CVP water service contract allocations less than 75 percent, there would be no adverse impacts to availability of Delta export capacity for other users.

Because the water is re-allocated between CVP M&I and irrigation water users in the same contract year, there is no change to storage in CVP reservoirs or to allocation of water to refuge water supplies, instream flows, or senior water rights holders.

TABLE 5-3

CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT DELIVERIES UNDER ALTERNATIVE 1B THAT WOULD PROVIDE PUBLIC HEALTH AND SAFETY WATER QUANTITIES FOR M&I CONTRACTORS UP TO 75 PERCENT OF CONTRACT TOTAL

	Divisions						
	Shasta and Trinity	**Sacramento River**	**Eastside**	**Delta**	**West San Joaquin**	**San Felipe**	**Total**
50 PERCENT ALLOCATION YEARS - Not Feasible, Water not available to increase deliveries							
Occurs for 4 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative CVP M&I Deliveries	16,341	138	4,500	107,485	10,956	73,138	212,558
Alternative 1B M&I CVP Deliveries	20,093	215	6,750	122,707	13,909	122,513	286,187
Difference in M&I CVP deliveries	3,752	77	2,250	15,222	2,953	49,375	73,629
52 PERCENT ALLOCATION YEARS - Not Completely Feasible, Water not available to totally meet needs							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	16,995	143	4,680	111,784	11,394	76,064	221,060
Alternative 1B M&I CVP Deliveries	20,423	215	6,750	122,731	14,132	122,839	287,089
Difference in M&I CVP deliveries	3,428	72	2,070	10,947	2,738	46,775	66,029
53 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	17,322	146	4,770	113,934	11,613	77,526	225,311
Alternative 1B M&I CVP Deliveries	20,623	215	6,750	124,645	14,245	123,001	289,478
Difference in M&I CVP deliveries	3,301	69	1,980	10,711	2,632	45,475	64,167
54 PERCENT ALLOCATION YEARS							
Occurs for 2 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	17,649	149	4,860	116,084	11,832	78,989	229,563
Alternative 1B M&I CVP Deliveries	20,826	215	6,750	126,729	14,357	123,164	292,040
Difference in M&I CVP deliveries	3,177	66	1,890	10,646	2,525	44,175	62,477

TABLE 5-3

CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT DELIVERIES UNDER ALTERNATIVE 1B THAT WOULD PROVIDE PUBLIC HEALTH AND SAFETY WATER QUANTITIES FOR M&I CONTRACTORS UP TO 75 PERCENT OF CONTRACT TOTAL

	Divisions						
	Shasta and Trinity	**Sacramento River**	**Eastside**	**Delta**	**West San Joaquin**	**San Felipe**	**Total**
57 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	18,629	157	5,130	122,533	12,490	83,377	242,316
Alternative 1B M&I CVP Deliveries	21,440	215	6,750	132,982	14,692	123,652	299,731
Difference in M&I CVP deliveries	2,811	58	1,620	10,449	2,202	40,275	57,415
63 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	20,590	173	5,670	135,431	13,805	92,154	267,823
Alternative 1B M&I CVP Deliveries	22,600	215	6,750	145,487	15,364	124,629	315,045
Difference in M&I CVP deliveries	2,010	42	1,080	10,056	1,559	32,475	47,222
66 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	21,571	182	5,940	141,880	14,462	96,542	280,577
Alternative 1B M&I CVP Deliveries	23,823	215	6,750	151,740	15,700	125,117	322,576
Difference in M&I CVP deliveries	1,712	33	810	9,860	1,238	28,575	42,000
70 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	22,878	193	6,300	150,479	15,338	102,393	297,581
Alternative 1B M&I CVP Deliveries	24,102	215	6,750	160,077	16,160	125,768	332,629
Difference in M&I CVP deliveries	1,224	22	450	9,598	822	23,375	35,048

TABLE 5-3

CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT DELIVERIES UNDER ALTERNATIVE 1B THAT WOULD PROVIDE PUBLIC HEALTH AND SAFETY WATER QUANTITIES FOR M&I CONTRACTORS UP TO 75 PERCENT OF CONTRACT TOTAL

	Divisions						
	Shasta and Trinity	**Sacramento River**	**Eastside**	**Delta**	**West San Joaquin**	**San Felipe**	**Total**
74 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	24,185	204	6,600	159,078	16,215	108,244	314,586
Alternative 1B M&I CVP Deliveries	24,248	215	6,750	161,335	16,748	126,419	335,759
Difference in M&I CVP deliveries	63	11	90	2,258	533	18,175	21,173

NOTES:

All values as acre-feet/year

No Action Alternative Values are based on values presented in Chapter 4 and aggregated into summary values for CVP divisions or units

Alternative 1B Values are based on calculations described in Figure 3-2

Difference values are based on the subtraction of the Alternative 1B value from the No Action Alternative value

American River Division values are not included in this table because there are no physical facilities to convey alternative water supplies to most of the American River Division. It is assumed that the American River Division would receive water under the Water Forum Proposal, as included in the OCAP 2004 model runs.

TABLE 5-4

SUMMARY OF CHANGES IN CENTRAL VALLEY PROJECT ALLOCATIONS FOR M&I AND IRRIGATION WATER SERVICE CONTRACTORS UNDER ALTERNATIVE 1B

50 PERCENT ALLOCATION YEARS

Occurs for 4 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1924, 1933, 1934, 1990)

CVP Allocations in No Action Alternative				CVP Allocation in Alternative 1B			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
212,558	50%	0	0%	212,558	50%	0	0%

The M&I allocation is calculated to be 286,186 acre-feet. However, because there are no Irrigation CVP water service contract allocations to provide to the M&I CVP Contractors, there is no increase in M&I CVP allocations

52 PERCENT ALLOCATION YEARS

Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1988)

CVP Allocations in No Action Alternative				CVP Allocation in Alternative 1B			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
221,060	52%	40,200	2%	261,260	62%	0	0%

The M&I allocation is calculated to be 287,089 acre-feet. However, because there are only 40,200 acre-feet of Irrigation CVP water service contract allocations to provide to the M&I CVP Contractors, with Alternative 1B cannot be fully implemented.

53 PERCENT ALLOCATION YEARS

Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1929)

CVP Allocations in No Action Alternative				CVP Allocation in Alternative 1B			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
225,311	53%	62,225	3%	287,536	68%	0	0%

The M&I allocation is calculated to be 289,478 acre-feet. However, because there are only 62,225 acre-feet of Irrigation CVP water service contract allocations to provide to the M&I CVP Contractors, with Alternative 1B cannot be fully implemented.

54 PERCENT ALLOCATION YEARS

Occurs for 2 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1926, 1977)

CVP Allocations in No Action Alternative				CVP Allocation in Alternative 1B			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
229,563	54%	77,300	4%	292,040	69%	14,823	1%

57 PERCENT ALLOCATION YEARS

Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1931)

CVP Allocations in No Action Alternative				CVP Allocation in Alternative 1B			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
242,316	57%	150,225	7%	299,731	71%	92,810	4%

63 PERCENT ALLOCATION YEARS

Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1991)

CVP Allocations in No Action Alternative				CVP Allocation in Alternative 1B			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
267,823	63%	282,375	13%	315,045	74%	235,153	11%

TABLE 5-4

SUMMARY OF CHANGES IN CENTRAL VALLEY PROJECT ALLOCATIONS FOR M&I AND IRRIGATION WATER SERVICE CONTRACTORS UNDER ALTERNATIVE 1B

66% PERCENT ALLOCATION YEARS **Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1976)**							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 1B**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
280,577	66%	358,150	17%	322,576	76%	316,151	15%
70% PERCENT ALLOCATION YEARS **Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1932)**							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 1B**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
297,581	70%	435,250	20%	332,629	78%	400,202	19%
74% PERCENT ALLOCATION YEARS **Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1960)**							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 1B**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
314,586	74%	499,350	23%	335,759	79%	478,177	22%

NOTES:

All values as acre-feet/year

% Allocation for M&I is equal to the M&I allocation value as compared to 425,116 acre-feet, or 100 percent allocation for M&I as defined in the No Action Alternative.

% Allocation for Irrigation is equal to the Irrigation allocation value as compared to 2,156,000 acre-feet, or 100 percent allocation for Irrigation as defined in the No Action Alternative.

No Action Alternative and Alternative 1B values for M&I Allocations are values presented in Table 5-3

No Action Alternative values for Irrigation Allocations are values of Irrigation CVP water service contract allocations in the OCAP 2004 model run for the years with the specific M&I Allocation characteristics. These values take into account that allocation of Irrigation CVP water service contract water could be less in areas located south of the Delta than north of the Delta. Alternative 1B values for Irrigation Allocations are based upon the subtraction of additional water to be provided to M&I CVP water service contractors from the No Action Alternative value.

American River Division values are not included in this table because there are no physical facilities to convey alternative water supplies to most of the American River Division. It is assumed that the American River Division would receive water under the Water Forum Proposal, as included in the OCAP 2004 model runs.

Alternative 2A. Under Alternative 2A, the allocations identified in Alternative 1B would be considered for a second tier of allocations. The second tier would provide up to 100 percent of the industrial water demand. The total allocations per contractor were limited to 75 percent of the CVP water service Contract Total. The results were compared to the No Action Alternative to determine the extent of additional water supplies that would be needed to meet the M&I water shortage policy goals under Alternative 2A, as shown in Table 5-5. As described in the discussion under Alternative 1A, additional water supplies would be provided by reductions in water supplies to Irrigation CVP water service contractors.

As shown in Table 5-6, additional water supplies would be required under Alternative 2A in all 13 years. However, in 4 of the 13 years, the allocations to Irrigation CVP water service contractors are zero, and , the M&I CVP water service contract allocations remain at 50 percent. During the 4 years that M&I CVP water service contract allocations are 52, 53, and 54 percent, Irrigation CVP water service contract allocations are 2, 3, and 4 percent, respectively, and are not adequate to fully meet the M&I CVP water service contract demand under Alternative 2A. The additional water for M&I CVP water service contractors is available in the remaining 5 of the 13 years. Allocations of 5 percent or less to Irrigation CVP water service contractors would occur in 9 of 13 years as compared to 8 of 13 years in the No Action Alternative. The reduction in allocation percentages to Irrigation CVP water service contractors in the remaining 4 years would be no more than 3 percent.

Because Delta exports are not limited due to capacity limitations during the contract years with M&I CVP water service contract allocations less than 75 percent, there would be no adverse impacts to availability of Delta export capacity for other users.

Because the water is re-allocated between CVP M&I and irrigation water users in the same contract year, there is no change to storage in CVP reservoirs or to allocation of water to refuge water supplies, instream flows, or senior water rights holders.

Alternative 2B. Under Alternative 2B, the allocations were determined to be 75 percent of the water amounts identified in the Water Needs Assessment. If the resultant amounts were less than the public health and safety water quantities for each of the contractors, the deliveries were increased to meet the public health and safety water quantities as limited to 75 percent of the CVP water service Contract Total. The total demands per contractor were limited to 75 percent of the CVP water service Contract Total for that contract. The results were compared to the No Action Alternative to determine the extent of additional water supplies that would be needed to meet the M&I water shortage policy goals under Alternative 2B, as shown in Table 5-7. As described in the discussion under Alternative 1A, additional water supplies would be provided by reductions in water supplies to Irrigation CVP water service contractors.

As shown in Table 5-8, additional water supplies would be required under Alternative 2B in all 13 years. However, in 4 of the 13 years, the allocations to Irrigation CVP water service contractors are zero, and , the M&I CVP water service contract allocations remain at 50 percent. During the 4 years that M&I CVP water service contract allocations are 52, 53, and 54 percent, Irrigation CVP water service contract allocations are 2, 3, and 4 percent, respectively, and are not adequate to fully meet the M&I CVP water service contract demand under Alternative 2B. The additional water for M&I CVP water service contractors is available in the remaining 5 of the 13 years. Allocations of 5 percent or less to Irrigation CVP water service contractors would occur in 9 of 13 years as compared to 8 of 13 years in the No Action Alternative. The reduction in allocation percentages to Irrigation CVP water service contractors in the remaining 4 years would be no more than 3 percent.

TABLE 5-5

CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT DELIVERIES UNDER ALTERNATIVE 2A THAT WOULD PROVIDE PUBLIC HEALTH AND SAFETY WATER QUANTITIES FOR M&I CONTRACTORS UP TO 75 PERCENT OF CONTRACT TOTAL

	Divisions						
	Shasta and Trinity	**Sacramento River**	**Eastside**	**Delta**	**West San Joaquin**	**San Felipe**	**Total**
50 PERCENT ALLOCATION YEARS - Not Feasible, Water not available to increase deliveries Occurs for 4 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative CVP M&I Deliveries	16,341	138	4,500	107,485	10,956	73,138	212,558
Alternative 2A M&I CVP Deliveries	20,241	215	6,750	151,293	14,169	123,013	315,681
Difference in M&I CVP deliveries	3,900	77	2,250	43,808	3,213	49,875	103,123
52 PERCENT ALLOCATION YEARS - Not Completely Feasible, Water not available to totally meet needs Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	16,995	143	4,680	111,784	11,394	76,064	221,060
Alternative 2A M&I CVP Deliveries	20,566	215	6,750	150,177	14,393	123,319	315,420
Difference in M&I CVP deliveries	3,571	72	2,070	38,393	2,999	47,255	94,360
53 PERCENT ALLOCATION YEARS Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	17,322	146	4,770	113,934	11,613	77,526	225,311
Alternative 2A M&I CVP Deliveries	20,764	215	6,750	151,521	14,505	123,471	317,226
Difference in M&I CVP deliveries	3,442	69	1,980	37,587	2,892	45,945	91,915
54 PERCENT ALLOCATION YEARS							
Occurs for 2 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	17,649	149	4,860	116,084	11,832	78,989	229,563
Alternative 2A M&I CVP Deliveries	20,965	215	6,750	153,035	14,617	123,624	319,206
Difference in M&I CVP deliveries	3,316	66	1,890	36,951	2,785	44,635	89,643

TABLE 5-5

CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT DELIVERIES UNDER ALTERNATIVE 2A THAT WOULD PROVIDE PUBLIC HEALTH AND SAFETY WATER QUANTITIES FOR M&I CONTRACTORS UP TO 75 PERCENT OF CONTRACT TOTAL

	Divisions						
	Shasta and Trinity	**Sacramento River**	**Eastside**	**Delta**	**West San Joaquin**	**San Felipe**	**Total**
57 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	18,629	157	5,130	122,533	12,490	83,377	242,316
Alternative 2A M&I CVP Deliveries	21,730	215	6,750	157,577	14,953	124,082	325,307
Difference in M&I CVP deliveries	3,101	58	1,620	35,044	2,463	40,705	82,991
63 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	20,590	173	5,670	135,431	13,805	92,154	267,823
Alternative 2A M&I CVP Deliveries	22,674	215	6,750	161,285	15,625	124,999	331,548
Difference in M&I CVP deliveries	2,084	42	1,080	25,854	1,820	32,845	63,725
66 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	21,571	182	5,940	141,880	14,462	96,542	280,577
Alternative 2A M&I CVP Deliveries	23,122	215	6,750	161,322	15,691	125,457	332,827
Difference in M&I CVP deliveries	1,551	33	810	19,442	1,499	28,915	52,250
70 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	22,878	193	6,300	150,479	15,338	102,393	297,581
Alternative 2A M&I CVP Deliveries	23,720	215	6,750	161,370	16,432	126,068	334,555
Difference in M&I CVP deliveries	842	22	450	10,891	1,094	23,675	36,974

TABLE 5-5

CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT DELIVERIES UNDER ALTERNATIVE 2A THAT WOULD PROVIDE PUBLIC HEALTH AND SAFETY WATER QUANTITIES FOR M&I CONTRACTORS UP TO 75 PERCENT OF CONTRACT TOTAL

	Divisions						
	Shasta and Trinity	**Sacramento River**	**Eastside**	**Delta**	**West San Joaquin**	**San Felipe**	**Total**
74 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	24,185	204	6,600	159,078	16,215	108,244	314,586
Alternative 2A M&I CVP Deliveries	24,342	215	6,750	161,418	17,018	126,679	336,422
Difference in M&I CVP deliveries	157	11	90	2,340	803	18,435	21,836

NOTES:

All values as acre-feet/year

No Action Alternative Values are based on values presented in Chapter 4 and aggregated into summary values for CVP divisions or units

Alternative 2A Values are based on calculations described in Figure 3-3

Difference values are based on the subtraction of the Alternative 2A value from the No Action Alternative value

American River Division values are not included in this table because there are no physical facilities to convey alternative water supplies to most of the American River Division. It is assumed that the American River Division would receive water under the Water Forum Proposal, as included in the OCAP 2004 model runs.

TABLE 5-6

SUMMARY OF CHANGES IN CENTRAL VALLEY PROJECT ALLOCATIONS FOR M&I AND IRRIGATION WATER SERVICE CONTRACTORS UNDER ALTERNATIVE 2A

50 PERCENT ALLOCATION YEARS							
Occurs for 4 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1924, 1933, 1934, 1990)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
212,558	50%	0	0%	212,558	50%	0	0%
The M&I allocation is calculated to be 315,681 acre-feet. However, because there are no Irrigation CVP water service contract allocations to provide to the M&I CVP Contractors, there is no increase in M&I CVP allocations							
52 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1988)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
221,060	52%	40,200	2%	261,260	61%	0	0%
The M&I allocation is calculated to be 315,420 acre-feet. However, because there are only 40,200 acre-feet of Irrigation CVP water service contract allocations to provide to the M&I CVP Contractors, with Alternative 2A cannot be fully implemented.							
53 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1929)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
225,311	53%	62,225	3%	287,536	68%	0	0%
The M&I allocation is calculated to be 317,226 acre-feet. However, because there are only 62,225 acre-feet of Irrigation CVP water service contract allocations to provide to the M&I CVP Contractors, with Alternative 2A cannot be fully implemented.							
54 PERCENT ALLOCATION YEARS							
Occurs for 2 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1926, 1977)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
229,563	54%	77,300	4%	306,863	75%	0	0%
The M&I allocation is calculated to be 319,206 acre-feet. However, because there are only 77,300 acre-feet of Irrigation CVP water service contract allocations to provide to the M&I CVP Contractors, with Alternative 2A cannot be fully implemented.							
57 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1931)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
242,316	57%	150,225	7%	325,307	77%	67,234	3%

TABLE 5-6

SUMMARY OF CHANGES IN CENTRAL VALLEY PROJECT ALLOCATIONS FOR M&I AND IRRIGATION WATER SERVICE CONTRACTORS UNDER ALTERNATIVE 2A

63 PERCENT ALLOCATION YEARS Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1991)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
267,823	63%	282,375	13%	331,548	78%	218,650	10%
66% PERCENT ALLOCATION YEARS Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1976)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
280,577	66%	358,150	17%	332,827	78%	305,900	14%
70% PERCENT ALLOCATION YEARS Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1932)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
297,581	70%	435,250	20%	334,555	79%	398,276	18%
74% PERCENT ALLOCATION YEARS Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1960)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2A**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
314,586	74%	499,350	23%	336,422	79%	477,514	22%

NOTES:

All values as acre-feet/year

% Allocation for M&I is equal to the M&I allocation value as compared to 425,116 acre-feet, or 100 percent allocation for M&I as defined in the No Action Alternative.

% Allocation for Irrigation is equal to the Irrigation allocation value as compared to 2,156,000 acre-feet, or 100 percent allocation for Irrigation as defined in the No Action Alternative.

No Action Alternative and Alternative 2A values for M&I Allocations are values presented in Table 5-5

No Action Alternative values for Irrigation Allocations are values of Irrigation CVP water service contract allocations in the OCAP 2004 model run for the years with the specific M&I Allocation characteristics. These values take into account that allocation of Irrigation CVP water service contract water could be less in areas located south of the Delta than north of the Delta. Alternative 2A values for Irrigation Allocations are based upon the subtraction of additional water to be provided to M&I CVP water service contractors from the No Action Alternative value.

American River Division values are not included in this table because there are no physical facilities to convey alternative water supplies to most of the American River Division. It is assumed that the American River Division would receive water under the Water Forum Proposal, as included in the OCAP 2004 model runs.

TABLE 5-7

CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT DELIVERIES UNDER ALTERNATIVE 2B THAT WOULD PROVIDE PUBLIC HEALTH AND SAFETY WATER QUANTITIES FOR M&I CONTRACTORS UP TO 75 PERCENT OF CONTRACT TOTAL

	Divisions						
	Shasta and Trinity	**Sacramento River**	**Eastside**	**Delta**	**West San Joaquin**	**San Felipe**	**Total**
50 PERCENT ALLOCATION YEARS - Not Feasible, Water not available to increase deliveries Occurs for 4 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative CVP M&I Deliveries	16,341	138	4,500	107,485	10,956	73,138	212,558
Alternative 2B M&I CVP Deliveries	28,333	248	6,750	161,733	19,501	130,651	347,216
Difference in M&I CVP deliveries	11,992	110	2,250	54,248	8,545	57,513	134,658
52 PERCENT ALLOCATION YEARS - Not Completely Feasible, Water not available to totally meet needs Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	16,995	143	4,680	111,784	11,394	76,064	221,060
Alternative 2B M&I CVP Deliveries	28,333	248	6,750	161,732	19,501	130,651	347,215
Difference in M&I CVP deliveries	11,338	105	2,070	49,948	8,107	54,587	126,155
53 PERCENT ALLOCATION YEARS Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	17,322	146	4,770	113,934	11,613	77,526	225,311
Alternative 2B M&I CVP Deliveries	28,333	248	6,750	161,732	19,501	130,651	347,215
Difference in M&I CVP deliveries	11,011	102	1,980	47,798	7,888	53,125	121,904
54 PERCENT ALLOCATION YEARS							
Occurs for 2 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	17,649	149	4,860	116,084	11,832	78,989	229,563
Alternative 2B M&I CVP Deliveries	28,333	248	6,750	161,732	19,501	130,651	347,215
Difference in M&I CVP deliveries	10,684	99	1,890	45,648	7,669	51,662	177,652

TABLE 5-7

CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT DELIVERIES UNDER ALTERNATIVE 2B THAT WOULD PROVIDE PUBLIC HEALTH AND SAFETY WATER QUANTITIES FOR M&I CONTRACTORS UP TO 75 PERCENT OF CONTRACT TOTAL

	Divisions						
	Shasta and Trinity	**Sacramento River**	**Eastside**	**Delta**	**West San Joaquin**	**San Felipe**	**Total**
57 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	18,629	157	5,130	122,533	12,490	83,377	242,316
Alternative 2B M&I CVP Deliveries	28,333	248	6,750	161,732	19,501	130,651	347,215
Difference in M&I CVP deliveries	9,704	91	1,620	39,199	7,011	47,274	104,899
63 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	20,590	173	5,670	135,431	13,805	92,154	267,823
Alternative 2B M&I CVP Deliveries	28,333	248	6,750	161,732	19,501	130,651	347,215
Difference in M&I CVP deliveries	7,743	75	1,080	26,301	5,696	38,497	79,392
66 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	21,571	182	5,940	141,880	14,462	96,542	280,577
Alternative 2B M&I CVP Deliveries	28,333	248	6,750	161,732	19,501	130,651	347,215
Difference in M&I CVP deliveries	6,762	66	810	19,852	5,039	34,109	66,638
70 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	22,878	193	6,300	150,479	15,338	102,393	297,581
Alternative 2B M&I CVP Deliveries	28,333	248	6,750	161,732	19,501	130,651	347,215
Difference in M&I CVP deliveries	5,455	55	450	11,253	4,163	28,258	49,634

TABLE 5-7

CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT DELIVERIES UNDER ALTERNATIVE 2B THAT WOULD PROVIDE PUBLIC HEALTH AND SAFETY WATER QUANTITIES FOR M&I CONTRACTORS UP TO 75 PERCENT OF CONTRACT TOTAL

	Divisions						
	Shasta and Trinity	**Sacramento River**	**Eastside**	**Delta**	**West San Joaquin**	**San Felipe**	**Total**
74 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions							
No Action Alternative Deliveries	24,185	204	6,600	159,078	16,215	108,244	314,586
Alternative 2B M&I CVP Deliveries	28,333	248	6,750	161,732	19,501	130,651	347,215
Difference in M&I CVP deliveries	4,148	44	90	2,655	3,286	22,407	32,629

NOTES:

All values as acre-feet/year

No Action Alternative Values are based on values presented in Chapter 4 and aggregated into summary values for CVP divisions or units

Alternative 2B Values are based on calculations described in Figure 3-4

Difference values are based on the subtraction of the Alternative 2B value from the No Action Alternative value

American River Division values are not included in this table because there are no physical facilities to convey alternative water supplies to most of the American River Division. It is assumed that the American River Division would receive water under the Water Forum Proposal, as included in the OCAP 2004 model runs.

TABLE 5-8

SUMMARY OF CHANGES IN CENTRAL VALLEY PROJECT ALLOCATIONS FOR M&I AND IRRIGATION WATER SERVICE CONTRACTORS UNDER ALTERNATIVE 2B

50 PERCENT ALLOCATION YEARS							
Occurs for 4 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1924, 1933, 1934, 1990)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2B**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
212,558	50%	0	0%	212,558	50%	0	0%
The M&I allocation is calculated to be 347,126 acre-feet. However, because there are no Irrigation CVP water service contract allocations to provide to the M&I CVP Contractors, there is no increase in M&I CVP allocations							
52 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1988)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2B**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
221,060	52%	40,200	2%	261,260	61%	0	0%
The M&I allocation is calculated to be 347,215 acre-feet. However, because there are only 40,200 acre-feet of Irrigation CVP water service contract allocations to provide to the M&I CVP Contractors, , with Alternative 2B cannot be fully implemented.							
53 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1929)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2B**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
225,311	53%	62,225	3%	287,536	68%	0	0%
The M&I allocation is calculated to be 347,215 acre-feet. However, because there are only 62,225 acre-feet of Irrigation CVP water service contract allocations to provide to the M&I CVP Contractors, with Alternative 2B cannot be fully implemented.							
54 PERCENT ALLOCATION YEARS							
Occurs for 2 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1926, 1977)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2B**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
229,563	54%	77,300	4%	306,863	72%	0	0%
The M&I allocation is calculated to be 347,215 acre-feet. However, because there are only 77,300 acre-feet of Irrigation CVP water service contract allocations to provide to the M&I CVP Contractors, with Alternative 2B cannot be fully implemented.							
57 PERCENT ALLOCATION YEARS							
Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1931)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2B**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
242,316	57%	150,225	7%	347,215	82%	45,326	2%

TABLE 5-8

SUMMARY OF CHANGES IN CENTRAL VALLEY PROJECT ALLOCATIONS FOR M&I AND IRRIGATION WATER SERVICE CONTRACTORS UNDER ALTERNATIVE 2B

63 PERCENT ALLOCATION YEARS Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1991)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2B**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
267,823	63%	282,375	13%	347,215	82%	202,983	9%
66% PERCENT ALLOCATION YEARS Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1976)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2B**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
280,577	66%	358,150	17%	347,215	82%	291,512	14%
70% PERCENT ALLOCATION YEARS Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1932)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2B**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
297,581	70%	435,250	20%	347,215	82%	385,616	18%
74% PERCENT ALLOCATION YEARS Occurs for 1 of the 72 years in OCAP 2004 CALSIM II model simulation for 2020 Conditions (1960)							
CVP Allocations in No Action Alternative				**CVP Allocation in Alternative 2B**			
M&I	% Allocation	Irrigation	% Allocation	M&I	% Allocation	Irrigation	% Allocation
314,586	74%	499,350	23%	347,215	82%	466,721	22%

NOTES:

All values as acre-feet/year

% Allocation for M&I is equal to the M&I allocation value as compared to 425,116 acre-feet, or 100 percent allocation for M&I as defined in the No Action Alternative.

% Allocation for Irrigation is equal to the Irrigation allocation value as compared to 2,156,000 acre-feet, or 100 percent allocation for Irrigation as defined in the No Action Alternative.

No Action Alternative and Alternative 2B values for M&I Allocations are values presented in Table 5-7

No Action Alternative values for Irrigation Allocations are values of Irrigation CVP water service contract allocations in the OCAP 2004 model run for the years with the specific M&I Allocation characteristics. These values take into account that allocation of Irrigation CVP water service contract water could be less in areas located south of the Delta than north of the Delta. Alternative 2B values for Irrigation Allocations are based upon the subtraction of additional water to be provided to M&I CVP water service contractors from the No Action Alternative value.

American River Division values are not included in this table because there are no physical facilities to convey alternative water supplies to most of the American River Division. It is assumed that the American River Division would receive water under the Water Forum Proposal, as included in the OCAP 2004 model runs.

Because Delta exports are not limited due to capacity limitations during the contract years with M&I CVP water service contract allocations less than 75 percent, there would be no adverse impacts to availability of Delta export capacity for other users.

Because the water is re-allocated between CVP M&I and irrigation water users in the same contract year, there is no change to storage in CVP reservoirs or to allocation of water to refuge water supplies, instream flows, or senior water rights holders.

Summary. A comparison of changes in allocations to M&I and Irrigation CVP water service contractors is presented in Table 5-9 for the future conditions considered in this EA. Alternatives 2A and 2B would result in more impacts to Irrigation CVP water service contractors than Alternatives 1A and 1B. Alternative 1A would result in the least impacts to the Irrigation CVP water service contractors. None of the alternatives would cause adverse impacts to other CVP operations or surface waters as compared to the No Action Alternative.

Cumulative Effects

Implementation of M&I Water Shortage Policy would not result in cumulative adverse impacts to surface water resources, water quality, or CVP operations when considered in combination with future projects such as water transfer projects or development of other water supplies. Alternatives considered in this EA may reduce the demand for water transfers by the amount of additional water supplied to the M&I CVP water service contractors. The alternatives considered in this EA would not affect the ability to implement those projects or increase the overall impacts from all of the projects. The alternatives in this EA would reduce availability of potential water that could have been transferred from Irrigation CVP water service contractors in the 9 of the 72 years considered in the CALSIM modeling analyses.

None of the alternatives considered in this EA would modify CVP Contract Totals or deliveries from within the historical ranges under the No Action Alternative. None of the alternatives considered in this EA would support additional residential, commercial, or industrial growth within the M&I water service contractors service area.

GROUNDWATER

This section describes groundwater resources and specific issues associated with delivery of water to M&I users in each division considered in this EA. The description of the Affected Environment has been developed from information presented in the CVPIA PEIS.

Affected Environment

The Central Valley regional aquifer system of California is a 400-mile long, northwest-trending asymmetric trough averaging 50 miles in width. The significant water-producing geologic units are the unconsolidated to semi-consolidated nonmarine sediments that range from the Oligocene and Miocene ages (13 million to 25 million years old) to recent, and are located in the valley trough. The west side of the trough is bounded by pre-Tertiary and Tertiary semi-consolidated to consolidated marine sedimentary rocks of the Coast Ranges. These faulted and folded sediments extend eastward beneath most of the Central Valley; any water contained in the sediments is usually saline. The east side of the valley is underlain by pre-Tertiary igneous and metamorphic rocks of the Sierra Nevada. Only small quantities of water are extracted from the joints and cracks of these basement rocks.

TABLE 5-9

PERCENT ALLOCATIONS TO CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT DELIVERIES FOR M&I AND IRRIGATION WATER SERVICE CONTRACTORS

No. of Years	No Action Alternative		Alternative 1A		Alternative 1B		Alternative 2A		Alternative 2B	
	M&I	Irrig.	M&I	Irrig.	M&I	Irrig.	M&I	Irrig.	M&I	Irrig.
4 years (1924, 1933, 1934, 1990)	50%	0%	50%	0 [a]	50%	0 [a]	50%	0 [a]	50%	0 [a]
1 year (1988)	52%	2%	61%	0 [b]	62%	0 [b]	61%	0 [b]	61%	0 [b]
1 year (1929)	53%	3%	66%	0 [b]	68%	0 [b]	68%	0 [b]	68%	0 [b]
2 years (1926, 1977)	54%	4%	66%	1%	69%	1%	75%	0 [b]	72%	0 [b]
1 year (1931)	57%	7%	67%	5%	71%	4%	77%	3%	82%	2%
1 year (1991)	63%	13%	70%	12%	74%	11%	78%	10%	82%	9%
1 year (1976)	66%	17%	72%	15%	76%	15%	78%	14%	82%	14%
1 year (1932)	70%	20%	74%	19%	78%	19%	79%	18%	82%	18%
1 year (1960)	74%	23%	76%	23%	79%	22%	79%	22%	82%	22%

"Irrig." = Irrigation
All percentages calculated as compared to total M&I or Irrigation CVP water service contracts

Number of Years refers to the years in the OCAP 2004 CALSIM II model run that was used to define the No Action Alternative

% Allocation for M&I is equal to the M&I allocation value as compared to 425,116 acre-feet, or 100 percent allocation for M&I as defined in the No Action Alternative.

% Allocation for Irrigation is equal to the Irrigation allocation value as compared to 2,156,000 acre-feet, or 100 percent allocation for Irrigation as defined in the No Action Alternative.

[a] Under the No-Action Alternative for 50 percent M&I Allocation years, deliveries to Irrigation CVP water service contractors are equal to zero. Therefore, there are no changes in deliveries to M&I or Irrigation water users.

[b] Re-allocation of water to increase M&I CVP water service contract water in these alternatives will result in zero deliveries to Irrigation CVP water service contractors

Many faults and folds exist in the Central Valley. Available information suggests that most faults and folds do not obstruct groundwater flow. Major groundwater barriers occur west of the Sacramento River between Redding and Red Bluff, near the Sutter Buttes northeast of Sacramento, and in the southeastern portion of the San Joaquin Valley. Groundwater characteristics in the Sacramento and San Joaquin valleys and the San Felipe Division are described below.

Sacramento Valley (Shasta, Trinity, Sacramento River, and American River Divisions). During the geologic period of deposition, as much as 10 vertical miles of unconsolidated continental and marine sediment accumulated in the structural trough of the Sacramento Valley basin. Alluvium deposits can be found throughout the region in the form of alluvial fans, stream channel deposits, and flood plain deposits. These vast deposits are the source of most of the groundwater pumped in the Sacramento Valley. Although the Sacramento Valley Aquifer System is considered unconfined, areas of confinement are present. Depth to the base of freshwater ranges from 1,000 feet north of Red Bluff to nearly 3,000 feet near Sacramento. Aquifer recharge of the basin has historically occurred from deep percolation of rainfall, the infiltration from stream beds, and subsurface inflow along basin boundaries. Most of the recharge for the Central Valley occurs in the north and east sides of the valley where the precipitation is the greatest. With the introduction of agriculture to the region, recharge occurs from deep percolation of applied irrigation water and seepage from canals.

The rate of change in groundwater withdrawals is generally proportional to changes in irrigated agricultural acreage and availability of surface water supplies. Groundwater use also increased in recent years as non-irrigated pasture lands were converted to urban land uses that rely upon groundwater. The increased use of groundwater in the western Sacramento Valley near Zamora and Davis have caused land subsidence.

Groundwater quality in the Sacramento Valley is generally good. However, there are areas with high levels of Total Dissolved Solids (TDS) and boron. TDS concentrations in the Sacramento Valley groundwater are generally considered to be low with most values being less than 500 mg/l. The low TDS concentrations are primarily due to the groundwater recharge from the Cascade Range and Sierra Nevada. Higher concentrations of up to 1,500 mg/l occur southwest of the Sutter Buttes and near the Delta.

Boron is not a regulated substance in drinking water, but it is a critical element in irrigation water. In small quantities, boron is essential for plant growth. However, concentrations as low as 0.75 mg/l may be toxic to boron-sensitive plants, and it is toxic to most crops at concentrations above 4 mg/l. Low levels of boron (below 0.75 mg/l) have been observed southwest of Sacramento. Boron concentrations greater than 0.75 mg/l have been reported in an area east of Red Bluff and north of Davis.

San Joaquin Valley (Eastside, Delta, and West San Joaquin Divisions). The San Joaquin Valley basin has accumulated up to six vertical miles of unconsolidated continental and marine sediment in the structural trough. The top 2,000 feet of these sediments consist of continental deposits that generally contain freshwater. As these sediments accumulated over the last 24 million years, large lakes periodically filled and drained, resulting in deposition of laterally extensive clay layers, forming significant barriers to the vertical movement of groundwater in the basin. The most extensive of these is the Corcoran Clay (a member of the Tulare Formation deposited about 600,000 years ago), consisting of a clay layer zero to 160 feet thick, found at depths of 100 to 400 feet below the land surface in the San Joaquin Valley. Other clay layers are present above and below the Corcoran Clay and may have local impacts on groundwater conditions. The Corcoran Clay divides the groundwater system into two major aquifers: a confined aquifer below the clay layer and a semi-confined aquifer above the layer.

The semi-confined aquifer can be divided into three geohydrologic units based on the source of the sediment: Coast Range alluvium, Sierra Nevada sediments, and flood basin deposit. The Coast Range alluvial deposits are derived largely from the erosion of marine rocks from the Coast Range. These deposits are thickest along the western edge of the valley and taper off to the east as they approach the center of the valley floor. These sediments contain a large proportion of silt and clay, are high in salts, and contain elevated concentrations of selenium and other trace elements. The Sierra Nevada sediments on the eastern side of the region are derived primarily from granitic rock. These deposits make up most of the total thickness of sediments along the valley axis and gradually thin to the west until pinching out near the western boundary. These sediments are relatively permeable, with hydraulic conductivities three times that of the Coast Range deposits. The flood basin deposits are relatively thin and, in geologic terms, have been created in recent time. These deposits occur along the center of the valley floor and are generally only 5 to 35 feet thick.

Recharge to the semi-confined upper aquifer generally occurs from stream seepage, deep percolation of rainfall, and subsurface inflow along basin boundaries. As agricultural practices expanded in the region, recharge was augmented with deep percolation of applied agricultural water and seepage from the distribution systems used to convey this water. Recharge of the lower confined aquifer consists of subsurface inflow from the valley floor and foothill areas to the east of the eastern boundary of the Corcoran Clay Member. Present information indicates that the clay layers, including the Corcoran Clay, are not continuous in some areas, and some seepage from the semi-confined aquifer above does occur through the confining layer.

Historically, the interaction of groundwater and surface water resulted in net gains to the streams. This condition existed on a regional basis through about the mid 1950s. Since that time groundwater level declines have resulted in some stream reaches losing flow through seepage to the groundwater systems below. Where the hydraulic connection has been maintained, the amount of seepage has varied as groundwater levels and streamflows have fluctuated. Along the San Joaquin River, flood control operations in conjunction with spring pulse flow requirements have caused high groundwater adjacent to the streams. The raised groundwater levels can impact the root zones of crops adjacent to the river.

Large-scale groundwater development during the 1960s and 1970s, combined with the introduction of imported surface water supplies, have modified the natural groundwater flow pattern towards the Delta. Flow largely occurs from areas of recharge towards areas of lower groundwater levels due to groundwater pumping. The vertical movement of water in the aquifer has been altered as a result of thousands of wells constructed with perforation above and below the confining unit (Corcoran Clay Member), where present, providing a direct hydraulic connection. This may have been partially offset by a decrease in vertical flow resulting from the inelastic compaction of fine-grained materials within the aquifer system.

Expansion of agricultural practices between 1920 and 1950 caused declines in groundwater levels in many areas of the San Joaquin Valley. Along the east side of the valley groundwater declined between 40 and 80 feet since the mid 1800s. Declines began occurring in the 1940s along the west side of the valley to more than 30 feet by 1960. In the confined aquifer of northwestern San Joaquin Valley, groundwater levels were recorded as ranging from 200 feet below sea level to sea level in spring 1960. By spring 1970, groundwater levels in this same area were recorded as ranging from 200 feet to 100 feet below sea level, a decline of about 100 feet. Groundwater levels near Stockton declined to about 50 feet below sea level by spring 1970, causing saline groundwater intrusion. Groundwater levels in the semiconfined aquifer between spring 1970 and spring 1980 declined in response to 1976-1977 drought conditions and recovered to near pre-drought levels by 1980 when surface water was available from the CVP system. During the 1987-1992 drought water levels declined by 20 to 30 feet throughout most of the central and eastern parts of the San Joaquin Valley.

As a result of declining groundwater, land subsidence has occurred throughout the valley. From 1920 to 1970, almost 5,200 square miles of irrigated land in the San Joaquin valley were characterized by at least one foot of land subsidence. By the mid 1970s, the use of imported surface water in lieu of groundwater pumping in the western and southern portions of San Joaquin Valley essentially eliminated new land subsidence. During the 1976-1977 and 1987-1992 droughts, land subsidence was observed in areas previously affected due to renewed high groundwater pumping rates, including areas near the Delta Mendota Canal.

Groundwater quality conditions vary throughout the San Joaquin Valley. Constituents of concern in the San Joaquin Valley groundwater include TDS, boron, nitrate, arsenic, and selenium. TDS concentrations vary considerably throughout the valley. Along the eastern side of the valley, TDS concentrations are generally less than 500 mg/l in this area because this area is recharged with water from the Sierra Nevada. On the west side of the valley, TDS concentrations are generally greater than 500 mg/l and can be in excess of 2,000 mg/l. The concentrations in excess of 2,000 mg/l generally occur above the Corcoran Clay and are related to local soil conditions and accumulation of salts from irrigation with water from the Delta. Boron concentrations are high in the northeastern sections of the San Joaquin valley. High nitrate concentrations occur north of Stockton and near Fresno. Municipal uses of groundwater for drinking water are impaired due to elevated arsenic concentrations along the eastern edges of valley.

Selenium is leached from soils into groundwater along the west side of the valley during the infiltration of irrigation water. The selenium-impacted groundwater then discharges into receiving surface waters. Recently, the State of California has established maximum selenium objectives for the San Joaquin River. Reclamation has worked with local water agencies and stakeholders in the area to reduce discharge of selenium into the San Joaquin River and reduce the accumulation of selenium in local wetlands.

San Felipe Division. Groundwater resources vary throughout the San Felipe Division. In Zone 6 of the San Benito County Flood Control and Water Conservation District, groundwater consist of numerous subbasins partially separated by barriers or fault zones. Irrigation of agricultural lands in this area has relied on groundwater as the primary supply. As agricultural development expanded, groundwater withdrawals exceeded recharge rates and caused severe declines in groundwater levels. In the 1980s, CVP water was imported into this area to reduce the overdraft conditions. Recently, the groundwater levels have increased to pre-irrigation levels. Groundwater quality is generally good. However, areas with high levels of TDS occur sporadically. Organic constituents are also detected in the vicinity of wastewater percolation ponds near the communities of Hollister and San Juan Bautista.

In Santa Clara County, extensive groundwater pumping for agricultural purposes produced overdraft conditions and resulted in land subsidence of up to 13 feet, increased pumping costs, and seawater intrusion from the San Francisco Bay. Local surface water facilities constructed in the 1940s eliminated most overdraft conditions by the 1950s, but subsequent increased development re-initiated the overdraft. To reverse these conditions, surface water was initially imported to the area in the late 1960s through the SWP South Bay Aqueduct. Continued growth during the late 1960s and 1970s threatened to return the area to overdraft conditions until CVP water was introduced through the San Felipe Division. Groundwater resources in Santa Clara County are generally of good quality. Seawater intrusion is presumably responsible for high chloride concentrations in the northern Santa Clara Valley. High boron concentrations occur in the foothills on the east side of the county and high nitrate concentrations occur in areas that rely upon septic systems for wastewater treatment and disposal.

Contra Costa and Alameda Counties (American River and Delta Divisions). Groundwater basins in Alameda and Contra Costa counties are structural depressions formed by folding and faulting. The basins are filled with marine and alluvial sediments and drained by surface streams. Seawater intrusion is common near San Francisco Bay.

Groundwater resources are limited and/or of poor water quality in many portions of these counties. Limited groundwater supplies have resulted in overdraft conditions, land subsidence, and degradation of water quality. In eastern Contra Costa County, high nitrates due to agricultural activities through the 1960s have made available groundwater supplies unacceptable for municipal drinking water uses. Groundwater is used for agricultural and industrial users.

Major municipal water suppliers in Contra Costa and Alameda counties rely upon local and imported surface water from the Delta or water imported by East Bay Municipal Utility District from the Mokelumne River.

Environmental Consequences

The effects of Alternatives 1A, 1B, 2A, and 2B on groundwater resources are compared to conditions under the No Action Alternative.

No Action Alternative. The No Action Alternative represents the future conditions without implementation of an M&I water shortage policy under the alternatives. Under the No Action Alternative, it is anticipated that groundwater use by both M&I and Irrigation CVP water service contractors would remain the same as under existing conditions except in the American River Division. In the American River Division, conjunctive use programs will be implemented as part of the Water Forum Agreement.

Alternative 1A. Under Alternative 1A, groundwater use by M&I and Irrigation CVP water service contractors would not change from the No Action Alternative conditions in 63 of the 72 years considered in this EA when the M&I CVP water service contract water allocations are equal to or greater than 75 percent or equal to 50 percent.

In the remaining 9 years of the 72 years considered in the CALSIM II model runs for this EA, it is unclear how the M&I CVP water service contractors will react with the increased water allocations. In some communities, this may result in a decreased use of groundwater or reduction of stringent conservation measures. It also is unclear how the Irrigation CVP water service contractors will respond to the reduction in water allocations. Some contractors may fallow lands more frequently on a short-term basis during drier years. Other contractors may increase use of groundwater, or use a combination of fallowing and increased groundwater withdrawals. Therefore, it is difficult to quantify the changes in groundwater conditions. However, if increased groundwater withdrawals are used for the irrigated areas in the 9 years, groundwater overdraft and groundwater quality will probably adversely affected on a temporary basis.

Alternative 1B. The changes in groundwater use under Alternative 1B would be similar to that described under Alternative 1A because the changes in M&I and Irrigation CVP water service contractor allocations would be similar under both alternatives.

Alternative 2A. The changes in groundwater use under Alternative 2A would be similar to that described under Alternative 1A because the changes in M&I and Irrigation CVP water service contractor allocations would be similar under both alternatives.

Alternative 2B. The changes in groundwater use under Alternative 2B would be similar to that described under Alternative 1A because the changes in M&I and Irrigation CVP water service contractor allocations would be similar under both alternatives.

Cumulative Effects

Implementation of M&I Water Shortage Policy would not result in cumulative adverse impacts to groundwater resources when considered in combination with future projects such as water transfer projects or development of other water supplies. Alternatives considered in this EA may reduce the demand for water transfers by the amount of additional water supplied to the M&I CVP water service contractors. The alternatives considered in this EA would not affect the ability to implement those projects or increase the overall impacts from all of the projects. The alternatives in this EA would reduce availability of potential water that could have been transferred from Irrigation CVP water service contractors in the 9 of the 72 years considered in the CALSIM modeling analyses. If the irrigation users decide to increase groundwater pumping in the 9 years, that could reduce the feasibility of increasing groundwater pumping under future water transfer programs.

None of the alternatives considered in this EA would modify CVP Contract Totals or deliveries from within the historical ranges under the No Action Alternative. None of the alternatives considered in this EA would support additional residential, commercial, or industrial growth within the M&I water service contractors. However, the improved water supply allocations in drought years may encourage the existing and projected water users to continue to be located within the M&I water service contractors' service areas.

MUNICIPAL AND INDUSTRIAL LAND USE AND CENTRAL VALLEY PROJECT WATER COSTS

This section describes land use and water supply costs for M&I users in each division considered in this EA. The description of the Affected Environment has been developed from information presented in the CVPIA PEIS and draft environmental documents prepared by and for Reclamation to support the Long-Term Contract Renewal process.

Affected Environment

Municipal and Industrial Land Use. M&I land is defined as land used for residential, industrial, commercial, construction, institutional, railroad yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment plants, water control structures, and other development purposes. Highways, railroads, and other transportation facilities are also included as M&I land use if they are part of a surrounding M&I area.

Existing and projected land uses within each of the M&I CVP water service contractor service areas are described in detail in Chapter 3. Regional land use for the Sacramento and San Joaquin valleys and the San Francisco Bay Area are summarized below.

M&I land use in the Sacramento Valley increased after 1950, in part as a result of the post-World War II “baby boom” and strong economic conditions. Between 1950 and 1980, M&I corridors developed along Interstate 80 and Highway 50 in the American River Division. During this time, development in the region included growth in Sacramento, which expanded the area from a regional transportation center for agriculture and the state capital; to an area that also supported aerospace, electronics, computer and other high technology industries. Between 1980 and 1990, M&I land acreage within the Sacramento River Region increased from approximately 316,000 acres to 444,000 acres. During the 1980s, areas within the American River Division were among the fastest growing areas in California. Recently, M&I land use has increased in the Trinity and Shasta Division as the cities of Redding, Shasta Lake, and Red Bluff and surrounding areas have increased residential units.

Increases in M&I land use in the San Joaquin Valley occurred primarily in Fresno, Merced, Stanislaus, and San Joaquin Counties. Between 1980 and 1990, M&I land acreage within the San Joaquin River Region increased from approximately 71,000 acres to 110,000 acres. Major M&I centers in the portions of the Eastside, Delta, and West San Joaquin divisions in the San Joaquin Valley include the cities of Stockton, Tracy, and Manteca. These cities are growing due to industrial growth and as suburban areas for the San Francisco Bay Area.

Between 1955 and 1970, M&I land use in the San Francisco Bay Area (including areas in the American River, Delta, and San Felipe divisions) increased from approximately 225,000 to 485,000 acres. M&I land use for 1990 was 655,000 acres. By the late 1990s, few areas remained in this region that could support new development. Extensive development occurred on the Interstates 680 and 580 corridors.

Municipal and Industrial Water Supply Costs for CVP Water. Water use and average water costs vary greatly among water suppliers, as described in the CVPIA PEIS. Summer seasonal M&I water use is higher in the Central Valley than in coastal communities due to higher landscape irrigation requirements. Winter seasonal residential M&I water use is higher in suburban areas than in high-density urban areas. Overall water use varies by M&I CVP water service contractor and is affected by types of land use, seasons, and availability of additional water sources. Most of the M&I CVP water service contractors have implemented extensive conservation and recycled water programs, and larger communities rely upon several water supplies, as described in Chapter 3.

Due to the use of several water supplies, it is difficult to determine or compare the actual cost of water to the retail customers. For the purpose of this EA, the analysis of M&I CVP water supplies is limited to a comparison of the 2004 cost of service rates for each M&I CVP water service contractor in this EA, as summarized in Table 5-10.

Environmental Consequences

The effects of Alternatives 1A, 1B, 2A, and 2B on M&I Land Use and Water Supply Costs are compared to conditions under the No Action Alternative.

No Action Alternative. The No Action Alternative represents the future conditions without implementation of an M&I water shortage policy under the alternatives. Under the No Action Alternative, it is anticipated that projected land uses would be consistent with general plans, water supply integrated resources plans, and other documents prepared by local agencies, as summarized in Chapter 3 of this EA. These plans have been prepared assuming the water supply conditions under the No Action Alternative which are consistent with projected conditions in the CVPIA PEIS proposed action. In areas with identified water supply deficiencies in 2030, plans have been or are being prepared by the local water supply agencies to implement extensive water use efficiency programs. Some agencies are developing conjunctive use programs. Many agencies have been evaluating opportunities to participate in water transfer programs that would provide additional water during dry periods. Under all of these programs, it is anticipated that water conservation will be extensively used when M&I CVP water service contract allocations are less than 75 percent.

CVP cost of service rates under the No Action Alternative would be consistent with values presented in Table 5-10. The cost of water transfers during droughts is difficult to project. Recent costs of water transfers have exceeded $100/acre-foot without the cost of conveyance from the transferor to the M&I water agency.

Alternative 1A. Under Alternative 1A, M&I land use is not anticipated to change because this alternative would not provide additional water to M&I CVP water service contractors except to meet public health and safety needs in drought periods. There would be no increase in CVP water service Contract Totals that could be used to support growth not identified in the Water Needs Assessment used in the No Action Alternative.

TABLE 5-10

2004 RATES FOR COST OF SERVICE FOR M&I CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT WATER

CVP Division	M&I Water Service Contractor	2004 Cost of Service Rate for M&I CVP Water ($/acre-feet)
Trinity River	Shasta Community Services District	24.25
	Shasta County Service Area - Keswick #25	28.01
	Bella Vista Water District (not Shasta County Water Agency service area)	64.77
	Clear Creek Community Services District	48.33
	Centerville Community Services District	26.36
Shasta	Shasta County Water Agency	31.40
	Mountain Gate Community Services District (not Shasta County Water Agency service area)	20.08
	City of Shasta Lake	23.97
	City of Redding	15.00 to 25.14 [a]
	U.S. Forest Service - Centimundi Boat Ramp	15.92
Sacramento River	Colusa County Water District	29.83
	County of Colusa	22.88
	Whitney Construction	21.36
	Elk Creek Community Services District	15.00
	U.S. Forest Service - Conservation Camp	18.07
American River	El Dorado Irrigation District (El Dorado Hills, only)	25.83
	City of Roseville	20.09
	San Juan Water District	22.64
	East Bay Municipal Utility District	110.55
	Sacramento Municipal Utility District	70.27
	Sacramento County Water Agency	19.02
	Placer County Water Agency	No M&I CVP water in 2004
Eastside	Tuolumne Utility District	No M&I CVP water in 2004

TABLE 5-10

2004 RATES FOR COST OF SERVICE FOR M&I CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT WATER

CVP Division	M&I Water Service Contractor	2004 Cost of Service Rate for M&I CVP Water ($/acre-feet)
Delta	Broadview Water District	42.58
	Del Puerto Water District	29.86
	Byron-Bethany Irrigation District	27.30
	City of Tracy	35.10
	Patterson Irrigation District	No M&I CVP water in 2004
	Contra Costa Water District	36.33
	U.S. Department of Veterans Affairs - Cemetery	36.47
West San Joaquin	Westlands Water District	49.51
	San Luis Water District	15.00 to 59.45
	Pacheco Water District	72.02
	Panoche Water District	39.87 to 44.78 [b]
	City of Avenal	94.39
	City of Coalinga	80.75
	City of Huron	91.71
	California Department of Fish & Game	39.58
San Felipe	Zone 6 of San Benito County Water Conservation & Flood Control District	40.01
	Santa Clara Valley Water District	53.59

All rates based on 2004 U.S. Bureau of Reclamation M&I Ratebook for the cost of capital repayment plus operation and maintenance.

[a] Range of costs depend upon whether water is delivered from Spring Creek Conduit or Sacramento River.

[b] Range of costs depend upon whether water is delivered from Delta Mendota Canal or San Luis Unit.

With the potential of additional years of no CVP irrigation water deliveries , farmers would need to find alternative water sources. Surface water could be available through agreements already held by the farmer or through short term transfers. These water sources are likely to be more expensive than CVP water service contracts, particularly transfers made during drier contract years.

At the expected frequency of no or very little CVP irrigation water deliveries associated with this alternative, it is likely that farmers without affordable and accessible alternative water supplies will be subject to significant financial burdens. Farmers may fallow crops, resulting in lost farm revenue and related jobs. Farmers with permanent crops would be most vulnerable to losing high valued investments. Loss of agricultural employment would affect lower income population and minority populations more than other populations in the state. There could be an improved allocations of industrial employment associated with industries that rely upon M&I CVP water service contract water and that were concerned about reductions in water supplies during droughts.

CVP cost of service rates under Alternative 1A would be equal to those used in the No Action Alternative. The total cost of M&I CVP water service contract water would be different than under the No Action Alternative depending upon the total volume delivered, although the unit cost would not change. The overall cost of supplying M&I water could also change as the need for water transfers changes in Alternative 1A as compared to the No Action Alternative.

Conditions in the American River Division under Alternative 1A would be identical as the conditions under the No Action Alternative.

Alternative 1B. Under Alternative 1B, M&I land use is not anticipated to change because this alternative would not provide additional water to M&I CVP water service contractors except to meet public health and safety needs in drought periods. There would be no increase in CVP water service Contract Totals that could be used to support growth not identified in the Water Needs Assessment used in the No Action Alternative.

With the potential of additional years of no CVP irrigation water deliveries, farmers would need to find alternative water sources. Surface water could be available through agreements already held by the farmer or through short term transfers. These water sources are likely to be more expensive than CVP water service contracts, particularly transfers made during drier contract years.

At the expected frequency of no or very little CVP irrigation water deliveries associated with this alternative, it is likely that farmers without affordable and accessible alternative water supplies will be subject to significant financial burdens. Farmers may fallow crops, resulting in lost farm revenue and related jobs. Farmers with permanent crops would be most vulnerable to losing high valued investments. Loss of agricultural employment would affect lower income population and minority populations more than other populations in the state. There could be an improved allocations of industrial employment associated with industries that rely upon M&I CVP water service contract water and that were concerned about reductions in water supplies during droughts.

CVP cost of service rates under Alternative 1B would be equal to those used in the No Action Alternative. The total cost of M&I CVP water service contract water would be different than under the No Action Alternative depending upon the total volume delivered, although the unit cost would not change. The overall cost of supplying M&I water could also change as the need for water transfers changes in Alternative 1B as compared to the No Action Alternative.

Conditions in the American River Division under Alternative 1B would be identical as the conditions under the No Action Alternative.

Alternative 2A. Under Alternative 2A, M&I land use is not anticipated to change because this alternative would not provide additional water to M&I CVP water service contractors except to meet public health and safety needs in drought periods to provide adequate water to maintain industrial users. There would be no increase in CVP water service Contract Totals that could be used to support growth not identified in the Water Needs Assessment used in the No Action Alternative.

With the potential of additional years of no CVP irrigation water deliveries, farmers would need to find alternative water sources. Surface water could be available through agreements already held by the farmer or through short term transfers. These water sources are likely to be more expensive than CVP water service contracts, particularly transfers made during drier contract years.

At the expected frequency of no or very little CVP irrigation water deliveries associated with this alternative, it is likely that farmers without affordable and accessible alternative water supplies will be subject to significant financial burdens. Farmers may fallow crops, resulting in lost farm revenue and related jobs. Farmers with permanent crops would be most vulnerable to losing high valued investments. Loss of agricultural employment would affect lower income population and minority populations more than other populations in the state. There could be an improved allocations of industrial employment associated with industries that rely upon M&I CVP water service contract water and that were concerned about reductions in water supplies during droughts.

CVP cost of service rates under Alternative 2A would be equal to those used in the No Action Alternative for the first tier. However, even under the first tier, the total cost of M&I CVP water service contract water would be higher than under the No Action Alternative due to the increased total volume delivered, although the unit cost would not change.

Cost of CVP water under the second tier would be higher than the CVP cost of service rates in all years - not just the years with M&I CVP water service contract allocations less than 75 percent. Therefore, with respect to the CALSIM II model simulation, the higher rates for the second tier increment would occur in all 72 years for the increased allocations in 9 of the 72 years. Alternative 2A would increase the cost of the second tier by three to 10 times the cost of service rate. However, this increase would be blended with the existing cost of service rate for the first tier, as described in the following example assuming a multiplier of 10.

Assumptions:
CVP Water Service Contract Cost of Service = $20/acre-foot (First Tier or Base Rate)
Second Tier Cost - assume multiplier of 10 = $200/acre-foot (Second Tier or Incremental Rate)

Allocation based upon methods described for Alternative 1B = 10,000 acre-feet
Additional amount of water to provide 100 percent of industrial water demand, up to a maximum of 75 percent of Contract Total = 1,000 acre-feet (Second-Tier)

Example of Blended Rate:
[(10,000 acre-feet * $20/acre-foot) + (1,000 acre-feet*$200/acre-foot)]/(11,000 acre-feet) = $36.4/acre-foot

The overall cost of water supply would also change as the need for water transfers would decrease in Alternative 2A as compared to the No Action Alternative. Conditions in the American River Division under Alternative 2A would be identical as conditions under the No Action Alternative.

Alternative 2B. Under Alternative 2B, M&I land use is not anticipated to change because this alternative would not provide additional water to M&I CVP water service contractors except to meet public health and safety needs in drought periods to provide adequate water to maintain industrial users. There would be no increase in CVP water service Contract Totals that could be used to support growth not identified in the Water Needs Assessment used in the No Action Alternative.

With the potential of additional years of no CVP irrigation water deliveries, farmers would need to find alternative water sources. Surface water could be available through agreements already held by the farmer or through short term transfers. These water sources are likely to be more expensive than CVP water service contracts, particularly transfers made during drier contract years.

At the expected frequency of no or very little CVP irrigation water deliveries associated with this alternative, it is likely that farmers without affordable and accessible alternative water supplies will be subject to significant financial burdens. Farmers may fallow crops, resulting in lost farm revenue and related jobs. Farmers with permanent crops would be most vulnerable to losing high valued investments. Loss of agricultural employment would affect lower income population and minority populations more than other populations in the state. There could be an improved allocations of industrial employment associated with industries that rely upon M&I CVP water service contract water and that were concerned about reductions in water supplies during droughts.

CVP cost of service rates under Alternative 2B would be equal to those used in the No Action Alternative for the first tier. However, even under the first tier, the total cost of M&I CVP water service contract water would be higher than under the No Action Alternative due to the increased total volume delivered, although the unit cost would not change.

The cost of CVP water under the second tier would be higher than the CVP cost of service rates in all years, not just the years with M&I CVP water service contract allocations less than 75 percent. Therefore, with respect to the CALSIM II model simulation, the higher rates for the second tier increment would occur in all 72 years for the increased allocations in 9 of the 72 years. Alternative 2B would increase the cost of the second tier by three to 10 times the cost of service rate, as described under Alternative 2B. However, this increase would be blended with the existing cost of service rate for the first tier, as described in the following example assuming a multiplier of 10.

> **Assumptions:**
> CVP Water Service Contract Cost of Service = $20/acre-foot (First Tier or Base Rate)
> Second Tier Cost - assume multiplier of 10 = $200/acre-foot (Second Tier or Incremental Rate)
>
> Allocation based upon methods described for Alternative 1B = 10,000 acre-feet
> Additional amount of water to provide 100 percent of M&I water demand, up to a maximum of 75 percent of Contract Total = 5,000 acre-feet (Second-Tier)
>
> **Example of Blended Rate:**
> [(10,000 acre-feet * $20/acre-foot) + (5,000 acre-feet*$200/acre-foot)]/(15,000 acre-feet) = $80/acre-foot

The overall cost of water supply would also change as the need for water transfers changes in Alternative 2B as compared to the No Action Alternative.

Conditions in the American River Division under Alternative 2B would be identical as conditions under the No Action Alternative.

Cumulative Effects

Implementation of M&I Water Shortage Policy would not result in cumulative adverse impacts to land use or CVP water supply costs when considered in combination with future projects such as water transfer projects or development of other water supplies. Alternatives considered in this EA may reduce the demand for water transfers by the amount of additional water supplied to the M&I CVP water service contractors. The alternatives considered in this EA would not affect the ability to implement those projects or increase the overall impacts from all of the projects. The alternatives in this EA would reduce availability of potential water that could have been transferred from Irrigation CVP water service contractors to any type of M&I users in the 9 of the 72 years considered in the CALSIM modeling analyses.

None of the alternatives considered in this EA would modify CVP Contract Totals or deliveries from within the historical ranges under the No Action Alternative. None of the alternatives considered in this EA would support additional residential, commercial, or industrial growth within the M&I water service contractors.

AGRICULTURAL LAND USE AND ECONOMICS

This section describes land use and economics for agricultural users in each division considered in this EA. The description of the Affected Environment has been developed from information presented in the CVPIA PEIS and draft environmental documents prepared by and for Reclamation to support the Long-Term Contract Renewal process.

Affected Environment

The Irrigation CVP water service contractors that may be affected by the alternatives for the M&I Water Shortage Policy are located in several divisions in the Central Valley and in the San Felipe Division in San Benito and Santa Clara counties. The Central Valley is an important agricultural region for California and the United States. In 2002, the 18 Central Valley counties that include Irrigation CVP water service contractors contributed 52 percent, by value, of California's agricultural production and included six of the top 10 agricultural counties in the state (Fresno, Tulare, Kern, Merced, Stanislaus, and San Joaquin counties). Agriculture in the Central Valley is an important employer and affects the regional economy through farm expenditures, as well as production of many crops that require processing or transportation after harvest.

Within the past few years, growth trends have shown that more municipal and industrial development is moving into the Central Valley from the coastal areas of California. This growth is caused by the availability of affordable land and homes, and less crowded living conditions available in the Central Valley. As a result of the growth, sectors such as construction, wholesale and retail trade, entertainment and leisure services, professional and business services, manufacturing, and technology are increasingly important in the Central Valley economy.

Despite these emerging trends, land use and economic productivity in the Central Valley counties are still primarily based in agricultural production. The production values and primary crops within California in 2002 for counties with Irrigation CVP water service contractors that could be affected by alternatives considered in this EA are summarized in Table 5-11.

The Sacramento Valley climate and soils allow cultivation of a wide variety of crops, and the fine-textured soils adjacent to the Sacramento River are especially suited to rice production. Sacramento Valley's leading crops by acreage include rice; grains and field crops; and hay, pasture, and alfalfa. More urbanized counties, such as Placer and Santa Clara counties, specialize in truck crops and nursery and horticultural products. Production from irrigated acreage within the San Joaquin Valley is planted with grains, hay, pasture, orchards, grapes, cotton, and vegetable crops. The region is the leading California area for production of grapes, almonds, walnuts, tomatoes, and melons.

Farm characteristics, including harvested acres and irrigated acreage, and agricultural economics of the counties described in this EA are summarized in Tables 5-12 and 5-13. Agricultural production in the Central Valley is sensitive to the cost and availability of water. The 2004 cost of service rates for agricultural water in areas located North of the Delta ranges from $16.35 to $32.90/acre-feet. For water service contractors located South of the Delta, 2004 irrigation cost of service rates range from $21.59 to $62.27/acre-foot.

Groundwater and other surface water are important alternative water supplies for Irrigation CVP water service contractors. However, availability and cost of these alternative sources vary. When CVP water service Contract Totals are not available due to supply constraints, agricultural producers would rely upon groundwater or other surface water, often at a higher cost than CVP water service contracts.

Environmental Consequences

The effects of Alternatives 1A, 1B, 2A, and 2B on Agricultural Land Use and Water Supply Costs are compared to conditions under the No Action Alternative.

Long term contract renewals will not directly affect the cost of service for agricultural contractors, but they could affect the irrigation allocations. Reductions in irrigation allocations could negatively affect profits, cause changes in cropping patterns and irrigation technologies, and affect which lands a farmer can cultivate. Agricultural production decisions, once made, are fairly inflexible, especially if capital has been invested and after a crop has been planted. For instance, when a farmer chooses to produce a particular crop, the farmer needs to apply a certain level of irrigation and the farmer has made a financial commitment through the harvest and marketing of the commodity. If water supply is decreased and irrigation cannot occur as needed, the quantity and quality of the crop likely suffers and profits are reduced. Farmers could make several kinds of responses to increased frequencies of shortage.

- If water supply is reduced over several seasons, the farmer may change to a different cropping pattern that requires less water. This can lead to decreased revenues and profits. In certain regions of the Central Valley, water is needed to move salts from the root zones of the soils. Without a sufficient amount of water to manage salinity, yields can be reduced, and some lands or some crops may not be profitable to irrigate.

- The farmer may have access to alternate sources of water such as groundwater or non-CVP surface water. Typically, these alternative sources are substantially more expensive. In some areas, especially in the western and southern San Joaquin Valley, groundwater pumping requires pumping for several hundreds of feet to the soil surface. The quality of the groundwater may be characterized by high TDS, which could reduce yields or the quality of the harvested commodity. Supplemental surface water is generally much more expensive than CVP water service contract supplies, especially during drought conditions.

TABLE 5-11

AGRICULTURAL PRODUCTION AND LEADING CROPS BY COUNTY
(2002 Values)

CVP Division	County	Agricultural Production ($1,000)	Percent of Agricultural Production in California by Value	Leading Crops by Value
Shasta and Trinity	Shasta	52,198	0.2%	Cattle, Nursery Products, Alfalfa and Other Hay
Sacramento River	Colusa	290,266	0.9%	Rice, Processing Tomatoes, Almonds
	Glenn	303,892	1.0%	Rice, Almonds, Dairy Products
	Tehama	126,372	0.4%	English Walnuts, Dried Plums, Dairy Products
American River	Placer	66,556	0.2%	Rice, Nursery Products, Cattle and Calves
Delta	Contra Costa	100,154	0.3%	Nursery Products, Cattle and Calves, Sweet Corn
	Fresno	3,415,591	11.1%	Grapes, Cotton, Poultry
	Merced	1,730,720	5.6%	Dairy Products, Poultry, Almonds
	San Joaquin	1,343,808	4.4%	Dairy Products, Grapes, Tomatoes
	Stanislaus	1,367,971	4.5%	Dairy Products, Almonds, Poultry
West San Joaquin	Fresno	3,415,591	11.1%	Grapes, Cotton, Poultry
	Kings	1,023,807	3.3%	Dairy Products, Cotton, Cattle and Calves
	Merced	1,730,720	5.6%	Dairy Products, Poultry, Almonds
San Felipe	San Benito	214,841	0.7%	Nursery Products, Lettuce, Vegetable Crops
	Santa Clara	255,374	0.8%	Nursery Products, Mushrooms, Bell Peppers
Cross Valley	Fresno	3,415,591	11.1%	Grapes, Cotton, Poultry
	Kern	2,586,247	8.4%	Grapes, Citrus, Carrots
	Kings	1,023,807	3.3%	Dairy Products, Cotton, Cattle and Calves
	Tulare	3,200,552	10.4%	Dairy Products, Citrus, Grapes

All values are from 2002 California Agricultural Statistics Service, U.S. Department of Agriculture

TABLE 5-12

AGRICULTURAL LAND USE AND IRRIGATED ACREAGE BY COUNTY (2002 Values)

Division	County	Land Area (acres)	Percent of Land Area in Farms	Number of Farms	Irrigated Acres (acres)
Shasta and Trinity	Shasta	2,422,525	14%	1,126	46,021
Sacramento River	Colusa	736,432	66%	821	290,861
	Glenn	841,468	60%	1,283	223,127
	Tehama	1,888,632	46%	1,573	98,840
American River	Placer	898,795	15%	1,438	36,305
Delta	Contra Costa	460,765	27%	592	32,921
	Fresno	3,816,144	51%	6,281	1,098,941
	Merced	1,234,364	82%	2,964	518,538
	San Joaquin	895,540	91%	4,026	520,172
	Stanislaus	956,026	83%	4,267	401,439
West San Joaquin	Fresno	3,816,144	51%	6,281	1,098,941
	Kings	890,236	73%	1,154	407,031
	Merced	1,234,364	82%	2,964	518,538
San Felipe	San Benito	888,997	65%	677	33,200
	Santa Clara	826,040	39%	1,026	24,659
Cross Valley	Fresno	3,816,144	51%	6,281	1,098,941
	Kern	5,210,217	52%	2,147	811,672
	Kings	890,236	73%	1,154	407,031
	Tulare	3,087,340	45%	5,738	652,385

All values are from 2002 National Agricultural Statistics Service, U.S. Department of Agriculture

TABLE 5-13

ANNUAL AVERAGE PER FARM VALUES AND EXPENSES BY COUNTY (2002 Values)

Division	County	Market Value of Production ($1,000)	Market Value of Land and Buildings ($1,000)	Market Value of Machinery and Equipment ($1,000)	Farm Production Expenses ($1,000)
Shasta and Trinity	Shasta	19,496	519,775	22,962	25,593
Sacramento River	Colusa	293,966	1,885,392	175,235	282,249
	Glenn	179,392	846,235	98,679	153,182
	Tehama	70,018	843,119	42,217	66,165
American River	Placer	25,847	587,380	25,720	28,145
Delta	Contra Costa	152,383	1,089,622	47,274	119,609
	Fresno	439,328	1,101,948	99,231	344,033
	Merced	475,457	1,363,034	114,594	419,663
	San Joaquin	303,640	1,203,010	91,721	244,010
	Stanislaus	287,932	1,062,751	77,381	235,640
West San Joaquin	Fresno	439,328	1,101,948	99,231	344,033
	Kings	687,228	2,012,543	167,431	571,194
	Merced	475,457	1,363,034	114,594	419,663
San Felipe	San Benito	292,311	1,479,433	63,852	240,765
	Santa Clara	203,214	1,185,166	44,545	134,580
Cross Valley	Fresno	439,328	1,101,948	99,231	344,033
	Kern	958,875	2,213,516	195,721	750,347
	Kings	687,228	2,012,543	167,431	571,194
	Tulare	407,560	948,550	90,642	335,754

All values are from 2002 National Agricultural Statistics Service, U.S. Department of Agriculture

- The farmer may choose to change irrigation technologies to conserve water, but this is an expensive capital investment that would reduce profits and increase debt for the farmer. Therefore this response would occur only under severe long term circumstances.

- The farmer could choose to fallow land, which would decrease not only revenues, but also possibly decrease on-farm jobs and production-related expenditures that support agribusiness.

- Changes in agricultural production, cropping patterns, and irrigation can have direct economic impacts on the industry through changes in revenues, costs, and jobs. These direct impacts can affect local and regional economies.

No Action Alternative. The No Action Alternative represents the future conditions without implementation of the M&I Water Shortage Policy under the action alternatives. Non-agricultural land uses will increase as development continues in the Central Valley, especially for those areas near population centers. Irrigated acreage will continue to be retired and used for dryland farming or wildlife habitat, or converted to urban land uses.

Alternative 1A. Under Alternative 1A, water would be re-allocated from Irrigation CVP water service contractors to provide public health and safety water quantities to M&I CVP water service contractors. This alternative would lead to changes in contract deliveries for Irrigation CVP water service contractors in 9 of the 72 years considered in the CALSIM II model simulation, as summarized in Tables 5-9 and 5-14.

While the overall level of CVP water deliveries to irrigation users are low in the13 years, ranging from zero deliveries to 24 percent of Contract Total, the impacts to agricultural land use and agricultural economics is difficult to estimate without additional information on each contractor's alternative sources of water. A delivery of 20 percent of the Irrigation CVP water service contract amount can be a serious production constraint if that is the only water source. If it is supplemental to other water supplies, then the shortage is less of a limitation.

TABLE 5-14

FREQUENCY OF IRRIGATION CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT DELIVERIES AS PERCENT OF TOTAL IRRIGATION WATER SERVICE CONTRACT DELIVERIES

Percent Deliveries of Irrigation CVP Water Service Contract Amount	No Action Alternative	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B
No Deliveries	4 years	5 years	6 years	8 years	8 years
1 to 10 percent	5 years	4 years	3 years	2 year	2 years
11 to 20 percent	3 years	3 years	3 years	2 years	2 years
21 to 24 percent	1 year	1 year	1 year	1 year	1 year
25 to 100 percent	59 years	59 years	59 years	59 years	59 years

The CALSIM II model is used to simulate operations under 72 years of varying hydrologic conditions. Of the 72 years, 13 years have M&I water service contract allocations less than 75 percent, and therefore; are subject to specific M&I Water Shortage Policy allocations under this alternative.

With the potential of one additional year of no CVP irrigation water deliveries, farmers would need to find alternative water sources. Surface water could be available through agreements already held by the farmer or through short term transfers. These water sources are likely to be more expensive than CVP water service contracts, particularly transfers made during drier contract years.

At the expected frequency of no or very little CVP irrigation water deliveries associated with this alternative, it is likely that farmers without affordable and accessible alternative water supplies will be subject to significant financial burdens. Farmers may fallow crops, resulting in lost farm revenue and related jobs. Farmers with permanent crops would be most vulnerable to losing high valued investments. Loss of agricultural employment would affect lower income population and minority populations more than other populations in the state. There could be an improved allocations of industrial employment associated with industries that rely upon M&I CVP water service contract water and that were concerned about reductions in water supplies during droughts.

Alternative 1B. Under Alternative 1B, water would be re-allocated from Irrigation CVP water service contractors to provide public health and safety water quantities to M&I CVP water service contractors. This alternative would lead to changes for Irrigation CVP water service contractors in the 9 of the 72 years considered in the CALSIM II model simulation, as summarized in Tables 5-9 and 5-14.

With the potential of two additional years of no CVP irrigation water deliveries, farmers would need to find alternative water sources. Surface water could be available through agreements already held by the farmer or through short term transfers. These water sources are likely to be more expensive than CVP water service contracts, particularly transfers made during drier contract years.

At the expected frequency of no or very little CVP irrigation water deliveries associated with this alternative, it is likely that farmers without affordable and accessible alternative water supplies will be subject to significant financial burdens. Farmers may fallow crops, resulting in lost farm revenue and related jobs. Farmers with permanent crops would be most vulnerable to losing high valued investments. Loss of agricultural employment would affect lower income population and minority populations more than other populations in the state. There could be an improved allocations of industrial employment associated with industries that rely upon M&I CVP water service contract water and that were concerned about reductions in water supplies during droughts.

Alternative 2A. Under Alternative 2A, water would be re-allocated from Irrigation CVP water service contractors to provide public health and safety water quantities to M&I CVP water service contractors. This alternative would lead to changes for Irrigation CVP water service contractors in the 9 of the 72 years considered in the CALSIM II model simulation, as summarized in Tables 5-9 and 5-14.

These results assume that all of the M&I CVP water service contractors would be willing to purchase the second tier water. If alternative water supplies are available at a lower cost, the M&I users may not acquire the second tier water. If that occurred, the impact on CVP irrigation deliveries would be less.

With the potential of four additional years of no CVP irrigation water deliveries, farmers would need to find alternative water sources. Surface water could be available through agreements already held by the farmer or through short term transfers. These water sources are likely to be more expensive than CVP water service contracts, particularly transfers made during drier contract years.

At the expected frequency of no or very little CVP irrigation water deliveries associated with this alternative, it is likely that farmers without affordable and accessible alternative water supplies will be subject to significant financial burdens. Farmers may fallow crops, resulting in lost farm revenue and related jobs. Farmers with permanent crops would be most vulnerable to losing high valued investments.

Loss of agricultural employment would affect lower income population and minority populations more than other populations in the state. There could be an improved allocations of industrial employment associated with industries that rely upon M&I CVP water service contract water and that were concerned about reductions in water supplies during droughts.

Alternative 2B. Under Alternative 2B, water would be re-allocated from Irrigation CVP water service contractors to provide public health and safety water quantities to M&I CVP water service contractors. This alternative would lead to changes for Irrigation CVP water service contractors in 9 of the 72 years considered in the CALSIM II model simulation, as summarized in Tables 5-9 and 5-14.

These results assume that all of the M&I CVP water service contractors would be willing to purchase the second tier water. If alternative water supplies are available at a lower cost, the M&I users may not acquire the second tier water. If that occurred, the impact on CVP irrigation deliveries would be less.

With the potential of four additional years of no CVP irrigation water deliveries, farmers would need to find alternative water sources. Surface water could be available through agreements already held by the farmer or through short term transfers. These water sources are likely to be more expensive than CVP water service contracts, particularly transfers made during drier contract years.

At the expected frequency of no or very little CVP irrigation water deliveries associated with this alternative, it is likely that farmers without affordable and accessible alternative water supplies will be subject to significant financial burdens. Farmers may fallow crops, resulting in lost farm revenue and related jobs. Farmers with permanent crops would be most vulnerable to losing high valued investments. Loss of agricultural employment would affect lower income population and minority populations more than other populations in the state. There could be an improved allocations of industrial employment associated with industries that rely upon M&I CVP water service contract water and that were concerned about reductions in water supplies during droughts.

Cumulative Effects

These alternatives would not result in cumulative adverse impacts to agricultural land use and economics when considered in combination with future projects in Alternatives 1A and 1B. Issues of reduced CVP irrigation deliveries, alternative water supplies, and water transfers were evaluated as part of the CVPIA PEIS and environmental evaluations prepared to support the Long-term Contract Renewal process. The CVPIA PEIS indicated that future projects may alter CVP water supply allocations, but not change long term CVP Contract Totals or deliveries from within historical ranges. However, Alternatives 2A and 2B, with full implementation of the second tier water supply by M&I CVP water service contractors, could add an additional four years where agricultural contractors would receive zero CVP irrigation deliveries. This could result in more frequent fallowing and/or new cropping patterns. Farm revenue and employment changes associated with Alternatives 2A or 2B could affect the regional economy in years when CVP irrigation deliveries would be zero.

FISHERY AND WILDLIFE RESOURCES

This section describes biological resources for the study area considered in this EA. The description of the Affected Environment has been developed from information presented in the CVPIA PEIS and draft environmental documents prepared by and for Reclamation to support the Long-Term Contract Renewal process.

Affected Environment

This section describes the various types and characteristics of aquatic and terrestrial habitats in the project area, and the fish and wildlife species inhabiting the project area. Special-status fish, wildlife and plant species with the potential to occur in the project area are identified and their general habitat associations summarized.

Aquatic Habitats and Species Assemblages in the Study area. Aquatic habitats in the study area fall into several broad types: riverine, lacustrine, and estuarine.

Riverine Habitat. Riverine habitat is aquatic habitat characterized by moving water. The nature and characteristics of riverine habitat can vary considerably. Depending on the size of the drainage basin and topography, riverine habitats can consist of large, slow-moving water to small, fast-moving water found in higher elevation drainages.

Historically in the Central Valley, smaller streams and rivers typically were dry in the late summer. Only the largest rivers were consistently perennial. With construction of reservoirs on most of the larger streams and rivers in the Central Valley, flows have been regulated resulting in more consistent availability of aquatic habitat within and among years. Aquatic and emergent vegetation is typically sparse in riverine habitats and limited to the margins and backwaters of the river in areas of shallow, slow-moving water.

In addition to the natural watercourses, the study area contains an extensive network of canals and ditches. These canals and ditches were created and are maintained to convey water to agricultural and urban users, collect and carry drainwater from the agricultural fields after application, and pass flood waters. Canals and drains provide aquatic habitat of widely varying characteristics within and among years. Depending on the frequency and intensity of maintenance activities as well as the consistency of water availability, some canals and drains can support emergent vegetation or bank vegetation. Water depth, velocity and water quality also vary dramatically depending on the channel’s size and use.

Fish assemblages in the riverine habitats of the study area include native and non-native species. More than 30 species of fish are known to use riverine habitats in the study area. Anadromous species include native species of chinook salmon (*Oncorhynchus tshawytscha*), steelhead (*Oncorhynchus mykiss*), green sturgeon (*Acipenser medirostris*), white sturgeon (*Acipenser transmontanus*), and non-native species such as American shad (*Alosa sapidissima*) and striped bass, (*Morone saxatilis*). Resident species include rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), largemouth (*Micropterus punctulatus*) and smallmouth bass (*Micropterus dolomieu*), channel catfish (*Ictalurus punctatus*), sculpin (*Cottus* sp.), carp (*Cyprinus carpio*), Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento sucker (*Catostomus occidentalis*), and hardhead (*Mylopharodon conocephalus*). The distribution and abundance of these species in riverine habitat of the study area varies depending on the specific conditions of the riverine habitat such as water temperature, gradient, substrate composition, among others.

In addition to fish, riverine habitat provides important habitat for a variety of wildlife species. Some mammals such as river otter (*Lutra canadensis*) and beaver (*Castor canadensis*) are closely tied to riverine habitats where they forage and travel. Various species of amphibians and some reptiles (e.g., pond turtles [*Clemmys marmorata*], giant garter snakes [*Thamnophis gigas*]) live near riverine systems during some or all of their lives. Waterbirds including ducks, geese, herons and egrets forage in riverine habitats. Osprey (*Pandion haliaetus*) and bald eagles (*Haliaeetus leucocephalus*) prey on fish in rivers in some locations and roost and nest in trees adjacent to rivers. Many other birds and mammals forage in or near rivers although not aquatic or semi-aquatic species.

Lacustrine Habitat. Lacustrine habitats are inland depressions containing standing water. They vary in size and characteristics and include natural lakes, reservoirs, dammed river channels, and ponds. This aquatic habitat type can be associated with rivers and freshwater emergent wetlands. Shallow, temporary habitats may support rooted plants, whereas deep permanent water bodies are primarily open water. Permanent open waters can support emergent and aquatic plants in shallow areas along the margins of the waterbody.

Fish and wildlife assemblages associated with lacustrine habitat vary substantially depending on the size and characteristics of the habitat and in primarily in the case of fish, whether species have been intentionally or unintentionally introduced. Larger reservoirs in the study area thermally stratified in the summer and can support warm and coolwater fish assemblages. Warmwater fish assemblages consist of sportfish such as largemouth bass, smallmouth bass, spotted bass (*Micropterus punctulatus*), bluegill (*Lepomis machrochirus*), crappie (*Pomoxis* spp.), and catfish (*Ictalurus* spp.). Native warmwater fish that inhabit lacustrine habitats include hardhead and pikeminnow. Coldwater sport species include brown trout, rainbow trout, and kokanee salmon (*Oncorhynchus nerka*) where these species have been introduced.

The open water zones of lakes and large rivers provide resting and escape cover for many species of waterfowl. Gulls, terns, kingfishers, osprey, and bald eagle hunt over open water. Insectivorous birds and bats often forage over open water. Common mammals associated with lacustrine habitats include muskrat (*Ondatra zibethica*), beaver, and river otter (Mayer and Laudenslayer 1988). Wetland associated species such as egrets, herons, and dabbling ducks may forage along the shallow margins of a lake.

Estuarine Habitat. Estuarine communities occur in periodically flooded substrates and open water portions of semi-enclosed coastal waters where tidal seawater is diluted by flowing freshwater. This mix of fresh and ocean waters usually forms a horizontal salinity gradient that varies by area and location, with seasonal variations in freshwater inflow and tidal action. Aquatic plants include phytoplankton and green and red algae. Eelgrass (*Zostera marina*) also grows in denser stands in many sub-tidal estuarine communities. Salinity determines plant species distribution in estuarine communities.

Fish species that use estuarine habitats are primarily marine in origin but anadromous species also use this habitat. Many marine species breed in estuarine habitats, and juvenile fish rear in this habitat until moving into marine environments as adults. Anadromous fish pass through estuarine areas during their upstream migrations to breeding areas. Juveniles of anadromous species may rear in estuarine habitats before moving to the ocean (e.g., salmon) or may continue to use estuarine habitats for much of their life (e.g., striped bass, splittail (*Pogonichthys macrolepidotus*). A few species such as delta smelt (*Hypomesus transpacificus*) are found almost exclusively in estuarine habitats. Mollusks, including gastropods and bivalves also occur in estuarine habitats.

Estuarine communities provide for reproduction, feeding, resting, and cover for many species of mammals and birds. Many of the wildlife species that use freshwater habitats also will use estuarine habitats. Examples include many species of ducks and geese, otters, muskrats, bald eagles, and osprey. However, for some species, resources found exclusively in estuarine habitats are essential. For example, the eelgrass beds supported by estuarine sub-tidal communities are critical to the black brant (*Branta bernicula*) which feeds almost exclusively on eelgrass.

Essential Fish Habitat. The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) mandates federal action agencies which fund, permit, or carry out activities that may adversely impact the essential fish habitat (EFH) of federally managed fish species to consult with NOAA Fisheries regarding the potential adverse effects of their actions on EFH (Section 305 (b)(2)). Section 600.920(a)(1) of the EFH regulations state that consultations are required of Federal action agencies for renewals, reviews, or substantial revisions of actions if the renewal, review, or revision may adversely affect EFH. The EFH regulations require that federal action agencies obligated to consult on EFH provide NOAA Fisheries with a written assessment of the effects of their action on EFH (50 CFR 600.920). The statute also requires federal action agencies receiving EFH Conservation Recommendations from NOAA Fisheries to provide a detailed written response to NOAA Fisheries within 30 days upon receipt detailing how they intend to avoid, mitigate or offset the impact of the activity on EFH (Section 305(b)(4)(B)).

EFH is the aquatic habitat (water and substrate) necessary to fish for spawning, breeding, feeding, or growth to maturity that will allow a level of production needed to support a long-term, sustainable commercial fishery and contribute to a healthy ecosystem. “Waters” include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and can include areas historically used by fish in addition to areas currently used. “Substrate” includes sediment, hard bottom, structures underlying the waters, and associated biological communities. “Necessary” means habitat required to support a sustainable fishery and a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species full life cycle.

Because of their commercial value, consultation is required with NOAA Fisheries on all runs of chinook salmon, including Sacramento River winter-run chinook salmon, Central Valley spring-run chinook salmon, and Central Valley fall-/late fall–run chinook salmon. Effects of the project on EFH are incorporated into the analysis for the listed and candidate species and incorporated by reference into this EA.

Aquatic Habitats in the Study Area. This section provides and overview of the aquatic habitats and fish resources found in the upper Sacramento Valley, in the American River watershed, western and central San Joaquin Valley, and central and southern San Francisco Bay Area.

Sacramento River. The Sacramento River valley from Shasta Lake to the Delta includes the study area for the Shasta, Trinity, and Sacramento divisions. In the service areas of the CVP water service contractors, riverine habitat occurs as large, perennial rivers; small, perennial streams and small, intermittent streams. The Sacramento River is the dominant riverine habitat in the study area. Other perennial rivers and streams in or near the study area include Clear Creek, Cottonwood Creek, Butte Creek, Battle Creek, Bear Creek and the Feather River. Intermittent streams include Stony and Thomes creeks. These intermittent and perennial streams are tributaries to the Sacramento River. In addition to the natural watercourses, the study area contains an extensive network of canals and ditches that are inhabited by various warmwater mostly non-native fish species.

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

The Sacramento River joins with several other rivers that drain the western slopes of the Sierra Nevada and numerous sloughs to form the Delta and ultimately empties into the San Francisco Bay. The Delta and San Francisco Bay make up the largest estuary on the west coast. Its importance to fisheries is illustrated by the more than 120 fish species that rely on its unique habitat characteristics for one or more of their lifestages. Fish species found in the Delta include anadromous species, as well as freshwater, brackish water, and saltwater species. Delta inflow and outflow are important for species residing primarily in the Delta (e.g., delta smelt and longfin smelt [*Spirinchus thaleichthys*]) as well as juveniles of anadromous species (e.g., chinook salmon) that rear in the Delta prior to ocean entry.

The Sacramento River supports native and non-native resident and anadromous fish. The Upper Sacramento River is of primary importance to native anadromous fishes and currently is used for spawning and early lifestage rearing, to some degree, by all four runs of chinook salmon (fall, late-fall, winter, and spring) and steelhead. Tributary rivers and streams also provide habitat for one or more runs of chinook salmon and steelhead.

Lacustrine habitat is uncommon in the study area. Diversion dams on the Sacramento River and several tributaries create lacustrine habitat. The large CVP and SWP reservoirs also provide lacustrine habitat.

American River. The American River watershed supports all three types of aquatic habitat. Lacustrine habitat is supported in several storage reservoirs in the upper American River basin upstream of Folsom Lake, as well as in Folsom Lake and Lake Natoma. Riverine habitat is represented by the North, Middle and South Forks of the American River, the lower American River, the Sacramento River, Dry Creek and other smaller permanent and intermittent streams that are tributary to these larger waterbodies. Cooler water temperatures exist in the Middle and South Fork American River during the summer and fall such that warmwater and coldwater fish species are supported. The North Fork American River supports only warmwater fish. The lower 23 miles of the American River (below Nimbus Dam), including backwaters and dredge ponds, supports more than 40 fish species, half of which are game fish. Common species include chinook salmon, steelhead, American shad, rainbow trout, striped bass (*Morone saxatilis*), bass, carp, Sacramento pikeminnow, Sacramento sucker, and hardhead (*Mylopharodon conocephalus*).

Folsom Lake is characterized by strong thermal stratification. In terms of aquatic habitat, the warm upper layer of Folsom Lake provides habitat for warmwater fishes, whereas the reservoir's lower layers form a "coldwater pool" that provides habitat for coldwater fish species throughout the summer and fall portions of the year. Native species that occur in the reservoir include hardhead (*Mylopharodon conocephalus*) and Sacramento pikeminnow (*Ptychocheilus grandis*). However, introduced largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), spotted bass (*Micropterus punctulatus*), bluegill (*Lepomis machrochirus*), crappie (*Pomoxis* spp.), and catfish (*Ictalurus* spp.) constitute the primary warmwater sport fisheries of Folsom Lake. The reservoir's coldwater sport species include brown trout (*Salmo trutta*), rainbow trout (*Oncorhynchus mykiss*), kokanee salmon (*Oncorhynchus nerka*), and chinook salmon (*Oncorhynchus tshawytscha*). Lake Natoma supports many of the same species as Folsom Lake.

Northern and Central San Joaquin Valley. The Northern San Joaquin Valley includes the Delta Division and the Central San Joaquin Valley includes the Western San Joaquin River Division. The riverine habitat in the northern San Joaquin Valley range from small intermittent streams that drain the Coast Ranges and rarely reach the San Joaquin River to large, perennial rivers. On the east side of the valley, three major tributaries of the San Joaquin River (Stanislaus, Tuolumne, and Merced rivers) drain the western Sierra Nevada and provide flow to the San Joaquin River. These tributaries are located east of the study area and provide habitat, spawning, and rearing for salmonids. Impoundments on each of these rivers provide flood control, irrigation, and power generation.

Historically, the upper reaches of the San Joaquin River and its tributaries provided habitat for federal-listed Chinook salmon and steelhead trout. Spring-run Chinook salmon historically used the upper San Joaquin River watershed, but the habitat became limited as dams were constructed on the major rivers. Both fall-run Chinook salmon and steelhead trout continue to use these rivers; their returns have been low for a number of years. The Merced River Fish Hatchery, which is operated by the California Department of Fish and Game, produces fall-run Chinook salmon.

The Lower San Joaquin River downstream of Mendota Pool is characterized as a warm-water, composed of a variety of habitats, ranging from slow-moving backwaters with emergent vegetation to the shallow tule beds and deep pools of slow-moving water in the main river (Moyle 1976). The environment is dominated by a warm-water habitat, but also supports anadromous, cold-water fish (chinook salmon) in the San Joaquin River.

Little information exists about fishery resources in water bodies located within the Delta Division. The intermittent streams located within the water service contractors' service areas are not known to support anadromous fish and are unlikely to support populations of resident fish because of the hydrologic conditions. The numerous water conveyance facilities and water supply and drainage canals could support warm water fish, such as bass, crappie, sunfish, bullhead (*Ameiurus spp.*), Sacramento sucker, catfish, shad, and various minnow species, such as Sacramento pikeminnow.

Contra Costa and Alameda Counties. Contra Costa and Alameda counties includes the service areas of M&I water service contractors in the Delta and American River divisions. Contra Costa County is bordered by Suisun Bay and the channels of the Sacramento and San Joaquin Rivers on its northern edge. Suisun Bay provides shallow water, estuarine habitat that is important for many fish species. Western Contra Costa and Alameda counties are bordered by San Francisco Bay. As described above, more than 120 fish species rely on the Delta and San Francisco Bay as important areas for species to complete one or more lifestages. Channels and sloughs of the Delta and Suisun Bay provide critical migration and rearing habitats for anadromous salmonids, delta smelt, splittail, among others.

Estuarine areas occur seasonally within and adjacent to the Delta and San Francisco Bay. These areas forming along the interface of freshwater and saltwater are highly productive and highly dynamic biotic zones. Juvenile fishes are attracted to these areas because of the abundance of small prey-sized fishes feeding on plankton. This mixing area is also important as a staging ground for anadromous fishes as they pass between, and acclimatize to the freshwater and saltwater environments.

Freshwater lacustrine habitat is provided in local reservoirs in Contra Costa and Alameda Counties. Riverine habitat is found in numerous permanent and intermittent streams that flow into the reservoirs or directly into Suisun Bay or San Francisco Bay.

Santa Clara and San Benito Counties. Santa Clara and San Benito counties include the San Felipe Division. Santa Clara County is bordered on its northern edge by the southern tip of the San Francisco Bay. The Bay and estuarine areas formed at freshwater inputs provide aquatic habitat for marine and estuarine species. Only a small portion of Santa Clara County encompasses estuarine habitats. Large areas of lacustrine communities are supported at San Justo Reservoir, Lexington Reservoir, Guadalupe Reservoir, Calero Reservoir, Uvas Reservoir, Chesbro Reservoirs, Coyote Lake, and Anderson Lake.

The major watercourses within the CVP water service contractors' service areas that provide riverine habitat are Coyote Creek, Guadalupe River and Pajaro River, which has very little flow during summer months. In addition, the area encompasses many smaller streams that are tributary to the major watercourses or discharge directly to San Francisco Bay. Fish species in these rivers and streams consist of the typical warm and coldwater fishes described previously. Many streams in this area historically supported steelhead, but temperature and substrate conditions are currently marginal or unsuitable. Suitable habitat is still available in Little Arthur, Llagas, and Uvas creeks in most years and these creeks are accessible to steelhead. This area is at the extreme southern edge of Coho salmon range and this species is not believed to have ever been abundant. Coho salmon do not currently occur within the San Felipe Division.

Special-Status Fish Species. Fish resources of the study area include native and non-native anadromous and resident species. Several native anadromous and resident species have been listed as threatened or endangered under the federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA) or are candidates for listing.

Seven fish species or Evolutionarily Significant Units (ESU) listed under the ESA have the potential to occur in the watercourses in the study area, as shown in Tables 5-15 and 5-16. In addition to these listed species, two species that are candidates for federal listing have the potential to occur in the study area. These species are green sturgeon and Central Valley fall-run/late fall-run chinook salmon.

Terrestrial Habitats and Wildlife Communities in the Study area. Historically, the Central Valley contained a mosaic of riverine, wetland, and riparian habitat along rivers and streams with surrounding terrestrial habitats consisting of perennial grassland and oak woodland. With settlement of the Central Valley, agricultural and urban development converted land from native habitats to cultivated fields, pastures, residences, water impoundments, flood control structures, and other developments. As a result, native habitats generally are restricted in their distribution and size and are highly fragmented. Agricultural land comprises most of the study area and includes row and field crops, rice, pasture, and orchards. The following discussion describes the various terrestrial habitats that are present in or near the study area.

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

TABLE 5-15

FEDERALLY LISTED AND PROPOSED FISH SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA

Species (Common Name)	Species (Scientific Name)	Federal Status[a]
Coho salmon – Central California Coast ESU[b]	*Oncorhynchus kisutch*	E
Coho salmon – Southern Oregon/Northern California ESU	*Oncorhynchus kisutch*	T
Delta smelt	*Hypomesus transpacificus*	T,X
Green sturgeon	*Acipenser medirostris*	PT 4/5/05
Spring-run chinook salmon – Central Valley ESU	*Oncorhynchus tshawytscha*	T,PX
Steelhead – Central California Coast ESU	*Oncorhynchus mykiss*	T,PX
Steelhead – Central Valley ESU	*Oncorhynchus mykiss*	T,PX
Chinook salmon – Sacramento River Winter-run ESU	*Oncorhynchus tshawytscha*	E,X

[a] E: Listed as endangered under the Federal Endangered Species Act
T: Listed as threatened under the Federal Endangered Species Act
P: Proposed – officially proposed for listing as endangered or threatened
X: Critical Habitat
PX: Proposed critical habitat
[b] ESU = Evolutionary Significant Unit

TABLE 5-16

POTENTIAL OCCURRENCE OF LISTED AND PROPOSED FISH SPECIES IN THE STUDY AREA

Species	DIVISION					
	Shasta, Trinity, and Sacramento	American River (Sacramento Valley)	Delta (San Joaquin Valley)	West San Joaquin	American River and Delta (Alameda and Contra Costa Counties)	San Felipe
Coho salmon – Central California Coast ESU[a]						X
Delta smelt	X	X	X	X	X	
Green Sturgeon	X	X	X	X	X	
Spring-run chinook salmon – Central Valley ESU	X	X	X		X	
Steelhead – Central California Coast ESU		X			X	X
Steelhead – Central Valley ESU	X	X	X	X	X	
Steelhead – South Central Valley ESU						X
Winter-run chinook salmon	X	X			X	

[a] ESU = Evolutionary Significant Unit

Wetland Habitats. Three types of wetland habitats occur in the study area, as listed below.

- Freshwater emergent wetland
- Vernal pool
- Saline emergent wetland (including coastal brackish marsh and northern coastal marsh).

The vegetation composition and characteristics and the associated wildlife communities are described below for each type of wetland.

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

Urban and agricultural development as well as hydrologic changes from flood control and water supply development, the amount of wetland habitat in the Central Valley has decreased substantially. Because much of the wetland habitat in California has been developed into other land uses, several species associated with wetlands have been listed as threatened or endangered by the Service. In the 1940s, freshwater emergent wetlands occupied about 554,000 acres of the Central Valley (Frayer et al. 1989; Central Valley Habitat Joint Venture 1990). By 1990, only 86,704 acres remained. Regional reductions in freshwater emergent wetlands have been estimated at 88.7 percent in the Sacramento Basin, 96.2 percent in the San Joaquin Basin, 99.2 percent in the Tulare Basin, 98.3 percent in the Delta, and 97.2 percent in the San Francisco Bay area.

Wetlands provide important habitat for waterfowl and a variety of other wildlife species, including grebes, herons, egrets, bitterns, coots, shorebirds, rails, hawks, owls, muskrat, raccoon, opossum, and beaver. Many upland species such as ring-necked pheasant, California quail, and black-tailed hare use the ecotone at the edge of the wetland for cover and forage. Reptiles and amphibians such as the common garter snake, aquatic garter snake, Pacific treefrog, and bullfrog also breed and feed in freshwater habitats of the region.

The hydrology of many of the remaining wetlands has been altered from seasonal to permanent inundation. This change has altered plant communities and facilitated the invasion of introduced aquatic predators such as bullfrogs, bass, and sunfish. These species compete with or prey upon native listed species, including federally listed species such as California red-legged frogs and giant garter snakes.

Vernal Pool. Vernal pools are typically found in association with annual grassland communities but constitute a unique habitat type. Vernal pools form in shallow depressions that are underlain by hardpan or volcanic rock. The hardpan or volcanic rock impedes drainage such that, in winter, the depressions fill with water and retain moist soil into late spring. The pools are then dry during the summer and fall until rains commence the following winter. The soils and moist microhabitat of these pools provides a unique habitat within a general matrix of annual grassland communities. Plant species of vernal pools differ from those of the surrounding annual grassland and many animals associated with annual grasslands depend on the occurrence of vernal pools to persist in the annual grassland landscape. Common plant species found in vernal pools include popcorn flower (*Plagiobothrys stipitata*), navarretia (*Navarretia leucocephala*), toad rush (*Juncus bufonius*), goldfields (*Lathenia chrysostoma*), yellow carpet (*Blennosperma nanum*), coyote thistle (*Eryngium vaseyi*), tidy tips (*Layia* sp.), water buttercup (*Ranunculus* sp.), and hairgrass

(*Deschampsia danthonioides*). The number and distribution of vernal pools have been greatly reduced as a result of agricultural practices and conversion to urban land uses. Holland (1978) estimated that five to 30 percent of California's vernal pools are intact today.

Although vernal pools are an ephemeral aquatic habitat, they are utilized by invertebrates and amphibians adapted to seasonal wetting and drying. When standing water is available, the California tiger salamander, western spadefoot toad, and Pacific treefrog may use the pools for egg laying and for the development of young. Aquatic invertebrates such as cladocerans, copepods, branchipods, and crawling water beetles may also inhabit vernal pools. In winter and spring, waterbirds such as mallard, cinnamon teal, killdeer, California gull, green-backed heron, great blue heron, and great egret may use vernal pools for resting and foraging grounds. Western kingbird, black phoebe, and Say's phoebe feed on flying insects above vernal pools. Several federally listed branchipods, including longhorn fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp are found in vernal pools.

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

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

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

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

Many species of birds, mammals, reptiles and amphibians use annual grasslands. Raptors, such as ferruginous hawks (*Buteo regalis*), red-tailed hawks (*Buteo jamaicensis*), white-tailed kites (*Elanus leucurus*), American kestrel (*Falco sparverius*) and northern harriers (*Circus cyaneus*) commonly forage in annual grasslands. Short-eared owls (*Asio flammeus*) and burrowing owls (*Athene cunicularia*) forage and breed in this habitat. Horned larks (*Eremophila alpestris*), western meadowlarks (*Sturnella neglecta*), and savannah sparrows (*Passerculus sandwichensis*) are other common bird species. Characteristic reptiles and amphibians include western fence lizard (*Sceloporus occidentalis*), common garter snake (*Thamnophis sirtalis*), and western rattlesnake (*Rotalus viridis*). Common mammals include black-tailed jackrabbits (*Lepus californicus*), California ground squirrels (*Spermophilus beecheyi*), California voles (*Microtus californicus*), badgers (*Taxidea taxus*), coyotes (*Canis latrans*), and Botta's pocket gophers (*Thomomys bottae*). A number of special-status species use annual grassland habitat, including white-tailed kite, burrowing owl, and prairie falcon (*Falco mexicanus*).

Scrub/Shrub Habitats. Coastal scrub/chaparral communities consist of structurally homogenous brushland dominated by shrubs. Shrub height and crown cover vary considerably with fire frequency, precipitation, aspect, and soil type. Scrub/shrub habitats in the study area include the following types of communities as distinguished by CWHR.

- Chemise-Redshank Chaparral and Mixed Chaparral
- Coastal Scrub.

Chamise Redshank Chaparral and Mixed Chaparral. Chemise-Redshank Chaparral and Mixed Chaparral are very similar and their differentiation is somewhat subjective. In general, Chemise-Redshank Chaparral consists of at least 60 percent coverage by chemise (*Adenostoma fasciculatum*) and redshank (*Adenostoma sparsifolium*) combined. Mixed chaparral supports a greater diversity of plant species, including scrub oak (*Quercus berberidifolia*), ceanothus, manzanita, toyon, and yerba-santa (*Eriodictyon californicum*), in addition to chemise and redshank. The upper and lower elevational limits of chaparral land cover varies considerably with precipitation, aspect and soil type, but typically occurs below 5,000 feet.

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

Coastal Scrub. Coastal scrub is typified by low to moderate-sized shrubs. Its growth form varies from patchy oceanside cover of nearly prostrate shrubs to dense, continuous areas of shrubs up to seven feet tall (Mayer and Laudenslayer 1988). Coyotebush is the predominant overstory shrub, but other common species are ceanothus, and coffeeberry. Understory species can include bracken fern (*Pteridium aquilinum*), swordfern (*Polystichum munitum*), yerba buena (*Satureja douglasii*) and Indian paintbrush (*Castilleja* sp.).

No wildlife species are restricted to coastal scrub habitats in the study area. Common species are the same as described for the chaparral habitats.

Woodland Habitats. Types of woodland habitats occur in the study area, as listed below.

- Blue Oak Woodland and Blue Oak-Foothill Pine Woodland
- Coastal Oak Woodland
- Valley Oak Woodland
- Montane Hardwood
- Montane Hardwood-Conifer
- Conifer Forest
- Valley Foothill Riparian

The vegetation composition and characteristics and the associated wildlife communities are described below for each type of woodland habitats.

Blue Oak Woodland and Blue Oak-Foothill Pine Woodland. Blue oak (*Quercus douglasii*) is the dominant overstory species of blue oak woodland and blue oak/foothill pine woodland. Foothill pine (*Pinus sabiniana*) becomes an important overstory species at higher elevations. Where foothill pine or other conifers comprise 25 to 49 percent of the overstory with blue oak comprising at least 50 percent of the overstory canopy, the CWHR classifies this community as Blue oak/Foothill Pine woodland. Frequent fire favors blue oak (a long-lived stump sprouter) over foothill pine. Stands vary from open savannas with grassy understories (usually at lower elevations) to fairly dense woodlands with shrubby understories. Typical shrub species in blue oak woodland are poison-oak (*Toxicodendron diversilobum*), coffeeberry (*Rhamnus californica*), redbud (*Cercis occidentalis*), ceanothus (*Ceanothus* sp.), and manzanita (*Arctostaphylos* sp.) with ground cover consisting of annuals such as bromegrass, wild oats, foxtail, and filaree (Mayer and Laudenslayer, 1988).

Blue oak woodlands provide habitat for a diversity of wildlife species, although no species appear to be completely dependent on this habitat type. Verner and Boss (1980) state that 29 species of amphibians and reptiles, 57 species of birds, and 10 species of mammals find optimal breeding habitat conditions in mature stages of blue oak woodlands. Acorns produced by blue oaks are an important food resource for a diversity of bird and mammal species. Typical species inhabiting blue oak woodlands in the study area include scrub jays, yellow-billed magpies (*Pica nuttalli*), gray squirrels, and California ground squirrels (*Spermophilus beecheyi*). Special-status species associated with oak woodland habitats include oak titmouse, Lawrence’s goldfish, and Nuttall’s woodpecker.

Coastal Oak Woodland. Coastal oak woodland occurs in the Coast Range in the western portion of the action area. In this woodland, coastal live oak (*Quercus agrifolia*) is the dominant overstory species and can be the only overstory species in some locations. In mesic areas, California bay (*Umbellularia californica*), Pacific madrone (*Arbutus menziesii*), tanoak (*Lithocarpus densiflorus*), and canyon live oak (*Quercus chrysolepis*) contribute to the overstory. The understory typically consists of shade-tolerant shrubs such as California blackberry (*Rubus ursinus*), creeping snowberry (*Gaultheria hispidula*) and toyon (*Heteromeles arbutifolia*).

A diversity of wildlife species use coastal oak woodlands in fulfilling one or more life requisites. At least 60 species of mammals use oaks in some manner and over 100 species of birds have been reported in oak-dominated habitats in California (Mayer and Laudenslayer 1988). Species composition is generally similar to that of other oak woodland types.

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

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

Montane Hardwood. Montane hardwood forest occurs in eastern portions of the study area at lower elevations than conifer forest communities, although it can be interspersed with ponderosa pine (*Pinus pondersosa*). This forest type is dominated by hardwood tree species including coastal live oak, California black oak (*Quercus kelloggii*), tanoak, and Pacific madrone, but often includes some conifers, such as gray pine and ponderosa pine. Typical understory shrub species include manzanita, poison-oak, coffeeberry, currant (*Ribes* sp.), and ceanothus (Mayer and Laudenslayer 1988).

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

Montane Hardwood-Conifer. Montane hardwood-conifer communities are similar to montane hardwood but include conifers and hardwoods, often as a closed forest. Hardwood species are the same as in montane hardwood communities. Typical conifer species are Douglas-fir (*Pseudotsuga menziesii*), ponderosa pine, and redwood (*Sequoia sempervirens*). The specific plant composition of this habitat type varies in response to soil type, exposure and moisture among other factors. Wildlife communities consist of a mix of the species found in montane hardwood and conifer forest types.

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

The Sierran mixed conifer habitat type occurs from about 4,000 to 10,000 ft in elevation in the study area (California Department of Forestry and Fire Protection, 1988) and grades with ponderosa pine and Douglas-fir habitats. In the Sierra Nevada, the Douglas-fir habitat is largely a subset of the Sierran mixed conifer type, where Douglas-fir occurs as a pure stand. Jeffery pine typically occurs at high elevations (above Sierran mixed conifer), but because it is tolerant of serpentine soils it occurs as pure stands in some areas of serpentine soils. A small amount of redwood forest occurs in the Coast Range in the western portion of the study area. Redwood communities are dominated by redwoods. Understory vegetation is usually dense, consisting of tall shrubs. Douglas-fir is a common associate.

Conifer forest habitat of the Sierra Nevada Mountains has been estimated to support about 355 species of vertebrates (Verner and Boss 1980). Mixed conifer forest typically supports greater species diversity than single-species conifer stands because of the greater plant species diversity. The variety in plant species composition of mixed conifer forest provides a diversity of food and cover types. Nonetheless, many wildlife species will exploit all of the conifer forest types to varying degrees. Special-status species potentially inhabiting conifer forest habitat in the study area include California spotted owl (*Strix occidentalis occidentalis*), northern goshawk (*Accipiter gentilis*), Pacific fisher (*Martes pennanti*), and bald eagle (*Haliaeetus leucocephalus*).

Valley Foothill Riparian. Valley foothill riparian land cover develops in the flood plains of low-gradient rivers and streams. This land cover occurs adjacent to freshwater reaches of permanent and seasonal watercourses. Typically, riparian land cover occurs as narrow bands of vegetation immediately adjacent to watercourses. Dominant tree species of valley foothill riparian land cover are cottonwood (*Populus fremontii*), California sycamore (*Plantanus racemosa*), and valley oaks (*Quercus lobata*). Typical shrub species include willows (*Salix* sp.), elderberry (*Sambucus* sp.), and wild grape (*Vitis californica*).

Riparian land cover forms a transitional community between the aquatic, riverine environment and dry upland areas. The composition of riparian plant communities is shaped by the timing, intensity, and duration of flooding. Willows predominate in areas subject to regular inundation and quickly colonize newly deposited gravel bars or recently scoured areas. Cottonwoods occur farther from the river channel in areas subject to less frequent and intense flooding. Still, the persistence of cottonwoods is linked to the natural seasonal pattern of flows. Cottonwoods evolved to release seeds at the same time as high spring flows would deposit nutrient rich sediments where germination and seedling survival would be enhanced.

Thus, the timing and intensity of flows is critical to the persistence of riparian vegetation. Flood control and water supply projects have resulted in hydrologic alterations that have changed the species composition, structure and extent of riparian habitats. In addition, most rivers have been channelized and are confined by levees which limit the area available to support riparian communities. As a result of these changes the extent of riparian land cover has been substantially reduced.

The structural and compositional diversity, abundant food resources, and availability of water in valley foothill riparian habitat make this habitat particularly valuable to wildlife. Wildlife species diversity is often higher in riparian habitats than in adjacent habitats. Many resident bird, amphibians, reptiles, and mammals breed in riparian habitats, while other species frequent this habitat in winter or during migration (Sanders et al. 1985.). Special-status species associated with riparian habitats in the study area include the valley elderberry longhorn beetle (*Desmocercus californicus dimorphus*), Swainson's hawk (*Buteo swainsoni)*, and western yellow-billed cuckoo (*Coccyzus americanus occidentalis*).

Agricultural Habitats. Native habitats in the Central Valley have been largely replaced by agricultural habitats. Agricultural land use is common in the study area and consists of a variety of row crops and field crops. Crop types vary from year-to-year depending on market conditions and other factors. However, there are three primary agricultural types are used to characterize agricultural habitat in the study area, as listed below.

- Croplands
- Rice
- Orchards and Vineyards.

Croplands. Cropland in the study area consists of row crops, and grain crops. Diverse row crops are grown in the study area including tomatoes, sugar beets, and melons. Grain crops include barley, wheat, corn, and oats. Many of these crops are planted in fall and harvested in spring. Row and grain crops are intensively managed, and chemicals are often used to control pests and diseases.

The habitat value in cropland is fluctuates with the crop production cycle. Most crops in California are annual species and are managed with a crop rotation system. During the year, several different crops may be produced on a given parcel of land. The value of agricultural fields to value varies seasonally with changes in crop type as well as with the different stages of crop maturity.

The young green shoots of grain crops are used for foraging by such species as greater white-fronted geese, tundra swans, and tule elk. Other species, including red-winged blackbirds, Brewer’s blackbirds, ring-necked pheasants, waterfowl, and western harvest mice, feed on the seeds produced by these crops. Many species of rodents and birds are able to exploit croplands, which often requires that the species be controlled to prevent extensive crop losses. This may require intensive management and often the use of various pesticides. Rodent species that are known to forage in row crops include the California vole, deer mouse, and the California ground squirrel. These rodent populations are preyed upon by Swainson’s hawks, red-tailed hawks, and white-tailed kites.

Rice. Cultivated rice in the Central Valley has some of the attributes found in seasonal wetlands. However, the intensive management of this habitat reduces many of the benefits found in natural wetlands. Flooded rice fields provide nesting and foraging habitat for waterfowl and shorebirds. Rice provides important forage for many wildlife species. After harvest, waterfowl (e.g., mallards and Canada geese), sandhill cranes, California voles, and deer mice feed upon the waste grain. Raptors, including northern harrier, white-tailed kite, and ferruginous hawk, feed upon rodents in this habitat. Irrigation ditches used to flood rice fields often contain dense cattail vegetation and provide habitat for wildlife species, such as the Virginia rail, American bittern, snowy egret, marsh wren, common yellowthroat, and song sparrow.

Orchard and Vineyard. Orchard habitat consists of cultivated fruit or nut-bearing trees. Typically, they are open, tree-dominated habitats consisting of a single tree species. This habitat is planted in a uniform pattern and intensively managed. Understory vegetation is usually sparse; however, in some areas, grasses or forbs are allowed to grow between orchard rows to reduce erosion. Walnuts and olives are the primary orchard crops in the study area.

Wildlife use of orchards is typically limited. Ground squirrels and other small mammals can inhabit understory areas and birds such as scrub jays may be seasonally attracted to fruit orchards. No special-status species rely on orchards or regularly use this habitat type.

Other Habitat Types. Other types of habitats occur in the study area, as listed below.

- Barren (throughout study area)
- Stabilized Interior Dunes (Delta Division - Contra Costa County)
- Serpentine (American and San Felipe divisions)

The vegetation composition and characteristics and the associated wildlife communities are described below for each type of habitats.

Barren. Barren areas are devoid of vegetation or support very sparse vegetation. Barren areas can be natural or human-created. Natural barren areas include sand bars, rock outcrops, beaches and mudflats. Human-created barren areas include quarries, roads and buildings.

Wildlife use of barren areas is strongly determined by the location and characteristics of the species area. Beaches and mudflats are used by numerous species of shorebirds that forage on invertebrates inhabiting the sand or brought in by wave action. Some shorebirds also nest on barren, sandy habitats. Rock outcrops, also classified as “barren,” are used by a completely different suite of species. This habitat type may be used by bats are roosting locations, or mice, chipmunks and ground squirrels as shelter. Foxes and weasels forage for small mammals in these areas.

Stabilized Interior Dunes. Stabilized interior dunes are sand dunes that have been stabilized or partially stabilized by shrubs, scattered low annuals, and perennial grasses in areas with less wind or higher water availability. These dunes typically occupy sites that are lower and more sheltered than active dunes, with soil moisture retained just below the sand surface, allowing perennial vegetation to survive long drought periods. The Antioch Dunes in Contra Costa County are the only stabilized interior dunes in the study area.

Development has eliminated about 90 percent of the original 500 acres of the Antioch Dunes. The Antioch Dunes National Wildlife Refuge and a few acres of surrounding lands are all that remain of sand dunes that formed during glaciation periods. The refuge contains 67 acres and includes two separate tracts of land west of Antioch, California. These dunes were declared critical habitat for the Contra Costa wallflower and Antioch Dunes evening-primrose in the late 1970s. The refuge supports designated critical habitat for these two species and Lange’s metalmark butterfly.

Serpentine. The serpentine habitat type is distinguished by soil type rather than by dominant plant species. Serpentine soils are formed from weathered volcanic (ultramafic) rocks such as serpentinite, dunite, and peridotite. These soils provide a harsh environment for plant growth.

Several factors contribute to the inhospitability of serpentine soils to plant growth including: (1) a low calcium-magnesium ratio; (2) lack of essential nutrients such as nitrogen, potassium, and phosphorous; and (3) high concentrations of heavy metals (mineral toxicity). As a result of these harsh conditions, serpentine soils support unique grassland communities consisting of fountain thistle (*Cirsium fontinale* ssp. *fontinale*), Santa Clara Valley dudleya (*Dudleya setchellii)*, Marin dwarf-flax (*Hesperolinon congestum*), Metcalf Canyon jewelflower (*Streptanthus albidus* ssp. *albidus*), uncommon jewelflower (*S. albidus* ssp. *peramoenus*), and coyote ceanothus (*Ceanothus ferrisae*).

Terrestrial Habitats in the Study Area. This section provides and overview of the terrestrial habitats and wildlife resources found in the upper Sacramento Valley, in the American River watershed, western and central San Joaquin Valley, and central and southern San Francisco Bay Area.

The CVP divisions share many of the same types of terrestrial habitats although some habitats are occur only in specific areas, as shown in Table 5-17. Agricultural habitat is found in all of the divisions, but is most prevalent in the Shasta, Trinity, Sacramento, Delta, and West San Joaquin divisions. The specific crop types differ among these divisions, such as rice being a substantial component of the Sacramento River Division. Freshwater emergent wetlands occur in all divisions but saline emergent wetlands are restricted to those areas that border the San Francisco Bay. Similarly, oak woodlands occur in most divisions but the type of oak woodland varies depending on the location with coastal oak woodland in moist coastal portions of the study area and blue oak woodland in the drier interior areas.

Special-Status Wildlife and Plant Species. The habitats of the study area support many species that are listed or proposed for listing as threatened or endangered under the ESA, as summarized in Tables 5-18 and 5-19. Critical habitat has been designated for some of the listed species that inhabit the study area. The occurrence of designated critical habitat in each division is summarized in Table 5-20. The habitat associations of special status wildlife and plant species are summarized in Table 5-21.

Environmental Consequences

The effects of Alternatives 1A, 1B, 2A, and 2B on biological resources are compared to conditions under the No Action Alternative. Environmental consequences to biological resources are related to changes in aquatic resources due to changes in CVP operations and changes in terrestrial resources due to changes in land use.

No Action Alternative. The No Action Alternative represents the future conditions without implementation of an M&I water shortage policy under the alternatives. There would be additional use of water rights water in the future. However, due to regulatory requirements for the CVP and SWP operations, minimum and maximum flows would be as described in the OCAP 2004. Projected land use changes as described in the CVPIA PEIS would result in additional agricultural lands either being converted to municipal uses or more frequently fallowed due to reduced water supply allocations. These changes and responses to the increased demand have been addressed in local general plans and associated environmental documentation.

TABLE 5-17

OCCURRENCE OF TERRESTRIAL HABITATS IN THE STUDY AREA

	DIVISION					
	Shasta, Trinity, and Sacramento	**American River (Sacramento Valley)**	**Delta (San Joaquin Valley)**	**West San Joaquin**	**American River and Delta (Alameda and Contra Costa Counties)**	**San Felipe**
WETLAND HABITATS						
Freshwater Emergent Wetland	X	X	X	X	X	X
Vernal Pools	X	X	X	X	X	X
Saline Emergent Wetland			X	X	X	X
GRASSLAND HABITATS						
Annual grassland	X	X	X	X	X	X
SCRUB/SHRUB HABITATS						
Chamise Redshank Chaparral	X	X	X		X	X
Mixed Chaparral	X	X			X	X
Coastal scrub					X	X
WOODLAND HABITATS						
Blue Oak-Foothill Pine	X	X	X		X	X
Blue Oak Woodland	X	X	X		X	X
Coastal Oak Woodland		X			X	X
Valley Oak Woodland	X	X	X			
Montane Hardwood		X				X
Montane Hardwood-Conifer		X				X
Conifer Forest[a]	X	X	X			X
Valley Foothill Riparian	X	X	X	X	X	X
AGRICULTURAL HABITATS						
Cropland	X	X	X	X	X	X
Rice	X		X	X		
Orchard and Vineyard	X	X	X	X	X	X
OTHER LAND COVER TYPES						
Barren	X	X	X	X	X	X
Stabilized Interior Dunes					X	
Serpentine		X				X

[a] Conifer forest habitat includes Ponderosa pine, Jeffrey pine, Redwood, Sierran mixed conifer, Douglas-fir

TABLE 5-18

FEDERALLY LISTED WILDLIFE AND PLANT SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA

Species (Common Name)	Species (Scientific Name)	Status (Threatened or Endangered), Critical Habitat (X)
PLANTS		
Antioch Dunes evening-primrose	*Oenothera deltoides ssp. howelli*	E,X
Butte County Meadowfoam	*Limnanthes floccosa* ssp. *californica*	E,X
California jewelflower	*Caulanthus californicus*	E
Colusa grass	*Neostapfia colusana*	T,X
Contra Costa wallflower	*Erysimum capitatum ssp. Angustatum*	E,X
Contra Costa goldfields	*Lasthenia conjugens*	E,X
Coyote ceanothus	*Ceanothus ferrisae*	E
El Dorado Bedstraw	*Galium californicum ssp. sierrae*	
Green's tuctoria	*Tuctoria greenei*	E,X
Hairy Orcutt grass	*Orcuttia pilosa*	E,X
Hoover's sprurge	*Chamaesyce hooveri*	T,X
Large-flowered fiddleneck	*Amsinckia grandiflora*	E,X
Layne's butterweed	*Senecio layneae*	T
Metcalf Canyon jewelflower	*Streptanthus albidus ssp. albidus*	E
Pallid manzanita	*Arctostaphylos pallida*	T
Palmate-bracted bird's beak	*Cordylanthus palmatus*	E
Pine Hill ceanothus	*Ceanothus roderickii*	E
Pine Hill flannelbush	*Fremontodendron californicum ssp. decumbens*	E
Sacramento Orcutt grass	*Orcuttia viscida*	E
San Joaquin woolly-threads	*Monolopia congdonii*	E
Santa Clara Valley dudleya	*Dudleya setchellii*	E
Santa Cruz tarplant	*Holocarpha macradenia*	T,X
Slender Orcutt grass	*Orcuttia tenuis*	T,X
Soft bird's beak	*Cordylanthus mollis ssp. mollis*	E
Solano grass	*Tuctoria mucronata*	E,X
Stebbins's morning glory	*Calystegia stebbinsii*	E
Succulent owl's clover	*Castilleja campestris ssp. succulenta*	T,X
Tiburon Indian paintbrush	*Castilleja campestris ssp. neglecta*	E
INVERTEBRATES		
Bay checkerspot butterfly	*Euphydryas editha bayensis*	T,X
California freshwater shrimp	*Syncaris pacifica*	E
Callipe silverspot butterfly	*Speyeria callippe callippe*	E
Conservancy fairy shrimp	*Branchinecta conservatio*	E,X
Delta green ground beetle	*Elaphrus viridis*	T,X
Lange's metalmark butterfly	*Apodemia mormo langei*	E

TABLE 5-18

FEDERALLY LISTED WILDLIFE AND PLANT SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA

Species (Common Name)	Species (Scientific Name)	Status (Threatened or Endangered), Critical Habitat (X)
Longhorn fairy shrimp	*Branchinecta longiantenna*	E,X
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	T
Vernal pool fairy shrimp	*Branchinecta lynchi*	T,X
Vernal pool tadpole shrimp	*Lepidurus packardi*	E,X
AMPHIBIANS		
California red-legged frog	*Rana aurora draytonii*	T,proposed X
California tiger salamander – Central California DPS	*Ambystoma californiense*	T,X
REPTILES		
Alameda whipsnake	*Masticophis lateralis euryxanthus*	T
Blunt-nosed leopard lizard	*Gambelia sila*	E
Giant garter snake	*Thamnophis gigas*	T
San Francisco garter snake	*Thamnophis sirtalis tetrataenia*	E
BIRDS		
Bald Eagle	*Haliaeetus leucocephalus*	T
California brown pelican	*Pelecanus occidentalis californicus*	E
California clapper rail	*Rallus longirostris obsoletus*	E
California condor	*Gymnogyps californianus*	E
California least tern	*Sterna antillarum browni*	E
Least Bell's vireo	*Virea bellii pusillus*	E
Marbled murrelet	*Brachyramphus marmoratus*	T
Northern spotted owl	*Strix occidentalis caurina*	T,X
Western snowy plover	*Charadrius alexandrinus nivosus*	T
MAMMALS		
Fresno kangaroo rat	*Dipodomys nitratoides exilis*	E,X
Giant kangaroo rat	*Dipodomys ingens*	E
Riparian woodrat	*Neotoma fuscipes riparia*	E
Riparian brush rabbit	*Sylvilagus backmani riparius*	E
Salt marsh harvest mouse	*Reithrodontomoys raviventris*	E
San Joaquin kit fox	*Vulpes macrotis mutica*	E
Tipton kangaroo rat	*Dipodomys nitratoides nitratoides*	E

TABLE 5-19

OCCURRENCE OF LISTED AND PROPOSED PLANT AND WILDLIFE SPECIES IN THE STUDY AREA

	DIVISION					
	Shasta, Trinity, and Sacramento	**American River (Sacramento Valley)**	**Delta (San Joaquin Valley)**	**West San Joaquin**	**American River and Delta (Alameda and Contra Costa Counties)**	**San Felipe**
PLANTS						
Antioch Dunes evening-primrose					X	
Butte County Meadowfoam	X					
California jewelflower			X	X		
Colusa grass	X				X	
Contra Costa wallflower					X	
Contra Costa goldfields					X	X
Coyote ceanothus						X
El Dorado Bedstraw		X				
Green’s tuctoria	X					
Hairy Orcutt grass	X					
Hoover’s eriastrum			X			
Hoover’s sprurge	X					
Large-flowered fiddleneck					X	
Layne’s butterweed		X				
Metcalf Canyon jewelflower						X
Pallid manzanita					X	
Palmate-bracted bird’s beak	X		X	X		
Pine Hill ceanothus		X				
Pine Hill flannelbush		X				
Sacramento Orcutt grass		X				
San Joaquin woolly-threads				X		
Santa Clara Valley dudleya						X
Santa Cruz tarplant					X	X
Slender Orcutt grass	X	X				
Soft bird’s beak					X	

TABLE 5-19

OCCURRENCE OF LISTED AND PROPOSED PLANT AND WILDLIFE SPECIES IN THE STUDY AREA

	DIVISION					
	Shasta, Trinity, and Sacramento	**American River (Sacramento Valley)**	**Delta (San Joaquin Valley)**	**West San Joaquin**	**American River and Delta (Alameda and Contra Costa Counties)**	**San Felipe**
Solano grass						
Stebbin's morning glory		X				
Succulent owl's clover		X				
Tiburon Indian paintbrush						X
INVERTEBRATES						
Bay checkerspot butterfly						X
California freshwater shrimp					X	
Callipe silverspot butterfly					X	
Conservancy fairy shrimp	X		X			
Delta green ground beetle					X	
Lange's metalmark butterfly					X	
Longhorn fairy shrimp					X	
Valley elderberry longhorn beetle	X	X	X	X	X	
Vernal pool fairy shrimp	X	X	X	X	X	
Vernal pool tadpole shrimp	X	X	X	X	X	
AMPHIBIANS						
California red-legged frog	X	X	X	X	X	X
California tiger salamander –Central California DPS	X	X	X	X	X	X
REPTILES						
Alameda whipsnake			X		X	X
Blunt-nosed leopard lizard			X	X	X	
Giant garter snake	X	X	X	X		

TABLE 5-19

OCCURRENCE OF LISTED AND PROPOSED PLANT AND WILDLIFE SPECIES IN THE STUDY AREA

	DIVISION					
	Shasta, Trinity, and Sacramento	**American River (Sacramento Valley)**	**Delta (San Joaquin Valley)**	**West San Joaquin**	**American River and Delta (Alameda and Contra Costa Counties)**	**San Felipe**
San Francisco garter snake						X
BIRDS						
Bald Eagle	X	X	X	X	X	X
California brown pelican					X	
California clapper rail					X	X
California condor				X		
California least tern					X	X
Least Bell's vireo						X
Marbled murrelet						X
Northern spotted owl	X					
Western snowy plover					X	
MAMMALS						
Fresno kangaroo rat			X	X		
Giant kangaroo rat			X	X		
Riparian woodrat			X	X	X	
Riparian brush rabbit					X	
Salt marsh harvest mouse					X	X
San Joaquin kit fox				X	X	X
Tipton kangaroo rat			X	X		

TABLE 5-20

OCCURRENCE OF CRITICAL HABITAT FOR LISTED PLANT AND WILDLIFE SPECIES

	DIVISION					
	Shasta, Trinity and Sacramento River	**American River (Sacramento Valley**	**Delta (San Joaquin Valley)**	**West San Joaquin**	**American River and Delta (Alameda and Contra Costa Counties)**	**San Felipe**
PLANTS						
Antioch evening-dunes primrose					X	
Butte County meadowfoam	X					
Colusa grass	X					
Contra Costa Goldfields					X	X
Contra Costa wallflower					X	
Green's tuctoria	X					
Hairy Orcutt grass	X			X		
Hoover's sprurge	X					
Keck's checkermallow						
Large-flowered fiddleneck			X			
San Joaquin Valley Orcutt grass				X		
Santa Cruz tar plant					X	
Slender Orcutt grass	X					
Solano grass	X					
Succulent ows' clover			X			
INVERTEBRATES						
Bay checkerspot butterfly						X
Delta green ground beetle	X					
Longhorn fairy shrimp					X	X
Conservancy fairy shrimp	X		X			X
Valley Elderberry longhorn beetle		X				

TABLE 5-20

OCCURRENCE OF CRITICAL HABITAT FOR LISTED PLANT AND WILDLIFE SPECIES

Vernal pool fairy shrimp	X	X	X	X	X	X
Vernal pool tadpole shrimp	X			X	X	X
AMPHIBIAN						
California red-legged frog	X	X	X	X	X	X
California Tiger Salamander	X	X	X		X	X
BIRDS						
Northern spotted owl	X					
Western snowy plover						X
MAMMALS						
Fresno kangaroo rat			X	X		
Giant kangaroo rat				X		

TABLE 5-21

HABITAT ASSOCIATIONS OF LISTED PLANT AND WILDLIFE SPECIES IN THE STUDY AREA

	HABITAT																				
	RIV	**LAC**	**EST**	**FEW**	**VP**	**SEW**	**AGS**	**CRC/MCH**	**CSC**	**BOP/BOW**	**COW**	**VOW**	**MHW**	**MHC**	**CF**	**VRI**	**CRP**	**RCE**	**OVN**	**BAR**	**SID**	**SERP**
PLANTS																						
Antioch Dunes evening-primrose																					X	
Butte County Meadowfoam					X																	
California jewelflower							X	X														
Colusa grass					X																	
Contra Costa wallflower																					X	
Contra Costa goldfields					X																	
Coyote ceanothus																						X
El Dorado Bedstraw										X												
Green’s tuctoria					X																	
Hairy Orcutt grass					X																	
Hoover’s spurge					X																	
Large-flowered fiddleneck							X			X	X	X										
Layne’s butterweed								X														X
Metcalf Canyon jewelflower																						X
Pallid manzanita								X	X													
Palmate-bracted bird’s beak							X	X														
Pine Hill ceanothus								X														
Pine Hill flannelbush								X														
Sacramento Orcutt grass					X																	
San Joaquin woolly-threads							X															
Santa Clara Valley dudleya																						X
Santa Cruz tarplant							X															
Slender Orcutt grass					X																	
Soft bird’s beak						X																
Solano grass					X																	
Stebbin’s morning glory								X														X
Succulent owl’s clover					X																	
Tiburon Indian paintbrush																						X
INVERTEBRATES																						
Bay checkerspot butterfly																						X
California freshwater shrimp	X																					
Callipe silverspot butterfly							X															
Conservancy fairy shrimp					X																	
Delta green ground beetle					X																	
Lange’s metalmark butterfly																					X	
Longhorn fairy shrimp					X																	
Valley elderberry longhorn beetle																X						

TABLE 5-21

HABITAT ASSOCIATIONS OF LISTED PLANT AND WILDLIFE SPECIES IN THE STUDY AREA

	HABITAT																					
	RIV	**LAC**	**EST**	**FEW**	**VP**	**SEW**	**AGS**	**CRC/MCH**	**CSC**	**BOP/BOW**	**COW**	**VOW**	**MHW**	**MHC**	**CF**	**VRI**	**CRP**	**RCE**	**OVN**	**BAR**	**SID**	**SERP**
Vernal pool fairy shrimp					X																	
Vernal pool tadpole shrimp					X																	
AMPHIBIANS																						
California red-legged frog	X	X		X			X			X	X	X				X						
California tiger salamander – Central California DPS					X		X															
REPTILES																						
Alameda whipsnake							X	X	X		X											
Blunt-nosed leopard lizard							X															
Giant garter snake	X	X		X			X									X		X				
San Francisco garter snake				X			X															
BIRDS																						
Bald Eagle	X	X	X												X	X						
California brown pelican			X																	X		
California clapper rail						X														X		
California condor							X			X												
California least tern			X			X														X		
Least Bell's vireo																X						
Marbled murrelet															X							
Northern spotted owl														X	X							
Western snowy plover																				X		
MAMMALS																						
Fresno kangaroo rat							X															
Giant kangaroo rat							X															
Riparian woodrat																X						
Riparian brush rabbit																X						
Salt marsh harvest mouse						X																
San Joaquin kit fox							X										X		X			
Tipton kangaroo rat							X															

RIV: Riverine
LAC: Lacustrine
EST: Estuarine
FEW: Freshwater emergent wetland
BOP/BOW: Blue oak foothill pine/Blue oak woodland
VP: Vernal pool
SEW: Saline emergent wetland
AGS: Annual grassland
CRC/MCH: Chamise-Redshank chaparral/ mixed chaparral
CSC: Coastal scrub
COW: Coastal oak woodland
VOW: Valley oak woodland
MHW: Montane hardwood
MHC: Montane hardwood-conifer
CF-Conifer forest
VRI: Valley foothill riparian
CRP: Cropland
RCE: RIce
OVN: Orchard and Vineyard
BAR: Barren
SID: Stabilized interior dune
SERP: Serpentine

Alternative 1A. Under Alternative 1A, it is anticipated that minimum and maximum stream flows would be similar to the No Action Alternative conditions. Because the water is re-allocated between CVP M&I and irrigation water users in the same contract year, there is no change to storage in CVP reservoirs or to allocation of water to refuge water supplies, instream flows, or senior water rights holders. Delta exports would be within normal CVP operational values and would be similar to conditions under the No Action Alternative.

Under Alternative 1A, land uses would be similar to those described under the No Action Alternative. Reduction in deliveries to Irrigation CVP water service contractors are relatively small in 13 of the 72 years considered based upon the CALSIM II modeling. It is anticipated that lands fallowed under the No Action Alternative may be fallowed more frequently. Due to the small incremental difference in deliveries under Alternative 1A as compared to the No Action Alternative, it is not anticipated that additional lands would be fallowed. Therefore, it is anticipated that biological resources, including special status species, under Alternative 1A would be similar to conditions under the No Action Alternative. In essence, Alternative 1A would result in no demonstrable change in conditions affecting listed species. Any effect that may result under Alternative 1A would be well within the scope of effects addressed in the contract specific and OCAP consultation. Thus, there would be no new effects that have not already been addressed in related consultations.

Alternative 1B. The impacts to CVP reservoir facilities and to surface water resources under Alternative 1B would be similar to those described under Alternative 1A. In essence, Alternative 1B would result in no demonstrable change in conditions affecting listed species. Any effect that may result under Alternative 1B would be well within the scope of effects addressed in the contract specific and OCAP consultation. Thus, there would be no new effects that have not already been addressed in related consultations.

Alternative 2A. The impacts to CVP reservoir facilities and to surface water resources under Alternative 2A would be similar to those described under Alternative 1A. However, the frequency of fallowing lands that would be fallowed under No Action Alternative would increase. Therefore, it is anticipated that biological resources, including special status species, under Alternative 2A would be similar to conditions under the No Action Alternative.

Alternative 2B. The impacts to CVP reservoir facilities and to surface water resources under Alternative 2B would be similar to those described under Alternative 1A. However, the frequency of fallowing lands that would be fallowed under No Action Alternative would increase. Therefore, it is anticipated that biological resources, including special status species, under Alternative 2B would be similar to conditions under the No Action Alternative.

Cumulative Effects

Alternatives 1A, 1B, 2A, and 2B would not result in cumulative adverse impacts to biological resources when considered in combination with future projects such as water transfer projects or development of other water supplies. The fallowed land may be located adjacent to other lands fallowed under separate programs or due to changing agricultural market conditions. Therefore, the cumulative loss of field crops may result in changes of associated habitat associated with fallowed lands. These changes in habitat are not expected to have an adverse impact on biological resources, including special status species as compared to the No Action Alternative conditions.

RECREATION

This section describes recreational opportunities for the study area considered in this EA. The description of the Affected Environment has been developed from information presented in the CVPIA PEIS and draft environmental documents prepared by and for Reclamation to support the Long-Term Contract Renewal process.

Affected Environment

Recreation can be an active or passive use of unimproved open space land or improved recreational facilities. Wildlife areas; areas of scenic, historic and cultural value; lake shores; beaches; and rivers and streams are examples of open space as a passive use that may have few or no improvements. Parks, golf courses, and sports clubs are examples of recreation areas that provide for more active uses and have more facility improvements.

Sacramento Valley (Shasta, Trinity, and Sacramento River Divisions). The Sacramento Valley includes opportunities that range from Shasta County to the Delta. Recreation opportunities within Shasta County are numerous. Federal and state agencies and the private sector are major providers of recreation facilities in Shasta County. Undeveloped open space, or natural areas contained within national recreation areas, national parks, wilderness areas, and state parks represent the major tourist recreation resources of Shasta County, and are important to the County's tourist industry. There are privately owned and operated recreational facilities, resorts, campgrounds, recreational vehicle parks, boat and boating equipment facilities.

In the Shasta Lake area and along the Upper Sacramento River, recreational opportunities are provided at many sites, including Shasta-Trinity National Forest, Whiskeytown-Shasta-Trinity National Recreation Area, Shasta Historic Park, Lake Redding - Caldwell Memorial Park, Turtle Bay Regional Park, and Balls Ferry Fishing Access.

The upper reach of the Sacramento River from Red Bluff to the Feather River confluence is a major aquatic recreation resource for the study area. This 160-mile segment of the river is characterized by slower moving water and a meandering river channel lined with riparian thickets and orchards. Although most land along this reach is privately owned, the California Department of Parks and Recreation and Tehama, Glenn, and Colusa counties provide public access along the middle reach. In addition, the Service and California Department of Fish and Game maintain several refuges along the Sacramento River. Water-dependent activities in this reach include boat and shore fishing, swimming, and beach use. Black Butte and Stony Gorge reservoirs also provide some recreation potential.

Recreation activities occur at national wildlife refuges (NWRs) including Sacramento, Delevan, and Colusa refuges that are managed as part of the Sacramento NWR Complex. Gray Lodge Wildlife Area is managed by the California Department of Fish and Game. Most recreation activities on the refuges are associated with the presence of waterfowl. These activities include nonconsumptive uses (such as wildlife observation and hiking) and consumptive uses (such as hunting). Hunting of ducks, geese, coots, snipes, and pheasants is permitted between October and January on portions of all refuges in the Sacramento NWR Complex. Fishing does not occur on any other refuge in the complex. Certain activities, such as hiking and driving tours, can be restricted when birds are present on the refuge. Most of the visitation to the wildlife refuges occurs in the late fall through the winter.

Lower American River (American River Division). Recreation in the Lower American River watershed occurs within many of the cities and at county facilities throughout the area. Regional recreational opportunities occur at Folsom Lake, Lake Natoma, and along the Lower American River corridor. The Folsom State Recreation Area (SRA) consists of Folsom Lake and Lake Natoma. This area is heavily used due to its proximity to a rapidly growing metropolitan area. The SRA includes 176 campsites that accommodate tent, trailer, recreational vehicles, and group campers; 11 day use areas; and over 90 miles of existing trails. The highest use rates occur in the summer and decrease in the fall and winter. Use in 2000 at the Folsom Lake SRA was more than 1.5 million visitors. Water-enhanced land-based activities include picnicking, camping, and trail use such as walking, hiking, cycling, mountain biking, and horseback riding. Water-dependent activities include boating, personal watercraft use (jetskis), windsurfing, water skiing, rafting, swimming, and fishing. Major facilities at Folsom Lake include six developed boat launching areas, a marina, and two formal beach areas. Folsom Lake's elevation declines from Memorial Day through Labor Day. Lake levels in a normal year will generally decline through the summer season. In most years, the water surface elevation stays above about 405 feet mean sea level and the berthing slips are available for year-round mooring. In wetter years, lake levels can rise above 450 feet mean sea level and inundate nearshore boat ramps and parking spaces. The nearshore boat ramps are useable between 450 and 420 feet mean sea level.

Lake Natoma is located at the downstream end of the Folsom Lake SRA. Major facilities at Lake Natoma include three boat launching areas, two formal beaches, California State University, Sacramento Aquatic Center, several picnic areas, and an eight-mile segment of the American River paved trail that is used by equestrians, hikers, runners, mountain bikers, and in-line skaters. Bank fishing is common, and swimming and diving occur from the rock outcrops at the upper end of the lake. The predominant recreational activity is trail use for jogging, bicycling, hiking, and horseback riding. Lake Natoma supports an average of half-million visitor-days/year, primarily during the spring and summer.

The Lower American River from Nimbus Dam to the confluence with the Sacramento River includes the American River Parkway. The Parkway includes 14 interconnected parks along the publicly owned lands of the river. The most popular feature of the Parkway is the Jedediah Smith Memorial Trail - more commonly known as the American River Bike Trail. The trail extends 32 miles east from Discovery Park near the Sacramento River to Beals Point in the Folsom Lake SRA. This trail offers to hikers, cyclists, and horseback riders opportunities for outdoor recreation, nature viewing, and relaxation. The American River is popular with fishing enthusiasts, canoeists, kayakers, and rafters, and the Parkway offers several picnic areas, and opportunities for nearby golf, guided natural and historic tours, archery, and game fields. More than five million visitors use the Parkway each year; visitation is expected to increase to 9.6 million by 2020.

Recreational opportunities in the Lower American River Watershed include the 165-acre Rancho Seco Lake that is owned and operated by Sacramento Municipal Utility District. CVP water is used for part of the water supply for the lake. Park facilities include group campgrounds and individual camp sites, recreational vehicle sites, group and family picnic areas, two boat launches, a store/snack bar, restrooms, and a swimming area. The lake is a popular fishing spot for catfish, blue gill, bass, crappie, and trout. Most lake facilities are located on the south and west shores of the lake. The peak number of persons at Rancho Seco Lake on a summer weekend is approximately 5,000.

There are many local and regional parks in the Lower American River watershed that are maintained by the cities, counties, and local agencies. These parks are frequently irrigated with CVP water supplies.

Delta (Delta Division). The Sacramento-San Joaquin Delta is used for extensive recreational activities, including fishing, boating, picnicking, and camping. The Delta supports about 12 million user days of recreation a year for water-oriented recreation, as well as picnic sites and camping areas. Usage typically peaks in July. Boating and fishing are the most popular activities. There are many private marinas and public boat launching facilities in the Delta.

Eastside Division. Recreational opportunities in the Eastside Division are focused at New Melones Reservoir and along the Stanislaus River. New Melones Reservoir supports boating, fishing, swimming, wading, camping, and sightseeing. The Stanislaus River supports fishing, swimming, boating, camping, and picnicking. Many of these activities are directly supported by local businesses in the region.

Northern and Central San Joaquin Valley (Delta and West San Joaquin Divisions). Recreational opportunities in the San Joaquin Valley primarily occur along the lower San Joaquin River, near San Luis Reservoir, and at the wildlife refuges. Recreational use for the Lower San Joaquin River is similar to activities in the Delta. It is estimated that river, boating and fishing activities in the Lower San Joaquin River is 157,000 six-hour Recreational Visitor Days.

San Luis Reservoir, the adjacent O’Neill Forebay, and Los Banos and Little Panoche reservoirs provide reservoir-related recreational resources. Recreational activities include boating, water-skiing, fishing, picnicking, camping, hunting, and hiking. Reservoir facilities consist of one campground and two concrete boat ramps and boarding docks. The reservoir has no designated swimming or lakeside beach areas. Boat and shore fishing occur throughout the three reservoirs. Hunting for deer and wild pig is allowed on the northwest shoreline of the San Luis Reservoir SRA. Relaxing and camping are the most popular of the water-related activities. Seventy-seven percent of annual use occurs between April and September. The majority of visitors are from the Bay-Delta and San Joaquin Valley areas.

O’Neill Forebay is located immediately east of San Luis Reservoir and serves as a regulating reservoir. Recreational facilities consist of two boat ramps, two picnic areas, a campground, and a swimming area. Other recreational features also include the Medeiros recreation area, which provides picnicking, camping, and boat ramp access, and the San Luis Creek day-use area, which provides picnicking, swimming, and boat ramp access. Facilities accommodate boating, fishing, swimming, wading, camping, and sightseeing. In addition, the O'Neill Forebay is widely used for windsurfing. The majority of visits occur between April and September.

Recreation facilities for picnicking, camping, hunting, swimming, fishing, and boating are also located at Los Banos and Little Panoche reservoirs and at fishing access locations along the San Luis and Delta Mendota Canals. The San Luis Canal includes 12 fishing access sites. The Delta Mendota Canal provides two fishing access sites. Only fishing is allowed at the access sites.

The San Luis and Merced NWR complexes are owned and operated by the Service. Volta, Los Banos, and Mendota Wildlife Management Areas are owned and operated by the California Department of Fish and Game. Fishing is by rod and reel only and the taking of frogs, crayfish, turtles, snakes, and all other wildlife is prohibited. Fishing also occurs near the refuges along streams and sloughs. The refuges also include selfguided driving tours. Camping is permitted at staging areas on the national wildlife refuges during hunting season only. Camping is not allowed at the wildlife areas. Most recreational activities are wildlife-dependent. They include non-consumptive uses such as wildlife observation or consumptive uses such as hunting. Management regulations designed to minimize wildlife disturbance at the refuges include limiting public access to certain time periods. There also are over 150 private waterfowl hunting clubs in the northern and central San Joaquin Valley.

San Felipe Division. Recreational opportunities in the Santa Clara County and in Zone 6 of San Benito County Flood Control and Water Conservation District includes local and regional parks, golf courses, and recreational opportunities at water supply reservoirs. Recreational opportunities at the water supply reservoirs that store CVP water include picnicking and hiking. The Bureau of Land Management owns and operates several wildlife refuges in this areas.

Contra Costa and Alameda Counties (Delta and American River Divisions). Recreation in this area ranges from water-oriented opportunities near the Delta and San Francisco Bay and at water supply reservoirs. Contra Costa Water District and East Bay Regional Park District manage facilities that are associated with CVP water at Contra Loma and Los Vaqueros reservoirs and along the Contra Costa Trail that parallels the Contra Costa Canal. The reservoir and canals provide opportunities for jogging, hiking, bicycling, and picnicking.

East Bay Municipal Utility District and East Bay Regional Park District manage facilities at Briones, Chabot, Lafayette, San Pablo, and Upper San Leandro reservoirs. These reservoirs offer a range of opportunities that include hiking, bicycling, jogging, fishing, non-contact water sports, boating, sailing, and picnicking. At San Pablo Reservoir and Lake Chabot, trout and catfish are planted to supplement the resident population of large- and smallmouth bass, white sturgeon, bluegill, and crappie. Public fishing and boating is not allowed at Briones Reservoir. Other opportunities include horseback riding at San Pablo Reservoir and crew by the U.C. Berkeley women's crew team at Lake Chabot.

Environmental Consequences

The effects of Alternatives 1A, 1B, 2A, and 2B on recreational resources are compared to conditions under the No Action Alternative. Environmental consequences to recreational resources are related to changes in water storage elevations at reservoirs that store CVP water and streams or canals that convey CVP water. Recreational use can also be affected by changes in land use.

No Action Alternative. The No Action Alternative represents the future conditions without implementation of an proposed September 2001 M&I Water Shortage Policy under the alternatives. There would be additional exercise of senior water rights water in the future. However, due to regulatory requirements for the CVP and SWP operations, minimum and maximum reservoir elevations and stream flows would be similar to those described in the OCAP 2004. Water supplies to refuges would be the same as under the No Action Alternative.

Alternative 1A. Under Alternative 1A, it is anticipated that minimum and maximum reservoir elevations and stream flows would be similar to the No Action Alternative conditions. Because the water is re-allocated between CVP M&I and irrigation water users in the same contract year, there is no change to storage in CVP reservoirs or to allocation of water to refuge water supplies, instream flows, or the ability to exercise senior water rights. It is also anticipated that land use patterns would be identical to the No Action Alternative conditions. Therefore, it is anticipated that recreational resources under Alternative 1A would be similar to those described under the No Action Alternative, and there would be no impact.

Alternative 1B. Under Alternative 1B, it is anticipated that minimum and maximum reservoir elevations and stream flows would be similar to the No Action Alternative conditions. Because the water is re-allocated between CVP M&I and irrigation water users in the same contract year, there is no change to storage in CVP reservoirs or to allocation of water to refuge water supplies, instream flows, or senior water rights holders. It is also anticipated that land use patterns would be identical to the No Action Alternative conditions. Therefore, it is anticipated that recreational resources under Alternative 1B would be similar to those described under the No Action Alternative, and there would be no impact.

Alternative 2A. Under Alternative 2A, it is anticipated that minimum and maximum reservoir elevations and stream flows would be similar to the No Action Alternative conditions. Because the water is re-allocated between CVP M&I and irrigation water users in the same contract year, there is no change to storage in CVP reservoirs or to allocation of water to refuge water supplies, instream flows, or senior water rights holders. It is also anticipated that land use patterns would be identical to the No Action

Alternative conditions. Therefore, it is anticipated that recreational resources under Alternative 2A would be similar to those described under the No Action Alternative, and there would be no impact.

Alternative 2B. Under Alternative 2B, it is anticipated that minimum and maximum reservoir elevations and stream flows would be similar to the No Action Alternative conditions. Because the water is re-allocated between CVP M&I and irrigation water users in the same contract year, there is no change to storage in CVP reservoirs or to allocation of water to refuge water supplies, instream flows, or senior water rights holders. It is also anticipated that land use patterns would be identical to the No Action Alternative conditions. Therefore, it is anticipated that recreational resources under Alternative 2A would be similar to those described under the No Action Alternative, and there would be no impact.

Cumulative Effects

These alternatives would not result in cumulative adverse impacts to recreational resources when considered in combination with future projects such as water transfer projects or development of other water supplies.

CULTURAL RESOURCES

This section describes cultural resources for the study area considered in this EA. The description of the Affected Environment has been developed from information presented in the CVPIA PEIS and draft environmental documents prepared by and for Reclamation to support the Long-Term Contract Renewal process.

Affected Environment

Cultural resources are those aspects of the physical environment that relate to human culture and society, and those cultural institutions that hold communities together and link them to their surroundings. Cultural resources include expressions of human culture and history in the physical environment such as prehistoric or historic archaeological sites, buildings, structures, objects, districts, and locations of important historic events, or sites of traditional/cultural importance.

The primary law governing cultural resources is the National Historic Preservation Act of 1966 (NHPA), as amended (16 USC Section 470) and implementing regulations (36 CFR 800). This act established the National Register of Historic Places (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 National Register. Because Section 106 compliance is usually in response to a proposed action that has the potential to affect historic properties, consultation with the California SHPO, interested parties, and where appropriate, the ACHP is required.

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

It is acknowledged that an unknown number of prehistoric sites and historic resources have been destroyed as a result of the early development of the area. In addition, it is acknowledged that there is the potential for the discovery of unknown sites in urban and rural contexts with some potential for deeply buried sites in the inland and delta areas of the study area.

Prehistory. This section provides a brief overview of the prehistoric contexts for the study area.

Sacramento Valley (Shasta, Trinity, Sacramento River, and American River Divisions). Human occupation of northern California may have begun shortly after 8,000 years ago, representing a subsistence pattern based largely on wild seeds and other plant foods. A dramatic intensification of land use began around 4,000-5,000 years ago. A cultural transition occurred about 2,500 years ago, marked by changes in burial practices, tool types, and ceremonial items. The transition may reflect the eastward spread of Miwok people from the Bay Area. Sites from about 1,500 years ago reflect dense populations with highly developed social organizations, trade networks, food storage and redistribution systems, ceremonial and funerary complexes, and a strong sense of territoriality. The settlement and subsistence patterns changed. The increased regional population may have intensified the use of land and fish and shellfish resources.

The earliest defensible dated cultural evidence from the Upper Sacramento Valley was from an archaeological site, CA-SHA-475, on the Squaw Creek drainage of Shasta Lake. Radiocarbon dates from the lowest stratum indicates human use dating between 6,530 and 7,580 years ago. This period lasting until about 5,000 years ago was likely typified by a foraging economy based on extensive hunting and the collection of native plants especially hard seeds, and is thought to be linked to Hokan speaking people, quite possibly the ancestors of the Yana.

During the period between approximately 5,000 and 3,000 years ago, there was an increased reliance on acorns and, perhaps, other softer foods. Evidence of this pattern, the Whiskeytown Pattern, is widespread and could be related to preservation or increasing human use.

During the last 1,500 years, the aboriginal inhabitants diversified and specialized in the exploitation of natural resources with large seasonal encampments along the major streams. This cultural pattern is related to the appearance of Penutian speaking people from the Columbia Plateau. These people are assumed to be the ancestors of the modern Wintu.

Glenn, Tehama, Colusa, and Yolo counties include evidence of prehistoric and historic use. Regional human use dates back to around 6,000 BC. The patterns relevant to Sacramento Valley prehistory are the Windmiller, Berkeley, and Augustinian Patterns. The Windmiller Pattern was primarily a hunting and fishing economy. The Berkeley Pattern focused on acorns as a dietary staple. Relatively more mortars are found, indicating a shift to a dependable, but labor intensive, food source. The Augustinian Pattern was distinguished by sites with evidence of intensive fishing, hunting, and acorn gathering. There is a shift toward densely populated villages, highly developed exchange systems, ceremonialism, social stratification, cremation, and preinternment burning of grave goods. This pattern is associated with the migration southward of Wintun peoples.

San Joaquin Valley (Eastside, Delta, and West San Joaquin Divisions). The Northern and Central San Joaquin Valley has a long and complex cultural history with district regional patterns that extend back more than 11,000 years. The first generally agreed-upon evidence for the presence of prehistoric peoples is represented by the distinctive fluted spear points (termed Clovis points) found on the margins of extinct lakes in the San Joaquin Valley. The ancient hunters who used these spear points existed during a narrow time range of 10,900 to 11,200 years ago. The next cultural period (8,000 to 10,000 years ago) is characterized by stemmed spear points. This early cultural tradition is regionally known from a small number of sites in the Central Coast Range, San Joaquin Valley lake margins, and Sierra Nevada foothills.

About 8,000 years ago, many California cultures shifted the main focus of their subsistence strategies from hunting to seed gathering. Within the last 3,000 years, specialized adaptations to locally available resources were developed and populations expanded. Many sites dated to this time contain mortars and pestles and/or are associated with bedrock mortars.

San Francisco Bay Area (Delta, American, and San Felipe Divisions). The San Francisco Bay Area was inhabited by at least three indigenous groups: the Ohlone Costanoan (or "coastal dwellers"), the Bay Miwok, and the Northern Valley Yokut. Early inhabitants lived in nomadic hunter-gatherer societies. Prior to 5,000 to 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. Early groups probably focused on hunting and the gathering of various plan foods along with shellfish collection. By about 4,000 years ago, villages were located along the shorelines of bay shore marshlands, streams, and other water bodies.

San Benito County was settled by a group of Hokan-speaking Native Americans over 10,000 years ago. The Hokans were replaced by the Ohlone, which lived along the San Francisco and Monterey bay areas and foothills. The Ohlones were hunters and gatherers. The tribes included the Mutsun tribe in the San Juan Canyon area, Pagsin tribe near Hollister, the Ausaima tribe in San Juan Valley and near Hollister, the Tamarron in the Diablo Range, the Chalon tribe in the south central part of the county, and the Salinan tribe in the southern part of the county. Extensive archaeological sites including midden sites, burial sites, and sacred sites are attributed to the Ohlones.

Ethnography. This section provides a brief overview of the ethnographic contexts for the study area.

Upper Sacramento Valley (Shasta, Trinity, and Sacramento River Divisions). Prior to appearance of Euro-American explorers and settlers, the Upper Sacramento Valley was populated by the Wintu, Yana, and Patwin. The Wintu occupied all of this area except the Cow Creek drainage that was included in the northwestern edge of the Yana territory. The Wintu spoke a Penutian language. The Yana spoke a Hokan dialect. The Wintu controlled the Sacramento River corridor and many of its most productive tributaries. The Yana lived in the eastern foothills and stream corridors of the southern Cascade. The Patwin occupied areas adjacent to the river in Southern Colusa and northern Yolo counties. The Northwestern Maidu or Konkow also occupied a portion of the river in northern Colusa and southern Glenn counties.

The material culture and lifestyles of the groups were quite similar. They constructed semi-permanent or permanent villages on the terraces above main stream corridors and emphasized the use of fish (especially salmon), shellfish, acorns, small mammals, birds, and native plant foods. These staples were processed to provide food during the winter and other lean periods. Reliance on a variety of foods lessened the possibility of famine due to the failure of supply of one or more food sources. Hunting augmented the staples of the diet. Skins acquired through the hunting or snaring of animals were processed and used for a variety of items especially clothing. Housing was comprised of conical, semi-subterranean family residences, approximately 10 feet in diameter, that were often located near a larger communal structure, which was used variously as a residence and for ceremonies. The size of these communal structures appear to have increased through time.

Lower Sacramento Valley (American River Division and Northern Delta). The Valley Nisenan lived along the Sacramento River from downstream of the confluence with the American River, upstream to beyond Yuba City/Marysville, and eastward along the American River for about eight miles. The Nisenan villages may have had 500 to 1,000 occupants. Villages contained houses, and also granaries for storage of acorns and other winter supplies. Near Roseville, the Nisenan inhabited a major village named Pitchiku. Structures included brush shelters, sweat houses, acorn granaries, and dance houses

Between Freeport and the confluence of the Cosumnes River, the Sacramento River is the ethnographic territory of the Plains Miwok. The Plains Miwok were overtaken by diseases brought into the area by miners and other immigrants. By about 1880, the Plains Miwok were considered culturally extinct although members were still alive. The Plains Miwok lived in large, semi-sedentary villages along the major river courses of the delta system. They focused on plant collecting, with fishing and hunting being subsidiary activities.

Placer County is known to have been occupied by two groups of Native Americans: the Nisenan and the Washoe. Both the Nisenan and the Washoe were hunter-gatherers. The Washoe lived a much more mobile life in smaller groups than the Nisenan.

El Dorado County was once inhabited by the ancestors of the Nisenan, Northern Sierra Miwok, and the Washoe. The lifeways and material culture of the three groups were very similar. Permanent houses were typically conical in shape and covered with brush or earth. All groups subsisted on a varied assortment of fish, game, and plants. Acorns were a staple throughout most of the territory; other materials were used for food, medicinal, and manufacturing purposes. Commonly hunted game included deer, bear, mountain lions, and rabbits.

Northern and Central San Joaquin Valley (Delta and West San Joaquin Divisions). This area includes lands claimed by the Penutian-speaking Yokuts. These peoples occupied an area extending from the crest of the Coast Diablo and Temblor Ranges easterly into the foothills of the Sierra Nevada, north to the American River (for the Northern Valley Yokuts), and south to Buena Vista and Kern Lakes at the southernmost end of the Great Central Valley (for the Southern Valley Yokuts). The life of the North Valley Yokuts was centered along the San Joaquin River and its many tributaries, which is flanked by dry, treeless grasslands along its length. The principal food sources for this group were salmon and acorns; procuring avifauna, big game hunting, and seed collecting also played an important role in subsistence. Round, single-family dwellings built of reeds were the primary structure in North Valley Yokuts villages. Basketry and other fiber weaving work constituted the primary craft, accompanied by a lithics industry that manufactured tools from locally obtainable chert, jasper, and chalcedony. Trade with neighboring peoples such as the Costanoans and Miwok was common.

The basic social unit for the Yokuts was the family, although the village may also be considered a social and a political and economic unit. Villages were inhabited mainly in the winter because it was necessary to go to the higher elevations to establish temporary camps during food-gathering seasons (spring, summer, and fall). Villages typically consisted of a scattering of small structures, each containing a single family of three to seven people. Larger villages that were maintainable seasonally might also contain an earth lodge.

Economic life for the Yokuts revolved around hunting, fishing, and collecting plants, with deer, acorns, and avian and aquatic resources representing primary staples. The Yokuts used a wide variety of wooden, bone, and stone artifacts to collect and process their food. The Yokuts were very knowledgeable in the uses of local animals and plants and the availability of raw materials that could be used to manufacture primary and secondary tools and implements.

History. This section provides a brief overview of the historic contexts for the study area.

Upper Sacramento Valley (Shasta, Trinity, and Sacramento River Divisions). In the early 1800s, the missions established by the Spanish on the coast were losing populations due to disease and people leaving the area. Military expeditions were organized to the Sacramento Valley to recapture the natives that had left the missions. Active native resistance led to a major battle in 1813 between the

Spanish and Miwok tribelets near the Cosumnes River. In 1833, a great epidemic swept through the Sacramento Valley destroying entire villages.

Ewing Young was the first American known to actually enter the Sacramento Valley in 1832. In response to these explorations, the Mexican government provided land grants to Mexican citizens within the Sacramento Valley to fortify their sovereignty. The most significant of the new land claimants within the study area was Pierson B. Reading who was granted the Buena Ventura 26,633 acre land grant in 1844. Reading played a major role in the Bear Flag Revolt of 1846 that paved the way for American claims to California and the Mexican-American War of 1846-1847. Reading led parties to discover the second gold strike in California at Reading Bar on Clear Creek in the Upper Sacramento Valley, at Reading Bar on the Trinity River, and at Reading Springs near the town of Old Shasta. Mining flourished throughout the 1850s and 1860s with individual operations giving way to corporate undertakings. Mining activities caused widespread destruction of what was left of the native culture and resource base.

The agricultural potential of the Sacramento Valley was recognized in the second half of the 19th century. Unreliable precipitation and the need for protection from periodic flooding limited further growth of agriculture in the region until irrigation facilities started to be constructed in the 1890s. The railroad was constructed to Redding in 1872 and was extended past Redding in 1883.

In the latter part of the 19th and early part of the 20th centuries, mining returned with the extraction and smelting of copper from Keswick upstream along the Sacramento and Pit rivers. By the conclusion of World War I, this industry had dwindled. The study area headed into an economic decline during the 1920s and 1930s. With the construction of Shasta Dam in the late 1930s and early 1940s, the economy and population began an upward trend. Lumber mills were built in and near the City of Redding following World War II. The completion of State Highway 99 in the 1920s augmented the shipping and transportation services of the railroad. With the proliferation of the automobile, the area became a destination for tourism and recreation.

Lower Sacramento Valley (American River Division and Northern Delta). The first Anglo-American to travel to what is now Sacramento County was Jedediah Strong Smith. Later, New Helvetia, the first non-Indian settlement in the Central Valley, was established by Captain John A. Sutter in 1839. He established Sutter's Fort in the City of Sacramento as a trading post. Gold was discovered at Sutter's Mill on the American River in January 1848. By 1854, Sacramento had become the state capital. As the city grew, it became necessary to protect it from flooding of the American and Sacramento rivers.

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

In the foothills, mining became the basis of the economy. The earliest towns in Placer County were Auburn founded in 1849, Ophir in 1852, and Rattlesnake in 1853. The economic development of the county was originally based on mining of gold, then coal, granite, iron, copper, quartz, and clay. The Central Pacific Railroad was completed from Sacramento to Auburn in 1865 and led to growth of the timber and agriculture industries. During the 1920s, Placer County was considered the largest fruit-producing area in the state. In the late 1950s, a pear disease and the lower yield of foothill ranches contributed to the demise of Placer County's fruit industry. Dairy farming became locally important after the decline of the fruit industry until the 1960s. Other agricultural enterprises in the county include raising beef cattle, horses, rice, sheep, turkeys, and producing honey, wine, and brandy.

Reclamation of the Delta occurred to provide land for agriculture. Further development of the area was facilitated by the development of regional rail and road networks to service industry and agriculture. The introduction of the refrigerator railcar in the 1880s allowed the transport of agricultural produce to distant markets. Coal mining occurred from the 1850s to the 1880s.

Northern and Central San Joaquin Valley (Eastside, Delta, and West San Joaquin Divisions). Until the late 1850s, the San Joaquin Valley was sparsely settled by Europeans. Extensive areas of marsh were a hindrance to farming. By the mid-1860s, however, American settlers were beginning to reclaim and drain land for agriculture and ranching.

The Southern Pacific and Central Pacific railroads and many smaller interurban lines to the north and around the cities of Stockton and Sacramento began intensive projects in the late 1860s. By the turn of the century, nearly 3,000 miles of rail lines connected the cities of Modesto and Stockton. By the 1870s, the San Joaquin Valley was the center of California's wheat production. The introduction of canning technology and transcontinental rail led to widespread diversification and development of specialty crops such as fruits and nuts. About the same time, development of the petroleum resources of the southern San Joaquin Valley was initiated and continues today. The need for a steady supply of water to irrigate the increasing acreage of farmed land led to the incorporation of water districts, and eventually to large-scale water supply projects.

San Francisco Bay Area (Delta, American, and San Felipe Divisions). The inland areas were explored by the Spanish between 1772 and 1811 prior to establishing presidios, missions, and secular towns along the California coast from 1769 to 1821. Mission San Jose in present-day Fremont, San Francisco de Asis in San Francisco, and Mission San Juan Bautista were established in this area.

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. 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.

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

The Central Railroad was completed between San Francisco and San Jose in 1864 which led to the growth of fruit orchards, vineyards, and other agricultural farms in Santa Clara County. Agricultural growth continued until after World War II when the electronic industry and other industries expanded in the area and associated residential areas grew.

In San Benito County, the City of Hollister was a center for sheep ranching in the mid-1800s. Hollister began to grow and become larger than San Juan Bautista when the railroad was constructed only near Hollister. In addition to the communities of Hollister and San Juan Bautista, several small agricultural communities were formed, including Tres Pinos which served as the southern terminus for Southern Pacific Railroad in the county; Paicines; Panoche which was a stagecoach and ore wagon stop; New Idria Quicksilver Mine (one of the largest quicksilver mines in the world); and Bear Valley.

Identified Cultural Resources. This section provides a brief overview of the identified cultural resources in the study area.

Upper Sacramento Valley (Shasta, Trinity, and Sacramento River Divisions). Approximately 17 cultural resources have been identified within or adjacent to the boundaries of the Shasta and Trinity Divisions. These resources include those listed in the NRHP, the California Historical landmark series, or the California Points of Interest Program. In addition, there are approximately 500 known sites or areas of archaeological significance.

In the Sacramento River Division, about 2,300 sites have been recorded. A total of 199 sites have been recorded in Colusa County. Of these, 84 are historic sites or have historic components. Prehistoric site densities are highest near the Sacramento River and tributary streams and in the vicinity of Grimes. The site of the Nowi Rancheria is the only archaeological resource that is formally listed on the NRHP. Many additional sites have been determined eligible for listing or are likely to meet the criteria for NRHP and/or California Register listing. Four buildings are formally listed on the NRHP. The Colusa County Courthouse is also listed as a California State Landmark along with two other properties. The California Inventory of Historical Resources lists six resources and includes three California Points of Historical Interest.

Over 475 sites have been recorded in Glenn County. Of these, 101 are historic sites or have historic components. Prehistoric site densities are highest near the Sacramento River and tributary streams. High site densities have also been recorded in higher elevation zones in the western part of the county, outside of the boundaries of the water districts. No prehistoric or historic archaeological resources are formally listed on the NRHP, but many additional sites have been determined eligible for listing or are likely to meet the criteria for the NRHP and/or the California Register of Historic Resources (CRHR). The Gianella Bridge and the Willows Post Office are the only historic buildings or structures formally listed on the NRHP. Two additional properties, the Swift Adobe and site of the first posted water notice, are listed as California State Landmarks. The California Inventory of Historical Resources lists 17 resources. Glenn County also includes 17 California Points of Historical Interest.

Recorded sites in Tehama County are located at over 1,615 recorded sites. Historic era sites or sites with historic components number over 200. Many habitation sites are located on ridges near the numerous streams and creeks which cross the county. Prehistoric site densities are highest near the Sacramento River and other watercourses. Only one archaeological resource is formally listed on the NRHP: the Sulfur Creek Archaeological District, located near Mill Creek. Many additional sites have been determined eligible for listing or are likely to meet the criteria for NRHP and/or California Register listing. Eight buildings are formally listed on the NRHP. Four additional properties are listed as a California State Landmark along with two other properties. The California Inventory of Historical Resources lists 13 resources, and the County also has a designated California Point of Historical Interest.

Lower Sacramento Valley (American River Division). Between the Sacramento/Sutter County boundary and Freeport along the Sacramento River, there are 24 prehistoric and 3 historic sites and at least 42 historic structures along this segment of the Sacramento River. Three of the prehistoric sites are considered eligible for the NRHP. The town of Freeport has the potential to be determined an important historical resource. Other eligible or potentially eligible historic resources along the lower Sacramento River include Reclamation District 1000, Washington Water Company Water Tower, Sacramento Weir and Yolo Bypass, St. Josephs Church and Rectory, Leonidis Taylor Monument, and 37 houses built between 1855 and 1900. One of the houses (John White House) was not recommended for the NRHP; the other 36 are listed as "appears eligible" or "may become eligible". There are 22 prehistoric, 13 historic, and 1 multi-component sites on the American River between Folsom Dam and the Sacramento River.

Folsom Boulevard right-of-way is eligible for listing in the NRHP. There are also three potentially significant historic structures in the right-of-way. Folsom has a Historic District that includes most of "Old Folsom", containing most of the remaining commercial and residential buildings dating back to the 1800s. The Sacramento Valley Railroad (the Union Pacific Railroad tracks between Sacramento and Folsom) is a historic resource that has been determined eligible for listing in the NRHP, and is designed as a California State Historic Landmark. A total of 185 prehistoric sites or components have been recorded at Folsom Lake, and 59 historic-period sites have been recorded there, mostly related to mining, transportation, and settlement.

There are three archaeological sites on the Rancho Seco site. At Site RS-1, about 30 prehistoric artifacts and numerous cultural items were noted on the surface, including flaked cobbles and pebbles. Site RS-2 appears to meet NRHP criteria, and consists of a main ditch, dams and reservoirs, and two areas of associated placer mining activity likely dating to the late 1800s. Site RS-3 contains the remains of the Skully Dairy, which operated in the 1950s, and does not appear to meet NRHP criteria.

Two large permanent Nisenan sites located within the Maidu Regional Park in Roseville are listed in the NRHP. Within Roseville, there are 11 sites of historic and cultural importance. Four historic isolated artifacts or features were recorded, including two buildings on the Diamond K Ranch property identified as eligible for the NRHP. Other identified historic sites consist of an old wooden stove pipeline and a barn that was constructed in about 1910.

Structures associated with the early lumber mills, buildings and other features associated with the fruit-growing industry. Depression-era concrete bridges, and other historic resources such as school houses, residences, commercial buildings, community halls, churches, and cemeteries exist throughout Placer County. El Dorado County contains approximately 850 prehistoric and historic sites. There are also 14 properties listed on the NRHP; 9 eligible for listing on the NRHP, 27 State Historic Landmarks, and 25 named gold mining districts.

Northern and Central San Joaquin Valley (Delta and West San Joaquin Divisions). A total of 89 archaeological and historic sites are currently documented within the contract service areas of the 20 districts in the Delta Division excluding Contra Costa Water District. Many of these prehistoric and historic sites have already been determined eligible or are considered potentially eligible for inclusion on the NRHP. Others remain unevaluated in relation to NRHP eligibility criteria. In addition to formally recorded sites, it is clear that a large number of prehistoric and historic sites remain undiscovered within the overall project area simply because for many areas, especially undeveloped ranch and farm lands, a formal archaeological inventory survey has never been undertaken. In addition to archaeological sites of prehistoric and historic-era affiliation, isolated artifacts have also been identified at numerous locations throughout the overall project area. *Isolates* are defined as single formed tools of prehistoric affiliation or portable historic artifacts and isolated historic features not associated with other cultural manifestations. By definition, such finds are not considered eligible for inclusion on the NRHP.

A total of 67 archaeological and historic sites are currently documented within the service areas of the West San Joaquin Division. These include sites that contain exclusively prehistoric material, sites with only historic material, sites with mixed prehistoric and historic components, and structures. Prehistoric sites are represented by habitation areas (village sites) in which habitation and special-use activity areas are represented; mortuary sites; specialized food-procurement and food-processing sites; and other site types representing a variety of specialized activities. Historic sites include buildings and structures dating to the 19th and early- through mid-20th centuries; historic transportation features; water distribution systems; occupation sites and homesteads with associated features such as refuse disposal areas, privy pits, barns, and sheds; historic disposal sites associated with historic communities; and ranch complexes. Some of these prehistoric and historic sites have been determined eligible for inclusion on the NRHP;

others remain unevaluated. In addition to formally recorded sites, it is probable that prehistoric and historic sites remain undiscovered within the study area because for many areas, especially on undeveloped ranch and farm lands, formal archaeological inventory surveys have not been undertaken.

San Francisco Bay Area (Delta, American, and San Felipe Divisions). The areas in Contra Costa and Alameda counties served by Contra Costa Water District and East Bay Municipal Utility District contain numerous prehistoric resources (including lithic scatters, quarries, habitations, shell mounds, bedrock mortars, petroglyphs, and burials), and historic resources, as well as standing historic structures, buildings, districts, and objects; and locations of important historic events or sites of traditional or cultural importance.

A total of 72 archaeological sites have been recorded in or adjacent to the Contra Costa Water District service area. These include 52 prehistoric sites, 19 historic sites, and 1 multi-component site with a prehistoric and historic component. Historic resources are likely to occur throughout the area although many are likely to have been destroyed by subsequent development or redevelopment. At least 44 NRHP listed or determined eligible individual properties or districts (buildings, building sites, landings, etc.) are located in this service area. These historic properties are also included in the CRHR. The Contra Costa Canal was evaluated and was determined not eligible for the NRHP by Reclamation and SHPO in 1992. No NRHP and/or CRHR historic properties, architecturally significant structures, landmarks, or points of interest are present either within or adjacent to the canal.

Archaeological districts in Santa Clara County include Isabel Valley, Santa Teresa, Circles within Circles near Morgan Hill, Uvas Creek-Little Arthur Creek, Upper and Lower Bodfish Creek, Leavesley Road-Alamias Creek, and Pacheco Pass Creek. Coyote Creek Archaeological District and Poverty Flat Site in Henry Coe State Park are listed on the National Register of Historic Places.

Historic sites are located near Los Gatos, Coyote area near Metcalf Road, the settlement of Old Gilroy, Madrone area, New Almaden historic district, Stanford University, Mt. Hamilton Road, and areas from Gilroy to San Martin. The sites include residences, windmills, tankhouse, and historic buildings. Historic districts have been established for Alviso (Embarcadero de Santa Clara), Downtown San Jose, St. James Square, Hensley, and New Almaden.

Environmental Consequences

The effects of Alternatives 1A, 1B, 2A, and 2B on cultural resources are compared to conditions under the No Action Alternative. Environmental consequences to cultural resources are primarily related to exposure of sensitive sites due to changes in water elevations at reservoirs that store CVP water and streams that convey CVP water.

No Action Alternative. The No Action Alternative represents the future conditions without implementation of an M&I water shortage policy under the alternatives. There would be additional exercising of senior water rights water in the future. However, due to regulatory requirements for the CVP and SWP operations, minimum and maximum reservoir elevations and stream flows would be similar to those described in the OCAP 2004. Therefore, additional areas would not be exposed under the No Action Alternative as compared to existing conditions.

Projected land use changes would result in additional agricultural lands either being converted to municipal uses or more frequently fallowed due to reduced water supply allocations. Increased municipal land use would be related to an increased potential of disturbance and exposure of cultural resources. These changes have been addressed in local general plans and associated environmental documentation.

Alternative 1A. Under Alternative 1A, it is anticipated that minimum and maximum reservoir elevations and stream flows would be similar to the No Action Alternative conditions. It is also anticipated that land use patterns would be identical to the No Action Alternative conditions. Therefore, it is anticipated that cultural resources under Alternative 1A would be similar to those described under the No Action Alternative. This alternative does not require construction. Therefore, there are no impacts associated with additional disturbance of cultural resources under this alternative as compared to the No Action Alternative.

Alternative 1B. Under Alternative 1B, it is anticipated that minimum and maximum reservoir elevations and stream flows would be similar to the No Action Alternative conditions. It is also anticipated that land use patterns would be identical to the No Action Alternative conditions. Therefore, it is anticipated that cultural resources under Alternative 1B would be similar to those described under the No Action Alternative. This alternative does not require construction. Therefore, there are no impacts associated with additional disturbance of cultural resources under this alternative as compared to the No Action Alternative.

Alternative 2A. Under Alternative 2A, it is anticipated that minimum and maximum reservoir elevations and stream flows would be similar to the No Action Alternative conditions. It is also anticipated that land use patterns would be identical to the No Action Alternative conditions. Therefore, it is anticipated that cultural resources under Alternative 2A would be similar to those described under the No Action Alternative. This alternative does not require construction. Therefore, there are no impacts associated with additional disturbance of cultural resources under this alternative as compared to the No Action Alternative.

Alternative 2B. Under Alternative 2B, it is anticipated that minimum and maximum reservoir elevations and stream flows would be similar to the No Action Alternative conditions. It is also anticipated that land use patterns would be identical to the No Action Alternative conditions. Therefore, it is anticipated that cultural resources under Alternative 2B would be similar to those described under the No Action Alternative. This alternative does not require construction. Therefore, there are no impacts associated with additional disturbance of cultural resources under this alternative as compared to the No Action Alternative.

Cumulative Effects

These alternatives would not result in cumulative adverse impacts to cultural resources when considered in combination with future projects such as water transfer projects or development of other water supplies.

INDIAN TRUST ASSETS

This section describes Indian Trust Assets (ITAs) for the study area considered in this EA. The description of the Affected Environment has been developed from information presented in the CVPIA PEIS and draft environmental documents prepared by and for Reclamation to support the Long-Term Contract Renewal process and recently reviewed by the Mid-Pacific Region.

Affected Environment

ITAs are legal interests in assets that are held in trust by the U.S. Government for federally recognized Indian tribes or individuals. The trust relationship usually stems from a treaty, executive order, or act of Congress. The Secretary of the Interior is the trustee for the United States on behalf of federally recognized Indian tribes. "Assets" are anything owned that holds monetary value. "Legal interests" means there is a property interest for which there is a legal remedy, such as compensation or injunction, if there is improper interference. Assets can be real property, physical assets, or intangible property rights, such as a lease, or right to use something. Indian trust assets can not be sold, leased, or otherwise alienated without United States' approval. Trust assets may include lands, minerals, and natural resources, as well as hunting, fishing, and water rights. Indian reservations, rancherias, and public domain allotments are examples of lands that are often considered trust assets. In some cases, Indian trust assets may be located off trust land.

Reclamation shares the Indian trust responsibility with all other agencies of the Executive Branch to protect and maintain ITAs reserved by or granted to Indian tribes, or Indian individuals by treaty, statute, or Executive Order.

The Trinity Division recognizes ITAs of the Hoopa and Yurok tribes. The Redding Rancheria is located in the Shasta Division and receives water from the City of Redding

In the western Sacramento Valley near or adjacent to the Sacramento River Division, the following Federally recognized Indian rancherias are located within the Study Area.

- Grindstone Rancheria in Glenn County
- Cortina Rancheria in Colusa County
- Colusa Rancheria in Colusa County
- Rumsey Rancheria in Yolo County
- Paskenta Band of Nomlaki Indians in Tehama County

The following three Native American rancherias are located in the American River Division.

- United Auburn Rancheria in Placer County
- Shingle Springs Rancheria in El Dorado County

There are no reservations or rancherias in the Delta, West San Joaquin, or San Felipe divisions.

Environmental Consequences

The effects of Alternatives 1A, 1B, 2A, and 2B on ITAs are compared to conditions under the No Action Alternative. Environmental consequences to ITAs are primarily related to disturbances of the land or impacts to other natural resources held in trust by the United States for federally recognized tribes.

No Action Alternative. The No Action Alternative represents the future conditions without implementation of the M&I Water Shortage Policy under the alternatives. Projected land use changes would result in additional agricultural lands either being converted to municipal uses or more frequently fallowed due to reduced water supply allocations. Increased municipal land use could be related to an increased potential of disturbance. These changes have been addressed in local general plans and associated environmental documentation.

Alternative 1A. Under Alternative 1A, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. Therefore, it is anticipated that conditions for ITAs under this alternative would be similar to those described under the No Action Alternative, and there would be no impacts.

Alternative 1B. Under Alternative 1B, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. Therefore, it is anticipated that conditions for ITAs under this alternative would be similar to those described under the No Action Alternative, and there would be no impacts.

Alternative 2A. Under Alternative 2A, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. Therefore, it is anticipated that conditions for ITAs under this alternative would be similar to those described under the No Action Alternative, and there would be no impacts.

Alternative 2B. Under Alternative 2B, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. Therefore, it is anticipated that conditions for ITAs under this alternative would be similar to those described under the No Action Alternative, and there would be no impacts.

Cumulative Effects

These alternatives would not result in cumulative adverse impacts to ITAs when considered in combination with future projects such as water transfer projects or development of other water supplies.

AIR QUALITY

This section describes air quality for the study area considered in this EA. The description of the Affected Environment has been developed from information presented in the CVPIA PEIS and draft environmental documents prepared by and for Reclamation to support the Long-Term Contract Renewal process.

Affected Environment

Air quality is regulated in accordance with federal and state mandates. These regulations are enforced by local and regional authorities. The federal Clean Air Act was passed in 1963, and provided the first national program to control pollution from automobiles and stationary sources. The U.S. Environmental Protection Agency (EPA) subsequently established national ambient air quality standards in 1971 for the following air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and respirable particulate matter (PM_{10}).

California ambient air quality standards were established by the California Air Resources Board starting in 1969, pursuant to the Mulford-Carrell Act. The California ambient air quality standards are generally more stringent and include more pollutants than the national ambient air quality standards. The national and California ambient air quality standards are listed in Table 5-22.

Pollutants commonly associated with agricultural land uses include PM, CO, nitrogen oxides (NO_x), and O_3 precursors (reactive organic gases [ROG} and NO_x). PM results from field burning, farm operations such as tilling, plowing, and the operation of farm equipment on loose earth, and entrained road dust releases and fuels combustion in vehicles and farm equipment. PM emissions may also occur when fallow fields do not have a crop cover to inhibit wind erosion. Suspended PM represents a diverse mixture of solid and liquid material having size, shape, and density characteristics that allow the material to remain suspended in the air for measurable periods.

TABLE 5-22

AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
			Primary[c]	Secondary[d]
Ozone	8 Hour 1 Hour	-- 0.09 ppm	0.08 ppm 0.12 ppm	0.08 ppm 0.12 ppm
Carbon Monoxide	8 Hour 1 Hour	9.0 ppm 20 ppm	9 ppm 35 ppm	-- --
Nitrogen Dioxide	Annual Arithmetic Mean 1 Hour	-- 0.25 ppm	0.053 ppm --	0.053 ppm --
Sulfur Dioxide	Annual Arithmetic Mean 24 Hour 3 Hour 1 Hour	-- 0.04 ppm -- 0.25 ppm	0.030 ppm 0.14 ppm -- --	-- -- 0.5 ppm --
PM_{10}	Annual Arithmetic Mean 24 Hour	20 ug/m^3 50 $\mu g/m^3$	50 $\mu g/m^3$ 150 $\mu g/m^3$	50 $\mu g/m^3$ 150 $\mu g/m^3$
$PM_{2.5}$	Annual Arithmetic Mean 24 Hour	12 $\mu g/m^3$ --	15 $\mu g/m^3$ 65 $\mu g/m^3$	15 $\mu g/m^3$ 65 $\mu g/m^3$
Sulfates	24 Hour	25 $\mu g/m^3$	--	--
Lead	30 Day Average Calendar Quarter	1.5 $\mu g/m^3$ --	-- 1.5 $\mu g/m^3$	-- 1.5 $\mu g/m^3$
Hydrogen Sulfide	1 Hour	0.03 ppm	--	--
Vinyl Chloride	24 Hour	0.01 ppm	--	--
Visibility Reducing Particles	8 Hour	See Note[e]	--	--

[a]California standards for ozone, carbon monoxide, sulfur dioxide (1-hour and 25-hour), nitrogen dioxide, suspended particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles) are values that are not to be exceeded. All others are not to be equaled or exceeded.
[b]National standards, other than ozone, particulate matter, and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 25-hour standard is attained when the expected number of days/calendar year with a 25-hour average concentration above 150 ug/m^3 is equal to or less than one. For $PM_{2.5}$, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
[c]National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
[d]National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
[e]In sufficient amount to produce an extinction coefficient of 0.23/kilometer due to particles when the relative humidity is less than 70 percent.

ppm = parts/million (by volume).

Source: California Air Resources Board, 2003.

The physical and chemical composition of suspended particulate matter is highly variable, resulting in a wide range of public health concerns. Health concerns associated with suspended PM focus on those particles small enough to reach the lungs when inhaled (PM_{10} or smaller). Particulates can damage human health and retard plant growth. Particulates also reduce visibility, stain buildings, and corrode materials.

CO is released to the atmosphere during field burning and fuel combustion in farm equipment. NO_x is also released during field burning. ROG and NO_x are released in farm equipment emissions and during the application of pesticides and fertilizers.

Many M&I practices result in hydrocarbon and PM emissions. Sources of hydrocarbon emissions include fuel combustion in vehicles and industrial equipment, painting and solvent use, and residential heating. Sources of PM emissions include dust entrained in pavement, structural and automobile fires, construction and demolition, residential fuel combustion, and fuel consumption in vehicles.

O_3 is a respiratory irritant and an oxidant that, when at unhealthy levels, increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. It is formed by a photochemical reaction in the atmosphere by its precursors, ROG and NO_x.

Section 176(c) of the Clean Air Act requires federal agencies to ensure that actions undertaken in nonattainment or maintenance areas are consistent with the Clean Air Act and with federally enforceable air quality management plans. The EPA has promulgated separate rules that establish conformity analysis procedures for highway/mass-transit projects and for other (general) federal agency actions. General conformity requirements are potentially applicable to most other federal agency actions but apply only to those aspects of an action that involve ongoing federal agency responsibility and control over direct or indirect sources of air pollutant emissions.

The EPA conformity rule establishes a process that is intended to demonstrate that the proposed federal action.

- Would not cause or contribute to new violations of federal air quality standards
- Would not increase the frequency or severity of existing violations of federal air quality standards
- Would not delay the timely attainment of federal air quality standards

The EPA general conformity rule applies to federal actions occurring in nonattainment or maintenance areas when the net increase in total direct and indirect emissions of nonattainment pollutants (or their precursors) exceeds specified thresholds. The emission thresholds that trigger requirements of the conformity rule are called de minimis levels.

The federal Clean Air Act requires each state to identify areas that have ambient air quality in violation of federal standards. States are required to develop, adopt, and implement a State Implementation Plan (SIP) to achieve, maintain, and enforce federal ambient air quality standards in these nonattainment areas. Deadlines for achieving the federal air quality standards vary according to air pollutant and the severity of existing air quality problems. The SIP must be submitted to and approved by EPA. SIP elements are developed on a pollutant-by-pollutant basis whenever one of more air quality standards are being violated.

Upper Sacramento Valley (Shasta, Trinity, and Sacramento River Divisions). Seven counties form the Northern Sacramento Valley Air Basin (NSVAB), including Shasta, Tehama, Glenn, Butte, Colusa, Yuba, and Sutter. The potential for air pollution in the NSVAB is high due to the basin being surrounded by the Klamath, Coastal, and Cascade Mountains, when combined with the relatively calm winds and fairly stable atmospheric conditions. Shasta County experiences moderate to very poor capability to disperse pollutants nearly 80 percent of the time due to the relatively stable atmosphere (inversion layer) that suppresses vertical air movement. The inversion layer traps dust and other pollutants at or near the ground surface, which poses significant health risks for plants, animals, and people. Ozone pollution caused by vehicle and industrial emissions is the major contamination concern in the summer. A cold-weather inversion layer that traps airborne particles from open-burning practices, fireplaces, and wood stoves is the major problem in the winter. The NSVAB does not meet the state ambient air quality standards for O_3 and PM_{10}. Shasta County is designated as a moderate nonattainment area with respect to state standards for O_3 and PM_{10}, and meets the federal standards for these two pollutants.

Concentrations of O_3 in the middle and northern part of the Sacramento Valley periodically exceed state standards, but seldom exceed the federal ozone standard in the west Sacramento Valley. PM_{10} concentrations throughout the Sacramento Valley periodically exceed state standards but do not exceed federal standards. The Yolo County portion of the study area is considered a nonattainment area for the federal O_3 standard. Other portions of the study area are considered attainment areas for the O_3 and PM_{10} standards. The Yolo County portion of the study area is subject to the EPA general conformity rule. The conformity de minimis thresholds for the Yolo County portion of the study area are 50 tons/year of reactive organic compounds and 50 tons/year of NO_x.

Lower Sacramento Valley (American River Division). Most of the air pollutants in Sacramento, Placer, and El Dorado counties may be associated with either urban or agricultural land uses. Pollutants commonly associated with agricultural land uses include PM_{10}, CO, NO_x, and O_3 precursors.

Sacramento County and western Placer County (west of Colfax) are located in the Sacramento Valley Air Basin. The eastern portion of Placer County (east of Colfax) and the western portion of El Dorado County are located in the Mountain Counties Air Basin.

In the Sacramento area, pollutants of greatest concern include ROG, NO_x, CO, PM_{10}, and other visibility-reducing material. The largest single source of pollutants in the Sacramento area is automobile exhaust; O_3 and CO pollution are largely attributable to automobile use. Other sources, such as agricultural and construction and/or demolition activities, also contribute to high levels in suspended particulates. Since 1991, local air districts are responsible for preparing SIPs with Sacramento Area Council of Governments taking a support role in document preparation.

The Placer County Air Pollution Control District is responsible for managing the County’s air quality in a manner to protect and promote public health by controlling and seeking reductions of air pollutants while recognizing and considering the economic and environmental impacts. The primary sources of PM_{10} in Placer County are entrained road dust and construction and demolition activities. The entire county has been designated as unclassified for CO. The primary source of CO emissions in Placer County is motor vehicle emissions. Regional development patterns cause O_3 problems. Motor vehicles are the primary source of Placer County NO_x and ROG emissions.

Air quality in El Dorado County is affected by stationary sources and mobile sources. Stationary sources include mining operations; lumber processing; industrial boilers; refuse burning; wildfires; service station operations; pesticide use; farm equipment operations; construction equipment operations; utility equipment; range improvement; forest management; residential wood combustion; residential space and water heating; fuel production and transfer; formulation and application of paints, solvents, and other coatings; organic waste disposal; dry cleaning operations; soil decontamination; wastewater processing; and graphic arts processes. Mobile sources include automobiles, trucks, buses, and other vehicles. Vehicle pollutants are produced by vehicles traveling within the county, but are also carried into the county by prevailing wind patterns from the Sacramento County urbanized area and the San Francisco Bay Area.

Vehicular traffic along U.S. Highway 50 between Sacramento and South Lake Tahoe is also a significant contributor of contaminants.

Northern and Central San Joaquin Valley (Eastside, Delta, and West San Joaquin Divisions). The San Joaquin Valley Air Basin (SJVAB) comprises the southern portion of the Central Valley, including the lower slopes of the mountain ranges. Air quality in the SJVAB is regulated by the San Joaquin Valley Unified Air Pollution Control District, which consists of Merced, Madera, Fresno, Kern, Kings, San Joaquin, Stanislaus, and Tulare counties. Major urban centers in the air basin include Bakersfield, Fresno, Modesto and Stockton. The entire SJVAB is designated nonattainment with respect to federal and state O_3 and PM_{10} standards, and is designated attainment or unclassified for CO, NO_2 and SO_2. Most of the air pollutants in the area are associated with urban and agricultural land uses. In general, four basic land uses occur in the area: irrigated agriculture; dryland agriculture (dry cropped, fallow, idle, or grazed); M&I; and undeveloped (natural). The primary air pollutants associated with all four land uses include PM and hydrocarbons or organic gases that may serve as O_3 precursors.

San Francisco Bay Area (American River, Delta, and San Felipe Divisions). Contra Costa, Alameda, and Santa Clara counties are included in the San Francisco Bay Area Air Basin which is managed by the Bay Area Air Quality Management District (BAAQMD). In 2000, the BAAQMD prepared a clean air plan designed to bring the area into compliance with nonattainment area pollutants. The area has been designated as a nonattainment area for O_3 and PM_{10}. The area has been designated as an attainment area for NO_2, SO_2, and CO. The largest sources of air pollution in the area are related to automobile traffic and entrained road dust. Other air pollution sources include petroleum refineries, manufacturers, power plants, construction, demolition, and urban activities such as painting. The counties are coordinating with the Metropolitan Transportation Commission to prepare a Transportation Improvement Plan to be in conformance with the SIP for nonattainment areas.

San Benito County is part of the North Central Coast Air Basin and Monterey Bay Unified Air Pollution Control District (MBUAPCD). The MBUAPCD was named a Federal Maintenance Area for ozone in 1997. There have been violations of the O_3 standards in San Benito County. However, the California Air Resources Board determined that most of these violations are due to emissions upwind of the North Central Coast Air Basin. The MBUAPCD is encouraging the land use agencies to consider air quality issues when considering land use changes, expansion of public transportation within this air basin, and expansion of public education programs, which will be especially important as residential areas of Hollister and San Juan Bautista are developed.

Environmental Consequences

The effects of Alternatives 1A, 1B, 2A, and 2B on air quality are compared to conditions under the No Action Alternative. Environmental consequences to air quality are primarily related to primary impacts associated with construction or disturbances of agricultural land or secondary impacts associated with growth.

No Action Alternative. The No Action Alternative represents the future conditions without implementation of the M&I Water Shortage Policy under the action alternatives. Projected land use changes would result in additional agricultural lands either being converted to municipal uses or more frequently fallowed due to reduced water supply allocations. These changes and responses have been addressed in local general plans and associated environmental documentation and in the CVPIA PEIS.

Alternative 1A. Under Alternative 1A, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. It is not anticipated that additional lands would be fallowed on a long-term basis due to changes in the allocations of Irrigation CVP water service contracts. Therefore, it is not anticipated that air quality would change under this alternative as compared to the No Action Alternative, and there would be no impacts.

Alternative 1B. Under Alternative 1B, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. It is not anticipated that additional lands would be fallowed on a long-term basis due to changes in the allocations of Irrigation CVP water service contracts. Therefore, it is not anticipated that air quality would change under this alternative as compared to the No Action Alternative, and there would be no impacts.

Alternative 2A. Under Alternative 2A, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. It is not anticipated that additional lands would be fallowed on a long-term basis due to changes in the allocations of Irrigation CVP water service contracts. Therefore, it is not anticipated that air quality would change under this alternative as compared to the No Action Alternative, and there would be no impacts.

Alternative 2B. Under Alternative 2B, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. It is not anticipated that additional lands would be fallowed on a long-term basis due to changes in the allocations of Irrigation CVP water service contracts. Therefore, it is not anticipated that air quality would change under this alternative as compared to the No Action Alternative, and there would be no impacts.

Cumulative Effects

Alternatives 1A, 1B, 2A,and 2B may result in cumulative adverse impacts to air quality when considered in combination with future projects such as water transfer projects or development of other water supplies. More frequent fallowing of lands may result in additional violations or prevent compliance with future SIPs. The area to be fallowed may not be different than an area that would be fallowed under future water transfer programs. However, it is difficult to project specific water transfer opportunities. Impacts of future projects would be evaluated under separate environmental documentation.

SOILS

This section describes soils for the study area considered in this EA. The description of the Affected Environment has been developed from information presented in the CVPIA PEIS and draft environmental documents prepared by and for Reclamation to support the Long-Term Contract Renewal process.

Affected Environment

Issues related to soils are defined with respect to soil characteristics and with respect to issues that may be affected by changes that could occur under the alternatives.

Soil Characteristics. In the Central Valley, soils are divided into four physiographic regions. Valley land and valley basin land soils occupy most of the Central Valley floor. Valley land soils consist of deep alluvial and aeolian soils that make up some of the best agricultural land in the state. Valley basin lands consist of organic soils of the Sacramento-San Joaquin Delta, poorly drained soils, and saline and alkali soils in the valley trough and on the basin rims.

Upper Sacramento Valley (Shasta, Trinity, and Sacramento River Divisions). Most of Shasta County is characterized by moderately expansive soils with areas of low expansiveness in the South Central Region and southeastern corner of the County. Small scattered areas of highly expansive soils occur in the mountains of the Western Upland, French Gulch, and North East Shasta County Planning Areas.

Soils throughout the Upper Sacramento Valley range from decomposed granite in Shasta County to clay and silt loams near Colusa. Many of the soils along the Sacramento River corridor are permeable and of good quality for agricultural activities. Soils on the basin margins tend to have slower infiltration rates than soils on flatter lands toward the center of the basin. Precipitation on soils with slow infiltration rates tends to runoff rather than infiltrate into the soil. This can result in erosion problems.

A significant band of decomposed granite soils is located west of the Redding area from west of Shasta Dam south to Clear Creek. Erosion is a concern whenever development activities are proposed in soils containing parent materials of decomposed granite. Once disturbed, decomposed granite soils are very difficult to re-stabilize and offer poor support for reestablishment of vegetation.

Lower Sacramento Valley (American River Division). The valley floor is divided into several geomorphic land types including low alluvial fans and plains, river flood plains and channels, terraced deposits and dissected uplands. The alluvial fans and plains consist of unconsolidated continental deposits that extend from the edges of the valleys toward the valley floor. The alluvial plains cover most of the valley floor and make up some of the intensely developed agricultural lands in the Central Valley. Alluvial fans along the Sierra Nevada consist of high percentages of clean, well sorted gravel and sand.

River flood plains and channels lie along the major rivers and to a lesser extent the smaller streams that drain into the valley from the surrounding Coast Range and Sierra Nevada. Some flood plains are well-defined where rivers are incised into their alluvial fans. These deposits tend to be coarse and sandy in the channels and finer and silty in the flood plains. Many of these deposits have been used for gravel mining activities.

Calcic brown and noncalcic brown alluvial soils are found in the Sacramento Valley on deep alluvial fans and flood plains occurring in intermediate rainfall (10 to 20 inches annually). These two soils tend to be brown to light brown with a loam texture that forms soft clods. Calcic brown soil is calcareous; noncalcic soil is usually neutral or slightly acid. These soils are highly valued for irrigated crops.

Terrace soils characterized by a red-iron hardpan layer are found along the east side of the Sacramento Valley. These soils consist of reddish surface soil with a dense silica-iron cemented hardpan, which is generally one foot thick. Some of these hardpan soils have considerable amounts of lime. Dry farming practices support hay, grains, and pastures, although following ripping; these soils are well suited for orchards and vineyards. These soils are subject to expansion, localized landslides, and erosion.

Upland soils located upslope of the terrace soils continue are characterized by shallow depth to bedrock. Soils on the east side of the Sacramento Valley have mostly developed on igneous rocks. The soil has a loam-to-clay-loam texture with low organic matter, and some areas have calcareous subsoils. These soils are found in areas of low to moderate rainfall that support grasslands used primarily for grazing. Tilled areas are subject to erosion.

Northern and Central San Joaquin Valley (Eastside, Delta, and West San Joaquin Divisions). The soils of the San Joaquin Valley are divided into four physiographic groups: valley land soils, valley basin land soils, terrace soils, and upland soils. Valley land and valley basin land soils occupy most of the San Joaquin Valley floor. Valley land soils are well-drained, agricultural soils that are generally found on flat to gently sloping surfaces such as on alluvial fans. These soils are composed of alluvial- and aeolian-deposited soils and tend to be loamy. These soils are highly valued for irrigated crops. A gray desert alluvial soil, a light-colored calcareous soil with little organic matter is found on alluvial fans and floodplains in areas with rainfall of four to seven inches/year. The gray desert alluvial soils are too dry to produce crops without irrigation.

Valley basin land soils occupy the lowest parts of the San Joaquin Valley, including imperfectly drained soils and saline/alkaline soils. Imperfectly drained soils, found in the troughs of the San Joaquin Valley, generally contain dark clays and have a high water table or are subject to overflow. These soils tend to be gray to dark gray with a high clay content that forms clods and may be neutral to slightly calcareous.

Saline and alkali soils are characterized by excess salts, excess sodium, or both. Saline soils often form a white crust on the surface while soils with excess sodium appear black. Saline soils form a crust on top of other soils, change the chemical characteristics of the soils in the root zone, and reduce the capability of the soil to transfer applied moisture to the roots. To minimize salinity problems, irrigators apply water to the soils before cultivation to leach salts from the root zone. These conditions frequently cause drainage and soil salinity problems, as described in the groundwater subsection of this chapter. In addition to drainage, problems have occurred with the accumulation of arsenic, boron, molybdenum, and selenium that have leached from natural deposits in the San Joaquin Valley.

San Francisco Bay Area (American River, Delta, and San Felipe Divisions). Soil characteristics in the San Francisco Bay Area vary widely because of the wide range of topography, parent material, vegetation, and geology. Soils vary from rocky and sandy textures to clayey textures. In much of western Alameda County, Franciscan bedrock is overlain by unconsolidated clays, silts, sands, and gravels These deposits range in thickness from more than 300 feet to more than 1,100 feet and sediments are fairly continuous beneath San Francisco Bay. These muds are often overlain and interlayered with alluvial deposits of fine-grained and clayey sands that are 10 to 50 feet thick on the east side of the bay (Helley and Graymer, 1997a, 1997b).

Overall Santa Clara County is formed by folded and faulted sedimentary and volcanic rock in the foothills and alluvial and bay deposits in the lower valleys. Soils include bay muds along the baylands; poorly drained alluvium under downtown San Jose and southeast of Gilroy; well drained alluvial plains and fans under most of the Santa Clara Valley; alluvial terraces and fans along the edges of the foothills; and bedrock of the Santa Cruz Mountains and Diablo Range which are areas generally not served by CVP water. Soils along the foothills are subject to erosion.

The alluvial materials in Zone 6 of San Benito County Flood Control and Water Conservation District service area includes alluvium and terrace deposits, with terrace deposits more prevalent along the east side of the Hollister Valley. Stream gravel is present along the rivers. Hillside areas to the south and east of the service area are underlain by continental mudstone. Soils on the valley floor are primarily loamy to clayey and have low to moderate shrink expansive potential.

Soil Issues. Critical issues considered in this section include wind erosion, water erosion, and soil salinity and chemical composition.

Wind Erosion. Soil erodibility, local wind erosion climatic factor, soil surface roughness, width of field, and vegetative cover affect wind erosion of soils. The more moisture in the soil, the less susceptible it is to wind erosion. Some soils, such as aeolian-deposited sands, are more susceptible to wind erosion than alluvial soils. Soil taken out of irrigation and allowed to remain barren with no cover vegetation would have greater losses to wind erosion than the same soils under a good crop and land management program with irrigation.

Wind erosion makes the soil shallower and can remove organic matter and needed plant nutrients. Also, blowing soil particles can damage plants, particularly young plants. Blowing soils can also cause offsite problems such as reduced visibility and increased allergic reaction to dust. Some soils on the west side of the San Joaquin Valley have naturally occurring asbestos. If these soils become airborne, the local population, as well as any nearby surface water facilities, could be affected. Soils prone to wind erosion require a vegetation cover to reduce or eliminate the impacts of blowing soils. Providing water for native plants may allow weeds to grow, potentially providing food and habitat value for wildlife, but also potentially requiring the increased use of pesticides on adjacent farmlands to control weeds, insects, and crop diseases. Also, uncultivated areas covered with cover crops can become fire hazards.

Water Erosion. There are several types of water-based soil erosion, including sheet, splash, and rill/gully erosion. Some factors that influence the erodibility of soils include land slope, surface texture and structure, infiltration rate, permeability, particle size, and the presence of organic or other cementing materials. Level land erodes less than sloped land because flow velocities are less. Based on this factor alone, terrace and upland soils would be more susceptible to water erosion than soils on the valley floor.

Soil Salinity and Chemical Composition. Soil salinity problems occur primarily in the western and southern portions of the San Joaquin Valley. Most soils in this region are derived from marine sediments of the Coast Range, which contain salts and potentially trace elements such as arsenic, boron, molybdenum, and selenium. Soil salinity problems in the San Joaquin Valley are intensified by poor soil drainage, insufficient water supply for adequate leaching, poor quality (high salinity) irrigation water, high water table, and an arid environment.

Soil selenium is primarily a concern on the west side of the San Joaquin Valley. When the soils on the west side are irrigated, selenium and other salts and trace elements dissolve and leach into the shallow groundwater. Soils derived from the Sierra Nevada on the east side of the valley are less salty and contain much less selenium. Over the past 30 to 40 years of irrigation, soluble selenium has been leached from the soils into shallow groundwater. Reclamation and local water supply agencies are working to minimize the impacts of salinity and selenium on agricultural activities and the water quality of groundwater and surface waters.

Environmental Consequences

The effects of Alternatives 1A, 1B, 2A, and 2B on soils are compared to conditions under the No Action Alternative. Environmental consequences to soils are primarily related to land use on the soils, erosion, and soil salinity.

No Action Alternative. The No Action Alternative represents the future conditions without implementation of proposed 2001 M&I Water Shortage Policy under the alternatives. Reduction in the allocations of Irrigation CVP water service contract water could result in an increase in groundwater use, especially in the San Joaquin Valley. During recent droughts when farmers increased groundwater withdrawals in the San Joaquin Valley, soil salinity increased. The high soil salinity persisted for several years until the salts could be leached. Long-term use of increased groundwater with fewer periods when Delta water is used for irrigation could increase soil salinity. Increased frequency of fallowing due to reductions in water supply allocations also will increase the potential for soil and water erosion.

Alternative 1A. Under Alternative 1A, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. It is not anticipated that additional lands would be fallowed on a long-term basis due to changes in the allocations of Irrigation CVP water service contracts, although the frequency of fallowing could be increased.

Alternative 1B. Under Alternative 1B, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. It is not anticipated that additional lands would be fallowed on a long-term basis due to changes in the allocations of Irrigation CVP water service contracts, although the frequency of fallowing could be increased.

Alternative 2A. Under Alternative 2A, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. It is not anticipated that additional lands would be fallowed on a long-term basis due to changes in the allocations of Irrigation CVP water service contracts, although the frequency of fallowing could be increased.

Alternative 2B. Under Alternative 2B, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. It is not anticipated that additional lands would be fallowed on a long-term basis due to changes in the allocations of Irrigation CVP water service contracts, although the frequency of fallowing could be increased.

Cumulative Effects

These alternatives would not result in cumulative adverse impacts to soils when considered in combination with future projects such as water transfer projects or development of other water supplies that will require separate environmental documentation to address additional impacts from the transfer projects or development of other water supplies.

VISUAL RESOURCES

This section describes visual resources for the study area considered in this EA. The description of the Affected Environment has been developed from information presented in the CVPIA PEIS and draft environmental documents prepared by and for Reclamation to support the Long-Term Contract Renewal process.

Affected Environment

Visual resources are the natural and cultural features of the landscape that can be seen and that contribute to the public's appreciative enjoyment of the environment. Visual resources impacts are generally defined in terms of a project's physical characteristics and potential visibility and the extent to which the project's presence would change the perceived visual character and quality of the environment in which it would be located.

Physical form and visual character are the result of the interaction of natural and engineered elements. Natural elements, including topography, hydrology, vegetation, and climate, create the basic physical context. Engineered elements, including buildings, roads, infrastructure, and settlement patterns, are secondary elements that act on the natural context to establish a particular physical or visual environment.

Upper Sacramento Valley (Shasta, Trinity, and Sacramento River Divisions). Shasta County is situated where the Central Valley meets the convergence of the Klamath and Coastal Mountain Ranges to the northwest and west, with the Cascade Mountain Range to the northeast and east. Elevations in Shasta County range between 400 and 700 feet. Coniferous forest is the predominant vegetation in the mountainous regions of the county; in many areas, this cover has been modified by human activities. Shasta County is characterized by a combination of land uses: municipal, industrial, agricultural, and open space. The human-made environment includes urban/suburban and rural residential areas, commercial and industrial areas, transportation networks, water impoundments, and cultivated areas. Many highways in Shasta County are considered scenic highways. Interstate 5 north of the City of Shasta Lake to the Oregon border is a corridor in which the natural environment is dominant. Along this corridor are outstanding views of Shasta Lake, the Sacramento River Canyon, Castle Crags, and Mount Shasta.

The western Sacramento Valley is characterized as predominately lowlands and plains with few hills. This area is mostly agricultural, with areas of wetlands and oaklands, riparian areas along the major watercourses, and numerous small communities throughout the valley. There are no officially designated state or local scenic highways in the western Sacramento Valley. However, State Route 16 in Yolo County approximately 10 miles west of the Dunnigan is eligible for designation because of views of chaparral, woodland, and grassland areas and unusual rock formations.

Lower Sacramento Valley (American River Division). Visual resources in this area range from urbanized areas to agricultural lands, with rivers, creeks, and lakes. The urbanized portion of this area also ranges from downtown areas in Sacramento to many suburban areas. The rural expanse surrounding the urbanized area consists of a landscape involving little visual diversity but a distinctly agricultural character typical of the region. Views of the Sierra Nevada foothills, rivers that pass through the area provide visual interest. Human-made features include roadways, railroad lines, high voltage transmission line corridors, and the Folsom South Canal.

Folsom Lake, a man-made reservoir consisting of nearly 75 miles of shoreline, is a significant visual entity that contrasts sharply with the foothill landscape, creating a vivid landscape. Reservoir levels are drawn down as summer progresses creating a ring of bare soil along the water's edge. This ring is a dominant negative visual feature, affecting the visual quality of the area, and is accentuated in dry years. Folsom Lake is generally considered to provide a pleasing visual setting. Views of Folsom Lake have become increasingly limited due to restricted access and residential development abutting public lands and recreation areas.

Lake Natoma, the regulating reservoir for releases from Folsom Dam, is a long, narrow lake. Land surrounding the lake is mostly undeveloped and consists primarily of wooded and undeveloped canyon areas, sheer bluffs, and dredge tailings (cobble piles remaining from the gold mining era).

The foothill areas of Placer and El Dorado counties provide a diverse physical and natural environment and exhibits variety in its visual resources. Landscapes include urban areas, small unincorporated communities, timber production and mineral extraction areas, agricultural preserves (lands under Williamson Act contract), areas for preservation of natural resources, recreation areas such as the Granite Chief Wilderness, the Folsom Lake State Recreation Area, and the Auburn State Recreation Area; U.S. Forest Service lands, and Bureau of Land Management lands.

Northern and Central San Joaquin Valley (Eastside, Delta, and West San Joaquin Divisions). The San Joaquin Valley is lowland with predominantly flat and gently sloping terrain bordered by hills and low mountains. The valley is semi-arid to arid, and few natural lakes of perennial streams are present. The San Joaquin River is the principal water feature. A number of wetlands used as wildlife refuges are located in the region. The valley area is developed predominantly for agriculture. It is sparsely to moderately populated with several major urbanized areas, such as Tracy and Stockton.

CVP facilities include the New Melones, San Luis, Los Banos, and Little Panoche reservoirs; O’Neill Forebay, and the Delta-Mendota, San Luis, and Coalinga canals. The reservoirs provide areas with significant views. The landscape in other area is considered common scenic to minimal scenic quality. The areas surrounding the San Luis Unit and Delta-Mendota Canal are predominantly of minimal scenic quality, with some areas of common scenic quality.

Interstate 5 provides panoramic view opportunities in some of the Delta-Mendota Canal Unit, some segments of which are designated scenic highways. Views of the Delta- Mendota Canal and California

Aqueduct are the basis for the designation of Interstate 5 as a scenic highway. Similarly, views of San Luis Reservoir are important reasons for State Route 152 being designated a scenic highway. Wildlife refuges in the region near the San Luis and Delta-Mendota Canal Units are considered to have landscape variety that ranges from common scenic to distinctive scenic quality. These areas provide visual contrast with surrounding agricultural lands primarily because of their vegetation and water. The scenic quality is enhanced seasonally by the large numbers and variety of waterfowl and seasonal wildflower displays, which attract substantial visitation, thereby increasing the viewer sensitivity of the area.

San Francisco Bay Area (Delta, American, and San Felipe Divisions). Topography in the San Francisco Bay area ranges in topography from sea level to the foothills with elevations of 1,500 feet and higher. This provides a diverse physical and natural environment and a wide range of visual resources. Typical views and landscapes include existing urban development, natural and altered open-space areas, open-space corridors, major ridgelines, and scenic waterways. The terrain ranges from the bay plain to the gently sloping hills and wooded ravines. The service area has smaller, localized scenic resources such as isolated hilltops, rock outcroppings, mature stands of trees, lakes, reservoirs, and other natural features. A mix of older and newer developments characterizes the urban areas. Locations in the urban areas that provide visual opportunities include the many ridgelines, knolls, canyons, hillsides, and watershed areas surrounding the communities. City parks and recreation areas, community-wide parks, open-space areas adjacent to ravines, golf courses, and resource preserves also provide visual opportunities for these urban areas.

The landscape also includes the urbanized shoreline along San Francisco Bay. The water system of San Francisco, San Pablo, and Suisun Bays are major scenic resources in the area. The waterway system provides a pleasant contrast to the land forms of the area. Where the water reaches the shoreline, a mix of land uses occur: salt marshes, railroad tracks, industrial activities, housing, and parkland. All of these uses add to the diversity and interest of the shoreline. There are many localized scenic features in the county, including scenic ridges, isolated hillsides and hilltops, rock outcroppings, mature stands of trees, lakes, reservoirs, and other natural features. State-designated scenic routes occur within Contra Costa, Alameda, Santa Clara, and San Benito counties.

Environmental Consequences

The effects of Alternatives 1A, 1B, 2A, and 2B on visual resources are compared to conditions under the No Action Alternative. Environmental consequences to visual resources are primarily related to disturbances of the land and land uses.

No Action Alternative. The No Action Alternative represents the future conditions without implementation of the M&I Water Shortage Policy under the alternatives. Projected land use changes would result in additional agricultural lands either being converted to municipal uses or more frequently fallowed due to reduced water supply allocations. The related changes in visual resources have been addressed in local general plans and associated environmental documentation.

Alternative 1A. Under Alternative 1A, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. Therefore, it is anticipated that visual resources under this alternative would be similar to those described under the No Action Alternative, and there would be no impacts.

Alternative 1B. Under Alternative 1B, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. Therefore, it is anticipated that visual resources under this alternative would be similar to those described under the No Action Alternative, and there would be no impacts.

Alternative 2A. Under Alternative 2A, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. Therefore, it is anticipated that visual resources under this alternative would be similar to those described under the No Action Alternative, and there would be no impacts.

Alternative 2B. Under Alternative 2B, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. Therefore, it is anticipated that visual resources under this alternative would be similar to those described under the No Action Alternative, and there would be no impacts.

Cumulative Effects

These alternatives would not result in cumulative adverse impacts to visual resources when considered in combination with future projects such as water transfer projects or development of other water supplies.

POWER RESOURCES

This section describes power resources conditions for the study area considered in this EA.

Affected Environment

CVP facilities were constructed and are operated under Reclamation Law and the authorizing legislation for each facility. Initially, Reclamation projects were authorized solely for irrigation and reclamation. Reclamation Law was amended to include power as a purpose of the projects if power was necessary for operation of the irrigation water supply facilities, or if power could be developed economically in conjunction with the water supply projects. Subsequently, Reclamation Law was amended to also allow leasing of surplus power for Preference Power Customers. Surplus power is described as power that exceeds the capacity and energy required to operate the Reclamation facilities (Project Use Load). Preference Power Customers include irrigation and reclamation districts, cooperatives, public utility districts, municipalities, California educational and penal institutions, and Federal defense and other institutions. Preference Power Customers also include “first preference” customers which have priority over other preference contractors, such as customers in Trinity, Calaveras, and Tuolumne counties.

Western Area Power Administration (Western) was established as part of the Department of Energy to operate, maintain, and upgrade the transmission grid that was constructed by the CVP. As part of their marketing function, Western ensures that CVP Project Use loads are met at all times by using a mix of generation resources including CVP generation and other purchased resources. Western also dispatches and markets power surplus to the CVP project needs to preference power customers and other utilities. The CVP power generation facilities were initially developed based on the premise that power could be generated to meet Project Use loads. Currently, Project Use demand uses on average approximately 25 to 30 percent of the power generated by the CVP.

The CVP power facilities include 11 hydroelectric powerplants with 38 generators, and have a total maximum generating capacity of 2,045,000 kilowatts (kW). Major factors that influence powerplant operations include required downstream water releases, electric system needs, and Project Use demand. CVP powerplants have produced an average of 4,800,000 kWh per year over the last 15 years.

Historically, power generation from CVP hydropower facilities has fluctuated significantly in response to reservoir releases. Reservoir releases are significantly affected by droughts, minimum streamflow requirements, flow fluctuation restrictions, and water quality requirements. Changes in CVP operations to meet water quality requirements have also impacted the monthly release patterns and resulting power generation at all CVP hydroelectric generation facilities. Historically, maximum releases from CVP facilities occurred during the summer months in periods of high irrigation water demand, which correspond to the peak power load periods in the area served by CVP generation. Recent water quality requirements have increased the need for water releases in the winter and spring months, reducing the amount of water available for release during the peak summer months. Consequently, peak generation during the summer period has been reduced and power generation in other months has been increased. Generation patterns may not coincide with power loads.

Environmental Consequences

The effects of Alternatives 1A, 1B, 2A, and 2B on power resources are compared to conditions under the No Action Alternative. Environmental consequences are primarily related to changes monthly on- and off-peak Project Use capacity and energy.

No Action Alternative. The No Action Alternative represents the future conditions without implementation of the September 2001 Draft CVP M&I Water Shortage Policy. Projected CVP water supply allocations and related power generation projections are described as in the OCAP 2004 model runs developed for the 2020 conditions.

Alternative 1A. Total CVP water use would be the same in this alternative as under the No Action Alternative. Use of more water for M&I uses as compared to agricultural uses increases deliveries during winter months. However, the highest M&I water demand occurs during the late summer months when peak power demand is highest. Therefore, the power generation potential under this alternative would be comparable to conditions under the No Action Alternative, and there would be no impacts.

Alternative 1B. Total CVP water use would be the same in this alternative as under the No Action Alternative. Use of more water for M&I uses as compared to agricultural uses increases deliveries during winter months. However, the highest M&I water demand occurs during the late summer months when peak power demand is highest. Therefore, the power generation potential under this alternative would be comparable to conditions under the No Action Alternative, and there would be no impacts.

Alternative 2A. Total CVP water use would be the same in this alternative as under the No Action Alternative. Use of more water for M&I uses as compared to agricultural uses increases deliveries during winter months. However, the highest M&I water demand occurs during the late summer months when peak power demand is highest. Therefore, the power generation potential under this alternative would be comparable to conditions under the No Action Alternative, and there would be no impacts.

Alternative 2B. Total CVP water use would be the same in this alternative as under the No Action Alternative. Use of more water for M&I uses as compared to agricultural uses increases deliveries during winter months. However, the highest M&I water demand occurs during the late summer months when peak power demand is highest. Therefore, the power generation potential under this alternative would be comparable to conditions under the No Action Alternative, and there would be no impacts.

Cumulative Effects

These alternatives would not result in cumulative adverse impacts to power resources when considered in combination with future projects such as water transfer projects or development of other water supplies.

SOCIAL CONDITIONS

This section describes social conditions for the study area considered in this EA.

Affected Environment

The Affected Environment is defined by the description of population, housing, and employment, and income using information from the California Department of Finance, California Economic Development Department, and the U.S. Census Bureau. The information is presented using county-wide data and therefore, may not necessarily be indicative of conditions within water service contractors' service areas. However, county-wide information presents the regional social conditions which need to be considered for an overall analysis of social conditions.

Population estimates and projections through 2030 were developed using information from the California Department of Finance, California Economic Development Department, as summarized in Table 5-23. Housing information was prepared using information from the U.S. Census Bureau, as summarized in Table 5-24. Employment information was prepared using information from the California Economic Development Department, as summarized in Table 5-25. Income information was developed using information from the U.S. Census Bureau, as summarized in Table 5-26.

All of the counties considered in this EA are projecting absolute growth rates in this period of 7 to 19 percent. The highest rate of change is in the Delta and West San Joaquin divisions. This change is primarily caused by the development of bedroom communities for workers in the San Francisco Bay Area and the continued development of communities located along the State Highway 99 corridor between Sacramento and Fresno. This development will result in a loss of agricultural development as lands are converted to municipal uses.

Environmental Consequences

The effects of Alternatives 1A, 1B, 2A, and 2B on social conditions are compared to conditions under the No Action Alternative. Environmental consequences are primarily related to changes in M&I and agricultural economics.

No Action Alternative. The No Action Alternative represents the future conditions without implementation of the M&I Water Shortage Policy under the alternatives. Projected land use changes would result in additional agricultural lands more frequently fallowed due to reduced water supply allocations. These changes could increase M&I employment and reduce agricultural employment. These changes may not necessarily occur simultaneously and therefore, higher unemployment may occur on an interim basis in a localized region, especially in the rural counties that have high agricultural employment.

Alternative 1A. Under Alternative 1A, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. However, the slight reduction in the availability of Irrigation CVP Water service contract water in drier years could result in higher unemployment and lower income in the rural counties and higher employment and incomes within M&I CVP water service contractors service area due to increased water allocations in drier years. This alternative does not support additional growth over values included in the No Action Alternative, but may provide more certainty for industrial and commercial water users.

TABLE 5-23

POPULATION ESTIMATES AND PROJECTIONS BY COUNTY

County	C VP Division	2003	2010	2020	2030
Shasta	Shasta and Trinity	167,500	196,464	227,922	260,160
Tehama	Sacramento River	57,900	62,442	68,323	74,171
Glenn	Sacramento River	27,400	29,348	31,950	34,379
Colusa	Sacramento River	19,750	22,697	26,337	29,353
Sacramento	American River	1,311,700	1,555,848	1,946,679	2,293,028
Placer	American River	283,500	349,113	456,040	544,690
El Dorado	American River	165,900	188,471	221,289	250,173
Stanislaus	Eastside and Delta	483,000	559,051	653,841	744,599
San Joaquin	Delta	616,500	747,149	989,462	744,599
Merced	Delta and West San Joaquin	227,000	277,715	360,831	437,880
Fresno	Delta and West San Joaquin	845,600	949,961	1,114,654	1,297,476
Kings	Delta and West San Joaquin	137,400	156,334	184,751	223,767
Contra Costa	American River and Delta	992,700	1,116,298	1,327,081	1,543,053
Alameda	American River	1,487,700	1,651,164	1,864,145	2,038,482
Santa Clara	San Felipe	1,719,500	1,844,146	2,006,992	2,152,963
San Benito	San Felipe	56,300	62,530	73,547	84,727
TOTALS		8,599,350	9,768,731	11,553,844	12,753,500

TABLE 5-24

HOUSING TYPES IN YEAR 2000 BY COUNTY

County	C VP Division	No. of Single-Family	No. of Multi-Family	No. of Mobile Home	Vacancy Rate	Median Monthly Rent	Median House Value
Shasta	Shasta and Trinity	48,162	10,622	10,610	7.8%	$404	$112,900
Tehama	Sacramento River	14,760	2,805	6,134	10.8%	$398	$97,000
Glenn	Sacramento River	7,190	1,418	1,404	8.1%	$330	$97,800
Colusa	Sacramento River	5,291	783	737	10.0%	$398	$111,000
Sacramento	American River	333,421	131,592	15,484	4.4%	$592	$141,100
Placer	American River	88,534	17,501	4,693	12.2%	$952	$213,900
El Dorado	American River	59,499	8,367	4,373	17.3%	$591	$191,500
Stanislaus	Eastside and Delta	118,841	25,939	8,482	3.8%	$531	$123,900
San Joaquin	Delta	143,591	39,435	9,242	4.0%	$491	$139,800
Merced	Delta and West San Joaquin	51,451	12,633	5,307	6.7%	$394	$110,900
Fresno	Delta and West San Joaquin	187,511	72,130	13,344	6.6%	$411	$102,600
Kings	Delta and West San Joaquin	27,719	6,950	2,092	5.8%	$436	$96,500
Contra Costa	American River and Delta	264,120	85,331	7,572	3.0%	$879	$253,800
Alameda	American River	331,724	204,425	7,650	3.0%	$833	$291,900
Santa Clara	San Felipe	378,664	185,841	19,658	2.3%	$1,405	$422,600
San Benito	San Felipe	13,891	1,951	874	3.7%	$715	$283,900
TOTALS		2,074,369	807,723	117,656	Not Applicable	$9,760	$2,791,100

TABLE 5-25

EMPLOYMENT IN YEAR 2003 BY COUNTY

County	C VP Division	Civilian Labor Force	Agricultural Employment	Total Employment	Rate of Unemployment
Shasta	Shasta and Trinity	81,900	800	65,100	7.8%
Tehama	Sacramento River	27,390	1,220	17,650	7.2%
Glenn	Sacramento River	9,840	1,260	7,110	12.7%
Colusa	Sacramento River	8,690	7,240	2,070	18.9%
Sacramento	American River	650,000	2,500	581,300	5.6%
Placer	American River	141,600	600	126,400	4.7%
El Dorado	American River	82,600	300	48,200	5.4%
Stanislaus	Eastside and Delta	216,700	13,500	165,500	11.5%
San Joaquin	Delta	279,000	16,500	214,100	10.1%
Merced	Delta and West San Joaquin	89,800	10,600	66,100	14.8%
Fresno	Delta and West San Joaquin	456,200	53,800	368,700	14.0%
Kings	Delta and West San Joaquin	49,200	39,700	7,300	14.6%
Contra Costa	American River and Delta	517,700	2,100	336,300	5.5%
Alameda	American River	750,300	600	691,100	6.8%
Santa Clara	San Felipe	895,100	4,200	858,400	8.2%
San Benito	San Felipe	28,980	2,360	15,750	9.6%
TOTALS		4,285,000	157,280	3,571,080	Not Applicable

TABLE 5-26

INCOME IN YEAR 1999 BY COUNTY

County	C VP Division	Per Capita Income/Year	Median Household Income/Year	Poverty Rate
Shasta	Shasta and Trinity	$17,738	$34,335	15%
Tehama	Sacramento River	$15,793	$31,206	17%
Glenn	Sacramento River	$14,069	$32,107	18%
Colusa	Sacramento River	$14,730	$35,062	16%
Sacramento	American River	$21,142	$43,816	14%
Placer	American River	$27,963	$57,535	6%
El Dorado	American River	$25,560	$51,484	7%
Stanislaus	Eastside and Delta	$16,913	$40,101	16%
San Joaquin	Delta	$17,365	$41,282	18%
Merced	Delta and West San Joaquin	$14,257	$35,532	33%
Fresno	Delta and West San Joaquin	$15,495	$34,725	23%
Kings	Delta and West San Joaquin	$15,848	$35,532	22%
Contra Costa	American River and Delta	$30,615	$63,675	8%
Alameda	American River	$26,680	$55,946	11%
Santa Clara	San Felipe	$32,795	$74,335	8%
San Benito	San Felipe	$20,932	$57,469	10%
TOTALS		$327,895	$724,142	Not Applicable

Alternative 1B. Under Alternative 1B, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. However, the slight reduction in the availability of Irrigation CVP Water service contract water in drier years could result in higher unemployment and lower income in the rural counties and higher employment and incomes within M&I CVP water service contractors service area due increased water allocations in drier years. This alternative does not support additional growth over values included in the No Action Alternative, but may provide more certainty for industrial and commercial water users.

Alternative 2A. Under Alternative 2A, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. However, the slight reduction in the availability of Irrigation CVP Water service contract water in drier years could result in higher unemployment and lower income in the rural counties and higher employment and incomes within M&I CVP water service contractors service area due increased water allocations in drier years. This alternative does not support additional growth over values included in the No Action Alternative, but may provide more certainty for industrial and commercial water users.

Alternative 2B. Under Alternative 2B, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. However, the slight reduction in the availability of Irrigation CVP Water service contract water in drier years could result in higher unemployment and lower income in the rural counties and higher employment and incomes within M&I CVP water service contractors service area due increased water allocations in drier years. This alternative does not support additional growth over values included in the No Action Alternative, but may provide more certainty for industrial and commercial water users.

Cumulative Effects

Alternatives 1A and 1B would not result in cumulative adverse impacts when considered in combination with future projects. Issues of reduced CVP irrigation deliveries, alternative water supplies, and water transfers were evaluated as part of the CVPIA PEIS and environmental evaluations prepared to support the Long-term Contract Renewal process. The CVPIA PEIS indicated that future projects may alter CVP water supply allocations, but not change long term CVP Contract Totals or deliveries from within historical ranges. However, Alternatives 2A and 2B with full implementation of the second tier water supply by M&I CVP water service contractors could add an additional four years where agricultural contractors would receive zero CVP irrigation deliveries. This could result in employment and income changes in agricultural areas. However, Alternatives 2A and 2B could increase reliability of employment in municipal areas that rely upon CVP water supplies.

ENVIRONMENTAL JUSTICE

The concept of environmental justice embraces two principles: (1) fair treatment of all people regardless of race, color, nation of origin, or income and (2) meaningful involvement of people in communities potentially affected by program actions. Executive Order 12898, Section 2-2, signed by the President in 1994, requires all Federal agencies to conduct “programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons the benefits of, or subjecting persons to discrimination because of their race, color or national origin”. Section 1-101 requires Federal agencies to identify and address, as appropriate, “disproportionately high and adverse human health or environmental effects” of programs on minority and low-income populations. This section describes environmental justice conditions for the study area considered in this EA.

Affected Environment

Minority populations included in the California Department of Finance databases are identified as Hispanic, Asian or Pacific Islander, Black, American Indian, or Multirace. The U.S. Census treats Hispanic as an ethnic designation such that an ethnically Hispanic person may be included in a race category and in the Hispanic category. This can result in the double counting of some individuals. The California Department of Finance avoids double counting by treating Hispanic as a unique category. That is if a person identifies himself or herself as Hispanic, he or she is placed in that category and no other. Therefore the percentage of each group with respect to total population will sum to 100 percent. Racial and ethnic distribution within the counties in the study area as defined by the California Department of Finance are summarized in Table 5-27. It should be noted that several counties are located in two CVP divisions.

Environmental Consequences

The effects of Alternatives 1A, 1B, 2A, and 2B on environmental justice conditions are compared to conditions under the No Action Alternative. Environmental consequences are primarily related to changes in M&I and agricultural employment.

No Action Alternative. The No Action Alternative represents the future conditions without implementation of proposed 2001 M&I Water Shortage Policy under the alternatives. Projected land use changes would result in additional agricultural lands more frequently fallowed due to reduced water supply allocations. These changes could increase M&I employment and reduce agricultural employment. These changes may not necessarily occur simultaneously and therefore, higher unemployment may occur on an interim basis in a localized region, especially in the rural counties that have high agricultural employment.

Alternative 1A. Under Alternative 1A, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. However, the slight reduction in the availability of Irrigation CVP Water service contract water in drier years could result in higher unemployment and lower income in the rural counties and higher employment and incomes within M&I CVP water service contractors service area due increased water allocations in drier years. This alternative does not support additional growth over values included in the No Action Alternative, but may provide more certainty for industrial and commercial water users.

Alternative 1B. Under Alternative 1B, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. However, the slight reduction in the availability of Irrigation CVP Water service contract water in drier years could result in higher unemployment and lower income in the rural counties and higher employment and incomes within M&I CVP water service contractors service area due increased water allocations in drier years. This alternative does not support additional growth over values included in the No Action Alternative, but may provide more certainty for industrial and commercial water users.

Alternative 2A. Under Alternative 2A, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. However, the slight reduction in the availability of Irrigation CVP Water service contract water in drier years could result in higher unemployment and lower income in the rural counties and higher employment and incomes within M&I CVP water service contractors service area due increased water allocations in drier years. This alternative does not support additional growth over values included in the No Action Alternative, but may provide more certainty for industrial and commercial water users.

TABLE 5-27

ETHNICITY BY COUNTY

County	CVP Divisions	Year	White	Hispanic	Asian and Pacific Islander	Black	American Indian	Multi-Race	Total
Shasta	Shasta and Trinity	2000	142,087	9,355	3,440	1,311	4,426	4,129	164,748
		2010	149,337	18,604	6,407	3,519	13,570	5,027	196,464
		2020	151,530	30,427	9,821	5,989	24,365	5,790	227,922
		2030	150,735	44,216	13,807	8,731	36,251	6,420	260,160
Tehama	Sacramento River	2000	44,018	8,947	513	320	1,055	1,189	56,042
		2010	44,566	13,313	821	459	1,869	1,414	62,442
		2020	43,296	18,939	1,114	585	2,783	1,606	68,323
		2030	41,584	25,138	1,394	726	3,592	1,737	74,171
Glenn	Sacramento River	2000	16,716	7,931	1,006	137	475	453	26,718
		2010	16,898	9,959	1,248	169	508	566	29,348
		2020	16,962	12,112	1,468	189	549	670	31,950
		2030	18,047	13,141	1,655	187	578	771	34,379
Colusa	Sacramento River	2000	9,007	8,844	358	103	362	249	18,923
		2010	8,745	12,595	443	102	491	321	22,697
		2020	8,640	16,030	525	97	640	405	26,337
		2030	8,704	18,707	579	91	782	490	29,353
Sacramento	American River	2000	713,744	199,516	147,008	120,820	9,987	39,390	1,230,465
		2010	680,646	349,014	247,683	187,057	41,354	50,094	1,555,848
		2020	670,563	512,027	350,322	271,318	82,825	59,624	1,946,679
		2030	656,975	661,199	440,854	347,006	117,732	69,262	2,293,028
Placer	American River	2000	208,741	24,337	7,775	1,980	1,723	4,915	249,471
		2010	278,574	38,036	14,757	7,117	4,114	6,515	349,113
		2020	349,421	53,579	24,439	12,470	7,854	8,277	456,040
		2030	404,278	68,696	33,263	17,041	11,263	10,149	544,690
El Dorado	American River	2000	134,626	15,044	3,706	833	1,459	2,902	158,570
		2010	152,024	21,955	6,144	1,445	3,249	3,654	188,471
		2020	169,678	30,775	8,831	2,260	5,356	4,389	221,289
		2030	182,523	40,602	11,509	3,133	7,360	5,046	250,173
Stanislaus	Eastside and Delta	2000	260,078	144,321	21,148	11,065	3,829	9,336	449,777
		2010	266,122	223,800	27,699	19,404	9,749	12,277	559,051
		2020	277,764	290,031	32,098	24,208	14,718	15,022	653,841
		2030	283,780	359,512	35,368	28,682	19,523	17,734	744,599
San Joaquin	Delta	2000	270,630	175,488	67,099	37,380	3,691	13,510	567,798
		2010	282,985	283,008	85,549	63,532	14,348	17,727	747,149
		2020	292,440	448,371	120,639	81,349	25,139	21,524	989,462
		2030	308,073	616,678	150,655	98,325	30,727	25,299	1,229,757

TABLE 5-27

ETHNICITY BY COUNTY

County	CVP Divisions	Year	White	Hispanic	Asian and Pacific Islander	Black	American Indian	Multi-Race	Total
Merced	Delta and West San Joaquin	2000	87,130	96,265	15,043	7,736	1,186	3,516	210,876
		2010	101,418	144,014	16,436	8,479	2,297	5,071	277,715
		2020	125,411	195,873	19,795	9,470	3,441	6,841	360,831
		2030	142,669	249,045	22,747	10,151	4,496	8,772	437,880
Fresno	Delta and West San Joaquin	2000	321,395	355,912	66,780	41,334	6,755	11,225	803,401
		2010	276,470	514,076	75,435	54,294	15,515	14,171	949,961
		2020	263,563	655,064	85,103	68,858	25,438	16,628	1,114,654
		2030	252,113	809,639	91,841	86,142	38,802	18,939	1,297,476
Contra Costa	American River and Delta	2000	555,747	171,239	110,166	88,534	4,059	24,759	954,504
		2010	515,397	283,455	166,832	108,386	12,199	30,029	1,116,298
		2020	478,508	411,890	243,905	135,078	23,753	33,947	1,327,081
		2030	452,761	536,219	320,073	160,800	35,279	37,921	1,543,053
Alameda	American River	2000	594,970	279,521	316,487	212,061	6,242	41,828	1,451,109
		2010	474,206	409,899	501,475	199,154	15,815	50,615	1,651,164
		2020	455,827	523,434	605,462	201,217	21,564	56,641	1,864,145
		2030	424,596	639,718	682,102	202,783	27,080	62,203	2,038,482
Santa Clara	San Felipe	2000	755,102	409,168	441,098	45,330	5,509	34,976	1,691,183
		2010	738,626	489,144	522,735	43,626	6,775	43,240	1,844,146
		2020	724,491	608,542	573,868	43,526	7,998	48,567	2,006,992
		2030	707,455	743,414	592,244	46,816	8,993	54,041	2,152,963
San Benito	San Felipe	2000	24,995	25,803	1,333	521	308	810	53,770
		2010	27,134	31,942	1,600	600	328	926	62,530
		2020	30,148	39,389	1,980	692	342	996	73,547
		2030	32,798	47,378	2,381	752	346	1,072	84,727

Alternative 2B. Under Alternative 2B, it is anticipated that land use patterns would be identical to the No Action Alternative conditions. However, the slight reduction in the availability of Irrigation CVP Water service contract water in drier years could result in higher unemployment and lower income in the rural counties and higher employment and incomes within M&I CVP water service contractors service area due increased water allocations in drier years. This alternative does not support additional growth over values included in the No Action Alternative, but may provide more certainty for industrial and commercial water users.

Cumulative Effects

Alternatives 1A and 1B would not result in cumulative adverse impacts when considered in combination with future projects. Issues of reduced CVP irrigation deliveries, alternative water supplies, and water transfers were evaluated as part of the CVPIA PEIS and environmental evaluations prepared to support the Long-term Contract Renewal process. The CVPIA PEIS indicated that future projects may alter CVP water supply allocations, but not change long term CVP Contract Totals or deliveries from within historical ranges. However, Alternatives 2A and 2B with full implementation of the second tier water supply by M&I CVP water service contractors could add an additional four years where agricultural contractors would receive zero CVP irrigation deliveries. This could result in employment and income changes in agricultural areas. However, Alternatives 2A and 2B could increase reliability of employment in municipal areas that rely upon CVP water supplies.

SECONDARY GROWTH IMPACTS

A project would not cause a secondary growth impact unless the growth would not occur without the project. For the purpose of this EA, secondary growth effects would need to be evaluated for the alternatives as compared to conditions under the No Action Alternative.

The No Action Alternative assumes continued delivery of CVP water service contract water with full deliveries to M&I CVP water service contracts in 55 of 72 years evaluated in the water supply model simulation. The No Action Alternative provides less allocations than historical CVP water operations due to implementation of environmental protections and CVPIA.

None of the alternatives increase the amount of water provided by the CVP water service contracts or the amount of water provided in years with 100 percent allocations. Population and land use projections developed by municipal agencies are generally based upon full water service Contract Totals with an assumption of water conservation during drier times. The alternatives considered in this EA will reduce the hardship associated with reductions of 25 to 50 percent of total M&I CVP water service contract water allocations (i.e., 75 to 50 percent allocations). None of these alternatives would affect reductions in water demand from zero to 25 percent (i.e., 100 to 75 percent allocations). The alternatives do not involve any construction, enlargement, or alteration of facilities in the CVP service area. Therefore, it is not foreseen that the alternatives would lead to an increase in growth or secondary growth impacts as compared to the No Action Alternative, and the same level of growth would occur without the project.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

NEPA Section 102(C)(v) requires federal agencies to consider to the fullest extent possible irreversible and irretrievable commitments of resources that would be involved in the proposed action should it be implemented. The alternatives considered in this EA do not involve construction or use of resources except water. There is no commitment of nonrenewable resources, and the alternatives would not commit future generations to permanent use of nonrenewable natural resources.

CHAPTER 6

CONSULTATION AND COORDINATION

CHAPTER 6
Consultation and Coordination

INTRODUCTION

Prior to preparation of this EA, input was solicited and incorporated from a broad range of 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 5. The compliance summaries apply only to the alternatives discussed in this EA and not the development of concurrent CVPIA implementation programs.

PUBLIC INVOLVEMENT

Reclamation considered a wide range of alternatives through a public process that started in 1993, as described in Chapter 2 of this EA. Public input continued during long-term contract negotiations and the Administrative Proposal process, and through public workshops and public notice and comment, in order to define the alternatives. A draft EA and draft FONSI were made available for a 30-day public review and comment period in March, 2005; comments and responses to comments are found in Attachment E of this EA.

CONSULTATION WITH OTHER AGENCIES

This EA was prepared in accordance with the policies and regulations for the following issues. Brief discussions of these issues and how compliance was addressed in this EA is discussed in the remaining sections of this chapter.

- National Environmental Policy Act
- California Environmental Quality Act
- Endangered Species Act
- Fish and Wildlife Coordination Act
- National Historic Preservation Act
- Indian Trust Assets
- Indian Sacred Sites on Federal Land
- Environmental Justice
- State, Area-wide, and Local Plan and Program Consistency
- Floodplain Management
- Wetlands Protection
- Wild and Scenic Rivers Act
- Farmland Protection Policy Act and Farmland Preservation
- Clean Air Act
- Safe Drinking Water Act
- Clean Water Act

National Environmental Policy Act

This 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 and alternatives, and environmental impacts of the alternatives.

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

The description of the biological resources as presented in Chapter 5 provides information that would be required for a biological assessment to determine if the preferred alternative will affect listed, threatened, and endangered species. The analysis addresses all species affected by alternatives considered for the M&I Water Shortage Policy. Reclamation will complete required compliance activities pursuant to the ESA prior to any final decisions on implementing any alternative.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) requires that Reclamation consult with fish and wildlife agencies (federal and state) on all water development projects that could affect biological resources. The implementation of the CVPIA, of which this action is a part, has been jointly analyzed by Reclamation and the Service and is being jointly implemented. This continuous consultation and consideration of the views of the Service in addition to their review of this document and consideration of their comments satisfies any applicable requirements of the FWCA.

National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) requires that Federal agencies evaluate the effects of Federal undertakings on historical, archeological, and cultural resources and afford the Advisory Council on Historic Preservation opportunities to comment on the proposed undertaking. The first step in the process is to identify cultural resources included on (or eligible for inclusion on) the National Register of Historic Places that are located in or near the project area. The second step is to identify the possible effects of 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. This project does not include construction activities. Related activities approved by local planning agencies must undergo separate evaluation as part of CEQA and permitting processes.

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. ITAs 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 ITAs, as described in Chapter 5.

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. During preparation of EA, it was determined based upon information provided in other Reclamation studies, that no Indian Sacred Sites would be affected by the alternatives.

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 has evaluated the environmental, social, and economic impacts on minority and low-income populations in the impact assessment of alternatives, as described in Chapter 5.

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 flood plain or to minimize potential harm. Executive Order 11988 requires Federal agencies to evaluate the potential effects of any actions they might take in a floodplain and to ensure that planning, programs, and budget requests reflect consideration of flood hazards and floodplain management. The alternatives would not affect floodplain management, as described in Chapter 5.

Wetlands Protection

Executive Order 11990 authorizes Federal agencies to take actions to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands when undertaking Federal activities and programs. Any agency considering a proposal that might affect wetlands must evaluate factors affecting wetland quality and survival. These factors should include the proposal’s effects on the public health, safety, and welfare due to modifications in water supply and water quality; maintenance of natural ecosystems and conservation of flora and fauna; and other recreational, scientific, and cultural uses. The alternatives would not affect wetlands, as described in Chapter 5.

Wild and Scenic Rivers Act

The Wild and Scenic Rivers Act designates qualifying free-flowing river segments as wild, scenic, or recreational. The Act establishes requirements applicable to water resource projects affecting wild, scenic, or recreational rivers within the National Wild and Scenic Rivers System, as well as rivers designated on the National Rivers Inventory. Under the Act, a Federal agency may not assist the construction of a water resources project that would have a direct and adverse effect on the free-flowing, scenic, and natural values of a wild or scenic river. If the project would affect the free-flowing characteristics of a designated river or unreasonably diminish the scenic, recreational and fish and wildlife values present in the area, such activities should be undertaken in a manner that would minimize adverse impacts and should be developed in consultation with the National Park Service.

Farmland Protection Policy Act and Farmland Preservation

Two policies require federal agencies to include assessments of the potential effects of a proposed project on prime and unique farmland. These policies are the Farmland Protection Policy Act of 1981 and the Memoranda on Farmland Preservation, dated August 30, 1976, and August 11, 1980, respectively, from the U.S. Council on Environmental Quality. Under requirements set forth in these policies, federal agencies must determine these effects before taking any action that could result in converting designated prime or unique farmland for nonagricultural purposes. If implementing a project would adversely affect farmland preservation, the agencies must consider alternatives to lessen those effects. Federal agencies also must ensure that their programs, to the extent practicable, are compatible with state, local, and private programs to protect farmland. The National Resource Conservation Agency is the federal agency responsible for ensuring that these laws and polices are followed. The alternatives would not affect the ability to use agricultural or urban lands as compared to the No Action Alternative, as described in Chapter 5.

Clean Air Act

The Federal Clean Air Act (CAA) was enacted to protect and enhance the nation’s air quality in order to promote public health and welfare and the productive capacity of the nation’s population. The CAA requires an evaluation of any federal action to determine its potential impact on air quality in the project region. Coordination is required with the appropriate local air quality management district as well as with the EPA. This coordination would determine whether the project conforms to the Federal Implementation Plan and the State Implementation Plan (SIP).

Section 176 of the CAA (42 U.S.C. Section 7506(c)) prohibits federal agencies from engaging in or supporting in any way an action or activity that does not conform to an applicable SIP. Actions and activities must conform to a SIP’s purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and in attaining those standards expeditiously. EPA promulgated conformity regulations (codified in 40 CFR Section 93.150 et seq.).

The alternatives assume that current practices to control dust and soil erosion on lands that are seasonally fallowed, as described as part of the Preferred Alternative in the CVPIA PEIS, would continue and the land use agencies would continue to work with the air quality districts. Therefore, no air quality impacts would occur due to the alternatives as compared to the No Action Alternative, as described in Chapter 5.

Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) (PL 99-339) became law in 1974 and was reauthorized in 1986 and again in August 1996. Through the SDWA, Congress gave the EPA the authority to set standards for contaminants in drinking water supplies. Amendments to the SDWA provide more flexibility, more state responsibility, and more problem prevention approaches. The law changes the standard-setting procedure for drinking water and establishes a State Revolving Loan Fund to help public water systems improve their facilities and to ensure compliance with drinking water regulations and to support state drinking water program activities.

Under the SDWA provisions, the California Department of Health Services has the primary enforcement responsibility. The California Health and Safety Code establishes this authority and stipulates drinking water quality and monitoring standards. To maintain primacy, a state’s drinking water regulations cannot be less stringent than the federal standards. The analysis of the EA alternatives as compared to the SDWA requirements indicated that there were no changes in compliance as compared to the No Action Alternative, as described in Chapter 5.

Clean Water Act

The Clean Water Act (CWA) gave the EPA the authority to develop a program to make all waters of the United States “fishable and swimmable.” This program has included identifying existing and proposed beneficial uses and methods to protect and/or restore those beneficial uses. The CWA contains many provisions, including provisions that regulate the discharge of pollutants into the water bodies. The discharges may be direct flows from point sources, such as an effluent from a wastewater treatment plant, or a non-point source, such as eroded soil particles from a construction site. The analysis of the EA alternatives as compared to the CWA requirements indicated that there were no changes in compliance as compared to the No Action Alternative, as described in Chapter 5.

ATTACHMENT A
LIST OF PREPARERS

ATTACHMENT A
List of Preparers

Preparers	Degree(s)/Years of Experience	Experience and Expertise	Role in Preparation
U.S. Bureau of Reclamation			
Robert Colella	B.S. Electrical Engineering M.B.A. Management J.D. Seven years experience in water resources management	Water service contracts, water rights	Agency Technical Project Lead Review and editing
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ATTACHMENT B
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ATTACHMENT B
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ATTACHMENT C

ACRONYMS, ABBREVIATIONS, AND METRIC CONVERSIONS

ATTACHMENT C
Acronyms, Abbreviations, and Metric Conversions

ACHP	Advisory Council on Historic Places
AFRP	Anadromous Fisheries Restoration Project
BAAQMD	Bay Area Air Quality Management District
BMP	Best Management Practices
CAA	Clean Air Act
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CO	Carbon Monoxide
COA	Coordinated Operations Agreement
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CRHP	California Register of Historic places
CWA	Clean Water Act
CWHR	California Wildlife Habitats Relationship System
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
EWA	Environmental Water Account
FLPMA	Federal Land Policy and Management Act of 1976
FONSI	Finding of No Significant Impact
FWCA	Fish and Wildlife Coordination Act
HCP	Habitat Conservation Plan
ITA	Indian Trust Asset
kW	Kilowatt
kWh	Kilowatt-hour
LAFCO	Local Area Formation Commission
LTCR	Long-Term Contract Renewal
M&I	Municipal and Industrial
MSHCP	Multi-Species Habitat Conservation Plan
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NO_2	Nitrogen Dioxide
NOx	Nitrogen Oxides
NRDC	Natural Resources Defense Council

NRHP	National Register Historic Places
NSVAB	North Sacramento Valley Air Basin
NWR	National Wildlife Refuge
OCAP	Operations Criteria and Plan
O_3	Ozone
PG&E	Pacific Gas & Electric Company
PEIS	Programmatic Environmental Impact Statement
PM	Particulate Matter
PL	Public Law
Reclamation	U.S. Bureau of Reclamation
ROD	Record of Decision
ROG	Reactive Organic Gases
SDWA	Safe Drinking Water Act
Secretary	Secretary of the Interior
Service	U.S. Fish and Wildlife Service
SHPO	State Historic Preservation Officer
SJVAB	San Joaquin Valley Air Basin
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SRA	State Recreation Area
SWP	State Water Project
SWRCB	State Water Resources Control Board
TCD	Temperature Control Device
VAMP	Vernalis Adaptive Management Program
Western	Western Area Power Administration
WQCP	Water Quality Control Plan
°F	degrees Fahrenheit

CONVERSION TABLES

U.S. CUSTOMARY TO METRIC

Multiply	By	To Obtain
inches (in)	25.4	millimeters
inches (in)	2.54	centimeters
feet (ft)	0.3048	meters
miles (mi)	1.609	kilometers
square feet (ft^2)	0.0929	square kilometers
acres (ac)	0.4047	hectares
square miles (mi^2)	2.590	square kilometers
gallons (gal)	3.785	liters
cubic feet (ft^3)	0.02832	cubic meters
acre-feet (af)	1,233.0	cubic meters
pounds (lb)	0.4536	kilograms
tons (ton)	0.9072	metric tons

Temperature in degrees Fahrenheit can be converted to degrees Celsius as follows:
degrees Celsius = 5/9 (degrees Fahrenheit - 32)

OTHER USEFUL CONVERSION FACTORS

Multiply	By	To Obtain
acre-feet	43,560	cubic-feet
acre-feet	325,851	gallons
cubic feet per second	1.9835	acre-feet per day
cubic feet per second	724.0	acre-feet per year

ATTACHMENT D

SUMMARY OF PROJECT EFFECTS ON LISTED SPECIES IN THE STUDY AREA

ATTACHMENT D
Summary of Project Effects on Listed Species in the Study Area

An effects summary specific to federally listed species (both aquatic and terrestrial) is presented in this attachment. Unlike the EA, in which all the action alternatives must be compared against a future no project condition, the effects analysis compares the proposed project relative to the environmental baseline. An effect determination has been made for each species potentially affected by the project (e.g., no effect; may affect, not likely to adversely affect; may affect and likely to adversely affect; and whether the project would result in adverse modification of critical habitat).

The proposed action under the M&I Shortage Policy is Alternative 1B. For this effects determination, the analysis is conducted for conditions using the "Current" model run used in the OCAP 2004. Under current conditions, the years in which the M&I CVP water service contractor allocations are less than 75 percent and the amount of allocations are different than under the "Future" conditions that were used in the definition of the No Action Alternative. Under current and future conditions, there are 13 of the 72 years considered in the OCAP 2004 CALSIM II model runs that meet the criteria for inclusion in this study. However, the number of years with zero deliveries to Irrigation CVP water service contractors occurs only during 3 years under the existing conditions and for 4 years under the future conditions, as shown in Table D-1.

The primary effect of Alternative 1B is that water deliveries to irrigation users would be slightly reduced in drier years as compared to existing conditions. These changes are not anticipated to result in any land use changes but would increase the frequency of fallowing agricultural lands. The dry-year delivery scenario under Alternative 1B is similar to conditions that occur in the analysis for long-term water contract renewals for the divisions covered by the M&I Water Shortage Policy. As part of the long-term contract renewal process, each water division was required to develop a biological assessment (BA) to assess the terrestrial effects to federally listed species of continuing their water service contracts. The consultations that follow development of the BAs assume the potential for full contract deliveries. Thus, any impacts that may be related to M&I CVP water allocations in drier years will have been addressed in the contract specific consultations.

Water-related effects of CVP and SWP operations to federally listed species from continued water contract deliveries were assessed in the recently completed biological assessments for the OCAP 2004 and the Long-term Contract Renewal process for the CVP water service contracts. The M&I Shortage Policy would not result in any effects to federally listed species. The long-term contract renewal consultation process and OCAP 2004 consultations address impacts to listed species of CVP operations and the delivery of CVP water to CVP contractors. Alternative 1B would not increase the total amount of water allocated to CVP water service contractors in any one year. All or part of the water that would be diverted by Irrigation CVP water service contractors in the drier years under the existing conditions would be diverted by M&I CVP water service contractors under Alternative 1B with a frequency of 9 of the 72 years evaluated in the OCAP 2004 CALSIM II model runs (which represent the existing conditions). Under Alternative 1B, water allocated to Irrigation CVP water service contractors in Alternative 1B would be reduced by 1 to 3 percent in the 9 of the 72 years. It should also be noted that most of the water to be re-allocated would be diverted from irrigation to M&I users both located south of the Delta. Therefore, there should be no noticeable difference in Delta outflow or exports under Alternative 1B as compared to existing conditions.

TABLE D-1

PERCENT DELIVERIES TO CENTRAL VALLEY PROJECT WATER SERVICE CONTRACT DELIVERIES FOR M&I AND IRRIGATION WATER SERVICE CONTRACTORS FOR EXISTING CONDITIONS AND ALTERNATIVE 1B

Number of Years over 72 Years	EXISTING CONDITIONS		Alternative 1B	
	M&I	Irrig.	M&I	Irrig.
3 years (1924, 1933, 1990)	50%	0%	50%	0 [a]
2 years (1931, 1977)	54%	4%	69%	2%
1 year (1988)	57%	7%	71%	5%
2 years (1934, 1929)	61%	10%	73%	8%
1 year (1991)	62%	12%	73%	10%
1 year (1932)	64%	13%	74%	11%
1 year (1976)	66%	16%	75%	15%
1 year (1926)	69%	19%	77%	17%

"Irrig." = Irrigation
All percentages calculated as compared to M&I or Irrigation CVP water service Contracts Totals

[a] Under the No-Action Alternative for 50 percent M&I Allocation years, deliveries to Irrigation CVP water service contractors are equal to zero. Therefore, there are no changes in deliveries to M&I or Irrigation water users.

Tables D-2 through D-4 summarize the effects for aquatic and terrestrial species, respectively, and critical habitats in the divisions covered in the M&I Shortage Policy.

TABLE D-2

DETERMINATION OF EFFECTS OF IMPLEMENTING ALTERNATIVE 1B

Determination[a]	Species (Common Name)	Species (Scientific Name)	Federal Status[b]
No Effect	Coho salmon – Central California Coast ESU[c]	*Oncorhynchus kisutch*	E
No Effect	Coho salmon – Southern Oregon/Northern California ESU	*Oncorhynchus kisutch*	T
No Effect	Delta smelt	*Hypomesus transpacificus*	T,X
No Effect	Green sturgeon	*Acipenser medirostris*	PT 4/5/05
No Effect	Spring-run chinook salmon – Central Valley ESU	*Oncorhynchus tshawytscha*	T,PX
No Effect	Steelhead – Central California Coast ESU	*Oncorhynchus mykiss*	T,PX
No Effect	Steelhead – Central Valley ESU	*Oncorhynchus mykiss*	T,PX
No Effect	Chinook salmon – Sacramento River Winter-run ESU	*Oncorhynchus tshawytscha*	E,X

[a] There are no new effects resulting from implementing Alternative 1B that have not been addressed in related consultations.
[b] E: Listed as endangered under the Federal Endangered Species Act
T: Listed as threatened under the Federal Endangered Species Act
P: Proposed – officially proposed for listing as endangered or threatened
X: Critical Habitat
PX: Proposed critical habitat
[c] ESU = Evolutionary Significant Unit

TABLE D-3

DETERMINATION OF EFFECTS OF IMPLEMENTING ALTERNATIVE 1B AS COMPARED TO THE OCCURRENCE OF LISTED AND PROPOSED PLANT AND WILDLIFE SPECIES BASED UPON LONG-TERM CONTRACT RENEWAL BIOLOGICAL ASSESSMENTS

	DIVISION AND EFFECT DETERMINATION[a]					
	Shasta, Trinity and Sacramento River	**American River (Sacramento Valley**	**Delta (San Joaquin Valley)**	**West San Joaquin**	**American River and Delta (Alameda and Contra Costa Counties)**	**San Felipe**
PLANTS						
Antioch Dunes evening-primrose					No Effect	
Butte County Meadowfoam	No Effect					
California jewelflower			No Effect	No Effect		
Colusa grass	No Effect				No Effect	
Contra Costa wallflower					No Effect	
Contra Costa goldfields					No Effect	No Effect
Coyote ceanothus						No Effect
El Dorado Bedstraw		No Effect				
Green's tuctoria	No Effect					
Hairy Orcutt grass	No Effect					
Hoover's eriastrum			No Effect			
Hoover's sprurge	No Effect					
Large-flowered fiddleneck					No Effect	
Layne's butterweed		No Effect				
Metcalf Canyon jewelflower						No Effect
Pallid manzanita					No Effect	
Palmate-bracted bird's beak	No Effect		No Effect	No Effect		
Pine Hill ceanothus		No Effect				
Pine Hill flannelbush		No Effect				
Sacramento Orcutt grass		No Effect				
San Joaquin woolly-threads				No Effect		
Santa Clara Valley dudleya						No Effect
Santa Cruz tarplant					No Effect	No Effect
Slender Orcutt grass	No Effect	No Effect				
Soft bird's beak					No Effect	
Solano grass						
Stebbin's morning glory		No Effect				

TABLE D-3

DETERMINATION OF EFFECTS OF IMPLEMENTING ALTERNATIVE 1B AS COMPARED TO THE OCCURRENCE OF LISTED AND PROPOSED PLANT AND WILDLIFE SPECIES BASED UPON LONG-TERM CONTRACT RENEWAL BIOLOGICAL ASSESSMENTS

	DIVISION AND EFFECT DETERMINATION[a]					
	Shasta, Trinity and Sacramento River	**American River (Sacramento Valley**	**Delta (San Joaquin Valley)**	**West San Joaquin**	**American River and Delta (Alameda and Contra Costa Counties)**	**San Felipe**
Succulent owl's clover		No Effect				
Tiburon Indian paintbrush						No Effect
INVERTEBRATES						
Bay checkerspot butterfly						No Effect
California freshwater shrimp					No Effect	
Callipe silverspot butterfly					No Effect	
Conservancy fairy shrimp	No Effect		No Effect			
Delta green ground beetle					No Effect	
Lange's metalmark butterfly					No Effect	
Longhorn fairy shrimp					No Effect	
Valley elderberry longhorn beetle		No Effect	No Effect	No Effect	No Effect	
Vernal pool fairy shrimp	No Effect	No Effect	No Effect	No Effect	No Effect	
Vernal pool tadpole shrimp	No Effect	No Effect	No Effect	No Effect	No Effect	
AMPHIBIANS						
California red-legged frog	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
California tiger salamander –Central California DPS	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
REPTILES						
Alameda whipsnake			No Effect		No Effect	No Effect
Blunt-nosed leopard lizard			No Effect	No Effect	No Effect	
Giant garter snake	No Effect	No Effect	No Effect	No Effect		
San Francisco garter snake						No Effect
BIRDS						
Bald Eagle	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
California brown pelican					No Effect	
California clapper rail					No Effect	No Effect

TABLE D-3

DETERMINATION OF EFFECTS OF IMPLEMENTING ALTERNATIVE 1B AS COMPARED TO THE OCCURRENCE OF LISTED AND PROPOSED PLANT AND WILDLIFE SPECIES BASED UPON LONG-TERM CONTRACT RENEWAL BIOLOGICAL ASSESSMENTS

	DIVISION AND EFFECT DETERMINATION[a]					
	Shasta, Trinity and Sacramento River	**American River (Sacramento Valley**	**Delta (San Joaquin Valley)**	**West San Joaquin**	**American River and Delta (Alameda and Contra Costa Counties)**	**San Felipe**
California condor				No Effect		
California least tern					No Effect	No Effect
Least Bell's vireo						No Effect
Marbled murrelet						No Effect
Northern spotted owl	No Effect					
Western snowy plover					No Effect	
MAMMALS						
Fresno kangaroo rat			No Effect	No Effect		
Giant kangaroo rat			No Effect	No Effect		
Riparian woodrat			No Effect	No Effect	No Effect	
Riparian brush rabbit					No Effect	
Salt marsh harvest mouse					No Effect	No Effect
San Joaquin kit fox			No Effect	No Effect	No Effect	No Effect
Tipton kangaroo rat			No Effect	No Effect		

[a] There are no new effects resulting from implementing Alternative 1B that have not been addressed in related consultations.

TABLE D-4
DETERMINATION OF EFFECTS OF IMPLEMENTING ALTERNATIVE 1B AND OCCURRENCE OF CRITICAL HABITAT FOR LISTED PLANT AND WILDLIFE BASED UPON LONG-TERM CONTRACT RENEWAL BIOLOGICAL ASSESSMENTS

	DIVISION / EFFECT DETERMINATION					
	Shasta, Trinity and Sacramento River	**American River (Sacramento Valley**	**Delta (San Joaquin Valley)**	**West San Joaquin**	**American River and Delta (Alameda and Contra Costa Counties)**	**San Felipe**
PLANTS						
Antioch evening-dunes primrose					No Adverse Modification	
Butte County meadowfoam	No Adverse Modification					
Colusa grass	No Adverse Modification					
Contra Costa Goldfields					No Adverse Modification	No Adverse Modification
Contra Costa wallflower					No Adverse Modification	
Green's tuctoria	No Adverse Modification					
Hairy Orcutt grass	No Adverse Modification			No Adverse Modification		
Hoover's sprurge	No Adverse Modification					
Keck's checkermallow						
Large-flowered fiddleneck			No Adverse Modification			
San Joaquin Valley Orcutt grass				No Adverse Modification		
Santa Cruz tar plant					No Adverse Modification	
Slender Orcutt grass	No Adverse Modification					
Solano grass	No Adverse Modification					
Succulent ows' clover			No Adverse Modification			
INVERTEBRATES						
Bay checkerspot butterfly						No Adverse Modification
Delta green ground beetle	No Adverse Modification					
Longhorn fairy shrimp					No Adverse Modification	No Adverse Modification
Conservancy fairy shrimp	No Adverse Modification		No Adverse Modification			No Adverse Modification

TABLE D-4

DETERMINATION OF EFFECTS OF IMPLEMENTING ALTERNATIVE 1B AND OCCURRENCE OF CRITICAL HABITAT FOR LISTED PLANT AND WILDLIFE BASED UPON LONG-TERM CONTRACT RENEWAL BIOLOGICAL ASSESSMENTS

Valley Elderberry longhorn beetle		No Adverse Modification				
Vernal pool fairy shrimp	No Adverse Modification	No Adverse Modification	No Adverse Modification	No Adverse Modification	No Adverse Modification	No Adverse Modification
Vernal pool tadpole shrimp	No Adverse Modification			No Adverse Modification	No Adverse Modification	No Adverse Modification
AMPHIBIAN						
California red-legged frog	No Adverse Modification	No Adverse Modification	No Adverse Modification	No Adverse Modification	No Adverse Modification	No Adverse Modification
California Tiger Salamander	No Adverse Modification	No Adverse Modification	No Adverse Modification		No Adverse Modification	No Adverse Modification
BIRDS						
Northern spotted owl	No Adverse Modification					
Western snowy plover						No Adverse Modification
MAMMALS						
Fresno kangaroo rat			No Adverse Modification	No Adverse Modification		
Giant kangaroo rat				No Adverse Modification		

ATTACHMENT E

COMMENTS AND RESPONSE TO COMMENTS ON DRAFT ENVIRONMENTAL ASSESSMENT

ATTACHMENT E
Comments and Response to Comments on Draft Environmental Assessment

INTRODUCTION

This attachment includes the comment letters from agencies, organizations, and individuals commenting on the Draft EA and responses to the substantive environmental issues raised in the comments. The following pages show all the comments received which relate to the project and the responses to those comments. All comments were reviewed and considered and determined whether or not the comments warranted further analysis and documentation. The need for changes in the EA are noted in the individual responses.

LIST OF COMMENTS AND RESPONSES

Comment No. 1

Del Puerto Water District
April 22, 2005

Del Puerto WATER District

P.O. Box 1596 • Patterson, CA 95363-1596

Fax (209) 892-4469 • Phone (209) 892-4470

April 22, 2005

Mr. David Lewis
Bureau of Reclamation
2800 Cottage Way, MP 730
Sacramento, CA 95825

(Via FAX 1-916-978-5094)

RE: Comments on Draft Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the CVP M&I Water Shortage Policy (Shortage Policy)

Dear Mr. Lewis:

The Del Puerto Water District (District) submits the following comments on the Draft Environmental Assessment for the Central Valley Project M&I Water Shortage Policy dated March of 2005.

The Del Puerto Water District is a CVP contractor located south of the Delta. Its contract providing for up to 140,210 acre-feet of CVP water is used almost exclusively to serve irrigation purposes within the District. CVP water is the sole source of supply for the vast majority of District users. Fully one half of the District's 40,000 irrigated acres are planted to permanent crops. The reliability of the District's water supplies to irrigate these plantings is crucial to our survival and that of the agricultural communities in which we live and who depend upon these supplies for their economic well-being. As such, the District has a vital if not critical interest in the proposed policy and the subject documents.

Comments

The EA is a seriously flawed document that in no way supports a finding of no significant impact. We strongly urge the Bureau of Reclamation to withdraw the proposed Draft EA and the proposed FONSI, to reconsider the purpose and need for such a policy in view of Reclamation law and to prepare a legally adequate analysis of all of the alternatives. **DPWD-1**

Previous draft policies, going back to the 1993 draft interim policy up to and including that of September 11, 2001, have raised serious legal issues and policy concerns which the District has detailed in our letters dated November 30, 2000, January 9, 2001 and November 26, 2001 (attached). Not only does it appear that the issues and concerns expressed in our previous comment letters have been totally ignored, they are, in fact, exacerbated by new language and concepts contained in the now proposed alternative. **DPWD-2**

The newly proposed policy no longer limits its applicability to the quantities of CVP water identified for M&I uses as of September 30, 1994 (as did the September 2001

Response to Comments

DPWD-1: See Chapter 3 for a discussion on the development of alternatives and description of alternatives considered in this EA. This EA and FONSI have been prepared in accordance with NEPA regulations and guidance from the Council on Environmental Quality.

DPWD-2: Attachments to the commenter's letter cover several important topics relating to the M&I water shortage policy and are similar to the comments in the April 22, 2005 letter. Reclamation has carefully reviewed and considered all comments received on the September 11, 2001 draft policy. These and all prior comments have been utilized to assist Reclamation in developing the range of alternatives for this EA. However, the following attachments were not included in the Final EA because they did not address the Draft EA specifically.

- Del Puerto Water District letter to Lester Snow, USBR, dated November 30, 2000, Re: Proposed M&I Water Shortage Policy
- Del Puerto Water District letter to Betty Riley-Simpson, USBR, dated January 9, 2001, Re: Proposed M&I Water Shortage Policy (December 22, 2000 draft)
- Del Puerto Water District letter to Alisha Sterud, USBR, dated November 26, 2001, Re: Comments on Draft CVP M&I Water Shortage Policy

proposal), but it increases the already significant impact on agricultural water supplies of the prior proposal by applying the policy to the quantities identified under Water Needs Assessments predicated on the amount of water that M&I Contractors estimate could be beneficially used by the year 2025. (Page 1-3) According to the subject documents, these assessments show many M&I contractors equaling or exceeding their full Contract Totals by the year 2025 (Page 1-3) thereby magnifying the policy's adverse effect on agricultural water supplies through the application of ever-greater shortages on an ever-smaller base of irrigation supplies.

DPWD-3

The proposed policy fundamentally and, by it own repeated acknowledgement, reallocates agricultural water service supplies to urban contractors and offers no mitigation for the resulting loss of agricultural water supplies. (ES-3, 3-2)

DPWD-4

We reiterate our previous claim that adoption of the proposed policy cannot be justified or enforced in light of Section 9(c) of the 1939 Act (43 USC §485(c)) which provides in part:

> "No contract relating to municipal water supply or miscellaneous purposes or to electric power or power privileges shall be made unless, in the judgment of the Secretary, it will not impair the efficiency of the project for irrigation purposes."

DPWD-5

While the District has been willing to acknowledge that some priority should be given for M&I purposes that are needed to protect public health and safety, and that fish and wildlife purposes might also be subject to "human health and safety" requirements as has been provided for by Section 3406(b)(2)(C) of the CVPIA, we would also point out that the reason that the OCAP 2004 described the allocation of CVP water supply for the 253 water service contracts and the Sacramento River Settlement Contracts in the following manner:

> "Those water service contracts had many varying water shortage provisions. In some contracts, M&I and agricultural use shared shortage equally. In most of the larger M&I contracts, agricultural water was shorted 25% of its contract entitlement before M&I water was shorted, and then both shared shortages equally." (Page 1-1, 2)

is because there are only a few water service contracts which reasonably could have been entered into with a Secretarial determination that such priorities would not impair the efficiency of the project for irrigation purposes.

We would also grant that "as the CVP system was being developed there were no shortage allocation because actual demands were less than the water supply each year." (Page 1-2) Unfortunately, as the subject document points out, "water allocations to contractors located south of the Delta have been most affected by changes in operations by legislative and regulatory changes." (Page 2-1) Today, the practical effect of granting any such M&I priority is to further reduce the quantity of water available for irrigation purposes to contractors located south of the Delta in many, if not most, years, as opposed to only occasionally during extreme drought conditions. The Draft EA seriously errors

Del Puerto Water District - continued

DPWD-3: Under any of the action alternatives, the CVP M&I Water Shortage Policy would only be applied in years with allocations of less than 75 percent to M&I water service contractors under the No Action Alternative. In these years, the maximum amount of CVP water delivered to M&I water service contractors subject to any of the CVP M&I Water Shortage Policy action alternatives would be 75 percent of the Contract Total. The No Action Alternative and action alternatives were analyzed in this EA at time of build out (when historical use and full contract quantity are the same) in order to capture the full range of impacts. Reclamation believes that Alternative 1B best meets policy purposes with the minimum impact upon CVP irrigation supplies.

DPWD-4: As shown in Tables ES-2 and 5-9, the changes under Alternative 1B, the proposed action, as compared to the No Action Alternative would result in decreased deliveries to irrigation water service contractors of only 1 to 3 percent in 9 of the 72 years included in the model runs used in the analysis of the OCAP 2004. It is difficult to determine exactly how irrigation water service contractors will respond to the reduction in water deliveries, and therefore, it is difficult to determine the exact extent of impacts occurring in these few years. However, Reclamation has determined that the small reductions in the irrigation allocation that would infrequently occur will not change agricultural land use.

Del Puerto Water District - continued

DPWD-5: Reclamation assumes the commenter is referring to 43 U.S.C. 485(h)(c).

Efficiency is defined as “ability to produce a desired effect, product, etc., with a minimum of effort, expense, or waste” . (Webster’s New World Dictionary, Third College Edition.) Such language in the 1939 Act regarding contracts or leases of electric power or power privileges applies to hydraulic or mechanical efficiency. (Memorandum of Asst Reg Sol Pelz, 4/4/75; S-127 Supp I 1967-1982 Federal Reclamation and Related Laws Annotated).

Commenter does not explain, nor does Reclamation see, how or why the establishment of a minimum water supply level for M&I contractors, while potentially reducing water deliveries to irrigation contractors, could impair the ability of Reclamation to deliver CVP irrigation water with minimum effort, expense, waste, or otherwise with impaired mechanical or hydraulic efficiency. In determining the impairment of irrigation efficiency due to delivery of project water for M&I purposes, the only relevant factors are those relating to the irrigation efficiency of the project; the Secretary is not required to consider the adequacy of the water supply for the irrigation of all lands in a river basin or the state. EDF v. Morton, 420 F.Supp. 1037 (D. Mont. 1976), affirmed EDF v. Andrus 596 F.2d 848 (9 Cir. 1979). (S-132). Also see Congressional Record – House, September 9, 1985, 99th Congress 1st Session, at 23000 (131 Cong Rec H 7296), quoted in part: “As was the case during that [1976-77] drought, we anticipate that the first responsibility for enduring reductions will come from agricultural contractors before reductions are imposed on municipal users who lack available

Del Puerto Water District - continued

DPWD-5 - continued: alternative sources of water for essential human health and safety needs. This is not a matter of regionalism or favoritism; it is a recognition that when disaster strikes, plants must suffer before human being. This is the basis upon which the project [CVP] has been operated in the past, and it is a sound priority system for future operations as well."

when it states that the alternatives will result in "changes for Irrigation CVP water service contractors" in only "9 of the 72 years" modeled. (Page 5-45) It will, in fact, have a significant impact in virtually every year, especially for south of the Delta irrigation contractors. The extent of the total reduction should be modeled and clearly identified in the analysis.

DPWD-6

We continue to contend that new contracts and the policies referenced in them, in accord with Reclamation Law and historical contractual language and understanding, should provide an equal footing between irrigation and M&I uses except to the extent that water is needed to meet M&I public health and safety demands during extreme droughts or as can be provided without impact to irrigation supplies.

DPWD-7

In this regard, the EA seriously errors in establishing a No Action Alternative baseline as that defined by the operational criteria in the OCAP 2004. (Page ES-3) To our knowledge, no previous draft policy establishing anything other than an equal sharing of shortages between M&I and irrigation water has been the subject of environmental review and the impacts to irrigation supplies of the current No Action Alternative have never been analyzed. The No Action Alternative as the environmental baseline used to measure the impacts of the policy is both legally inadequate and improperly defined. The subject analysis thoroughly masks and minimizes the effects of the proposed alternative, particularly for South of the Delta water contractors, by failing to measure its effects against the true, no-policy, no-M&I preference alternative.

DPWD-8

Even without the appropriate baseline analysis, the adverse effects of such a policy on agricultural water supplies are significant. To mention that concepts to increase M&I CVP water service contract deliveries include: "storage of additional water during wet years" along side of reductions of deliveries to Irrigation CVP Water Service Contractors, and then, to immediately dismiss this concept as "not possible with existing facilities", not only begs the question but ignores and serves to dismiss out-of-hand a number of viable concepts. (Pages ES-3, 3-2)

DPWD-9

Other alternatives available to M&I Contractors if they wish to achieve greater reliability than is otherwise available from the project are 1) including willing seller/willing buyer transfers provided for under CVPIA, 2) water reallocation programs, such as Santa Clara Valley Water District (SCVWD) has done with the San Luis Delta-Mendota Water Authority and certain of its members, and 3) the development and/or participation in water banking programs, such as SCVWD and other urban agencies have done with Semitropic Water Storage District.

DPWD-10

To base a proposed FONSI on the following statement:

> "At the expected frequency of no or very little CVP irrigation water deliveries associated with this alternative, it is likely that farmers without affordable and accessible alternative water supplies will be subject to significant financial burdens. Farmers may fallow crops, resulting in lost farm revenue and related jobs. Farmers with permanent crops would be most vulnerable to losing high valued investments. Loss of agricultural employment would affect lower income population and minority

DPWD-11

Del Puerto Water District - continued

DPWD-6: The CVP M&I Water Shortage Policy would only be applicable in years in which allocation to M&I water service contractors would be less than 75 percent in the No Action Alternative (13 of the 72 years modeled). There would be changes in only 9 of the 13 years because water deliveries to irrigation water service contractors would be zero in 4 of the 13 years under both the No Action Alternative and all of the alternatives considered in the EA.

There would be no changes to allocations for irrigation and M&I water service contracts when allocations to M&I water service contractors are 75 percent or greater (59 of 72 years modeled).

The reference to the "72 years modeled" is based on the CALSIM model runs used by Reclamation to assess changes in CVP operations. The model simulates CVP operations under various methods and uses historic precipitation and unimpaired hydrologic patterns that would occur for 1922 through 1994.

DPWD-7: Compared to the No Action Alternative, the CVP M&I Water Shortage Policy would only be implemented to meet M&I public health and safety demands during drier years (when M&I water service contract allocations would be less than 75 percent and irrigation water service contract allocations would be less than 25 percent). Under Alternative 1B, the proposed action, if the M&I allocation is already greater than the public health and safety demand, than the existing M&I water service contract allocation would be provided and there would not be an increase in allocations as a result of implementing the policy.

Del Puerto Water District - continued

DPWD-8: The allocation method presented under the No Action Alternative is consistent with the allocation method used in all of the alternatives in the Central Valley Project Improvement Act Programmatic Environmental Impact Statement and other environmental documents prepared by Reclamation.

Justification for a policy that does not apply equal shortages to both irrigation and M&I users includes (1) Reclamation's experience from the last drought where M&I contractors submitted requests for critical needs water, (2) the widespread, heavy level of economic disruption that can be caused by insufficient M&I supply allocations, and (3) the fact that during drought emergencies human assistance becomes paramount. Also see Congressional Record - House, September 9, 1985, at 23000 (131 Cong Rec H7296), quoted in part in response to DPWD-5.

DPWD-9: There were historically four periods of drier hydrology that are considered in the 13 years of the 72 years modeled that would provide less than 75 percent allocation to M&I water service contractors. The period of 1924-1934 included multiple Dry and Critical Dry years; however one Wet year and one Above Normal year occur in the middle of this period. In 1958, a Wet year occurred, two years before the Dry year in 1960. The Critical Dry years of 1976 and 1977 were proceeded by a Wet year. The Dry and Critical Dry years of 1988 through 1991 were proceeded by a Wet year in 1986. If additional waters had been stored in wetter years to provide for higher M&I water service contract allocations, the stored water would have been spilled in Wet and Above Normal years to

Del Puerto Water District - continued

DPWD-9 - continued: provide for flood protection. It is not possible to provide the additional storage with the existing facilities and operational requirements.

DPWD-10: The opportunities for water transfer programs between CVP water service contractors and development of local water banking programs continue to be available. However, Reclamation cannot serve as the lead agency for these programs. The M&I Water Shortage Policy represents the program implemented by Reclamation to provide public health and safety demands.

DPWD-11: The excerpt cited continues by noting that there could be improved allocations of industrial employment. Because each irrigation water service contractor responds differently to reduced allocations, it was difficult to determine specific responses and related impacts to irrigators. Under Alternative 1B, the proposed action, there would be no difference in water supply allocations to irrigation water service contractors in 63 of the 72 years modeled. The reduction in allocations in the remaining 9 years would be 1 to 3 percent less and would be similar to conditions in the 13 of 72 years when irrigation allocations would be less than 25 percent. Therefore, it was determined that over the 72 years modeled, agricultural practices would not change as compared to the No Action Alternative.

This EA evaluated the impacts to both irrigation and M&I water service contractors with respect to the CVP divisions. Information was developed to project public health and safety values for individual M&I water service contractors.

populations more than other populations in the state." (Page 5-45, emphasis added)

is not only unjustifiable, it is quite simply incomprehensible.

DPWD-11 continued

To adopt such a policy is tantamount to suggesting that one can farm without water. There is no justification or rationale for such taking the proposed policy position. If M&I contractors know that the reliability of existing and converted water supplies retains its original agricultural status, as it must to avoid these unacceptable and significant impacts, they are in a position to plan for and acquire the quantities they need to assure the desired level of reliability.

Reclamation has never similarly considered increasing contract supplies or reliability to agricultural contractors based on increased acreage planted to permanent crops or the number of farms or farm families served. The point here is that the proposed policy quite clearly favors urban growth and water supply demand at the direct and ever-increasing expense of irrigation water supplies.

DPWD-12

The District remains seriously opposed to this and any other policy that would further impair the efficiency of the project for irrigation purposes.

In addition to these and the attached comments, the District wishes to incorporate by reference the comments provided you by and on behalf of Westlands Water District.

Your thoughtful consideration of these comments is appreciated.

Sincerely,

William D. Harrison
General Manager

Cc: Board of Directors
Ernest Conant, Esq.
Tom Birmingham, Westlands Water District

Del Puerto Water District - continued

DPWD-12: The M&I Water Shortage Policy does not provide M&I water service contractors assurances during drought years of minimum CVP supplies. Instead, it attempts to assist M&I water service contractors in sustaining urban areas during times of drought by (1) maintaining a 75 percent M&I CVP supply that can be reduced during times of limited supplies, and (2) providing M&I supplies to help protect public health and safety during emergencies, if water is determined available by Reclamation, up to 75 percent of Contract Total. Reclamation believes that the draft policy, when implemented in accordance with Alternative 1B, attempts to achieve the best compromise possible in sustaining urban areas during drought and protecting public health and safety while at the same time minimizing impacts to irrigation water service contractors.

Comment No. 2

The West Side Irrigation District, Patterson Irrigation District, and Banta Carbona Irrigation District April 22, 2005

HERUM CRABTREE BROWN
Attorneys At Law

Jeanne M. Zolezzi
jzolezzi@herumcrabtree.com

April 22, 2005

VIA FACSIMILE

Mr. David Lewis
United States Bureau of Reclamation
2800 Cottage Way, MP-730
Sacramento, California 95825

Re: Comments on the Draft Environmental Documents for the CVP Municipal and Industrial Water Shortage Policy

Dear Mr. Lewis:

These comments are made on behalf of The West Side Irrigation District, Patterson Irrigation District, and Banta-Carbona Irrigation District on the above referenced Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI).

Reclamation is using the National Environmental Policy Act process to justify a decision it has already made, which NEPA does not allow. In determining whether an Environmental Impact Statement (EIS) is required, Reclamation is required to analyze both the context and intensity of the impacts of the proposed action. 50 CFR § 1508.27. As to "context," the agency must consider such factors as whether the action has impacts on "society as a whole, the affected region, the affected interests, and the locality." Id. at § 1508.27(a). As to "intensity," the agency must consider whether the action involves "prime farmlands," Id. at § 1508.27(b)(3); the degree to which the action is related to other actions with . . . cumulatively significant impacts," Id. at § 1508.27(b)(7); and whether "the action threatens a violation of Federal . . . law or requirements imposed for the protection of the environment." Id. at § 1508.27(b)(10). The presence of one or more of these factors should result in an agency decision to prepare an EIS. (Public Service Co. of Colorado v. Andrus, 825 F.Supp. 1483, 1495 (D. Idaho 1993)). If, after fully evaluating these factors, 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." This "statement of reasons is crucial to determining whether the agency took a 'hard look' at the potential environmental impact of a project." *Blue Mountains Biodiversity Project v. Blackwood* 161 F.3d 1208, 1212.

Reclamation has undertaken NEPA analysis as to only a portion of the policy it is proposing; has failed to explain how it can implement the proposed policy without violating requirements of federal law; and has minimized the impact of the proposed alternative on the farmland involved. Each of these concerns is explained below.

1. No Action Alternative. The Bureau of Reclamation has made the EA largely irrelevant because of its carefully selected "No-Action Alternative." Reclamation cleverly defines the no-action alternative as including Reclamation's current policy of illegally

TWD, PID, BCID-1

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Response to Comments

TWD, PID BCID-1: The No Action Alternative is based upon the operational criteria presented in OCAP 2004. Page 3-9 of the Final EA defines the No Action Alternative as "the operational criteria presented in the OCAP 2004." Page 6-9, Table 6-2 of OCAP 2004 shows operating criteria for the OCAP modeling that are similar to the No Action Alternative Water Shortage Allocation in Table 3-4 of the EA. The No Action Alternative also uses the same priorities as in the proposed action of the Central Valley Project Improvement Act Programmatic Environmental Impact Statement.

Mr. David Lewis
April 22, 2005
Page 2 of 3

providing M&I contractors with a priority unauthorized by Congress, statute or contract. As a result, Reclamation has eliminated the majority of impacts resulting from its proposed implementation of the Proposed M&I Shortage Policy.

2. Legality of Alternatives. NEPA requires Reclamation to evaluate all reasonable alternatives. The Council of Environmental Quality has stated, "Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant." 46 Fed. Reg. 18026 (March 23, 1981), as amended, 51 Fed. Reg. 15618 (April 25, 1986). Any potential conflict with federal law must be considered. 50 CFR §1506.2(d).

The EA describes the no-action alternative as the operational criteria presented in the June 30, 2004 Long-Term Central Valley Project and State Water Project Operations Criteria and Plan (OCAP 2004). OCAP 2004 does not explain Reclamation's water allocation priorities and categories – particularly its description of the allocation of CVP water supplies as a "two-tiered hierarchy". The top hierarchy, Group I, includes M&I water supplies. Group II includes all agricultural water service contracts. OCAP 2004 states: "Group II water allocations are made only after Group I obligations have been met." The text further notes, "Because of increases in certain Group I requirements over time (M&I and refuge water) . . .the potential for deficiencies to Group II exists every year."

TWD, PID, BCID-2

In OCAP 2004 Reclamation based its CVP allocation priorities on a policy that has not yet been promulgated, and for which no NEPA analysis has been completed. Yet Reclamation now bootstraps that action into the current EA. OCAP 2004 states that: ". . . water service contracts are readily documented consisting of . . .contracts with specific terms and conditions" but the document ignores those conditions, however, and proceeds to group water service contractors into priority classes in direct contravention of the specific terms and conditions of those water service contracts. The majority of M&I water service contracts do not have a limit on reductions in supply, and none of the M&I water service contracts in the Delta Division have such a limit. Such a limit has been provided only by Reclamation's practice, not by contractual authority. At least in the Delta Division of the CVP, the contractual provisions specify that the same shortage allocations should be given to both ag and M&I water service contracts.

TWD, PID, BCID-3

Most importantly, NEPA requires that Reclamation consider how the hierarchy of water allocation priorities and categories described in each of the alternatives considered in the EA are reconcilable with the requirements of the Reclamation Project Act of 1939, which provides:

> "No contract relating to municipal water supply or miscellaneous purposes or to electric power or power privileges shall be made unless, in the judgment of the Secretary, it will not impair the efficiency of the project for irrigation purposes."

TWD, PID, BCID-4

3. Impacts are significant. The Findings of No Significant Impact conclude that the water supply shortages imposed upon agricultural water users as a result of implementing Alternative 1B are not significant. Reclamation does not discuss the fact that these impacts

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The West Side Irrigation District, Patterson Irrigation District, and Banta Carbona Irrigation District - continued

TWD, PID, BCID-2: See response to TWD, PID, BCID-1.

TWD, PID, BCID-3: Most of the existing water service contracts include a shortage provision. However, only a few of the existing M&I water service contracts include a specific provision to maintain 100 percent allocations until irrigation water service contract allocations are reduced to 75 percent. As described above, the methodology described in the No Action Alternative has been utilized in previous Reclamation environmental documents and in practice due to limited availability of water supplies for CVP water service contractors.

TWD, PID, BCID-4: See response to DPWD-5.

Mr. David Lewis
April 22, 2005
Page 3 of 3

may affect prime farmland. Rather, it determines that as a percentage, the impact is insignificant. While the EA evaluates each M&I contractor individually, it does not evaluate impacts to individual ag contractors to evaluate district specific environmental affects.

TWD, PID, BCID-5

Finally, there has been no public scoping process or comment period on newly developed "Preferred Alternative 1B". One of the major faults with the Draft M&I Policy is its selection of an arbitrary point in time to quantify the quantity of water to which the policy applies, that is the "projected M&I demand as of September 30, 1994, as shown for year 2030 on Schedule A-12 of the 1996 Municipal and Industrial Water Rates book." CVP contractors were unaware that this schedule would be used for this purpose until 1997, so contractors did not have the opportunity to review the Schedule for accuracy, nor to make corrections. Reclamation was subject to substantial criticism for this portion of the policy, and has apparently attempted to change that provision of the proposed policy through the NEPA process rather than the rulemaking process.

TWD, PID, BCID-6

The proposed change, however, suffers from the same flaw as the "cut-off" date – it is arbitrary, retroactive and selected without notification. Similar to the original cut-off proposal, CVP contractors have had no notice that the water needs assessment documentation, prepared for long-term CVP contract renewal, would be used to define their historic and future potential use of M&I water. Using the Water Needs Assessment for this purpose is inappropriate for numerous reasons. Most importantly, Reclamation identified the water needs assessment as a tool to confirm a contractor's demand for water, without emphasizing the importance of accurately forecasting whether that demand was ag or M&I. In fact, the USBR provided different instructions for preparation of the water needs assessments to ag and municipal contractors, and directed the agricultural contractors to prepare assessments on a regional basis. As a result of this regional approach identified in the February 22, 1999 letter from Reclamation, many contractors identified their future M&I needs in the "Transfers/ Exchanges Out" column rather than as a separate demand in the M&I column. Had these contractors known that their water needs assessments were to be used to determine the future availability of M&I to their districts on a reliable basis they would have taken a different approach to completion of the assessments.

TWD, PID, BCID-7

Finally, Alternative 1B must be made subject to public review and comment.

TWD, PID, BCID-8

Very truly yours,

JEANNE M. ZOLEZZI
Attorney-at-Law

JMZ:rl

cc: Ms. Barbara Kleinert
Mr. John Sweigard
Mr. David Weisenberger

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The West Side Irrigation District, Patterson Irrigation District, and Banta Carbona Irrigation District - continued

TWID, PID, BCID-5: Because each irrigation water service contractor responds differently to reduced allocations, it was difficult to determine specific responses and related impacts to irrigators. Under Alternative 1B, the proposed action, there would be no difference in water supply allocations to irrigation water service contractors in 63 of the 72 years modeled. The reduction in allocations in the remaining 9 years would be 1 to 3 percent less and would similar to conditions in the 13 of 72 years when irrigation allocations would be less than 25 percent. Therefore, it was determined that over the 72 years modeled, agricultural practices would not change as compared to the No Action Alternative.

The EA evaluated the impacts to both irrigation and M&I water service contractors with respect to the CVP divisions. Information was developed to project public health and safety values for individual M&I water service contractors.

TWID, PID, BCID-6: Reclamation believes that selection of Alternative 1B responsively addresses the concerns previously expressed by the contractors regarding the quantity of water to which the M&I Allocation applies. The criteria for developing the water needs assessments have been developed through a public process incorporating generally accepted procedures and the water needs assessments have been prepared in consultation and coordination with the individual contractors and with staff from the California Department of Water Resources. Based on the nature of their content and the collaborative process through which they were generated, and in

The West Side Irrigation District, Patterson Irrigation District, and Banta Carbona Irrigation District - continued

TWID, PID, BCID-6 - continued: the absence of substantive information otherwise, Reclamation believes this source of information is the most current and appropriate for this purpose. The final M&I Water Shortage Policy will be made available following selection of the NEPA alternative and release of the Final EA.

TWID, PID, BCID-7: CVP contractors were requested to provide information concerning existing and projected water demands based upon existing planning studies and information. The water needs assessments as prepared, which in some instances include “Transfers/Exchanges Out” notations, provide the information necessary for Reclamation to implement Alternative 1B.

TWID, PID, BCID-8: See response to TWID, PID, BCID-6. Alternative 1B has already been made subject to review and comment through the public draft EA and has been developed based upon information from prior public workshops and public comment. The criteria for developing the water needs assessments have been developed through a public process incorporating generally accepted procedures and the water needs assessments have been prepared in consultation and coordination with the individual contractors.

Comment No. 3

James Irrigation District and Reclamation District 1606
April 22, 2005

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Ernest A. Conant
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John Young 1913 - 2003
Joseph Wooldridge 1913 - 1996
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April 22, 2005

<u>VIA FASCIMILE & U.S. MAIL (916) 978-5094</u>

Mr. David Lewis
Bureau of Reclamation
2800 Cottage Way, MP-730
Sacramento, CA 95825

Re: **Comments regarding Municipal and Industrial Water Shortage Policy, Draft Environmental Assessment.**

Dear Mr. Lewis:

This letter is submitted on behalf of James Irrigation District and Reclamation District 1606, and for which we serve as general counsel, and the respective landowners and water users regarding the Draft Environmental Assessment for Municipal and Industrial Water Shortage Policy for the Central Valley Project, dated March, 2005 ("Draft M&I EA").

As you are aware, these two Districts have contracted for Project Water from the United States Bureau of Reclamation from the Delta Mendota Canal via the Mendota Pool. Their respective long term renewal contracts do incorporate by reference and M&I policy with respect to the Project Water supplies. In addition, under the original contracts they received Schedule 2 water, which would not be subject to the M&I policy, if and when adopted. The M&I shortage policy which reportedly was going to be shortly finalized at the time of negotiating these contracts was far different than many of the alternatives examined in EA, and the Districts never would have agreed to incorporate by referencing an M&I policy, if some of the alternatives examined in the EA were to become a reality.

These districts have significant concerns with both the legal authority for the M&I Shortage Policy under consideration, along with the analysis in the Draft M&I EA. For the sake of brevity, we incorporate by reference comments of Del Puerto Water District and Westlands Water District.

JID, RD1606-1

Response to Comments

JID, RD1606-1: See responses to comments from Del Puerto Water District and Westlands Water District.

James Irrigation District and Reclamation District 1606 - continued

We encourage the Bureau of Reclamation to reconsider the legal authority for the M&I Shortage Policy and to revise and recirculate the Draft M&I EA, taking into account the comments incorporated by this letter.

You consideration of these comments would be appreciated. If you have any questions, please contact me.

Very truly yours,

Ernest A. Conant

EAC:ars

Cc: James Irrigation District
Reclamation District 1606
Del Puerto Water District
Westlands Water District

Comment No. 4

Byron-Bethany Irrigation District
April 20, 2005

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April 20, 2005

VIA FACSIMILE AND REGULAR MAIL

David Lewis
Bureau of Reclamation
2800 Cottage Way, MP 730
Sacramento, CA 95825

Re: Comments on Municipal and Industrial Water Shortage Policy, Central Valley Project, California, Draft Environmental Assessment

Dear Mr. Lewis:

This letter is written on behalf of Byron-Bethany Irrigation District (BBID), formerly Plain View Water District (PVWD), in response to the draft Environmental Assessment (EA) on the Bureau of Reclamation's (Reclamation) Municipal and Industrial (M&I) Water Shortage Policy (Shortage Policy), Central Valley Project (CVP), California.

In November 2004, BBID wrote to William Luce, Area Manager, stating BBID's position that Reclamation contractually committed to define BBID's historic use of M&I water for purposes of applying the Shortage Policy to 800 acre-feet of water. This is the quantity of water assumed to have been converted from irrigation water to agricultural water during the term of the interim contract.

A decision by Reclamation to adopt any alternative shortage policy which would define BBID's historic use as less than 800 acre-feet constitutes a breach of the existing interim contract between BBID and Reclamation. BBID, therefore, encourages Reclamation to adopt a shortage policy based upon Alternative 1B.

BBID's specific comments regarding the draft EA are as follows:

1. Pages 3-4 – 3-5, Table 3-2: Table 3-2 does not provide sufficient information to evaluate the accuracy of the numbers included. BBID is in the process of negotiating an agreement with the City of Tracy wherein BBID will ultimately assign to the City over a period of years 12,000 acre-feet of water. According to the narrative provided in Chapter 4, at page 4-30, only a quantity of 9,500 acre-feet is assumed to be assigned to the City of Tracy. The information in Table 3-2 is inaccurate if it is based on the same assumptions made in Chapter 4. **BBID-1**

Response to Comments

BBID-1 All references to Plain View Water District will be modified to reflect the merger with Byron-Bethany Irrigation District.

Table 3-2 will not be modified because the agreement is still being negotiated between the City of Tracy and Byron-Bethany Irrigation District

The discussion on page 4-30 was developed based upon a notation on the Needs Assessment for the City of Tracy and Plain View Water District. A notation in the water needs assessment prepared for the City of Tracy and that was available at the time of the analysis indicates a transfer-in from Plainview Water District in the amount of 9,500 acre-feet/year, not 12,000 acre-feet/year. The discussion will be modified in accordance with the recently published Long-Term Contract Renewal Environmental Assessment for the Delta-Mendota Canal Unit and this comment.

David Lewis
April 20, 2005
Page 2

2. Page 4-30: The discussion in the first paragraph should be revised to reflect that BBID and PVWD have merged. PVWD no longer exists as a legal entity. The discussion should also be revised to reflect that BBID plans on assigning 12,000 acre-feet under its CVP water service contract to the City of Tracy.

BBID-2

3. Page 4-31: The public health and safety analysis for the City of Tracy is based only on its current CVP water service contract and does not reflect the assignments of CVP water that have been made by the Banta-Carbona Irrigation District and Westside Irrigation District or the proposed assignment of 12,000 acre-feet from BBID. This analysis is inconsistent with other evaluations of public health and safety allocations made for other contractors which are based on total CVP supplies, including assigned water. The public health and safety analysis for the study period should be premised upon the City of Tracy's total CVP water supply, not its current contract total.

BBID-3

4. The Affected Environment and Environmental Consequences, Chapter 5, should be reviewed to ensure that analysis was based upon the accurate quantities of water as set forth in these comments.

BBID-4

BBID appreciates the opportunity to review and comment on the draft EA.

Very truly yours,

Sandra K. Dunn
Attorney

SKD:sb

Byron-Bethany Irrigation District - continued

BBID-2: See response to BBID-1.

BBID-3: The CVP long-term renewal contract with City of Tracy is expected to have a contract quantity of 17,500 acre-feet/year, which includes transfers from Banta-Carbona ID in the amount of 5,000 acre-feet/year and from the Westside ID in the amount of 2,500 acre-feet/year.

BBID-4: The analysis has been modified based on quantities provided in these responses to comments.

Comment No. 5

Clear Creek Community Services District
April 21, 2005

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April 21, 2005

David Lewis
Bureau of Reclamation
2800 Cottage Way, MP-730
Sacramento, CA 95825

Comments By Clear Creek Community Services District on the Draft Environme[ntal] Documents for the CVP Municipal and Industrial Water Shortage Policy

Dear Mr. Lewis:

I serve as general counsel for the Clear Creek Community Services District. Enclosed is a comprehensive mark-up of Reclamation's proposed M&I Shortage Policy, showing at the relevant locations in the document our comments on the Policy and the adequacy of the Draft Environmental Assessment and Draft FONSI to address those portions of the Policy. Some attachments are also included to shed additional light on our comments.

While I would recommend that Reclamation give all of the comments serious consideration, two issues are probably of greatest importance to the District:

(1) The Draft EA has applied a new "needs analysis" of unknown origin to the District. Not only is the needs analysis arbitrarily imposed, the limitation on the District's usage of its full contract amount of M&I water violates the District's contract rights. **CCCSD-1**

(2) Secondly, the Draft EA and FONSI take no account of future water sales and conversions of AG-to-M&I water as a result of Reclamation's unilateral conversion of Ag-only contracts to Ag/M&I contracts about 5 years ago. The true effect will be to convert massive amounts of Ag to M&I water throughout the CVP, fueling future urban growth and land use changes. These effects were noted in Reclamation's 1997 Bookman-Edmonston Engineering report, but are not addressed in the EA or the FONSI. The District is concerned that the curtailment of future Ag water supplies to the District resulting from this Policy, are not accounted for in the environmental review. **CCCSD-2**

Please include these comments in the record of Reclamation's environmental review of the proposed M&I Shortage Policy.

Very truly yours,

LAW OFFICES OF WALTER P. MCNEILL

Walter P. McNeill

WALTER P. MCNEILL

Response to Comments

CCCSD-1 The Needs Assessments were prepared by Reclamation as part of the Long-Term Contact Renewal process for the CVP Water Service Contracts. The information contained in the water needs assessments represents the best estimates of water demands made in a collaborative fashion by Reclamation and the contractors and was provided to each of the subject contractors. By letter dated February 9, 2000, Reclamation forwarded to Clear Creek Community Services District its draft water needs assessment with a request to provide Reclamation specific urban use information because the evaluation of beneficial use of urban water supplies showed the district had almost an order of magnitude greater per capita usage than considered reasonable for the area, i.,e., much higher than the reference per capita usage figure. The district's February 29, 2000 response indicated a reduction in per capita usage down to 66 gallons per capita day above the reference per capita usage figure. By letter dated October 3, 2000, Reclamation forwarded to Clear Creek Community Services District its final water needs assessment with the comment that Reclamation decreased urban water use in the assessment to the reference per capita use figure plus 100 gallons per capita day. That final water needs assessment indicates a total M&I demand of 8,283 acre-feet/year, the same figure shown on page 4-5 and used in the analysis. In the absence of any communication from Clear Creek Community Services District indicating otherwise,

Clear Creek Community Services District - continued

CCCSD-1 - continued: Reclamation had assumed Clear Creek Community Services District was satisfied with its final water needs assessment.

CCCSD-2 The EA describes the impacts to CVP irrigation water service contractor water supplies of implementing Alternatives 1 and 2 as compared to the No Action Alternative in Chapter 5.

The development of contract language and the execution of irrigation and/or municipal and industrial water service contracts are not unilateral actions, but reflect a preference by the CVP contractors that was implemented by mutual agreement of the parties.

<u>DRAFT</u>
Central Valley Project
M&I Water Shortage Policy
<It's a misnomer to refer to this as only an M&I shortage policy. By necessity it also defines Ag shortages. To be accurate "M&I" should be deleted.>
September 11, 2001

CCCSD-3

The CVP (Central Valley Project) is operated under Federal statutes authorizing the CVP and by the terms and conditions of water rights acquired following California law. During any year, there may occur constraints on the availability of CVP water for an M&I (municipal and industrial) contractor under its contract. Thus, the purposes of this policy are to:

- Define water shortage terms and conditions applicable to all CVP M&I <insert "and Ag"> contractors

CCCSD-4

- Establish a minimum water supply level that (a) with M&I contractors' drought water conservation measures and other water supplies<Consideration of non-CVP water supplies has the effect of federalizing water management and penalizing development of alternate non-CVP water sources.> would sustain urban areas during droughts, and (b) during severe or continuing droughts would, as much as possible, protect public health and safety

CCCSD-5

- Provide information to help M&I contractors develop drought contingency plans

Currently, many M&I contractors are not using their full M&I portion of their contract total. <Successive drafts of this policy have become less rather than more informative as to the context in which this policy is adopted. Full disclosure would reveal that the M&I contractors are currently using less than two-thirds of their contract quantities, and thus have a tremendous amount of unused quantity to absorb future growth to the detriment of future Ag water allocations---a factor not considered or analyzed whatsoever in the Draft EA or Draft FONSI.> If the M&I water shortage allocation were applied to full contract entitlements, the resulting allocation for some contractors would exceed their current demand. M&I water demands within the CVP are continually increasing. Therefore, the provision for "75 percent M&I reliability" will be applied to a contractor's *historical use*, with certain adjustments, up to the CVP projected M&I demand as of September 30, 1994. < It is not clear from the Draft EA if Reclamation has retained or abandoned the "historical use" concept. On page 3-11 of the Draft EA it indicates that "Under Alternative 1, allocations would be based upon historical use ..." But Table 3-5 of the Draft EA pertaining to Alternative 1 shows all shortage allocations based upon <u>contract total</u>. If in fact contract total is now the basis for allocations, this is a huge change in the policy that is not analyzed or discussed anywhere in the environmental documents.> Reclamation recognizes that as water conservation measures are implemented there is a hardening of demand that lessens an M&I contractor's ability to reduce demand during shortages.

CCCSD-6

CCCSD-7

The capability of the CVP to meet the water supply levels addressed by this policy is subject to the availability of CVP water supplies. M&I water shortage allocation may differ between divisions of the CVP. Generally, the allocation (percentage) to the various divisions will be the same, unless specific operational constraints on Reclamation require otherwise.

Clear Creek Community Services District - continued

CCCSD-3 The program has been referred to as the M&I Water Shortage Policy based upon the CVPIA Administrative Policy efforts.

CCCSD-4 Shortage terms and conditions applicable to irrigation CVP water service contractors are described in the OCAP 2004.

CCCSD-5 Reclamation believes that the CVP M&I Water Shortage Policy will have very little, if any, negative impact on an M&I water service contractor's motivation to seek other water supplies. The policy clarifies that Reclamation will deliver at a public health and safety water supply level, up to 75 percent of the Contract Total, provided CVP water is available. This proviso along with fully disclosed constraints on availability of CVP water per the OCAP 2004 should encourage development of non-CVP water supplies by M&I water service contractors for use during times of emergencies. Because one of the goals of the policy is to provide protection during emergency conditions as much as possible, attempting to provide project water where and when actually needed to maintain public health and safety during emergencies is necessary to accomplish that goal.

CCCSD-6 The analysis in the EA is conducted based upon the future No Action Alternative conditions as defined by the Needs Assessment and other studies. The No Action Alternative conditions represent projections for 2030 when it is assumed that M&I water service contractors will be fully utilizing their water service contract allocations.

Clear Creek Community Services District - continued

CCCSD-7 Table 3-5 presents the water shortage allocation methods to be applied to all CVP water service contracts based upon the system conditions, as described in OCAP 2004. The overall allocation percentage will then be applied to individual contractors based upon their individual historical use, as described in Exhibit 3-1. The No Action Alternative and action alternatives were analyzed in the EA at time of build out (when historical use and full contract quantity are the same) in order to capture the full range of impacts.

Reclamation explored the concept of two tiers of M&I water supply reliability as proposed by contractors in the CVPIA (Central Valley Project Improvement Act) Administrative Proposal on Urban Water Supply Reliability. Although Reclamation determined not to adopt two tiers, it will facilitate the sale of CVP water from willing sellers to M&I contractors when necessary. <This paragraph doesn't have a clear meaning except to suggest that Reclamation will encourage sales of water to M&I contractors. The most common current sales (following the wholesale conversion of the CVP irrigation contracts to dual purpose Irrigation/M&I contracts) and probable future sales are transfers of water from primarily Irrigation contractors to M&I contractors. Reclamation's facilitation of such sales will enhance and accelerate the conversion of land use from raw and/or Ag to urban uses throughout the CVP, and hasten the steep decline of Irrigation water allocations. >

CCCSD-8

Definitions

Historical use - The average quantity of CVP water put to beneficial use within the service area during the last 3 years of water deliveries, unconstrained by the availability of CVP water. Reclamation and the contractor will negotiate the calculated historical use, to be outlined in a contract exhibit that can be modified during the contract period (but that will not require formal contract amendment). Reclamation recognizes that certain circumstances may require adjustment of the historical use such as growth, extraordinary water conservation measures, or use of non-CVP supplies. Also, Reclamation may agree to adjust the historical use on the basis of unique circumstances. An example of a unique circumstance is the year following a drought year, in which water users are still using extraordinary water conservation measures, or the converse, in which a contractor may use more water than historically used in order to recharge ground water. <Though some flexibility is desirable, the allowance for "unique circumstances" raises more questions than answers, and looks more like a loophole than a guideline. Every contractor feels "unique" in some way. This language will invite competition among contractors and political intrigue to see who can qualify for "unique circumstances. Because there are no standards or guidelines to qualify "unique circumstances," this is an invitation for potentially arbitrary and capricious exceptions with no accountability or predictability for environmental review purposes.>

CCCSD-9

Adjusted for growth - An adjustment to the contractor's historical use quantity to account for demand increases within the contractor's service area to include (but not be limited to) increases due to population growth and to the number or demand of industrial, commercial, and other entities the contractor serves, provided the contractor provides required documentation to Reclamation.

Adjusted for extraordinary water conservation measures – An adjustment to the contractor's historical use quantity to account for conservation measures that exceed applicable best management practices adopted by the California Urban Water Conservation Council. A water conservation measure considered extraordinary in 2001 may be a mandatory best management practice in 2010 and thus would not be considered extraordinary in 2010.

Adjsuted forNon-CVP water - An adjustment to the contractor's historical use quantity to account for water sources other than the CVP used to satisfy M&I demand within the contractor's service area, subject to written documentation from the contractor that shows the extent to which use of the non-CVP water actually reduced the contractor's use of CVP water

Clear Creek Community Services District - continued

CCCSD-8 The purpose of this EA is to evaluate the impacts of implementation of the M&I Water Shortage Policy . Individual water transfers involving CVP water service contract water would be subject to separate environmental documentation.

CCCSD-9 The draft M&I Water Shortage Policy devotes much discussion to defining "historical use." Reclamation believes that this is an objective and verifiable standard. The EA includes an example of the application of historical use. Any further specificity beyond the definition provided in the policy is impractical at a CVP-wide policy level. Some level of relatively fine tuning that addresses the use and management of water by individual contractors is included in the policy, including references to "unique circumstances."

It should be noted that negotiated long-term renewal contract (for example, R.O. FINAL 4/19-2004) language will protect the contractor from arbitrary determinations while simultaneously affording Reclamation needed operational flexibility during dry and critical years. See the following Articles: "Opinions and Determinations" ("said terms shall not be construed as permitting such action to be predicated upon arbitrary, capricious, or unreasonable opinions or determinations"); "Coordination and Cooperation" "The contracting officer and contractor shall communicate, coordinate, and cooperate with each other…The communication, coordination and cooperation regarding operations and management shall include … any action which will or may materially affect the quantity or quality of Project Water

Clear Creek Community Services District - continued

CCCSD-9 - continued: Supply, the allocation of Project Water supply,…"

in other years. <This has been explained as being intended to avoid disadvantaging contractors who develop alternate non-CVP sources of supply. It is not effective when non-CVP water is much more expensive than CVP water, as is almost always the case. There is no reason to substitute expensive water for less expensive water, and use the expensive water as the base supply. (See comment to term # 8.) ***It is also worth noting that consideration of non-CVP supplies is unique to M&I water as contrasted with Ag water. As a result, Ag water is given a significant preference for use of groundwater and other alternate non-CVP supplies. No policy grounds or justification is given for this disparate treatment of M&I and Ag CVP supplies. Reclamation should not (by implication) regulate non-CVP water, and this should not be part of the shortage policy.>

CCCSD-10

Public health and safety - M&I uses to which water is allocated consistent with criteria established by the State of California, or as established by Reclamation consistent with criteria applied by similarly situated California M&I water supply entities, as applicable, during declared water shortage emergencies. "Public health and safety" is a difficult and potentially contentious definition. Water Code § 354 provides priority for "domestic use, sanitation, and fire protection." Current Reclamation rule-of-thumb estimate is 50 gallons per capita per day. Some M&I contractors argue for inclusion or "next in line" status for critical industries. Logical arguments can be made for various definitions of the public health and safety level of supply. The issue really is too important to defer till later or pass off to other agencies. This language is not a "definition" at all. The issue may ultimately prove more contentious when an actual decision is required than it would be to fashion a real definition for this policy now. This language should be replaced by a real working definition of public health and safety before a shortage policy is finally adopted. The Draft EA, at p. ES-5, completely defers addressing the issue, stating: However, these quantities are not currently available for use in this analysis but are expected to developed by Reclamation and the contractors." **Consequently the Draft EA and Draft FONSI are not based upon any real analysis at all and cannot provide competent or coherent environmental review.** *** Also, this definition and the policy need to be coordinated with the fact that only local agencies –not Reclamation—have the authority to define and declare a "water shortage emergency." (Water Code § 350 et seq.) The definition may have to operate as a minimum Reclamation service level, as opposed to a level below which a "water shortage emergency" is declared. (See comment to term # 7.)

CCCSD-11

Terms and Conditions

1. Allocation of M&I water will be based on a contractor's historical use of CVP M&I water, adjusted for (a) *growth*, (b) *extraordinary water conservation measures*, and (c) *non-CVP water*, subject to Term and Condition 3. At the contractor's request, Reclamation will consult with the contractor to adjust the constractor's historical use on the basis of (a) growth, (b) extraordinary water conservation measures, and (c) use of non-CVP water. Term and Condition 1 is intended to encourage contractors to use non-CVP water first and rely on CVP water as a supplemental supply. <See comments on non-CVP water definition above; contractors will not invest in the development of non-CVP supplies, knowing that the investment will be made worthless by Reclamation's counteracting withdrawal of equivalent CVP supplies during shortages.> Reclamation will adjust the historical-use calculation to reflect the effect of non-CVP water used in lieu of use of the contractor's CVP water. Crediting for this non-CVP water will be based on 1 acre-foot for 1 acre-foot, unless Reclamation and the contractor agree otherwise in considering

CCCSD-12

Clear Creek Community Services District - continued

CCCSD-10 See Response to CCCSD-5.

CCCSD-11 As described on page 3-6, CVP contractors are required to develop water conservation plans that will include the identification of public health and safety water quantities for each M&I contractor. However, these quantities are not currently available for use in the EA. Therefore, for the purposes of the EA, several assumptions related to public health and safety values were developed to provide a basis of the impact assessment in the EA, as described in Chapter 4. See Table 3-3 for a summary of public health and safety criteria developed by water agencies, indicating that 50 gallons per capita day is a generally accepted and very reasonable figure for public health and safety residential water use.

CCCSD-12 See Response to CCCSD-5.

unique circumstances. The contractor must fully document use of non-CVP water to clearly show how much that water use actually reduced the contractor's use of CVP water in other years, and submit the documentation in writing to Reclamation. <Reclamation has yet to explain how this "credit" benefits a contractor, as there is no indication or assurance that the policy will use the "credit" quantity as a basis to provide water during critical water years. Nowhere does this policy promise that a contractor regularly using "X non-CVP water plus Y CVP water" will receive a (for example) 75 % (X+Y) allocation of CVP water in addition to its non-CVP supply during a critical water year. Given Reclamation's promise to provide water at public health and safety levels (term # 7) and the proviso that non-CVP supplies may be considered "at times of extraordinary circumstance"(also in term # 7), then during widespread drought conditions that threaten health and safety levels Reclamation will be compelled to redistribute CVP water from M&I contractors that can get by on non-CVP water to protect the health and safety of contractors who have little or no non-CVP water. As far as I can tell, the contractor gains no protection against shortages by developing new non-CVP supplies, and has no incentive to substitute non-CVP for CVP water. *** The "credit" is actually mathematically detrimental to the CVP supply, because the % reduction taken against the aggregate supply (X+Y) takes out more CVP water off the top than if the % were applied to actual amount of CVP water (Y). >

CCCSD-13

2. For an M&I contractor to be eligible for the "minimum shortage allocation" of 75 percent of adjusted historical use, the contractor's water service contract must reference that M&I water shortage policy. < Reclamation now interjects this policy as if it were a critical term in the water service contract, created outside of the contract without negotiation. This is an illegal attempt to modify M&I contracts, that carry an absolute right of renewal subject to renegotiation only of specified terms—of which this is not one. Clear Creek CSD has already entered into a long term renewal of the water service portion of its contract, which includes a reference to the M&I shortage policy. However, this does not give Reclamation carte blanche to adopt a policy which contradicts or interferes with the contract terms. The proposed policy would result in a breach of the new long term contract by decreasing and limiting the M&I quantity available to the District under the contract. The District has an unqualified right to 15,300 acre feet of M&I water on the same basis as all other so-called "M&I contractors" who use M&I water exclusively. > In addition, the water service contractor must (a) have developed and be implementing a water conservation plan that meets CVPIA criteria and (b) be measuring such water consistent with section 3405(b) of the CVPIA.. Reclamation intends to incorporate in all new, renewed, and amended water service contracts, a provision that references the CVP M&I water shortage policy. <Reclamation may state its intentions through any news media or general communications it chooses. Reclamation cannot dictate future or existing contract terms through the formulation of a "policy."

CCCSD-14

CCCSD-15

3. This M&I water shortage policy applies only to that portion of the CVP water identified as projected M&I demand as of September 30, 1994, as shown for year 2030 on Schedule A-12 of the 1996 Municipal and Industrial Water Rates book and for those contract quantities specified in section 206 of Public law 101-514 Subject to these limitations, except as provided for public health and safety levels (Term and Condition 7), irrigation water transferred or converted to M&I use after September 30, 1994, will be subject to shortage allocation as irrigation water. < According to the Draft EA and Draft FONSI, the preceeding has been replaced by the Water Needs Assessment prepared by Reclamation for the CVP Long-Term Water Service Contract renewal. **The Draft EA now shows a "needs assessment" figure of 8,223 acre feet for the District that the District has never seen before !** And this is a reduction from the previous proposed rate book quantity of 10,300 acre feet, to which the District

CCCSD-16

Clear Creek Community Services District - continued

CCCSD-13 A mathematical example of the application of the CVP M&I Water Shortage Policy related to the use of non-CVP water service contract water is presented in Exhibit 3-1 in the EA.

CCCSD-14 The water needs assessment for Clear Creek Community Services District that was prepared in consultation and coordination with the district notes a projected Total M&I Demand of 8,283 acre-feet in year 2025.

CCCSD-15 Term and Condition 2 of the draft CVP M&I Water Shortage Policy requires a reference in the long-term CVP water service renewal contract to the policy in order for the M&I water shortage allocation of the policy to apply. The contractual reference in the contractor's long-term CVP water service renewal contract has been a subject of negotiations between Reclamation and the contractors.

CCCSD-16 Alternative 1A defines the M&I allocation of the Contract Total to which the CVP M&I Water Shortage Policy applies to be defined as the value shown for Year 2030 on Schedule A-12 of the 1996 Municipal and Industrial Water Rate book as of September 30, 1994. Alternatives 1B, 2A, and 2B utilized the information from the Needs Assessment prepared by Reclamation as part of the long-term contract renewal process. The results of the Needs Assessment, as summarized on page 4-5, have been compared to the information provided as an attachment to the commenter's letter. By letter dated October 3, 2000, Reclamation forwarded to the district its final water needs assessment. That final water needs assessment indicates a total M&I demand of 8,283 acre-feet, has also objected during the development of the "shortage policy." The District's needs analysis submitted to Reclamation for the CVP Long-Term Water Service Contract renewal showed future demand for M&I water at 25,068 acre feet. (See attached.) As noted previously, the District has an unqualified right to 15,300 acre feet of M&I water on the same basis as all other so-called "M&I contractors" who use M&I water exclusively. The District's water contract has provided for use of the full amount as M&I water from the commencement of the contracted water service in 1963 and cannot be changed now.

This proposed policy violates the District's contract rights to use of M&I water. There is no legal basis for establishing an arbitrary ceiling on the District's M&I water usage within its existing contract amount. Unlike the M&I contractors who typically have 0% agricultural usage, Clear Creek has a major proportion of Ag usage (about 60%) that may eventually be converted to M&I use, as the district currently provides 100% M&I quality water to all of its customers (including Ag customers). There also is no legal basis for a policy which compels the district to accept two different classes of M&I water--reliable existing M&I supplies and unreliable "converted" M&I supplies from an Ag allocation. The District has been arbitrarily treated differently from all other so-called "M&I contractors" (with exclusively M&I usage), all of whom are given projected needs assessment amounts in excess of their contract quantities.

The use of any ceiling at all in the shortage policy arises only because Reclamation (around the year 2000) arbitrarily, and without any environmental review or consultation, converted all of the Ag-only CVP contracts to joint use Ag/M&I contracts. The purpose of the conversion was to allow Ag contractors to sell their water supplies to M&I contractors, at great profit to the Ag contractors. Without that change of authorized use in the Ag contracts to Ag or M&I, the Ag contractors could not have legally marketed and sold their contract supplies. The creation of a ceiling to define and control the "conversion" of Ag to M&I water was deemed necessary to prevent a wholesale explosion of urban growth fueled by new M&I water supplies. That "ceiling" --designed and created for the new M&I water sellers of the Central Valley—has now been arbitrarily and illegally applied to Clear Creek CSD (which has had a full M&I contract supply for over 40 years).

For CVP water transferred or assigned, a CVP contractor may request that the CVP water so obtained be eligible for M&I reliability. Before Reclamation may approve such a request, the transferee or assignee must fully mitigate any adverse impacts to agricultural water supplies. Further, for CVP water converted, an M&I contractor may request a permanent conversion from an agricultural shortage criteria to M&I shortage criteria, provided there are no adverse impacts to agricultural or other M&I water supply contracts.

4. Before allocation of M&I water to a contractor will be reduced, allocation of irrigation water will be reduced below 75 percent of contract entitlement, as shown here:

Irrigation Allocation	M&I Allocation
100%	100%
95%	100%
90%	100%
85%	100%
80%	100%

CCCSD-16 continued

Clear Creek Community Services District - continued

CCCSD-16 - continued: per year the same figure shown on page 4-5 and used in the analysis.

Both the Needs Assessment and the attachment are based on a projected population of 20,721. The Needs Analysis includes a residential water demand of 5,905 acre-feet/year. The attachment indicated a residential water demand of 1,510 acre-feet/year.

Both the Needs Assessment and the attachment included 1,028 acre-feet/year for commercial demand.

Both the Needs Assessment and the attachment included 1,350 acre-feet/year for system losses.

The Needs Assessment included 26,550 acre-feet/year for irrigation demands of 7,375 acres. The attachment indicates an irrigation demand of 22,690 acre-feet/year for 6,506 acres. This appears to include both residential landscaping and agricultural acreage. Table 4.3-20 in the Final EA for the Long-Term Contract Renewal for Shasta and Trinity River Divisions included a projected acreage for 2029 (consistent with the Needs Assessment) of 4,690 acres of irrigated agriculture using CVP water service contract water. Therefore, using the water demand unit rate in the attachment, the irrigation water demands would be 15,271 acre-feet/year for irrigated agriculture and 5,913 acre-feet/year for residential landscaping (assuming appropriate interpretation of the attachment information).

District Name: Clear Creek CSD								Year 2025
Residential Demand:								[1000 AF]
Interior Demand			**Landscape Demand**					
# of Residents	Per Capita Factor[1]	Subtotal[2]	Irrigated Acreage	ETo[3]	ET Factor	Subtotal[4]		Total
30,721	65	1.51	6,506	4.07	0.8	21.18		22.690
Nonresidential Demand:								[1000 AF]
Interior Demand			**Landscape Demand**					
Industrial[5]	Commercial/ Institutional	Subtotal	Irrigated Acreage	ETo[3]	ET Factor	Subtotal[4]		Total
-	0.0838	0.0838	290	4.07	0.8	0.9444		1.028
Distribution System Demand:								[1000 AF]
Distribution System Losses[6]			Unaccounted Beneficial Use[7]					Total
0.300			1.050					1.350
Total M&I Demand=Residential + Nonresidential + Distribution System =								25.068

Monthly Pattern for M&I Demand:												[%]
J	F	M	A	M	J	J	A	S	O	N	D	Total
3	3	4	7	11	12	17	16	12	8	4	3	100

[1] The "M&I Water Demand Analysis" methodology assumes per capita factors of 75 gallons per customer per day (gpcd) and 55 gpcd to estimate current (1995) and future (2020) residential demands, respectively.

[2] The formula for interior residential demand is:
[(# of residents)x(per capita factor in gpcd)x(365 days/year)x(TAF/1000 ac-ft)]/325,851(gallons per ac-ft).

[3] Evapotranspiration=annual reference evapotranspiration in inches/yr (Eto)x(ET factor)/12 inches/ft; where ET factor is assumed to be 1.0 in the base year and 0.8 by the year 2020.

[4] Landscape demand=total irrigated acreagex evapotranspirationx(TAF/1000 ac-ft).

[5] The "M&I Water Demand Analysis" methodology suggests using the month of February demand x 12 months to estimate interior nonresidential demand where landscape water demands are not metered separately; however, for industries with seasonal peak demands, this suggestion will result in underestimating the demand.

[6] Either actual data for such uses as firefighting, mainline flushing, stormdrain flushing, sewer and street cleaning, construction site use, water quality, and testing or average of 1-2% of total metered use for previous 5 yrs.

[7] Either actual data for leaks, evaporation and and water theft or less than 7% of average total metered use for previous 5 yrs.

Clear Creek Community Services District - continued

CCCSD-16-continued:

The Needs Assessment indicates a total M&I and irrigated water demand of 8,283 and 26,550 acre-feet/year, respectively, and a total of 34,833 acre-feet/year. The total based on an interpretation of information in the attachment would be 9,801 and 15,267 acre-feet/year, respectively, and a total of 25,068 acre-feet/year. The 9,801 figure is approximately within 10% of the 8,283 Total M&I Demand figure shown in the water needs assessment.

The criteria for developing the water needs assessments have been developed through a public process incorporating generally accepted procedures and the water needs assessments have been prepared in consultation and coordination with the individual contractors, including Clear Creek Community Services District, as well as with staff from the California Department of Water Resources. Based on the nature of their content and the collaborative process through which they were generated, Reclamation does not believe that any other source of information available could be more appropriate for this purpose or, consequently, that selection of the water needs assessment for this purpose could be deemed as arbitrary.

Reclamation does not control what portion of Clear Creek Community Services District's contract supply is used for M&I purposes, as the district uses its contract supply for M&I purposes as it sees fit in order to meet demands. The CVP M&I Water Shortage Policy will not prohibit a contractor from using its Contract Total for M&I use to the extent otherwise permitted in the water service contract

Clear Creek Community Services District - continued

CCCSD-16 - continued: and by applicable law. As described and analyzed in this EA, the CVP M&I Water Shortage Policy will provide Clear Creek Community Services District a minimum public health and safety allocation, if CVP water is available, and therefore, as part of meeting policy purposes, will serve Clear Creek Community Services District well.

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75%	100%

5. When allocation of irrigation water has been reduced below 75 percent and still further water supply reductions are necessary, both the M&I and irrigation allocations will be reduced by the same percentage increment. The M&I allocation will be reduced until it reaches 75 percent of adjusted historical use, and the irrigation allocation will be reduced until it reaches 50 percent of contract entitlement. The M&I allocation will not be further reduced until the irrigation allocation is reduced to below 25 percent of contract entitlement, as shown in the following tabulation.

Irrigation Allocation	M&I Allocation
70%	95%
65%	90%
60%	85%
55%	80%
50%-25%	75%

6. When allocation of irrigation water is reduced below 25 percent of contract entitlement, Reclamation will reassess both the availability of CVP water supply and CVP water demand. Due to limited water supplies, M&I water allocation to contractors may be reduced below 75 percent of adjusted historical use. < This table stops at the 25/75 level. Table 3-5 in the Daraft EA continues and goes down to 0/50. That is a significant proposed change in the Policy itself. A major deficiency in the Draft EA and Draft FONSI is that Reclamation has not produced a reviewable version of the proposed Policy that incorporates and shows all of the new terms, whatever those may be. >

CCCSD-17

7. Reclamation will deliver CVP water to an M&I contractor at not less than a *public health and safety* level, provided CVP water is available <Is water "available"if it is also needed for environmental purposes or some other urgent need ? If public health and safety has the top priority, there ought to be a statement to that effect in this policy.>, if (a) the Governor declares an emergency due to water shortage applicable to that contractor or (b) Reclamation, in consultation with the contractor, determines that an emergency exists due to water shortage.

CCCSD-18

<Reclamation puts itself in the position of determining whether the contractor is experiencing a water shortage emergency. By State law (Water Code § 350 et. seq.) the contractor has the sole legal responsibility to decide whether to declare a water shortage emergency and how to administer the emergency. This is a legal duty that cannot be contracted or delegated away .>

CCCSD-19

The contractor will calculate the public health and safety level usong criteria developed by the State of California and submit the calculated level to Reclamation along with adequate support documentation for review. < Does "review" mean merely for information purposes or for the purpose of approval ? Even though the level is "set by the contractor," past experience indicates that "review" also means "approval.">

CCCSD-20

If State criteria do not exist, the contractor will apply criteria developed by Reclamation <Again this is a potential conflict with the contractor's duty under State law to determine the existence of a water shortage emergency.> (in consultation with the contractor) that will be consistent with relevant criteria used by similarly situated California M&I water entities.

CCCSD-21

Reclamation will provide a water supply at the public health and safety level to all CVP M&I contractors, including contractors with allocation of irrigation water transferred or converted to M&I use after September 30, 1994. < This is where Reclamation's

Clear Creek Community Services District - continued

CCCSD-17 See Response to TWID, PID, BCID-6

The text and the tables in the EA extensively address in detail a description of Alternative 1B, example contract allocations under Alternative 1B, and an analysis of the impacts of implementing Alternative 1B. This detailed information was provided to the public for review and comment within the public draft EA. See the following regarding description of Alternative 1B and its impact upon surface water resources: Pages ES-4, 3-9 through 3-12, and 5-9; Figure 3-2, Exhibit 3-3, and Tables 3-5, 5-3, 5-4 and 5-9. Similar information is provided for the three other action alternatives. The final CVP M&I Water Shortage Policy will be made available following selection of the NEPA alternative and release of the Final EA.

CCCSD-18 As described in Chapter 2 of the EA and OCAP 2004, the determination of available CVP water for water service contractors is made after compliance with water rights responsibilities and environmental requirements in accordance with the requirements of the State Water Resources Control Board, US Fish and Wildlife Service, and National Oceanic and Atmospheric Administration Fisheries Service. As described in Chapter 5 of the EA, in the driest of years, there will not be water available to fully meet public health and safety values of the M&I water service contractors.

CCCSD-19 Reclamation does not claim authority to declare a water shortage emergency. The draft policy states that Reclamation will deliver, subject to conditions, at a public health and safety level if (a) the Governor declares an emergency or (b)

Clear Creek Community Services District - continued

CCCSD-19 - Reclamation determines an emergency exists. Reclamation's determination in this context relates to exercise of Federal discretion regarding water allocation to Federal water service contractors, not to any official emergency declaration within the purview of the State that involves a contractor located within the State.

CCCSD-20 Review is for approval purposes.

CCCSD-21 Reclamation recognizes the importance of State law, and therefore, would rely upon State criteria if such exist. If the criteria do not exist for determining public health and safety values (as under current conditions in the State of California), then criteria developed by Reclamation would apply for that portion of water provided under a CVP water service contract.

environmental review is totally deficient. Sales of what was formerly restricted as Ag water for use as M&I water, sold by newly minted joint-use contractors (formerly Ag-only contractors) to M&I contractors for expanded M&I usage, are not contained or controlled by this Policy. Once the water is sold and "converted" to M&I use it then carries a "floor" of M&I "health and safety" reliability. That floor can be as high as 90% for sensitive industrial uses. An accurate assessment of the effect of the "floor" is impossible, since Reclamation has deferred making a specific determination or definition of "health and safety" levels. Regardless of the precise levels that could or might be established, there is no limitation on converted Ag-to-M&I water as a proportion of overall CVP water usage. In other words, **Ag water will be permanently converted to M&I usage as a growing percentage of all CVP water deliveries, as a direct result of this Policy.** The environmental impacts are enormous and unaccounted for in the Draft EA and the Draft FONSI. Further, the impacts are more dramatic in some regions of the CVP than others. The attached copy of selected portions of the Bookman-Edmonston Engineering report (1997) titled "Urban Reliability Policy Impact Analysis" (prepared for Reclamation) provides a substantially accurate analysis of the currently proposed Policy. It shows that in the CVP Operations Office Group "North of the Delta" the "shortage impact" on Irrigation (Ag) contractors will ultimately increase to 30.8% from 5.2%, at the 55% shortage level, as a result of implementation of the shortage Policy. Plainly stated, contrary to the findings in the Draft FONSI, there will be a massive and permanent shift of Ag to M&I water usage, providing water for growth and changes in land use. At times of extraordinary circumstance, Reclamation may determine that is necessary to vary the allocation of M&I water among contractors, taking into consideration a contractor's available non-CVP water. <This is what really penalizes contractors who develop expensive non-CVP water supplies to use either as supplemental water in regular water years or for emergency use in severe drought conditions. If a contractor and its customers make a huge financial investment in developing a supplemental non-CVP supply for emergency use, Reclamation may force the contractor to use its non-CVP supply as a replacement for its CVP water, and redistribute that CVP water to other contractors who need it to maintain health and safety levels. The contractor completely loses the value of the investment in new non-CVP supplies. The risk of redistribution by Reclamation makes it impossible to justify the investment in the first place. ***

CCCSD-22

This provision also "federalizes" local water management at the individual district level. Whereas water districts currently seek out a variety of water sources, if they can, to enhance reliability and quantity, Reclamation would now step in and become the determining factor during drought conditions. Centralized command and control of local water management by Reclamation is inappropriate, inefficient, and beyond the resource capability of Reclamation to administer.

CCCSD-23

8. Each M&I contractor will provide to Reclamation its drought contingency plan designed to protect public health and safety. The contractor may provide a copy of its Urban Water Management Plan (UWMP) or water conservation plan (WCP) to Reclamation in lieu of a separate drought contingency plan so long as the UWMP or WCP contains the contractor's drought contingency plan.

Clear Creek Community Services District - continued

CCCSD-22 The EA, CVPIA PEIS, and OCAP 2004 included quantitative evaluations using the best available estimates of M&I and irrigation uses for CVP water service contractors. It is anticipated that as areas are converted from agriculture and open space to municipal uses both for the CVP water service contractors and water rights users, there will be less water for irrigation CVP water service contractors. The trends in the reduction in reliability for irrigation CVP water service contractors can be determined through comparison of information in the CVPIA PEIS and also through comparison of conditions under analyses of both the future and existing OCAP analyses. See response to Comment CCCSD-5.

CCCSD-23 The M&I Water Shortage Policy provides for allocation of a Federal water supply that is already constrained due to factors including hydrological conditions and implementation of Federal and state law. The CVP M&I Water Shortage Policy will allocate already limited CVP supplies. Reclamation is not allocating or affecting the allocation of non-federal water supplies.

Comment No. 6

Westlands Water District
April 22, 2005

KRONICK MOSKOVITZ TIEDEMANN & GIRARD
A PROFESSIONAL CORPORATION

BECKY DELL SHEEHAN
bsheehan@kmtg.com

April 22, 2005

VIA FACSIMILE AND REGULAR MAIL

Mr. David Lewis
Bureau of Reclamation
2800 Cottage Way, MP-730
Sacramento, CA 95825

Re: Comments Regarding Municipal and Industrial Water Shortage Policy, Draft Environmental Assessment and Finding of No Significant Impact

Dear Mr. Lewis:

Westlands Water District ("Westlands"), on behalf of its landowners and water users, submits these comments on the Draft Environmental Assessment for the Municipal and Industrial Water Shortage Policy for the Central Valley Project, dated March, 2005 ("Draft M&I EA").

Westlands is a California water district with contractual rights to more than 1,150,000 acre-feet of Central Valley Project ("CVP") water from the United States Bureau of Reclamation ("Reclamation"). Westlands provides water for the irrigation of approximately 574,000 acres on the west side of the San Joaquin Valley, in Fresno and Kings counties, and maintains the authority to protect, on behalf of its landowners and water users, rights that may be of common benefit to lands within Westlands. The Draft M&I EA reviews the potential impacts of formally adopting a water shortage policy for municipal and industrial water use ("M&I Shortage Policy"). Westlands, as an agricultural water contractor, will be subject to shortages as a result of the implementation of the M&I Shortage Policy. Accordingly, it maintains a vital interest in the Draft M&I EA.

By submitting this comment letter, Westlands is not objecting to Reclamation operating in accordance with a municipal and industrial shortage policy. Instead, Westlands submits this comment letter because of concerns it has with the manner in which the alternatives are described and impacts are presented. For example, it was difficult for Westlands to appreciate the differences in potential impacts that may be realized from a change from the existing M&I Shortage Policy to any of the action alternatives considered in the EA. Westlands hopes that by submitted this letter, Reclamation will revise the environmental assessment, and the resulting document will better present the information for review by the public and the decision-makers. **WWD-1**

Response to Comments

WWD-1: This EA and the scope of the analysis were developed consistent with NEPA regulations and guidance from the Council on Environmental Quality (CEQ). The analysis in the EA finds the CVP M&I Water Shortage Policy water allocations as defined in Alternatives 1A, 1B, 2A, or 2B to be identical in years when M&I CVP water service contract allocations are 75 percent or greater. In the years when the allocations are less than 75 percent (for example, 13 of the 72 years in the CALSIM modeling used to describe the OCAP 2004 conditions under the No Action Alternative), then all or a portion of the water allocated to irrigation CVP water service contractors would be re-allocated to the M&I CVP water service contractors in accordance with the definition of each alternative. If there is no water available for irrigation under the No Action Alternative (4 of the 72 years), then none of the action alternatives could be implemented.

Westlands Water District- continued

Mr. David Lewis
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The National Environmental Policy Act ("NEPA") requires that federal agencies undertake an environmental analysis for every "major Federal action." 42 U.S.C § 4332; 40 C.F.R. § 1508.18. Although NEPA is a procedural statute, *City of Davis v. Coleman*, 521 F.2d. 661, 670 (9th Cir. 1975), compliance with its mandates serves an important public purpose. This requirement ensures that federal agencies are informed of environmental consequences before making decisions. *Inland Empire Public Lands Council v. United States Forest Service*, 88 F.3d. 754, 758 (9th Cir. 1996). Since proper NEPA procedures may not have been followed, the potential impacts of the M&I Shortage Policy may be underestimated. Therefore, Reclamation should reconsider its analysis.

WWD-1 continued

A. The Description Of The Environmental Baseline Is Confusing.

A legally sufficient environmental assessment completed pursuant to NEPA must include an adequate description of the existing environment. In fact, "[t]he concept of a baseline against which to compare predictions of the effects of the proposed action and reasonable alternatives is critical to the NEPA process." Council on Environmental Quality, *Considering Cumulative Effects under the National Environmental Policy Act*, p. 41, http://ceq.eh.doe.gov/nepa/ccenepa/ccenepa.htm (visited April 14, 2005). As the case law explains:

> 'NEPA clearly requires that consideration of environmental impacts of proposed projects take place *before*' [a final decision] is made.' (cite omit.) (emphasis in original). Once a project begins, the 'pre-project environment' becomes a thing of the past, thereby making evaluation of the project's effect on pre-project resources impossible. (cite omit).

Half Moon Bay Fishermans' Association v. Carlucci, 857 F.2d. 505, 510 (9th Cir. 1988).

When undertaking its analysis, the agency must be cognizant of the fact that the environmental baseline is not necessarily the same as the No Action Alternative. The baseline is a description of the affected environment at a fixed point in time, at some point prior to the approval of the project. Conversely, the No Action Alternative describes the future environmental conditions that would exist if the proposed action was not taken, thus it may include some forecasting. The No Action Alternative may assume that other things may happen even if the proposed project is not adopted.

1. The Baseline May Be Improperly Defined.

The Draft M&I EA is ambiguous. There is no explanation of the difference between the baseline, the No Action Alternative and Alternative 1A. Draft M&I EA at pp. 3-8, 3-9. The environmental baseline, which is apparently encompassed by the No Action Alternative, is

WWD-2

WWD-2 The No Action Alternative allocations, as shown in Table 3-4 in the EA, are consistent with the allocations shown on page 2-2 of OCAP 2004. The allocations for Alternatives 1A and 1B are shown in Table 3-5 in the EA and for Alternatives 2A and 2B in Tables 3-6 and 3-7, respectively. Although OCAP 2004 does contain a narrative description of the CVP M&I Shortage Policy that is similar to Alternative 1A and the September 11, 2001 draft, page 3-9 of the Final EA defines the No Action Alternative as "the operational criteria presented in the OCAP 2004." Page 6-9, Table 6-2 of OCAP 2004 shows operating criteria for the OCAP modeling that are similar to the No Action Alternative Water Shortage Allocation in Table 3-4 of the EA.

Westlands Water District - continued

Mr. David Lewis
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defined as project operations as they are described in the 2004 Long-Term CVP-Operating Criteria and Plan ("CVP-OCAP"). *Id.* at p. 3-8. However, the 2004 CVP-OCAP includes a Municipal and Industrial Shortage Policy ("M&I Shortage Policy") that appears identical to Alternative 1A. CVP-OCAP, June 30, 2004, at pp. 2-1 to 2-2.

WWD-2 continued

The Draft M&I EA should have also clearly described the existing environment and compared that environmental condition to the changed environment resulting from the implementation of each alternative. The No Action Alternative makes a forecast about the water supply in the future, which is permissible. Draft EA at p. 3-26, Table 3-8. However, there is no parallel analysis of the water supply under the existing affected environment, as it exists prior to the formal adoption of an M&I Shortage Policy. Each alternative should have been compared to the environment as it exists prior to approval of the project and to the environment as it would exist in the future if the current project operations were continued. As a result, the impacts of the M&I shortage Policy may be improperly minimized.

WWD-3

Finally, the accuracy of the analysis may be questioned because, when the No Action Alternative and Alternative 1A are compared, the impacts are not identical, even though there is no discernable difference in the descriptions of the respective alternatives in the EA. *See* Draft M&I EA at p. 5-44.

WWD-4

B. **The Scope Of The Alternatives May Be Limited.**

To comply with NEPA, Reclamation must rigorously explore all reasonable alternatives, including the No Action Alternative, in a comparative form, sharply contrasting the issues and providing a clear basis for choice by decision makers and the public. *See* 40 C.F.R §§ 1502.1, 1502.14(a), (b) and (d); 42 USC §§ 4332(a)(C)(iii) and E. The Draft M&I EA may not meet this standard.

In the case of the Draft M&I EA, the problem is with the description of the No Action Alternative and Alternative 1A. As explained above, there is no discernable difference between these alternatives. Draft M&I EA at pp. 3-8, 3-9. For this reason, Reclamation should re-consider its definitions of the No Action Alternative and Alternative 1A in order to ensure that a reasonable range of alternatives is examined.

WWD-5

C. **The M&I Policy's Potential Impacts May Be Disguised.**

Reclamation must consider the direct, indirect, and cumulative effects of the M&I Shortage Policy. According to the Council on Environmental Quality ("CEQ") NEPA Regulations, direct effects are caused by the action and occur at the same time and place as the action, 40 C.F.R § 1508.8(a), while indirect effects "occur later in time or farther removed from distance, but are still reasonably foreseeable." 40 C.F.R § 1508(b). Indirect effects, for example, may include growth inducing effects and other effects related to induced changes in pattern of land use, population density, or growth rate. *Id.* Conversely, cumulative effects are the

WWD-3 The impact analysis involves comparison of conditions under Alternatives 1A, 1B, 2A, and 2B and conditions under the No Action Alternative. The No Action Alternative represents the future conditions with the allocation criteria for CVP water service contracts included in the OCAP 2004. Reclamation Existing conditions are described in Chapter 5 of the EA and in the OCAP 2004 document published in June 2004.

WWD-4 Table 3-8 summarizes information from the impact analysis presented in Chapter 5 of the EA. Text has been modified to more appropriately reflect information presented in Chapter 5.

WWD-5 Alternative 1A is not similar to the No Action Alternative. Page 5-44 of the Draft EA describes Alternative 1A whereby water would be reallocated from the Irrigation CVP water service contractors to provide public health and safety water quantities; the No Action Alternative description includes no such reallocation. As described in Table 3-8 and in Table 5-9, the EA presents a range of alternatives based upon the No Action Alternative and four action alternatives. See response to WWD-4.

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incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency, person, or entity initiates the action. 40 C.F.R § 1508.7. Cumulative effects may result from individually minor but collectively significant actions that take place over a period of time. *Id.*

When Reclamation considered whether the impacts resulting from the project are "significant," it was required to consider both the "context" and the "intensity" of the impacts. 40 C.F.R §§ 1508.27(a) and (b). The term "context" means that impacts of the proposal must be considered in light of its specific location, the affected region, and society as a whole. *Id.* "Intensity" refers to the magnitude of the project's impacts on the environment. *Id.* In determining the intensity of the impacts of the M&I Shortage Policy on the environment, Reclamation must consider: environmentally beneficial actions, public health, unique characteristics of the project site, degree of controversy surrounding the project, degree of unique or unknown risk, precedent setting effect, cumulative effect, cultural or historical resources, special status species, and consistency with federal, state or local laws. *Id.* The Draft M&I EA may not satisfy these requirements. **WWD-6**

1. **Impacts To The Water Supply.**

The analysis of the M&I shortage Policy's impacts on the water supply is confusing, and it is therefore difficult to determine the extent of the impact of the M&I Shortage Policy on Westlands' water supply. The analysis in the Draft M&I EA clearly identifies the impacts of the M&I Shortage Policy in very dry years, when Westlands will be receiving less than 25% of its historical use. However, it does not clearly indicate the extent of the M&I Shortage Policy's impacts in all other years. As Westlands and the other agricultural water contractors will be receiving less water in any year that there is insufficient water to provide all contractors with 100% of their supplies, the extent of the total reduction should be clearly identified in the M&I EA. **WWD-7**

Besides the shortcomings identified above, the Draft M&I EA is also inconsistent when it refers to the extent of the possible water supply impacts. The Draft M&I EA is not entirely accurate when it states that the alternatives will "result in changes in CVP contract" in 9 of the 72 years modeled, which is a statement that is made in multiple locations throughout the Draft M&I EA. *See e.g.* Draft M&I EA at p. 5-45. The alternatives will result in changes in the CVP contracts in more than merely nine years. Table 5-14 shows that agricultural water deliveries will in fact be less than 25 percent in 13 years out of the 72 years modeled under every alternative. Draft M&I EA at p. 5-44. **WWD-8** Moreover, the impacts of the alternatives are greater or less than the No Action Alternative in each of the thirteen years, to a greater or lesser extent depending on the alternative. *Id.* Therefore, the Draft M&I EA should be modified to present a more consistent and accurate portrayal of the M&I Shortage Policy's impacts. **WWD-9**

Westlands Water District - continued

WWD-6 The EA considered the potential for cumulative impacts. However, as described in the EA, the M&I Water Shortage Policy would not result in additional water service potential for M&I CVP water service contractors because the Contract Total would not be increased and allocations would not increase as a result of the policy when M&I CVP water service contract water allocations are 75 percent or greater. In addition, in the driest of years when water is not available to increase allocations to M&I CVP water service contractors, allocations will continue to be less than 75 percent, as in the No Action Alternative. Therefore, the EA determined that there would not be any indirect growth impacts due to the implementation of the M&I Water Shortage Policy, as described in Chapter 5 of the EA.

The EA also determined that because irrigation CVP water service contractor received no water in the driest years under the No Action Alternative, and because the number of additional years in which this condition would occur would be limited, there would not be any indirect land use changes or cumulative effects, as described in Chapter 5 of the EA.

WWD-7 The range of reductions under all of the alternatives to irrigation CVP water service contractors is shown in Table 5-9 of the EA.

Westlands Water District - continued

WWD-8 There would be no changes in four of the 13 years considered in this analysis because there are no deliveries to irrigation CVP water service contractors under the No Action Alternative. In those years, there would be no increase in allocations to M&I CVP water service contractors. Therefore, there would be no change from the No Action Alternative in those four years. However, there would be changes in the remaining nine of the 13 years. Table 5-14 of the EA is consistent with this in that it shows 4 years out of the 72 where there are no irrigation deliveries under the No Action Alternative.

WWD-9 The changes in CVP water service contract allocations under the four alternatives and the No Action Alternative are presented in Table 5-9 of the EA. Table 5-14 of the EA portrays the frequency of irrigation deliveries for each alternative, including the No Action Alternative, consistent with Table 5-9 of the EA.

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Page 5

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2. **Impacts To Groundwater, Air Quality And Soil Resources.**

The Draft M&I EA's analysis of the M&I shortage Policy's potential impacts on groundwater, air quality and soil resources appears internally inconsistent. For example, in the groundwater section, it states that "some contractors may fallow land more frequently" as a result of the reduced agricultural contractor's water allocation. Draft M&I EA at p. 5-31. In the same document, however, the air quality and the soils sections state that "it is not anticipated that additional lands would be fallowed due to changes in the allocations of Irrigation CVP water service contracts." Draft M&I EA at p. 5-94. *See also*, Draft M&I EA at p. 5-97–5-98. The aforementioned statements are clearly inconsistent.

WWD-10

The Draft M&I EA appears to contradict itself again in the soil section. In that section, it concludes, without any analysis, that "[t]hese alternatives would not result in cumulative adverse impacts to soils *when considered in combination with future projects such as water transfer projects* or development of other water supplies." Draft M&I EA at p. 5-98 (emphasis added). This statement directly contradicts the statement in the air quality section where the Draft M&I EA defers the cumulative impacts analysis of future water transfer projects on air quality. Draft M&I EA at p. 5-94. These statements are contradictory because a cumulative impacts analysis of the combined effects of future water transfer projects and the M&I Shortage Policy on soil erosion would have to address air quality, because soil erosion (i.e., dust) is the cause of the reduced air quality in this circumstance.

WWD-11

D. **The Assumptions Regarding the Amount of Health And Safety Water That Will Be Required Is Questionable.**

Since the actual health and safety needs of the M&I contractors has not been determined, the Draft M&I EA assumes for purposes of the analysis that the health and safety allocations for "industry" and "commercial enterprises" will be 80% and 90% respectively. The Draft M&I EA justifies these high percentages by reasoning that water reductions below these levels could cause financial impacts. Draft M&I EA at p. 3-6. However, the resulting financial impacts from further reductions does not seem to be a "health and safety" issue, no more than the financial impacts to the farmers and ranchers impacted by a drought is a health and safety issue. Perhaps Reclamation should consider the approach adopted by the California Water Code. When a "water shortage emergency" is declared pursuant to the Water Code, first priority if given to domestic uses, sanitation and fire protection. Cal Water Code § 354. Financial interests are given a secondary priority. The Water Code's approach appears appropriate as it more directly addresses actual health and safety issues. For this reason, Reclamation should reconsider its criteria for defining minimum health and safety water requirements, particularly since each urban contractor will be determining its own health and safety requirements, which means there will be inconsistent implementation of the policy unless clear guidance is provided.

WWD-12

Westlands Water District - continued

WWD-10 The description in the Groundwater section of Chapter 5 referred to periodic fallowing that occurred due to water availability. The descriptions in the Air Quality and Soils sections referred to long-term changes in land use by permanently fallowing land. The text has been modified.

WWD-11 The discussion in the Cumulative Effects portion of the Soils section of Chapter 5 assumed that future projects would address the potential for impacts to soil due to the proposed project and that there were no impacts due to implementation of any of the alternatives as compared to the No Action Alternative, as described in the EA.

WWD-12 As described in Chapter 3 of the EA, there are many methods to define public health and safety values. As part of the water conservation program required by Reclamation under the long-term water contract renewal process, the M&I CVP water service contractors will be required to identify specific public health and safety values. A conservative approach was used in the EA to evaluate potential impacts of implementing the alternatives. Reclamation recognizes the potential for economic disruption caused by reduced industrial and commercial allocations that can jeopardize public health and safety.

Westlands Water District - continued

Mr. David Lewis
Page 6

April 22, 2005

Your consideration of these comments is appreciated. If you have any questions, please call Jon D. Rubin or me at (916)321-4500.

Very truly yours,

KRONICK, MOSKOVITZ, TIEDEMANN & GIRARD

Becky Sheehan

BECKY SHEEHAN

cc: Thomas W. Birmingham
Thad Bettner

705062.3

Comment No. 7

Sacramento Municipal Utility District
April 21, 2005

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT
The Power To Do More.™

P.O. Box 15830, Sacramento, CA 9585[illegible]

April 21, 2005
ET&C 05-132

Kirk C. Rodgers, Regional Director
Mid Pacific Regional Office
U.S. Bureau of Reclamation
Federal Office Building
2800 Cottage Way
Sacramento CA 95825-1898

SUBJECT: Draft Environmental Assessment and Finding of No Significant Impact for the Municipal and Industrial Shortage Policy, March 2005

Dear Mr. Rodgers:

The Sacramento Municipal Utility District (SMUD) is both a Central Valley Project (CVP) water service contractor and one of the largest CVP power customers, providing not only payments into the Restoration Fund but repayment of the CVP plant-in-service and operations and maintenance (O&M) costs allocated to power. SMUD has a significant financial interest in the prudent management of CVP resources and facilities.

SMUD relies on firm water supplies for power generation to meet the electrical needs of our customers and to provide electrical grid stabilization for the region. SMUD is concerned with any action that would impact the reliability of its contract water supply.

As a member of the American River Division contracting community, SMUD appreciates the opportunity to comment on the Draft Environmental Assessment for the Municipal and Industrial Shortage Policy (EA), March 2005. This EA is the site-specific environmental documentation supporting the Long-Term Contract Renewal for water service contracts in the American River Division. As such, it is critical that the document be accurate. As to SMUD, there is one glaring, critical error regarding the proposed water supply to SMUD.

Specifically, the 2029 assumptions for American River Division deliveries to SMUD in Table 4-1 (page 4-13) are incorrect. Table 4-1 states that the delivery to SMUD is 15,000 acre-feet. The correct amount and the amount discussed in Long Term Contract Renewal discussions is 30,000 acre-feet, the net amount of SMUD's contract entitlement presuming Reclamation approves the assignment of 30,000 acre-feet of SMUD's present entitlement (60,000 acre-feet) to the Sacramento County Water Agency (SCWA). As previously communicated to Reclamation staff, SMUD will not complete the Long Term Contract Renewal process until this error is rectified to the satisfaction of SMUD. **SMUD-1**

CUSTOMER SERVICE CENTER • *6301 S Street, Sacramento CA 9[illegible]*

Response to Comments

SMUD-1 Reclamation believes that the comment refers to text and table on page 4-25 in the Draft EA. The text and table have been modified to be consistent with the Final EIS for the American River Division Long-Term Contract Renewals.

Specific Comments on the American River Division EA:

Page 4-3 affected environment – Upper American River Watershed.

Please note that in the description of the Upper American Watershed, the locations of SMUD reservoirs is misleading. SMUD owns and operates a series of reservoirs and powerhouses known as the Upper American River Project. (UARP). The majority of the UARP is located in the Crystal Basin, which is tributary to the South Fork American River. Rubicon Reservoir, Buck Island, Loon Lake and Gerle Reservoir are located in the Rubicon drainage, which are tributary to the Middle Fork American River, the same as Hell Hole Reservoir. As the text currently reads, the SMUD reservoirs all flow into Hell Hole, which is incorrect.

Please add to the paragraph on the South Fork of the American River the following text: "The Sacramento Municipal Utility District has constructed the Upper American River project, including Union Valley Reservoir, Junction Reservoir and Ice House Reservoir."

On page 4-8 under the subheading Sacramento Municipal Utility District, first paragraph, please change the following sentence to read: "SMUD is planning new power plants to be constructed on this site and in other locations within its boundaries that could require a total of 45,000 acre feet by 2040". Also reference the new 500 Megawatt Cosumnes Power Plant (CPP) currently under construction, which will be commercially operational in 2006. Both the CPP and a second 500 MW unit approved by the California Energy Commission are authorized to utilize CVP Water Service Contract water for the cooling requirements of the new power plants.

There is inconsistency when comparing table 2-2 (page 2-4) to table 4-1 (page 4-13). Table 2-2 is correct in depicting the District's future water needs in accord with the CVPIA Water Needs Analysis conducted by SMUD in April 2000. In that analysis, SMUD identified its water needs at two thresholds, 2025 and 2040, and identified a shortfall of water in 2040. Reclamation concurred with the SMUD Needs Analysis in December 2000.

The 2029 assumptions of American River Division deliveries to SMUD in Table 4-1 (page 4-13) are incorrect. Table 4-1 states that the delivery to SMUD is 15,000 acre-feet. Table 4-1 is incorrect and should state 30,000 acre-feet. Please correct this error in the Final EA.

A statement is made on page 4-13: the "contract amounts of CVP water service contractors in the American River Division under the No Action Alternative were discussed in Chapter 2 and are summarized in Table 4-1". This is incorrect. The contract assumptions stated on Table 2-3 (page 2-7) correctly state that SMUD will assign 30,000 acre-feet to the SCWA and retain 30,000 acre-feet for its own use.

SMUD-2

Sacramento Municipal Utility District - continued

SMUD-2 See Response to SMUD-1

SMUD suggests that a footnote be added to table 4-1 on page 4-13. The footnote should note that SMUD's complete build-out of its 30,000 acre feet of CVP Water will be achieved by 2045.

For the analysis in this EA, 30,000 acre-feet of CVP water will be utilized by SMUD for future power plant generation and be delivered via the Folsom South Canal.

SMUD-3

Reference is made to the June 2004 Operations Criteria and Plan (OCAP). Unfortunately, the OCAP analysis also reflects this error of misstating the quantity of water to be delivered under SMUD's renewed water service contract. The OCAP must be revised to state that 30,000 acre-feet of CVP water will flow down the Folsom South Canal in addition to the existing 15,000 acre-feet of SMUD Water Rights water.

SMUD-4

The source of confusion in regard to the environmental analysis for the Long-Term Contract Renewals may be a potential future assignment of 15,000 acre-feet of CVP Contract water to the South Sacramento County Agricultural interests included in SMUD's Purveyor Specific Agreement (PSA) in the Water Forum. The Water Forum recognized this as a possible future action only. At present, this assignment remains speculative.

If further explanation is needed, please contact SMUD immediately.

Thank you for the opportunity to comment. SMUD looks forward to reviewing the Final EA. If you have any comments or questions, please contact me at (916) 732-5716.

Sincerely,

Paul Olmstead
Water and Power Resource Specialist

cc:
Jim Shetler
Leslie Dunsworth
Brian Jobson
Corporate Files

Sacramento Municipal Utility District - continued

SMUD-3 See Response to SMUD-1

SMUD-4 Comment noted.

Comment No. 8

Sacramento County Water Agency
April 21, 2005

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April 21, 2005

VIA FACSIMILE AND REGULAR MAIL

David Lewis
Bureau of Reclamation
2800 Cottage Way, MP 730
Sacramento, CA 95825

Re: Central Valley Project (CVP) Municipal and Industrial (M&I) Water Shortage Policy (Shortage Policy) Environmental Assessment (EA)

Dear Mr. Lewis:

This letter is written on behalf of the Sacramento County Water Agency (SCWA) regarding the draft EA for the CVP Shortage Policy. The primary concern of SCWA regarding the draft EA pertains to the decision made by Reclamation to exclude from the evaluation any increased allocations under the Shortage Policy to the American River Division water service contractors.

According to the draft EA at page 3-2,[1] increased allocations were not analyzed for the American River Division contractors because: (1) the American River Division is not projected to include any Agricultural CVP water service contractors from which increased allocations may be offset; and (2) there are no conveyance facilities on the Sacramento River that would enable American River Division water service contractors to have access to an alternative source of supply.

SCWA does not accept the underlying premise of the draft EA that water shortages within the American River can be made up only by reducing the water allocations to agricultural water users. Water allocations to the water service contractors are a result of a complex series of decisions made by Reclamation regarding its operation to meet competing demands for water. Due to its proximity to the Sacramento-San Joaquin Rivers Delta, Reclamation generally increases reservoir releases from Folsom Reservoir prior to releasing water from other CVP storage facilities for purposes of meeting Delta water quality objectives. As noted in Reclamation's 2004 Long-Term CVP Operations Criteria and Plan, Folsom Reservoir has a relatively small amount of useable conservation storage, particularly given Folsom Reservoir's critical role in providing flood control to the urban Sacramento area. Consequently, Folsom Reservoir is disproportionately burdened with meeting

SCWA-1

[1] SCWA comments are applicable to each identical statements made throughout the draft EA but not specifically identified.

Response to Comments

SCWA-1 CVP operational alternatives were considered in previous environmental documents and studies to define a range of possible operations that would meet the requirements of the State Water Resources Control Board, biological assessments, Coordinated Operations Agreement, and the CVP water service contractors. To meet these needs, it was determined that for the purposes of this EA, CVP operations would be defined by the OCAP 2004 including the Water Forum agreement actions included in OCAP 2004.

Sacramento County Water Agency - continued

David Lewis
April 21, 2005
Page 2

Reclamation's overall project purposes to the detriment of the water supply needs in the American River basin. By shifting a portion of the water quality obligations to other project facilities, Reclamation could mitigate water shortages within the American River Division.

SCWA-1 continued

SCWA's concern holds especially true with regard to Reclamation's conclusion on page 4-47 that public health and safety water quantities cannot be provided to the M&I water service contractors in the American River Division. Again, Reclamation's operational decision to utilize water from Folsom Reservoir to meet water quality obligations should be reassessed to ensure that American River Division contractors received, at a minimum, the water needed to protect the public's health and safety. (See page 4-47 of the draft EA.)

SCWA-2

The EA states that if new conveyance facilities on the Sacramento River are eventually approved, Reclamation could increase CVP water allocations to American River Division M&I CVP water service contractors. On January 4, 2005, Reclamation approved its Record of Decision for the Freeport Regional Water Project, which includes a new intake structure in the Sacramento River that will be used to serve water to both SCWA and the East Bay Municipal Utility District (EBMUD) under their respective water service contracts with Reclamation. The Freeport Regional Water Authority will be operational by 2010, clearly within the study period defined in the draft EA for M&I only contracts, i.e., 2044. According to Reclamation's own statements in the EA, increased allocations of water pursuant to the water shortage policy should have been analyzed for SCWA.

SCWA-3

On page 3-4, a footnote should be included in Table 3-2 for SCWA to indicate that SCWA's CVP existing Contract Total includes 7,000 acre-feet of CVP water that is subcontracted to the City of Folsom, as well as 30,000 acre-feet assigned to SCWA from the Sacramento Municipal Utility District (SMUD).

SCWA-4

Page 4-23 describes the calculation Reclamation used to determine the quantity of water assumed to be necessary for SCWA to meet its public health and safety demands. While the calculation was prepared based upon SCWA's total CVP contract amount, 52,000 acre-feet, which include 30,000 acre-feet of CVP water assigned by SMUD, the legend of the table only references SCWA's contract total under its Fazio water service contract, 22,000 acre-feet.

SCWA-5

Page 4-45, third paragraph: In addition to the documents cited, the EA should also reference the EIR/EIS approved by Reclamation, as well as SCWA and EBMUD, for the Freeport Regional Water Project.

SCWA-6

Page 5-6, Table 5-1, Notes: The Notes indicate that the American River Division values are not included because there are no physical facilities to convey alternative water supplies. Accordingly, no American River Division water service contractor is allocated water for public health and safety, despite the determined need for such water as identified in Chapter 4. The Freeport Regional Water Project has been approved and will be operational

SCWA-7

SCWA-2 See Response to SCWA-1.

SCWA-3 In the environmental documentation for the East Bay Municipal Utility District Amendatory Contract and Freeport Regional Water Project, the allocations for East Bay Municipal Utility District and Sacramento County Water Agency are based on available water supplies on the American River. The ongoing Sacramento River Reliability Study is evaluating methods to provide water supply to the American River CVP water service contractors based on allocations and physical facilities to divert water from the Sacramento River. The text in Chapter 4 of the EA has been modified to reflect this information.

SCWA-4 The text has been modified.

SCWA-5 The text has been modified.

SCWA-6 The text has been modified.

SCWA-7 See Response to SCWA-3.

David Lewis
April 21, 2005
Page 3

during the study period of the draft EA. Accordingly, alternative water supplies from the Sacramento River will be available for use by SCWA. This comment applies to Table 5-2, Table 5-3, Table 5-4, Table 5-5, Table 5-6, Table 5-7 and Table 5-8. Moreover, the environmental consequences for the various resources evaluated may change as a result of including an alternative water supply for SCWA. The Affected Environment and Environmental Consequences described in Chapter 5 should be reviewed and modified as necessary to take into account additional alternative water supplies for SCWA.

SCWA-7 continued

Very truly yours,

Sandra K. Dunn
Attorney

SKD:sb

Comment No. 9

East Bay Municipal Utility District
March 24, 2005

From: "Thompson, Alan" <athompso@ebmud.com>
To: <dlewis@mp.usbr.gov>, "Robert Colella" <RCOLELLA@mp.usbr.gov>
Date: 3/24/2005 2:43:28 PM
Subject: M&I Shortage Policy

Mr. Lewis - I'm writing about the recently released M&I shortage policy. As you no doubt are aware, EBMUD is somewhat unique in that we have a CVP water service contract that only provides water in dry years. It will help me to explain how the Policy specifically applies to EBMUD if I could get from you or CH2MHill a table that lists the annual deliveries to EBMUD. The information in Table 4-2 of the EA only lists the deliveries to EBMUD in the 13 years where deliveries would be less than 75%. **EBMUD-1**

If you have any questions, please call me at 510/287-1185.

Alan L. Thompson, Senior Civil Engineer

Water Supply Improvements Division, EBMUD

Phone: 510/287-1185 FAX: 510/287-1295

Response to Comments

EBMUD-1 The information in Table 4-2 of the EA was provided in a format that was compatible with the format of information presented in the environmental documentation prepared for the Freeport Regional Water Project. It was noted that there was a discrepancy in definitions in this EA as compared to recent documents prepared by Reclamation and others in the term "Water Year." The term "Water Year" is generally applied to the period of October 1 through September 30. In this EA, it represented the period of March 1 through February 28 (or February 29 in a leap year). To avoid confusion in this EA, the term "Water Year" has been modified to "Contract Year."

Comment No. 10

Contra Costa Water District
April 21, 2005

CONTRA COSTA
WATER DISTRICT

1331 Concord Avenue
P.O. Box H2O
Concord, CA 94524
(925) 688-8000 FAX (925) 688-8122

April 21, 2005

Mr. David Lewis
United States Bureau of Reclamation
2800 Cottage Way, MP-730
Sacramento CA 95825

via facsimile: 916-978-5094

RE: Comments on Draft Environmental Assessment for the Central Valley Project Municipal and Industrial Water Shortage Policy

Dear Mr. Lewis:

Contra Costa Water District (CCWD) appreciates the opportunity to comment on the Draft Environmental Assessment (EA) for the Central Valley Project (CVP) Municipal and Industrial (M&I) Water Shortage Policy (Shortage Policy). CCWD is the largest CVP M&I contractor and serves raw and treated water to approximately 500,000 people throughout north-central and east Contra Costa County. CCWD is generally supportive of the proposed M&I Shortage Policy and the proposed alternative in the EA. The following comments are in regards to errors in Reclamation's calculated value for CCWD's minimum public health and safety level for purposes of the EA. CCWD requests that the draft EA document be corrected prior to being finalized.

Page 3-7 Table 3-3 incorrectly indicates that CCWD's suggested per capita use factor for minimum health and safety residential use includes an allocation for commercial and industrial uses. The per capita use factor includes residential indoor use only. The following language should be deleted from line describing CCWD under the column labeled Suggested Values for Residential Use "(includes allocation for commercial and industrial uses)".

CCWD-1

Page 4-33 The example calculation of CCWD's minimum public health and safety needs to be revised. First, the table assumes that commercial demand is included in the population figure used. This is not correct. Population represents residential customers only. Commercial demand is included in the per capita use factor of 220 gal/capita/day but is not represented in the population total. The table should be revised to indicate a per capita use factor of 190 gal/capita/day for residential demand and a total commercial demand of 21,000 acre-feet, 80% of which would be 16,800 acre-feet. This change would increase CCWD's health and safety level by 16,800 acre-feet in the table.

CCWD-2

Response to Comments

CCWD-1 The text has been modified.

CCWD-2 The text has been modified.

Contra Costa Water District - continued

Mr. David Lewis
CCWD Comments on M&I Shortage Policy EA
April 21, 2005
Page 2

As noted in the EA, when water allocations are reduced below 75% for M&I, Reclamation will use the greater of (1) a percentage of contract amount, versus (2) the minimum public health and safety level to determine actual allocations. CCWD understands Reclamation's calculated value for each contractor's minimum public health and safety level to be solely for purposes of the EA, and that according to the policy specific values will be developed by each contractor following execution of its long-term CVP contract. CCWD notes that its determination of the District's minimum public health and safety level is currently 65 percent of normal demand, which is documented in the CCWD Urban Water Management Plan (UWMP). The example calculation in the EA does not conform to CCWD's UWMP adopted methodology and should be revised to be consistent with it.

CCWD-3

Please call me at (925) 688-8172 if you have any questions regarding CCWD's comments.

Sincerely,

Jerry Brown
Director of Planning

JB/JQ

CCWD-3 The assumptions presented in Chapter 4 were developed for the purposes of the EA only and were used in general to capture a range of impacts that could occur under the alternatives as compared to the No Action Alternative. It is understood that each M&I CVP water service contractor will develop a specific public health and safety value with Reclamation. Following the completion of those analyses, the total public health and safety values may be compared to the overall impacts presented in this EA.

Comment No. 11

Contra Costa Water District
April 6, 2005

Richard M. Stevenson
Chief, Water Rights and Contracts Branch
(916) 978-5250
rstevenson@mp.usbr.gov

>>> "Jerry Brown" <jbrown@ccwater.com> 4/6/2005 5:33:00 PM >>>
Michael

When we spoke this morning you asked that I cc your team on this note which summarizes our discussion.

Our concern is that the EA for the Shortage Policy shows a methodology for calculating CCWD's minimum public health and safety level that is inconsistent with the approach used by CCWD in our water shortage contingency plan. The Policy allows for a case by case determination and we would like Reclamation to consider accepting our approach at this time. Our current contract specifies that CCWD's approach will be used. If Reclamation concurs, we could address the situation in a similar way to what we did for adjusted historical use (i.e. a separate letter from Reclamation). We would like to get this accomplished before the public comment period ends for the Shortage Policy EA so that we don't have to submit comment. My understanding is that the public comment period ends on April 22, 2005. This issue is also delaying our processing of the LT contract.

CCWD-1A

We've prepared the attached table that includes CCWD's approach and the example approach given in the EA for comparison purposes. After you and your team have had an opportunity to review this matter, let's set up a conference call to discuss the issue and next steps.

Thanks for your consideration.

Jerry

CC: Jackson, Micha

CCWD Minimum Public Health and Safety Level (USBR Methodology - Draft EA)

2025 Water Demand	Population	Gallons/capita/day	Total Residential Water Demand	Commercial Water Demand	Industrial Water Demand	System Water Losses	Total M&I Water Demand
	568,000	220	140,200	included	57,000	10,000	207,200
	Total Residential @ 50 gpcd	80% of Commercial	90% Industrial	80% of System Losses			Minimum Health and Safety
Public Health & Safety	31,814	0	51,300	8,000			91,114

CCWD Minimum Public Health and Safety Level (Proposed CCWD Methodology)

2025 Water Demand	Population	Gallons/capita/day	Total Residential Water Demand	Commercial Water Demand	Industrial Water Demand	System Water Losses	Total M&I Water Demand
	568,000	220	140,200	21,030	57,000	10,000	207,200
	Total Residential @ 68 gpcd	80% of Commercial	95% Industrial	80% of System Losses			Minimum Health and Safety
Public Health & Safety	43,266	16,824	54,150	8,000			122,239

Notes: Commercial assumed to be 15% of residental demand based on TWSA consumption records

4/21/2005

Response to Comments

CCWD-1A See Response to CCWD-3.

Comment No. 12

Santa Clara Valley Water District
April 22, 2005

Clara Valley
District

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SAN JOSE, CA 95118-3686
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FACSIMILE (408) 266-0271
www.valleywater.org
AN EQUAL OPPORTUNITY EMPLOYER

April 22, 2005

Mr. David Lewis
Bureau of Reclamation
2800 Cottage Way (MP-730)
Sacramento, CA 95825

Subject: Draft Environmental Assessment and Finding of No Significant Impact (DEA/FONSI) for the Municipal and Industrial Water Shortage Policy, Central Valley Project, California.

Dear Mr. Lewis

The Santa Clara Valley Water District (District or SCVWD) has reviewed the Draft Environmental Assessment and Finding of No Significant Impact (DEA/FONSI) for the Municipal and Industrial Water Shortage Policy, Central Valley Project, California dated March 2005. The District serves both Central Valley Project (CVP) Municipal and Industrial (M&I) and Irrigation water in Santa Clara County. The District is the largest CVP M&I water user south of the Delta, serving approximately 1.7 million residents and the vital high-tech economy known as "Silicon Valley." We appreciate the opportunity to provide the following comments and corrections:

<u>General Comments</u>

The DEA /FONSI is supported by CALSIM II modeling to simulate operations of the CVP. In many places, readers are referred to Operating Criteria and Plan (OCAP) descriptions of CALSIM II and modeling assumprions. These are helpful references. However, many assumptions were used for the modeling in OCAP, and the DEA should clearly state which set of CALSIM II assumptions were used to support analysis of the M&I Water Shortage Policy. **SCVWD-1**

In addition, the DEA should note the existence of the 1997 Water Reallocation Agreement approved by the Bureau of Reclamation, the San Luis & Delta-Mendota Water Authority, and the Santa Clara Valley Water District that resolved differences with respect to Irrigation and M&I water allocations under the Interim M&I Water Shortage Policy. That Agreement has an expiration date of December 31, 2022, and notwithstanding finalization of the Policy, will continue to affect the amount of M&I water scheduled by SCVWD. While it may not be necessary to incorporate the Agreement into the modeling done for this DEA, we believe it is important to recognize that this Agreement will continue to offset impacts to Irrigation contractors south of the Delta. **SCVWD-2**

<u>Specific Comments</u>

ES-1 – Contracts that reference the Policy – The DEA states that Reclamation expects that the M&I Shortage Policy will not be referenced in contracts for the (1) Friant Division; (2) New Melones interim supply; (3) Hidden and Buchanan Units; (4) Cross Valley contractors; (5) Sugar Pine Units; (6) San Joaquin settlement contractors, and; (7) Sacramento River settlement contractors. It is not clear why the Cross Valley contractors are listed. Allocations to these contractors appear to be largely the same as other south of Delta Irrigation water service contractors. **SCVWD-3**

The mission of the Santa Clara Valley Water District is a healthy, safe and enhanced quality of living in Santa Clara County through watershed stewardship and comprehensive management of water resources in a practical, cost-effective and environmentally sensitive manner.

Response to Comments

SCVWD-1 As described in Chapter 1 of the EA, all references to OCAP 2004 reference the OCAP report published in June 2004 and the related biological assessment.

SCVWD-2 The text in Chapter 4 has been modified.

SCVWD-3 The contracts in these divisions of the CVP do not include a provision that references the M&I Water Shortage Policy. Cross Valley Canal contractors are reliant upon the availability of conveyance capacity provided by the State of California in order to convey supplies delivered at the Delta by the CVP.

Mr. David Lewis 2 April 22, 2005

ES-1 and Page 1-3 – Study Period – The DEA states that the study period for Irrigation contracts is 25 years, or to the Year 2029. Because contracts are being signed in 2005, this should likely be changed to 2030. The same is true for the M&I-only contracts, which extend 40 years, or to the Year 2044. The SCVWD contract may extend beyond 2030, depending on the effective date of the contract.

SCVWD-4

Page ES-2: The document states that "In years when allocations to irrigation and M&I CVP water service contractors are less than contract totals, there are no "surplus flows." It would be helpful if the document expanded the discussion to explain what is meant by "surplus flows". For example, Section 215 water is often made available even in years when allocations to Irrigation and M&I are less than 100%.

SCVWD-5

ES-7 – Table discussing impacts of alternatives – For the No Action alternative, Reclamation has stated that "CVP water supply allocations in the future will be slightly less than under existing conditions." The reason for this is not clear.

SCVWD-6

Chapter 1: Figure 1-1 should be modified to reflect all of Santa Clara County consistent with the study area in the Water Needs Assessment and analysis in Chapter 5. The District's service area is established in State law to be the whole of Santa Clara County.

SCVWD-7

Chapter 2: It would be helpful to include a table showing M&I allocations under Alternative 1B compared to existing conditions. This table would include a comparison between the contractors' 1996 CVP M&I Ratebook Schedule A-12 figures and the M&I water needs assessment amounts that are used for Alternative 1B. To provide some examples, the 1996 CVP M&I Ratebook Schedule amount for the City of Roseville was 32,000 acre-feet. The City's Water Needs Assessment indicates a demand of 54,900 in 2025, of which 32,000 can be met from the CVP contract. Thus, there is no change. The same is true for Santa Clara Valley Water District. Setting forth all of these numbers in a single comparison table may be helpful.

SCVWD-8

Chapter 3: Reclamation has identified values for public health and safety based on standards developed by various water suppliers. Reclamation acknowledges the values chosen are not necessarily applicable to individual contractors, and that they will work with each contractor to develop specific public health and safety levels of water supply applicable to that contractor. The District agrees with this approach. The public health and safety values set forth in the DEA based on the gross assumption that 50 gallons per person per day is adequate may be too low. Specific operational, water supply, water quality or other constraints and conditions within a district may affect the public health and safety allocation needed from the CVP. Also, the assumption that system losses in urban water systems may be reduced by 20% during a drought year is unrealistic, particularly the assumption that 20% reductions could be achieved in each successive drought year.

The DEA should clarify that public health and safety allocations for commerce and industry includes water to support populations of workers who commute to a district's service area. In Santa Clara County, a large percentage of jobs in the high-tech industry are performed by workers who commute daily from other parts of the Bay Area and the Central Valley. Disruption of the high-tech industry in Silicon Valley could also have broader implications for public safety, to the extent that national security and the world economy rely on such businesses in Santa Clara County.

SCVWD-9

Santa Clara Valley Water District - continued

SCVWD-4 The text has been modified.

SCVWD-5 The text refers to water available after all CVP water is allocated to regulatory requirements, water rights requirements, and water service contractors on a system-wide basis. Section 215 water is generally available within a specific watershed and therefore, does not change system-wide allocations.

SCVWD-6 As described in the CVPIA PEIS and in OCAP2004, non-project water rights holders in the Central Valley are projected to more fully utilize water rights in the future. Therefore, there will be less water available for CVP water service contractors.

SCVWD-7 Figure 1-1 of the EA portrays the correct CVP service area for the district.

SCVWD-8 This information is in Table 3-2.

SCVWD-9 The assumptions presented in Chapter 4 were developed for the purposes of the EA only and were used in general to capture a range of impacts that could occur under the alternatives as compared to the No Action Alternative. It is understood that each M&I CVP water service contractor will develop a specific public health and safety value with Reclamation. The basis for including a high percentage of commercial and industrial (80 and 90 percent, respectively) in the public health and safety values was both in recognition that many commercial and industrial users have already reduced water demand by long-term water conservation measures and the importance of these users on local and regional

Santa Clara Valley Water District - continued

SCVWD-9 - continued: economies that support public health and safety of many people in the region.

Santa Clara Valley Water District - continued

Mr. David Lewis 3 April 22, 2005

Chapter 4: Page 4-44, under **"Santa Clara Valley Water District".**

First Paragraph: The District does not have "member agencies" as referenced in the first paragraph and the description of water supplies is not accurate. Please revise as follows:

"Santa Clara Valley Water District's service area encompasses all of Santa Clara County. Urban users are located throughout the county and agricultural users are primarily in the southern portion of the county. CVP water is used for municipal, industrial and irrigation uses and for groundwater recharge. The District manages water resources and wholesales treated water to retailers in Santa Clara County. ~~*The District provides surface water to on a wholesale basis to member municipal agencies within the county.*~~ *The District's water supply comes from a variety of sources, however, conveyance constraints limit the flexibility with which these sources may be used throughout the County. On average, nearly half the annual supply is from local surface and groundwater, while the other half comes from imported water delivered by the CVP and State Water Project.* ~~*The surface water is directly diverted by the district includes CVP water, State Water Project water, and local water rights. The district also monitors and manages the groundwater by making surface water available to the member agencies.*~~ *During critically dry years, when local watersheds produce very little runoff, the County's need for imported water from the CVP and State Water Project increases substantially. Several of the municipalities in the County have contracts with the City and County of San Francisco for water from the Hetch-Hetchy Project. The District does not manage this water, but the supply helps reduce the demand for District supplies.* ~~*Some of the member agencies also purchase water from the San Francisco Public utilities Commission.*~~*"*

SCVWD-10

Second Paragraph: The DEA states the District's CVP water service contract is for 57,207 acre-feet. The correct quantity of the District's CVP contract is 152,500 acre-feet. The DEA states that the District's State Water Project contract is for 74,000 acre-feet. The correct State Water Project contract amount is 100,000 acre-feet. The last sentence of the second paragraph states "The district and member agencies withdraw an average of 33,000 af/year of groundwater." The District does not operate any groundwater wells and the estimate of groundwater use is inaccurate. The sentence should be revised as follows: "*Santa Clara County groundwater subbasins provide water supply for potable use and irrigation through pumping by retail water agencies and individual well owners. The District does not operate any water supply wells. As stated in the District's Water Needs Assessment, the estimated groundwater use in Santa Clara County is approximately 160,000 acre-feet/year, and the District uses* ~~The district and member agencies withdraw an average of 33,000 af/year of groundwater and uses about 164,800~~ *about 168,500* acre-feet/year of water from other supplies including Hetch-Hetchy ~~rights water, including purchases from San Francisco Public Utilities Commission and local water rights.~~

SCVWD-11

SCVWD-12

Third Paragraph: The District's agricultural water demand in 2005 is stated as 57,207 acre-feet. SCVWD's Water Needs Assessment indicates agricultural water demand of 45,579 acre-feet.

SCVWD-13

Chapter 5: On page 5-26 and 5-39, under Cumulative Effects the DEA states: "However, the improved water supply allocations in drought years may encourage the existing and projected water users to continue to be located within the M&I water service contractors' service area." There is no supporting evidence for this statement, and we believe it to be inaccurate. The statement should be eliminated.

SCVWD-14

Table 5-24: The figures for SCVWD appear to be the ones for San Benito County Water District, and visa versa, and should be switched.

SCVWD-15

SCVWD-10 The text has been modified.

SCVWD-11 The text has been modified.

SCVWD-12 The text has been modified.

SCVWD-13 The text has been modified.

SCVWD-14 The text has been modified.

SCVWD-15 The text has been modified.

Santa Clara Valley Water District - continued

Mr. David Lewis 4 April 22, 2005

The District appreciates Reclamation's work to evaluate the environmental impacts associated with finalizing the M&I Water Shortage Policy. The DEA should be revised to address the comments and corrections described above. If you have any questions, please contact Ms. Kellye Kennedy at (916) 447 1534.

Sincerely,

Original signed by

Joan A. Maher
Imported Water Unit Manager

Comment No. 13

San Benito County Water District
April 21, 2005

San Benito County Water District

30 Mansfield Road • P.O. Box 899 • Hollister, CA 95024-0899 • (831) 637-8218 • Fax (831) 637-7267

April 21, 2005

Kirk Rodgers, Regional Director
U. S. Bureau of Reclamation, Mid-Pacific Region
2800 Cottage Way, MP100
Sacramento, CA 95825

Re: Draft Municipal & Industrial Water Shortage Policy

Dear Mr. Rodgers:

San Benito County Water District has reviewed the draft Municipal & Industrial Water Shortage Policy and accompanying Draft Environmental Assessment, and appreciates this opportunity to comment on these documents.

You may recall that the District previously urged that an environmental analysis under NEPA be conducted on the proposed policy. We are gratified and satisfied that Reclamation has thoughtfully considered the impacts of the proposed Policy, and has made a good faith effort to consider potential alternative policies. While we may disagree with the conclusion of the Environmental Assessment that the impact of the Policy on irrigation allocations is "not a significant impact," we do believe that the nature and extent of the impact has been described and considered. The District's and it's irrigators' understanding of potential impacts to agricultural supplies provides the opportunity to plan for conjunctive use, water banking, municipal wastewater recycling and other compensating strategies to minimize the significant social, economic, and environmental impacts that agricultural supply shortages will cause.

The other principal comment the District had to the previously-proposed Policy was that limitation of the Policy's protection to those future municipal demands projected in the 1994 CVP Ratebook was arbitrary and without adequate notice to the contractors. The currently proposed Policy relies instead on the projections of future municipal demand made by the contractors themselves in the more current and realistic "look forward" provided by the Water Needs Assessments on which the CVP Renewal Contracts are based. For the District, that "look forward" necessarily reflects inevitable urbanization as Santa Clara County's growing metropolitan influence creeps southward into San Benito County. It is our understanding, from reviewing the Policy and accompanying Environmental Assessment, that as municipal uses increase in San Benito County the proposed Policy would extend to as much as 16,276 acre feet of the District's CVP supply. **SBCWD-1**

Thank you for the opportunity to comment on the Policy.

Sincerely,

John S. Gregg
District Manager/Engineer

Classification	4.7 A 4.08
Project	CVP
Control No.	5006676
Folder I.D.	

Response to Comments

SBCWD-1 The value of 16,276 acre-feet/year is included in Alternatives 1B, 2A, and 2B. The value based upon 1996 CVP M&I Ratebook Schedule A-12 Year 2030 of 8,250 acre-feet/year is included in Alternative 1A.

Comment No. 14

East Niles Community Services District
April 6, 2005

East Niles Community Services District

1417 Vale Street, Bakersfield, CA 93306
P.O. Box 6038, Bakersfield, CA 93386
Phone: (661) 871-2011
Fax: (661) 871-2356

Kirk Rodgers, Regional Director
UNITED STATES BUREAU OF RECLAMATION
MP- 100, Regional Office
2800 Cottage Way, Room E-1604
Sacramento, CA 95825-1898

April 6, 2005

Municipal and Industrial Water Supply in Overlap Service Area and Comment M&I Water Shortage Policy – CVP, California Draft Environmental Assessmen

Dear Mr. Rodgers,

This letter is being written on behalf of our District, East Niles Community Services District (ENCSD). Our District overlaps, in part, the Arvin Edison Water Storage District. Arvin Edison Water Storage District (AEWSD), through its contract with the Bureau of Reclamation, has, for the past thirty plus years, delivered water to the overlap area via a canal and piping facilities that were constructed by Arvin-Edison as part of their project which was voted on, and approved by the AEWSD's electorate including the "overlap area". Based upon that water supply, our District provided M&I water service to lands within the AEWSD overlap area through a water treatment plant constructed within the AEWSD service area. Due to operational concerns of AEWSD and this District, the service to the overlap area was discontinued and the treatment plant abandoned in 2003. This has placed a great deal of stress on our District to provide water to this area of Arvin-Edison that does not have access to a reliable, good quality water supply. Groundwater in the area is of very poor quality and is not readily available.

Recently, we have obtained the opportunity to participate in the Kern County Water Agency's (KCWA) Urban Bakersfield Water Supply Expansion Project. This project, which you may be familiar with, would allow ENCSD to take AEWSD water at the end of the Friant-Kern Canal, or in its proximity and deliver it to the Cross Valley Canal Extension, and then to the KCWA, Henry Garnet Water Treatment Plant for treatment. From there the water would be pumped through the KCWA East Pipeline facilities to our District. Our District would then deliver the water to the M&I water users in the AEWSD/ENCSD overlap area.

We were recently informed that the USBR has or will be declaring the area of AEWSD that overlaps our District to be <u>outside of the USBR M&I water service area</u>. We strongly oppose this declaration and do not understand how this possibly could happen. The area in the overlap between AEWSD and ENCSD needs a water supply and the Bureau water supply supplied to Arvin-Edison historically has been used in that area and should continue to be used in that area. Some of the lands within the overlap area and potential overlap area currently obtain an agricultural supply from AEWSD. Obviously, these agricultural lands, which are in the urban expansion planning area, will be converted to M&I demands and will, like the agricultural land, need a water supply. We ask for clarification as to why the March 2005 Draft Environmental Assessment for the M&I Water Shortage Policy, Central Valley Project, California does not address the AEWSD service area.

ENCSD-1

Response to Comments

ENCSD-1 The Friant Division and Cross Valley Canal contracts do not include provisions that reference the CVP M&I Water Shortage Policy, and therefore those contractors are not addressed in this EA. Friant Division contracts provide M&I supplies from the dependable Class 1 supply. Cross Valley Canal contractors are reliant upon the availability of conveyance capacity provided by the State of California in order to convey supplies delivered at the Delta by the CVP.

East Niles Community Services District - continued

Page 2

April 6, 2005

We understand that the AEWSD-USBR water supply contract dated January 20, 2001 (contract 14-06-200-229A-LTR1) does provide for M&I water in the AEWSD service area. We have to believe the overlap area is within the USBR service area for Friant-Kern/CVP Eastside Project Water, for M&I water use. We would appreciate your help in confirming M&I water availability to the AEWSD/ENCSD overlap and potential overlap areas. Please also confirm that the Bureau has not, nor does it intend to, remove these areas from the M&I service area. If it is more convenient for the Bureau and AEWSD for ENCSD to have a direct contract with the Bureau for supplying water within this overlap area, then we would be interested in taking the steps necessary to obtain a water supply Contract with the USBR. The supply could simply come from water now covered by the AEWSD-USBR Contract, as the water would still be used in AEWSD service area that overlaps the ENCSD.

ENCSD-2

We appreciate your review of this and advice of whom we should be contacting relative to further pursuit of this issue. This is an absolutely essential water supply for the ENCSD area that overlaps the AEWSD and which is serviced with the Bureau's Friant-Kern Canal Project water. That supply cannot be lost. If the supply is lost, we do not know how it can be replaced in a reasonable time or at a reasonable cost.

We have offered to AEWSD to deliver the water from the end of the Friant-Kern to the overlap area through facilities that we will have to finance, construct and operate. As you can imagine, this is not an insignificant financial undertaking. We understand the desire of AEWSD to not provide water to the Municipal/Industrial users in its service area through its canal system. Our proposal eliminates that requirement for delivery. At this time they indicate they may not be able to honor our request because the area is being removed somehow from the USBR M&I service area. We need your assistance in getting this matter resolved so that we can continue service to the M&I water users in the overlap area with an assured water supply.

Thank you very much; we appreciate your continued effort to serve the essential needs of the AEWSD and our District.

Sincerely,

Timothy P. Ruiz, P.E.
General Manager - East Niles Community Services District

Copies to: David Lewis, Bureau of Reclamation, 2800 Cottage Way, MP-730 Sacramento, CA 95825
Steve Collup/Arvin-Edison Water Storage District
Eric Averett/Kern County Water Agency

ENCSD-2 These comments are not related to the analyses or information presented in this EA.

Comment No. 15

Arvin Edison Water Storage District
April 20, 2005

ARVIN-EDISON WATER STORAGE DISTRICT

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PRESIDENT
Howard R. Frick

VICE PRESIDENT
Bill Giumarra

SECRETARY-TREASURER
John C. Moore

ENGINEER-MANAGER
Steven C. Collup

ASSISTANT MANAGER
David A. Nixon

STAFF ENGINEER
Steven H. Lewis

April 20, 2005

Kirk Rogers, Regional Director
United States Bureau of Reclamation
MP-100, Regional Office
2800 Cottage Way, Room E-1604
Sacramento, CA 95825-1898

Subject: **M&I Water Shortage Policy - Draft Environmental Assessment Response to East Niles Community Services District Letter Dated April 6, 2005**

Dear Mr. Rogers:

This letter is written in response to an April 6, 2005, letter to you (copy attached) from East Niles Community Services District (East Niles) regarding water supply issues associated with the Arvin-Edison Water Storage District's (Arvin-Edison) contract with the Federal government for water from the Friant-Kern System of the Central Valley Project.

Please take note that East Niles' comments were not solicited, reviewed, nor supported by Arvin-Edison.

Furthermore, East Niles is both mistaken and misleading in their comments to the Bureau, the following clarifies:

By way of background, East Niles, in the past, had a contract for surface water from Arvin-Edison for use on lands in both Arvin-Edison and East Niles (the overlap area), and their use of it was highly variable and irregular. That contract has now expired and, subsequently, East Niles receives no surface water from Arvin-Edison. East Niles does, however, receive substantial benefits for the overlap area from the Arvin-Edison project, which continues to mitigate groundwater overdraft in the District by the administration of direct and in-lieu groundwater recharge. East Niles relies heavily on its use of groundwater to service its customers.

East Niles requests clarification as to why the March 2005 Draft Environmental Assessment for the M&I Water Shortage Policy for the Central Valley Project does not address that portion of East Niles within the Arvin-Edison service area. It is our understanding that this document is intended to address only the Shasta System portion of the CVP and not the Friant Division. Furthermore, we are not aware of any M&I Contracts on the Friant Division that have shortage provisions differing from the corresponding Ag Contract Shortage Provisions, so the development of a M&I Shortage Policy on the Friant Division would be a moot point.

Control No. 0077??

AEWSD-1

Response to Comments

AEWSD-1 See response to ENCSD-1 pertaining to Friant Division and Cross Valley contracts. Remaining comments are not related to the analyses or information presented in this EA.

Kirk Rogers, Regional Director
April 20, 2005
Page 2

you are aware, the Friant Division already as a "two tier" system, incorporated into its operations and all water service contracts, providing for both Class 1 and Class 2 supplies. Please also note that if the Bureau were to ever consider granting M&I contracts a priority to water during times of shortage that said policy would be firmly opposed by Arvin-Edison as well as, we suspect, the majority if not all of the Friant Division contractors.

AEWSD-1 continued

East Niles also raises several other issues in their letter, which are not relevant to the M&I Water Shortage Policy and related environmental documentation, but are issues for which I clarify by the following:

East Niles asked for confirmation that the Bureau does not intend to remove Arvin-Edison from the permitted M&I Place-Of-Use (M&I POU). While we know of no efforts to remove Arvin-Edison, we are aware of some confusion, as reported by the Bureau, as to whether or not all or portions of Arvin-Edison is currently within or, has ever been in, the permitted M&I POU. Regardless of the ultimate resolution, please be aware that Arvin-Edison is firmly opposed to any action that would amend, revise or otherwise "open" the Friant-Kern water permits held by the Bureau for ANY reason, including, but not limited to, amending the M&I POU to include Arvin-Edison lands. Please note that the Friant Water Authority at their March 24, 2005, Board of Directors' meeting also unanimously supported this position.

East Niles also expressed interest in obtaining a water supply from the Bureau, and suggests that this could be accomplished by simply reducing Arvin-Edison's contract amounts. Arvin-Edison's supplies are already inadequate and it is only able to secure enough surface water to serve less than one-half of the 130,000 acres within the District. Although I'm sure that this goes without saying, Arvin-Edison would not consent to assignment of any portion of its contract with the Bureau to East Niles or any other entity.

If you have any questions as to Arvin-Edison's full position on the issues briefly identified above, please do not hesitate to contact me.

In addition, we request copies of any and all correspondence, formal, written, verbal, of electronic, from East Niles regarding Arvin-Edison and its water supplies.

Sincerely,

Steve Collup

Steve Collup
Engineer-Manager

cc: Board of Directors
Ernest Conant, Esq.
John White, ENCSD
David A. Nixon, Assistant Manager
Steven H. Lewis, Staff Engineer
Ron Jacobsma, FWA
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Comment No. 16

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April 22, 2005

Mr. David Lewis
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Re: Proposed Finding of No Significant Impact and Environmental Assessment Regarding Municipal and Industrial Water Shortage Policy (March 2005)

Dear Mr. Lewis:

On behalf of the Hoopa Valley Indian Tribe ("Tribe"), we submit the following comments concerning the Municipal and Industrial Water Shortage Policy-Central Valley Project, California Draft Environmental Assessment and Draft Finding of No Significant Impact ("FONSI").

The draft FONSI states that all of the alternatives considered are limited by existing water availability to the CVP water service contractors. It states that reallocation would be limited to the total amount allocated to the Irrigation CVP water service contractors, if and when the water is available. Draft FONSI at 2. It states: "Because water is reallocated between CVP M&I and Irrigation users in the same water year, there is no change in storage in CVP reservoirs or to allocations of water to refuge water supplies, instream flows, or senior water right holders." *Id.* at 3. These statements are critically important if, as we understand, they are intended to clearly subordinate water deliveries and the M&I reallocations to the instream fishery flow requirements of the Trinity River as specified in the Trinity River Flow Evaluation Final Report of June 1999 ("TRFEFR"), pursuant to CVPIA § 3406(b)(23), Pub. L. 102-575. Please clarify that the Trinity River instream flow requirements are among the "instream flows" which will not be changed by the CVP M&I Water Shortage Policy. **HVIT-1**

These comments reflect the Tribe's ongoing concern with management of the CVP, which includes the CVP long-term contracts, the Trinity River Division, and their effects on the federally-reserved fishing rights of the Tribe.

Hoopa Valley Indian Tribe Response to Comments
April 22, 2005

HVIT-1 The Tribe asks for clarification here. CVP operations in all alternatives in the EA would be in accordance with OCAP 2004. Implementation of any of the alternatives would not change Reclamation methods to meet flow requirements on the Trinity River.

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A. Nature of the Tribe's Interest

Since time immemorial, the fishery resources of the Klamath and Trinity Rivers have been the mainstay of the life and culture of the Hoopa Valley Tribe. The fishery was "not much less necessary to the existence of the Indians than the atmosphere they breathed." *Blake v. Arnett*, 663 F.2d 906, 909 (9th Cir. 1981) (quoting *United States v. Winans*, 198 U.S. 371, 381 (1905)). The Hoopa Indians follow exacting cultural practices to protect individual runs of fish and to celebrate the bounty of the river that gives life to their people. The salmon fishery also holds significant value in the Hoopa culture and economies, and the Tribe holds property rights in the Trinity River Basin fishery. *See* Mem. from John D. Leshy, Solicitor of the Department of the Interior to the Secretary of the Interior 3, 15, 18-21 (Oct. 4, 1993), *cited with approval*, *Parravano v. Babbitt*, 70 F.3d 539, 542 (9th Cir. 1995), *cert. denied*, 518 U.S. 1016 (1996). The lower twelve miles of the Trinity River and a stretch of the Klamath River flows through the Hoopa Valley Reservation.

The CVP has a direct and dramatic effect on fisheries reserved for the Tribe. The Trinity River Division ("TRD"), which is part of the CVP, diverts water from the Klamath-Trinity River Basin by means of a system of dams and trans-mountain diversion works. Act of August 12, 1955 ("1955 Act"), 69 Stat. 719, Pub. L. 84-386 (authorizing construction and operation of the TRD). Water diverted by the TRD eventually flows into the Sacramento River and Delta, and becomes part of the supply available to satisfy CVP water service delivery contracts.

In section 2 of the 1955 Act, Congress expressly made diversion to the Central Valley subject to requirements for fish and wildlife preservation and propagation in the Klamath-Trinity River Basin. However, upon completion of the TRD in 1964, up to 90% of the Trinity's flow was diverted. TRFEFR at 8, 63-64. Fishery studies throughout the late 1970s and early 1980s determined that the operation of the TRD was the single greatest contributor to the Trinity fishery declines. The devastating effects on the anadromous fishery resulted in listing of Klamath-Trinity coho salmon under both State and Federal Endangered Species Acts.

Congress has enacted a number of laws intended to restore the Trinity River fishery. In particular, CVPIA § 3406(b)(23) directed the Secretary to determine and, upon concurrence of the Tribe, implement permanent instream fishery flow requirements and operating criteria and procedures for the Trinity River Division to restore and maintain the Trinity River fishery. This provision was one of many Congress added to the CVP authorizing legislation in 1992 in conjunction with that Act's clarification that the CVP be operated for the purposes of protecting fishery resources, mitigating fish and wildlife impacts, and providing water deliveries to irrigators and municipalities and industrial users. *See, e.g.*, CVPIA § 3406(a).

In accordance with the specific directive of CVPIA § 3406(b)(23), the Trinity River Flow Study was completed in June 1999. The Tribe concurred in the Flow Study results on December 18, 2000. Related environmental reviews were completed and, on December 19, 2000, the Secretary and the Tribe signed a record of decision ("ROD") implementing a suite of habitat improvement actions including instream fishery flow releases from the TRD commensurate with those recommended in the Flow Study.

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The Tribe is committed to ensuring that Reclamation actions comply with applicable law, including the CVPIA, the Endangered Species Act ("ESA"), 16 U.S.C. § 1631 *et seq.*, and the government's trust responsibility to the Tribe. The Tribe is also fully committed to the timely implementation of the scientifically based fishery flow requirements set forth in the Trinity River Flow Study and mandated by the ROD. *See Westlands v. United States*, 275 F. Supp.2d 1157 (E.D. Cal. 2002), *rev'd on other grounds*, 376 F.3d 853 (9th Cir. July 13, 2004), *reh'g denied* (9th Cir. Nov. 8, 2004) (upholding the Trinity River EIS and concluding that "nothing remains prohibiting the full implementation of the ROD, including its complete flow plan for the Trinity River").

B. Specific Comments

The DEA indicates the M&I Water Shortage Policy will be referenced in all but seven groups of CVP long-term contracts. ES-1. The Hoopa Valley Tribe has separately submitted comments on a number of the proposed long-term CVP water service contracts. It appears that the M&I Water Shortage Policy was sometimes omitted from the contracts for the Delta-Mendota Canal Unit, although it is not one of the seven exceptions noted in the EA. Very large allocations of water are delivered under the seven groups of contracts to which the M&I Water Shortage Policy is expressly inapplicable. Since the M&I Water Shortage Policy is inapplicable unless specifically referenced, the extent to which this policy will be applied, and therefore its environmental impact is unclear and should be clarified in the Final EA.

HVIT-2

Reclamation has noted elsewhere that many M&I contractors are not using the full M&I portion of their contract total. As a result, if the M&I water shortage allocation were applied to the full contract entitlements, the resulting allocation for some contractors would exceed their current demand. For example, Reclamation notes in the Delta-Mendota Canal Unit responses to comments (February 2005) that "the provision for "seventy-five percent M&I reliability" will be applied to a contractor's *historic use*, with certain adjustments, up to the CVP projected M&I demands as of September 30, 1994." *Id.* at 7. The possibility that the M&I Water Shortage Policy would increase current demand should be more fully spelled out in order to assess the environmental impact of this Policy.

HVIT-3

The study area for this EA is unreasonably narrow. Although the EA purports to study areas with "water rights holders affected by CVP operations," Figure 1-1 shows that affected water rights in Humboldt and Del Norte County are omitted. The TRFEFR graphically demonstrated the adverse effects of CVP operations on Indian trust resources and senior water rights throughout the Trinity and Klamath Rivers. The study area for this EA should include such areas in order to satisfy the analysis requirements of NEPA. For example, the provisions of Chapter 5 Affected Environment and Environmental Consequences are very incomplete without discussion of the Trinity River Valley and lower Klamath River. Thus, Indian Trust Assets of the Hoopa Valley and Yurok Tribes are mentioned but only with a single sentence. EA at 5-88.

HVIT-4

Hoopa Valley Indian Tribe - continued

HVIT-2 The Tribe asks for clarification here. See contracts that will be subject to the CVP M&I Water Shortage Policy which include references to the policy. For example, Del Puerto Water District includes the reference in Article 11 of the long-term water service contract.

HVIT-3 The Tribe asks for clarification here. The EA, CVPIA PEIS, and OCAP 2004 included quantitative evaluations using the best available estimates of M&I and irrigation uses for CVP water service contractors. It is anticipated that as areas are converted from agriculture and open space to municipal uses both for the CVP water service contractors and water rights users, there will be less water for irrigation CVP water service contractors. The trends in the reduction in reliability for irrigation CVP water service contractors can be determined through comparison of information in the CVPIA PEIS and also through comparison of conditions under analyses of both the future and existing OCAP analyses. The No Action and action alternatives were analyzed in the EA at time of build out (when historical use and full contract quantity are the same) in order to capture the full range of impacts.

HVIT-4: The Tribe believes that the Study Area shown in Figure 1-1 is too narrow in order to conduct a proper NEPA analysis regarding impacts on Indian Trust Assets and should be expanded to include affected water rights holders in Humboldt and Del Norte counties. This comment apparently resulted from the statement in the Study Area description of the EA describing the study area to include "water rights holders affected by CVP operations".

Hoopa Valley Indian Tribe - continued

HVIT-4 (continued): The actual study area was focused on the service areas that could be affected by the alternatives. Because the alternatives considered in this EA only relied upon re-allocation of water available to CVP water service contractors in a given year after all regulatory and environmental requirements and water rights were met, the study area limits could be focused on the potential impact area. Humboldt and Del Norte counties are not within the potential impact area. Other alternatives were considered but eliminated as described in Chapter 3 of the EA. Reclamation will correct the Study Area textual description in the EA accordingly.

Hoopa Valley Indian Tribe - continued

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C. Conclusion

The Tribe urges Reclamation to clarify in the FONSI that the proposed action will be subordinate to steps necessary to protect the Tribe's senior federally-reserved fishing and instream water rights. Thank you for the opportunity to comment on the M&I DEA. We trust our comments will be appropriately considered and addressed in final NEPA documentation for this proposed action.

Sincerely yours,

MORISSET, SCHLOSSER, JOZWIAK & McGAW

Thomas P. Schlosser
Attorneys for the Hoopa Valley Tribe

TPS/nmc

cc: Kirk Rodgers
Steve Thompson

HVIT-5

HVIT-5 The Tribe asks for clarification here. Because the M&I Water Shortage Policy would only reallocate CVP water service contract water, instream flows on the Trinity River would not be affected due to implementation of this policy. The FONSI recognizes that there are no changes to CVP reservoir, river operations, or instream flows and no changes to ITAs. These findings are among the reasons cited in the FONSI justifying why Reclamation determined that the impacts of the proposed action are not significant and that an Environmental Impact Statement (EIS) is not required. Reclamation believes as such that the FONSI was developed consistent with NEPA regulations, guidance from the Council on Environmental Quality, and Reclamation policy.