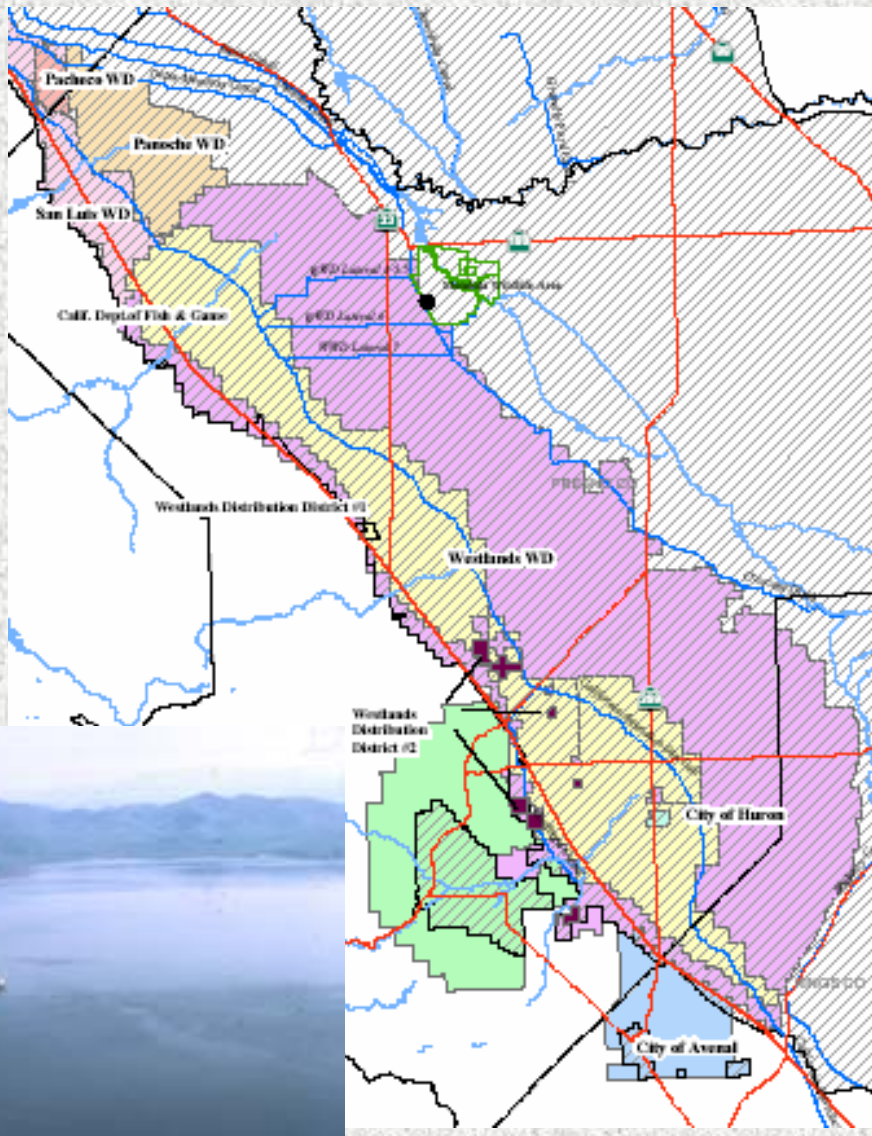
Public Draft

Central Valley Project, West San Joaquin Division, San Luis Unit Long-Term Water Service Contract Renewal Environmental Impact Statement and Appendices

September 2005



Mid-Pacific Region

Sacramento, California

South-Central California Area Office, Fresno, California

Acknowledgements

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U.S. Bureau of Reclamation website.

DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)
CENTRAL VALLEY PROJECT
SAN LUIS UNIT LONG-TERM CONTRACT RENEWAL

Lead Agency for the EIS:	U.S. Bureau of Reclamation
Title of Proposed Action:	Renewal of Long-Term Water Service Contracts for the San Luis Unit of the West San Joaquin Division of the Central Valley Project
Affected Jurisdictions:	Fresno, Kings, and Merced Counties, California Cities of Avenal, Coalinga and Huron, California
Designation:	Draft Environmental Impact Statement (EIS) Central Valley Project, San Luis Unit Long-Term Contract Renewal

On October 30, 1992, the President signed into law the Reclamation Projects Authorization and Adjustment Act of 1992 (Public Law [PL] 102-575), which included Title XXXIV, the Central Valley Project Improvement Act (CVPIA). The CVPIA amended the previous authorizations of the CVP to achieve a reasonable balance among competing demands for use of CVP water, including the requirements of fish and wildlife and agricultural, municipal and industrial (M&I), and power contractors. Through the CVPIA, U.S. Bureau of Reclamation (Reclamation) is developing policies and programs to improve the environmental conditions that were affected by the operation and maintenance and physical facilities of the CVP. The CVPIA also includes tools to facilitate larger efforts in California to improve environmental conditions in the Central Valley and the San Francisco Bay-Delta system (Bay-Delta). Section 3404(c) of the CVPIA directs the Secretary of the Interior (Secretary) to renew existing CVP water service and repayment contracts following completion of a Programmatic Environmental Impact Statement (PEIS) and other needed environmental documentation. Section 3404(c) of the CVPIA states that 25 years will be the upper limit for long-term irrigation repayment and water service contracts within the CVP. However, Section 3404(c) did not amend the provisions of Section 9(c) of the Reclamation Project Act of 1939 and the Reclamation Project Act of June 21, 1963, which authorized renewal of M&I water contract terms for up to 40 years. These authorizations remain in place as guidance for establishing the terms of M&I contracts. Therefore, under the federal action, the term for agricultural (irrigation) water service contracts will be 25 years, the term for mixed agricultural/M&I water service contracts will be 25 years, and the term for M&I-only long-term water service contracts will be 40 years. Section 3409 of the CVPIA required the Secretary to prepare a PEIS to evaluate the direct and indirect adverse impacts and benefits of implementing the CVPIA. The PEIS was prepared under the National Environmental Policy Act (NEPA) by Reclamation and U.S. Fish and Wildlife Service (USFWS). Reclamation released a Draft PEIS on November 7, 1997. The USFWS became a co-lead agency in August 1999. An extended comment period closed on April 17, 1998. Reclamation and the USFWS released the Final PEIS in October 1999 and the Record of Decision in January 2001.

The purpose of the federal action is to renew the San Luis Unit long-term water service contracts, consistent with Reclamation authority and all applicable state and federal laws, including the CVPIA. This EIS was prepared in accordance with the Fish and Wildlife Coordination Act, National Historic Preservation Act, Executive Order 13007 (Indian Sacred Sites on Federal Land), federal policies and regulations pertaining to Indian Trust Resources, Executive Order 128989 (Environmental Justice), Executive Order 11988 (Floodplain Management), Executive Order 11990 (Wetlands Protection), the Farmland Protection Policy Act of 1981, the Memoranda on Farmland Preservation (dated August 30, 1976, and August 11, 1980), the Wild and Scenic Rivers Act, the Clean Air Act, the Safe Drinking Water Act, the Clean Water Act, and state- and area-wide and local plan and program consistency.

The project alternatives include the terms and conditions of the long-term contracts and tiered water pricing. The four alternatives identified present a range of water service agreement provisions that could be implemented for the long-term contract renewals. The first alternative, the No-Action Alternative, consists of renewing existing water service contracts consistent with the Preferred Alternative of the CVPIA PEIS. In November 1999, Reclamation published a proposed long-term water service contract. In April 2000, the CVP Contractors presented an alternative long-term water service contract. Reclamation and the CVP Contractors continued to publicly negotiate the CVP-wide terms and conditions with these proposals serving as the basis for an analysis of such "bookends." Reclamation has developed final versions of all such contracts, which are identified collectively as the "Preferred Alternative" in this EIS. This EIS evaluates these three proposals against the No Action Alternative to be considered for the environmental documentation that evaluates the impacts of renewing long-term water service contracts. The No Action Alternative acknowledges existing environmental trends in the area of potential effect. When evaluated against the No Action Alternative, no potentially significant impacts have been identified that could result from the renewal of San Luis Unit long-term water service and repayment contracts analyzed in this EIS.

The public comment period for this EIS extends from October 7, 2005 to November 25, 2005. Written comments should be addressed to:

Mr. Joe Thompson, U.S. Bureau of Reclamation
South Central California Area Office
1243 N Street
Fresno, CA 93721-1813

SAN LUIS UNIT

DRAFT ENVIRONMENTAL IMPACT STATEMENT
LONG-TERM CONTRACT RENEWAL

Summary

September 2005

SUMMARY

INTRODUCTION

This Environmental Impact Statement (EIS) evaluates the potential adverse impacts and benefits of the U.S. Bureau of Reclamation (Reclamation) renewal of the long-term water service contracts to deliver water from the Central Valley Project (CVP) for agricultural and municipal and industrial (M&I) uses to the San Luis Unit CVP water service contractors.

PURPOSE AND NEED FOR THE ACTION

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

The purpose of the federal action is to renew long-term water service contracts, delivering CVP water for agricultural irrigation or for M&I uses to the nine service contractors with in the San Luis Unit, consistent with Reclamation authority and all applicable state and federal laws, including the Central Valley Project Improvement Act (CVPIA) (H.R. 429, Public Law 102-575). The project alternatives will include the terms and conditions of the long-term contracts and tiered water pricing.

The long-term contract renewals are needed to:

- Continue the beneficial use of water in the San Luis Unit.
- Incorporate certain administrative conditions into the renewed contracts to ensure CVP continued compliance with current federal Reclamation law and other applicable statues; and
- Allow the continued reimbursement to the federal government for costs related to CVP construction and operation.
- Satisfy the statutory requirements for renewal of the existing San Luis Unit water services contracts.

DEVELOPMENT OF ALTERNATIVES

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

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

NO ACTION ALTERNATIVE

The No Action Alternative assumes renewal of long-term CVP water service contracts in accordance with implementation of CVPIA. Contract assumptions in the No Action Alternative are defined by the current water service contract documents for San Luis Unit contractors, including applicable interim and continuing longer-term contracts. The No Action Alternative and related future conditions acknowledge ongoing environmental trends as a benchmark against which effects resulting from the implementation of the action alternatives (Alternatives 1, 2, and the Preferred Alternative) are compared.

PREFERRED ALTERNATIVE

The Preferred Alternative is based upon the final or near-final versions of the contracts that have been negotiated between Reclamation and each of the San Luis Unit Contractors. The nine contracts analyzed in this EIS were negotiated with the California Department of Fish and Game, the cities of Avenal, Huron, and Coalinga, and the Pacheco, Panoche, San Luis, and Westlands Water Districts.

ALTERNATIVE 1

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

ALTERNATIVE 2

Alternative 2 is based upon the proposal presented by Reclamation to CVP water service contractors in November 1999. The November 1999 proposal did include several

provisions that were different than the assumptions for No Action Alternative including differences related to tiered pricing and the definition of M&I users.

SUMMARY OF THE IMPACT ASSESSMENT

The alternatives considered in this EIS were analyzed to determine the potential for adverse and beneficial impacts associated with their implementation as compared to the No Action Alternative. None of the alternatives include the construction of facilities or changes in CVP water service contract service areas. Population and land use projections would be the same for all alternatives, because all assume continuing delivery of available contractual water supplies within the range of existing conditions. Demographic, economic, political, and other factors, independent of the long-term contract renewal process, are causing changes with effects to land use that are beyond the range of Reclamation's responsibilities. General plans for the areas within the San Luis Unit contractors' service areas include protections for biological resources, land use, cultural resources, air quality, soils, visual resources, and recreational opportunities. The responsibility to address effects to land uses will be with the local government as part of its California Environmental Quality Act compliance for actions of the municipalities or counties pursuant to those general plans.

Long-term contract renewal is not the appropriate forum for addressing ongoing drainage and related issues in the San Luis Unit. Although this EIS acknowledges ongoing trends associated with the continued application of irrigation water by all of the alternatives—including the No Action Alternative—the provision of agricultural drainage service to the San Luis Unit as mandated by the Ninth Circuit Court of Appeals will come later in time and is being addressed in a separate federal action in the San Luis Drainage Feature Re-evaluation Draft Environmental Impact Statement.

A major difference between the alternatives is due to tiered water pricing assumptions and the responses to the pricing method. The tiered water pricing assumptions are identical under No Action Alternative and Alternative 1. The tiered water pricing assumptions under Alternative 2 and the Preferred Alternative would increase CVP water rates as compared to the No Action Alternative. If tiered pricing makes CVP water unaffordable to some of the existing users, those users may increase groundwater use to replace more expensive CVP water. Table ES-1 summarizes the environmental consequences of the Preferred Alternative, Alternative 1, and Alternative 2 as compared to the No Action Alternative.

Table S-1
Environmental Consequences of Long-Term Contract Renewal No Action Alternative, Preferred Alternative, Alternative 1, and Alternative 2 as Compared to the No Action Alternative

Affected Resource/ Concern	Environmental Consequences of The No Action Alternative	Environmental Consequences of The Preferred Alternative	Environmental Consequences of Alternative 1	Environmental Consequences of Alternative 2
Drainage and Water Quality	Impacts to the San Luis Unit are expected to be a continuing increase in soil salinity in Westlands and continuing expansion of lands for reuse of drainage water in the northern districts until provision of drainage service by Reclamation in 2010. Provisions for drainage service by Reclamation, together with the ongoing activities undertaken by the individual districts, are designed to control these impacts. The quality of the surface waters in the affected area will continue to be governed by water quality standards, TMDLs and other instruments regulating water quality. Therefore the No Action Alternative is not expected to impact surface water quality.	The Preferred Alternative is not expected to produce drainage conditions or surface water quality impacts that can be distinguished from those that would exist under the No Action alternative. Because the tiered pricing provisions of the Preferred Alternative are identical to those of the No Action Alternative, it is expected that deliveries of surface water and pumpage of groundwater would be the same for both alternatives. As a result, both alternatives would bring the same volume of water and contaminants into the San Luis Unit, resulting in indistinguishable impacts.	Implementation of this alternative is expected to produce no impacts on drainage or surface water quality. As such, impacts to the San Luis Unit with respect to drainage conditions or surface water quality would be indistinguishable from those that would exist under the No Action Alternative.	Impacts to the San Luis Unit with respect to drainage conditions or surface water quality would be indistinguishable from those that would exist under the No Action Alternative. This is because the distinctions between Alternative 2 and the No Action Alternative with respect to tiered pricing are minor and differences in other areas are not expected to impact drainage or surface water quality.

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Agriculture	Total irrigated acreage in the San Luis Unit is estimated at 927,500 acres (average water year); 927,600 acres (wet water year); and 917,200 acres (dry water year) Value of Production in the San Luis Unit estimated at $2,268.3 million (average water year); $2,268.2 million (wet water year); and $2,256.3 million (dry water year).	Impact to San Luis Unit total irrigated acreage would be a 1,000-acre decrease during an average year that follows a dry five-year period. Impact to San Luis Unit value of production would be an $800,000 decrease in total value of production during an average year that follows a dry five-year period. Impacts to San Luis Unit net farm revenues would range from a $6.3 million decrease during a wet year following a wet five-year period to a $7.3 million increase during a dry year following a dry five-year period.	Agricultural resource use is assumed to be similar to the No Action Alternative because the amount of water delivered, the timing of those deliveries, and the rates and methods of payment for deliveries do not substantially differ from the No Action Alternative.	Impact to San Luis Unit total irrigated acreage would be a 1,000-acre decrease during an average year that follows a dry five-year period. Impact to San Luis Unit value of production would be an $800,000 decrease in total value of production during an average year that follows a dry five-year period. Impacts to San Luis Unit net farm revenues would range from a $6.3 million decrease during a wet year following a wet five-year period to a $7.3 million increase during a dry year following a dry five-year period.

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Affected Resource/ Concern	Environmental Consequences of The No Action Alternative	Environmental Consequences of The Preferred Alternative	Environmental Consequences of Alternative 1	Environmental Consequences of Alternative 2
Socioeconomics/ Power Resources	Relative income and employment levels adjusted for inflation would not differ substantially from existing conditions. Total energy requirements are not expected to substantially differ from existing conditions as pump loads will remain relatively similar to those currently observed within the San Luis Unit. CVP hydroelectric facilities would also be expected to operate at levels general similar to existing conditions.	No impacts to power resources because CVP hydroelectric facilities would continue to be operated as under No Action Alternative conditions. San Joaquin River region total employment would decrease by 120 jobs and income from profits and wages would decrease by $4.2 million under the average-average hydrologic sequence. Region would lose an estimated 250 persons. San Joaquin River region total employment would decrease by 420 jobs and income from profits and wages would decrease by $12.4 million under the dry-average hydrologic sequence. Region would lose an estimated 873 jobs.	Socioeconomic and power resources impacts are expected to be similar to the No Action Alternative because the amount of water delivered, the timing of those deliveries, and the rates and methods of payment for deliveries do not substantially differ from the No Action Alternative.	No impacts to power resources because CVP hydroelectric facilities would continue to be operated as under No Action Alternative conditions. San Joaquin River region total employment would decrease by 120 jobs and income from profits and wages would decrease by $4.2 million under the average-average hydrologic sequence. Region would lose an estimated 250 persons. San Joaquin River region total employment would decrease by 420 jobs and income from profits and wages would decrease by $12.4 million under the dry-average hydrologic sequence. Region would lose an estimated 873 persons.

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Affected Resource/ Concern	Environmental Consequences of The No Action Alternative	Environmental Consequences of The Preferred Alternative	Environmental Consequences of Alternative 1	Environmental Consequences of Alternative 2
Land Use	No direct land use impacts within the study area. Renewal of long-term contracts would not involve the construction of new facilities that would alter current land uses and would not result in the installation of structures that would conflict with current land use plans. Assumes Reclamation will implement drainage service by 2010. Long-term provision of CVP water would continue to provide water supplies that accommodate a portion of the planned populations and land uses that are identified in the three counties' general plans. Implementation of this alternative would not directly impact the continued production of agricultural crops or impair the productivity of important farmlands when compared to existing conditions.	No direct adverse impacts to land use. Renewed contract water deliveries continue to accommodate a portion of planned growth and support agricultural land uses as under No Action Alternative conditions.	No direct adverse impacts to land use. Renewed contract water deliveries continue to accommodate a portion of planned growth and support agricultural land uses as under No Action Alternative conditions.	No direct adverse impacts to land use. Renewed contract water deliveries would continue to accommodate a portion of planned growth and support agricultural land uses as under No Action Alternative conditions.
Air Quality	Because agricultural water deliveries would remain the same as those currently being experienced under existing conditions, emissions from farm equipment and transportation of agricultural materials are similarly expected to remain similar as those resulting from existing conditions.	Similar crops, cropping patterns, and total irrigated acreage would not result in substantial fallowed acreage capable of adverse fugitive dust or related air quality impacts when compared to the No Action Alternative.	Similar crops, cropping patterns, and total irrigated acreage would not result in substantial fallowed acreage capable of adverse fugitive dust or related air quality impacts when compared to the No Action Alternative.	Similar crops, cropping patterns, and total irrigated acreage would not result in substantial fallowed acreage capable of adverse fugitive dust or related air quality impacts when compared to the No Action Alternative.

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Affected Resource/ Concern	Environmental Consequences of The No Action Alternative	Environmental Consequences of The Preferred Alternative	Environmental Consequences of Alternative 1	Environmental Consequences of Alternative 2
Soils and Geology	Because agricultural water deliveries would remain the same as those currently being experienced under existing conditions, future trends in soil degradation from increased levels of salt and sodium are not expected to differ substantially from trends occurring under existing conditions. Existing rates of soil degradation may be slowed if future conditions evolve such that water that had previously been applied to retired lands is instead used to increase the reliability of deliveries of CVP water applied to higher quality lands remaining in production that are not characterized by higher contributions of salts and sodium under irrigation. Assumes Reclamation will implement drainage service by 2010. Increased groundwater pumping could increase land subsidence when compared to existing conditions. Increased soil salinity could result from reductions in surface water available for leaching salts through crop root zones or from poor quality groundwater pumped in response to reduced surface water deliveries.	Increased groundwater pumping could increase land subsidence. Increased soil salinity could result from reductions in surface water available for leaching salts through crop root zones or from poor quality groundwater pumped in response to reduced deliveries.	Increased groundwater pumping could increase land subsidence. Increased soil salinity could result from reductions in surface water available for leaching salts through crop root zones or from poor quality groundwater pumped in response to reduced deliveries.	Increased groundwater pumping could increase land subsidence. Increased soil salinity could result from reductions in surface water available for leaching salts through crop root zones or from poor quality groundwater pumped in response to reduced deliveries.

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Groundwater	Because agricultural water deliveries would remain the same as those currently being experienced under existing conditions, future trends will be similar to current/existing conditions trends. Urban expansion and increased M&I use are expected to cause increasing volumes of contracted water to be shifted from agricultural to M&I purposes, with accompanying increases in impervious surfaces, and reduced (but un-substantial) proportions of delivered water percolating to groundwater resources – thereby reducing the mass of salts, selenium, and other contaminants introduced into groundwater resources. Land retirement expected to result in less deep percolation of applied water and less transport of salts and other contaminants to groundwater. Water that had previously been applied to retired lands may instead be used to increase the reliability of deliveries of CVP water applied to higher quality lands. Application on higher quality lands may reduce the need to increase groundwater pumping in these areas. Assumes Reclamation will implement drainage service by 2010.	Increased pumping in response to reduced surface water deliveries could reduce groundwater levels and salinity.	Increased pumping in response to reduced surface water deliveries could reduce groundwater levels and salinity.	Increased pumping in response to reduced surface water deliveries could reduce groundwater levels and salinity.

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Affected Resource/ Concern	Environmental Consequences of The No Action Alternative	Environmental Consequences of The Preferred Alternative	Environmental Consequences of Alternative 1	Environmental Consequences of Alternative 2
Surface Water Resources	Estimated likely deliveries under the No-Action Alternative anticipated to be similar to those provided under recent historic conditions, and thus similar to deliveries under existing conditions. CALFED, CVPIA, and other related programs will affect future No Action conditions to better achieve CVPIA objectives and PEIS implementation. Operational decisions will precede quantification of water available for south-of-Delta deliveries—similar to decision structure occurring under existing conditions.	No impacts to surface water resources. Contract total, water to be made available, time for delivery, point of diversion, responsibility for water diversion, water measurement, and rates and methods of payment would not differ substantially from No Action Alternative.	No impacts to surface water resources. Contract total, water to be made available, time for delivery, point of diversion, responsibility for water diversion, water measurement, and rates and methods of payment do not differ substantially from No Action Alternative.	No impacts to surface water resources. Contract total, water to be made available, time for delivery, point of diversion, responsibility for water diversion, water measurement, and rates and methods of payment would not differ substantially from No Action Alternative.

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Affected Resource/ Concern	Environmental Consequences of The No Action Alternative	Environmental Consequences of The Preferred Alternative	Environmental Consequences of Alternative 1	Environmental Consequences of Alternative 2
Biological Resources	Ongoing species conservation programs would continue. Renewal of long-term contracts would not involve the construction of new facilities that would alter current land uses and dependent biological resources, and would not result in the installation of structures that would conflict with species conservation plans. Ongoing drainage, water quality, agriculture, land use, soils, groundwater, and surface water trends occurring under existing conditions will continue. Regulatory (e.g., water quality regulations) and drainage management programs are likely to reduce related rates of resource degradation when compared to rates occurring under existing conditions. Assumes Reclamation will implement drainage service by 2010.	No adverse impacts to fish, vegetation and wildlife. Contract renewal would continue water deliveries accommodating land uses existing under the No Action Alternative. No habitat supporting species would be converted to agricultural or, M&I use when compared to the No Action Alternative.	No adverse impacts to fish, vegetation and wildlife. Contract renewal would continue water deliveries accommodating land uses existing under the No Action Alternative. No habitat supporting species would be converted to agricultural or, M&I use when compared to the No Action Alternative.	No adverse impacts to fish, vegetation, and wildlife. Contract renewal would continue water deliveries accommodating land uses existing under the No Action Alternative. No habitat supporting species would be converted to agricultural or, M&I use when compared to the No Action Alternative.

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Cultural Resources	All of the actions associated with long-term renewal of the San Luis Unit water service contracts are within the range of "existing conditions" with respect to land use. While archaeological and historic sites have already been documented within the service areas of four of the nine San Luis Unit contractors (and are likely present in all of the service areas, but simply have not yet been documented), the continuation of existing land uses is not considered adverse, and no specific mitigation measures would be necessary. Contract renewal would not alter the area of use, types of use, range of river or stream flows, or reservoir fluctuations (except an instance in which the San Luis Reservoir is operated to increase end-of-month storage in September; which would beneficially reduce the present "bathtub ring" effect when compared to existing conditions.	No impacts to cultural resources. Virtually all of the actions associated with long-term contract renewals are within the range of land uses expected under the No Action Alternative. The area of use, types of use, range of river flows, and range of reservoir fluctuations fall within this range when compared to the No Action Alternative. No changes in land use or additions to contractor service areas would affect cultural resources when compared to the No Action Alternative.	No impacts to cultural resources. Virtually all of the actions associated with long-term contract renewals are within the range of land uses expected under the No Action Alternative. The area of use, types of use, range of river flows, and range of reservoir fluctuations fall within this range when compared to the No Action Alternative. No changes in land use or additions to contractor service areas would affect cultural resources when compared to the No Action Alternative.	No impacts to cultural resources. Virtually all of the actions associated with long-term contract renewals are within the range of land uses expected under the No Action Alternative. The area of use, types of use, range of river flows, and range of reservoir fluctuations fall within this range when compared to the No Action Alternative. No changes in land use or additions to contractor service areas would affect cultural resources when compared to the No Action Alternative.

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Recreational Resources	San Luis Reservoir levels could be affected by water level fluctuations during one or more dry water years if deliveries are constrained beyond levels experienced under existing conditions. Similarly, boating opportunities may be constrained and shoreline activities may decline if CVP operational decisions cause reduced reservoir deliveries.	No adverse impacts to recreational resources. Facility operations, recreational opportunities, annual use levels, and reservoir water surface elevations would not differ substantially when compared to the No Action Alternative.	No adverse impacts to recreational resources. Facility operations, recreational opportunities, annual use levels, and reservoir water surface elevations would not differ substantially when compared to the No Action Alternative.	No adverse impacts to recreational resources. Facility operations, recreational opportunities, annual use levels, and reservoir water surface elevations would not differ substantially when compared to the No Action Alternative.
Visual Resources	No adverse impacts to visual resources. Patterns of cultivated and fallowed acreages would remain substantially the same as under existing conditions. Agricultural viewsheds, scenic views, and visibility would not be substantially affected when compared to the No Action Alternative.	No adverse impacts to visual resources. Patterns of cultivated and fallowed acreages would remain substantially the same as under No Action Alternative conditions. Agricultural viewsheds, scenic views, and visibility would not be substantially affected when compared to the No Action Alternative.	No adverse impacts to visual resources. Patterns of cultivated and fallowed acreages would remain substantially the same as under No Action Alternative conditions. Agricultural viewsheds, scenic views, and visibility would not be substantially affected when compared to the No Action Alternative.	No adverse impacts to visual resources. Patterns of cultivated and fallowed acreages would remain substantially the same as under No Action Alternative conditions. Agricultural viewsheds, scenic views, and visibility would not be substantially affected when compared to the No Action Alternative.
Public Health	No adverse impacts to public health or increases in mosquito breeding. No increase in flows or standing water would result when compared to existing conditions.	No adverse impacts to public health or increases in mosquito breeding. No increase in flows or standing water would result when compared to the No Action Alternative.	No adverse impacts to public health or increases in mosquito breeding. No increase in flows or standing water would result when compared to the No Action Alternative.	No adverse impacts to public health or increases in mosquito breeding. No increase in flows or standing water would result when compared to the No Action Alternative.

TABLE OF CONTENTS

ABSTRACT .....

SUMMARY S-1

ABBREVIATIONS AND ACRONYMS xi

CHAPTER 1 PURPOSE AND NEED 1

Introduction 1
Purpose and Need for the Action 1
Basis of CVP Water Service Contract Renewals 2
Relation to the CVPIA PEIS 4
Basis of San Luis Unit Water Service Contract Renewals 6
Public Involvement Process 6
Localized Impacts Of CVPIA ROD/PEIS Preferred Alternative 7
Study Area 8
Contract Period 9

CHAPTER 2 DESCRIPTION OF ALTERNATIVES 2-1

Long-Term Water Service Contract Negotiation Process 2-1
Terms of Expiring Contracts 2-2
Issues Considered as Part of Long-Term Contract Renewals 2-2
Water Needs Assessments 2-2
Changes in Water Service Areas 2-10
Water Transfers 2-10
Terms & Conditions of Long-Term Water Service Contracts 2-11
California Department of Fish and Game (Mendota Wildlife Management Area) 2-11
City of Avenal 2-11
City of Coalinga 2-11
City of Huron 2-14
Pacheco Water District 2-14
Panoche Water District 2-14
San Luis Water District 2-15

Westlands Water District 2-16
Westlands Water District – Distribution District #2 2-16
Development of Alternatives 2-17
No Action Alternative 2-18
No Action Alternative Contract Provisions 2-18
Tiered Water Pricing 2-19
Definition of M&I Users 2-25
Water Conservation 2-25
Water Measurement 2-26
No Action Alternative Trends and Future Conditions 2-26
Alternative 1 2-27
Alternative 2 2-29
Tiered Water Pricing 2-29
Definition of M&I Users 2-30
Preferred Alternative 2-30
Alternatives Considered but Eliminated 2-31
Nonrenewal of Long-Term Contracts 2-31
Reduction in Contract Amounts 2-31

CHAPTER 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES 3-1

Introduction 3-1
Scope of the Analysis 3-1
Elements of Long-Term Contract Renewals Where Environmental Effects Would Not be Reasonably Expected 3-1
Language, Terms, and Conditions of Long-Term Contracts 3-1
Other NEPA and ESA Processes 3-2
The No-Action Alternative and Existing Conditions as an Environmental Baseline 3-2
Estimated Frequency of Full Contract Deliveries 3-2
Cumulative Impacts and Irreversible and Irretrievable Commitments of Resources 3-3
Incomplete or Unavailable Information 3-4
Section 3.1 : Contractor Service Area Descriptions 3.1-1
San Luis Unit Contractors' Facilities and Water Use 3.1-1
City of Avenal's Facilities and Water Use 3.1-1
Use of CVP Water 3.1-2
Use of Other Available Water Supplies 3.1-2
City of Coalinga's Facilities and Water Use 3.1-2
Use of CVP Water 3.1-4
Use of Other Available Water Supplies 3.1-4
City of Huron's Facilities and Water Use 3.1-4
Use of CVP Water 3.1-4
Use of Other Available Water Supplies 3.1-5

San Luis Water District's Facilities and Water Use 3.1-5
Description of District Facilities 3.1-5
CVP Contracts 3.1-6
Use of Other Available Water Supplies 3.1-6
Operating Rules and Regulations 3.1-7
Water Transfers 3.1-7
Irrigation 3.1-7
Westlands Water District's Facilities and Water Use 3.1-7
Westlands Water District Distribution District No. 1 ..... 3.1-9
Westlands Water District Distribution District No. 2 ..... 3.1-9
Description of District Facilities 3.1-9
CVP Contracts 3.1-10
Use of Other Available Water Supplies 3.1-10
Operating Rules and Regulations 3.1-10
Water Transfers 3.1-10
Irrigation 3.1-10
Pacheco Water District's Facilities and Water Use 3.1-11
Description of District Facilities 3.1-11
CVP Contracts 3.1-11
Use of Other Available Water Supplies 3.1-12
Operating Rules and Regulations 3.1-12
Water Transfers 3.1-12
Irrigation 3.1-12
Panoche Water District's Facilities and Water Use 3.1-12
Description of District Facilities 3.1-13
CVP Contracts 3.1-13
Use of Other Available Water Supplies 3.1-13
Operating Rules and Regulations 3.1-14
Water Transfers 3.1-14
Irrigation 3.1-14
CDFG's Facilities and Water Use 3.1-14
Use of CVP Water 3.1-14
Use of Other Available Water Supplies 3.1-15
San Luis Unit Contractors' Transfers from 1993 through 2004 ..... 3.1-15
Section 3.2 : Drainage and water quality 3.2-1
Affected Environment 3.2-1
Study Area 3.2-1
San Joaquin River 3.2-1
Environmental Consequences 3.2-4
No Action Alternative 3.2-4
Production of Drainage Water 3.2-4
District Activities 3.2-6
Constituents 3.2-11
Activities that influence drainage and water quality 3.2-16
Regional Activities Affecting Discharges to Surface Waters ... 3.2-19
Relevant Regulatory Conditions 3.2-24

Related Projects and Authorities 3.2-32
Preferred Alternative 3.2-38
Alternative 1 ..... 3.2-39
Alternative 2 ..... 3.2-39
Cumulative Impacts 3.2-39
Irreversible and Irretrievable Commitments of Resources 3.2-40
Section 3.3 : Agriculture 3.3-1
Affected Environment 3.3-1
Environmental Consequences 3.3-2
No Action Alternative 3.3-3
Preferred Alternative 3.3-5
Alternative 1 ..... 3.3-5
Alternative 2 ..... 3.3-6
Cumulative Impacts 3.3-12
Irreversible and/or Irretrievable Commitment of Resources 3.3-13
Section 3.4 : Socioeconomics and Power Resources 3.4-1
Affected Environment 3.4-1
Environmental Consequences 3.4-3
No Action Alternative 3.4-4
Preferred Alternative 3.4-5
Alternative 1 ..... 3.4-5
Alternative 2 ..... 3.4-5
Cumulative Impacts 3.4-9
Irreversible and/or Irretrievable Commitment of Resources 3.4-9
Section 3.5 : Land Use 3.5-1
Affected Environment 3.5-1
County Land Uses 3.5-1
Merced County 3.5-1
Fresno County 3.5-2
Kings County 3.5-3
CVP Contractors 3.5-4
City of Avenal 3.5-4
City of Coalinga 3.5-5
City of Huron 3.5-6
Pacheco Water District 3.5-7
Panoche Water District 3.5-7
San Luis Water District 3.5-7
Westlands Water District 3.5-8
Farmland Categories 3.5-9
Agricultural Land Use Trends 3.5-10
Regulatory Setting 3.5-12
Williamson Act 3.5-12
Actions Not Evaluated in This EIS 3.5-13
Environmental Consequences 3.5-14
M&I, Commercial, and Residential Development 3.5-14

Indirect Impacts/Interrelated Activities 3.5-15
No Action Alternative 3.5-16
Preferred Alternative 3.5-18
Alternative 1 ..... 3.5-18
Alternative 2 ..... 3.5-18
Cumulative Impacts 3.5-18
Irreversible and/or Irretrievable Commitment of Resources 3.5-19
Section 3.6 : Air Quality 3.6-1
Affected Environment 3.6-1
Climate and Meteorology 3.6-1
Regional Air Pollutants 3.6-2
Ozone 3.6-2
Carbon Monoxide 3.6-2
Nitrogen Oxides 3.6-3
Sulfur Dioxide 3.6-3
Particulate Matter 3.6-3
Fugitive Dust 3.6-3
Reactive Organic Gas 3.6-4
Volatile Organic Compounds 3.6-4
Smog 3.6-4
Smoke 3.6-4
Regulatory Setting 3.6-4
Recent Air Quality Conditions 3.6-6
Environmental Consequences 3.6-8
Impact Assessment 3.6-9
No Action Alternative 3.6-9
Preferred Alternative 3.6-10
Alternative 1 ..... 3.6-10
Alternative 2 ..... 3.6-10
Cumulative Impacts 3.6-11
Irreversible and/or Irretrievable Commitment of Resources 3.6-12
Section 3.7 : Soils and Geology 3.7-1
Affected Environment 3.7-1
Soils 3.7-1
Valley Land Soils 3.7-2
Valley Basin Land Soils 3.7-2
Status of Agricultural Lands 3.7-3
Prime and Unique Farmlands 3.7-4
Farmlands of Statewide Importance (FSI) 3.7-5
Geology 3.7-6
Soil-Related Issues of Concern and Ongoing Trends 3.7-7
Wind Erosion 3.7-7
Water Erosion 3.7-8
Soil Salinity 3.7-8
Soil Selenium 3.7-8
Geology-Related Issues of Concern and Ongoing Trends 3.7-9

Subsidence and Uplift 3.7-9
Environmental Consequences 3.7-10
No Action Alternative 3.7-10
Preferred Alternative 3.7-12
Alternative 1 ..... 3.7-12
Alternative 2 ..... 3.7-12
Cumulative Impacts 3.7-12
Irreversible and Irretrievable Commitments of Resources 3.7-13
Section 3.8 : Groundwater 3.8-1
Affected Environment 3.8-1
Hydrogeology 3.8-1
Groundwater Storage and Production 3.8-3
Description of the Westside Subbasin 3.8-4
Impacts of Agriculture 3.8-4
Land Subsidence 3.8-7
Groundwater Quality 3.8-8
Total Dissolved Solids 3.8-8
Selenium 3.8-9
Other Contaminants 3.8-9
Environmental Consequences 3.8-10
No Action Alternative 3.8-10
Preferred Alternative 3.8-11
Alternative 1 ..... 3.8-11
Alternative 2 ..... 3.8-12
Cumulative Impacts 3.8-12
Irreversible and Irretrievable Commitments of Resources 3.8-12
Section 3.9 : Surface Water Resources 3.9-1
Affected Environment 3.9-1
Central Valley Project Water Supply 3.9-1
Water Delivery Criteria 3.9-1
Water Delivery Conditions Under CVPIA Implementation 3.9-2
State and Federal Coordination 3.9-4
San Luis Reservoir Operations 3.9-5
San Luis Unit Facilities 3.9-6
Surface Water Resources – Natural Watercourses 3.9-7
CVP Water Service Contracts 3.9-11
Environmental Consequences 3.9-14
No Action Alternative 3.9-14
Related Projects Affecting Operational Decisions and South-of-Delta Water Supply 3.9-17
San Luis Reservoir Low-Point Improvement Project 3.9-19
Joint Point of Diversion 3.9-21
San Joaquin River Agreement/Vernalis Adaptive Management Plan 3.9-22
Tracy Fish Facility Improvement Program 3.9-24
Delta-Mendota Canal/California Aqueduct Intertie 3.9-24

Consolidated Place of Use and Conformed Purposes of CVP Water, Use Petition and EIR 3.9-26
South Delta Improvements Program 3.9-28
Alternative 1 ..... 3.9-30
Alternative 2 ..... 3.9-30
Cumulative Impacts 3.9-31
Irreversible and/or Irretrievable Commitments of Resources 3.9-31
Section 3.10 : Biological Resources 3.10-1
Documents Addressing Potential Impacts to Listed Species Associated with Deliveries to the San Luis Unit 3.10-1
Affected Environment 3.10-4
Land Use and Natural Communities Within Two Miles of the San Luis Unit 3.10-4
Land Use and Natural Communities Within the San Luis Unit 3.10-5
Fisheries 3.10-7
Vegetation and Wildlife 3.10-8
Natural or Semi-Natural Communities 3.10-8
Agricultural Habitat 3.10-11
Deciduous and Evergreen Forest 3.10-12
Areas Not Affected by Use of CVP Water 3.10-13
Areas Affected by Use of CVP Water 3.10-13
Significant Natural Areas 3.10-13
Current General Plan Protective and Management Measures 3.10-17
Fresno County 3.10-17
Merced County 3.10-17
Kings County 3.10-18
Environmental Consequences 3.10-18
Fisheries and Aquatic Ecosystems 3.10-18
Vegetation and Wetlands 3.10-19
Wildlife 3.10-19
Impact Assessment 3.10-19
No Action Alternative 3.10-19
Preferred Alternative 3.10-22
Alternative 1 ..... 3.10-22
Alternative 2 ..... 3.10-22
Cumulative Impacts 3.10-23
Irreversible and Irretrievable Commitments of Resources 3.10-23
Section 3.11 : Cultural Resources 3.11-1
Affected Environment 3.11-1
Information Sources and Background Data for Affected Environment 3.11-1
Natural Environmental Context 3.11-2
Prehistoric Context 3.11-3
Ethnographic Context 3.11-4
Resource Considerations, Native American Sites 3.11-5
Historic Context 3.11-5

Resource Considerations, Historic Resources 3.11-7
Current Inventory of Cultural Resources 3.11-7
Issues Identified 3.11-8
Environmental Consequences 3.11-9
Impact Assessment 3.11-10
No Action Alternative 3.11-11
Preferred Alternative 3.11-12
Alternative 1 ..... 3.11-12
Alternative 2 ..... 3.11-12
Cumulative Impacts 3.11-13
Irreversible and/or Irretrievable Commitment of Resources 3.11-13
Section 3.12 : Recreational Resources 3.12-1
Affected Environment 3.12-1
Reservoirs 3.12-1
San Luis Reservoir 3.12-1
San Luis Reservoir and Los Banos Creek State Recreation Area Joint General Plan and Resource Management Plan 3.12-2
Pacheco State Park 3.12-3
Los Banos Dam and Reservoir 3.12-4
Little Panoche Reservoir 3.12-4
O'Neill Forebay 3.12-4
San Luis Canal 3.12-5
San Joaquin River 3.12-5
Salt Slough 3.12-5
Mud Slough 3.12-5
Wildlife Refuges 3.12-5
Private Hunting Clubs 3.12-6
Clear Creek Management Area 3.12-6
Environmental Consequences 3.12-7
Impact Assessment 3.12-7
No Action Alternative 3.12-7
Preferred Alternative 3.12-8
Alternative 1 ..... 3.12-8
Alternative 2 ..... 3.12-9
Cumulative Impacts 3.12-9
Irreversible and/or Irretrievable Commitments of Resources 3.12-9
Section 3.13 : Visual Resources 3.13-1
Affected Environment 3.13-1
Environmental Consequences 3.13-2
Impact Assessment 3.13-2
No Action Alternative 3.13-2
Preferred Alternative 3.13-3
Alternative 1 ..... 3.13-3
Alternative 2 ..... 3.13-3
Cumulative Impacts 3.13-3

Irreversible and/or Irretrievable Commitment of Resources 3.13-4
Section 3.14 : Public Health 3.14-1
Affected Environment 3.14-1
Mosquitoes 3.14-1
Selenium 3.14-2
Environmental Consequences 3.14-3
No Action Alternative 3.14-3
Mosquitoes 3.14-3
Preferred Alternative 3.14-4
Alternative 1 ..... 3.14-4
Alternative 2 ..... 3.14-4
Cumulative Impacts 3.14-4
Irreversible and/or Irretrievable Commitment of Resources 3.14-5

CHAPTER 4 OTHER CONSIDERATIONS 4-1

Environmental Justice 4-1
Indian Trust Assets 4-2
Growth-Inducing Impacts 4-2

CHAPTER 5 CONSULTATION AND COORDINATION/ PUBLIC INVOLVEMENT 5-1

Public Involvement 5-1
Review and Consideration of Comments on First Public Draft EIS 5-2
Consultation with San Luis Unit Contractors 5-4
Agency Consultation 5-4
National Environmental Policy Act 5-5
California Environmental Quality Act 5-5
Endangered Species Act 5-5
Fish and Wildlife Coordination Act 5-5
National Historic Preservation Act 5-6
Indian Sacred Sites on Federal Land 5-6
State, Area-Wide, and Local Plan and Program Consistency 5-6
Floodplain Management 5-6
Wetlands Protection 5-7
Wild and Scenic Rivers Act 5-7
Farmland Protection Policy Act and Farmland Preservation 5-7
Clean Air Act 5-8
Safe Drinking Water Act 5-8
Clean Water Act 5-9
Distribution List 5-9

LIST OF PREPARERS LOP-1

REFERENCES.....REF-1

INDEX.....INDEX-1

List of Tables

1-1 San Luis Unit Water Service Contracts 1

2-2 Contractors' Water Supply Sources and Quantities for 1989 2-12

2-3 Contractors' Water Supply Sources and Quantities for 2025 2-13

2-4 Environmental Consequences of Long-Term Contract Renewal Alternatives 1 and 2 as Compared to the No Action Alternative..... 2-20

3.1-1 San Luis Unit Contractor Water Transfers: 1993 – 2004[1] 3.1-15

3.2-1 Drainage Program Loan Funding to San Luis Unit Contractors and Drainage Districts 3.2-18

3.2-2 Compliance Timetable for Meeting the 4-Day Average And Monthly Mean Water Quality Objectives for Selenium..... 3.2-21

3.2-3 Grassland Bypass Project October 1, 1996-September 30, 20031 Selenium Load Allocations and Discharge from The San Luis Drain into Mud Slough (North)..... 3.2-21

3.2-4 Grassland Bypass Project, Phase II, October 1, 2001-December 31, 2009 Selenium Load Allocations and Discharge from the San Luis Drain into Mud Slough (North)*..... 3.2-22

3.2-5 Selected Water Quality Objectives and Criteria For the San Joaquin River.. 3.2-26

3.2-6 Constituents for TMDL Implementation and Their Priority in the Affected Area..... 3.2-28

3.3-1 CVP Tiered Water Rates Used in No Action Alternative..... 3.3-4

3.3-2 No Action Alternative Irrigated Acreage by CVPM Subregion and Crop 3.3-6

3.3-3 No Action Alternative Value of Production by CVPM Subregion and Crop .. 3.3-7

3.3-4 CVP Tiered Water Rates Used in Alternative 2..... 3.3-8

3.3-5 CVP Blended Water Rates Used in Alternative 2..... 3.3-9

3.3-6 Change in Irrigated Acreage from No Action Alternative by CVPM Subregion and Crop Resulting from Implementation of Alternative 2..... 3.3-10

3.3-7 Change in Value of Production from No Action Alternative by CVPM Subregion and Crop Resulting from Implementation of Alternative 2 ..... 3.3-11

3.3-8 Change in Net Farm Income from No Action Alternative by CVPM Subregion Resulting from Implementation of Alternative 2 ..... 3.3-12

3.4-1 1998 Total Earnings by Industry by County[1] 3.4-1

3.4-2 1998 Total Employment by Industry by County[1] 3.4-2

3.4-3 Population and Ethnicity-San Luis Unit Study Area[1] 3.4-3

3.4-4 Regional Economic Impacts on All Sectors in the San Joaquin River Region for the Average-Average Hydrologic Sequence Compared to the No Action Alternative Average Water Year Conditions 3.4-7

3.4-5 Regional Economic Impacts on All Sectors in the San Joaquin River Region for the Dry-Average Hydrologic Sequence Compared to the No Action Alternative Average Water Year Conditions 3.4-7

3.5-1 Fresno County Land Uses in 1997 ..... 3.5-3

3.5-2 Land Available in Kings County for Urban Development in 1993 ..... 3.5-4

3.5-3 Important Farmland Map Categories 3.5-9

3.5-4 2002 Farmland Conversion Data 3.5-10

3.6-1 Federal and State Ambient Air Quality Standards 3.6-5

3.6-2 Ambient Air Quality Standards and San Joaquin Valley Air Pollution Control District Attainment Status 3.6-7

3.9-1 Long-Term Averages for the Six OCAP CALSIM II Studies 3.9-15

3.9-2 Modeled/Likely Deliveries to the San Luis Unit Contractors From Six OCAP CALSIM II Studies 3.9-16

3.11-1 Summary of Previous Studies and Cultural Properties 3.11-8

List of Figures

3.1-1 San Luis Unit Action Area 3.1-3

3.2-1 Mean Annual Water Flow in the San Joaquin River 3.2-2

3.2-2 Average and Median Monthly Flows in the San Joaquin River at Crows Landing (Based on 30 Years of Records) 3.2-4

3.2-3 Selenium Concentrations and Daily Flow in the San Joaquin River at Crows Landing (Station N) 3.2-10

3.2-4 Existing Conditions for Selenium (WY 1999) 3.2-12

3.2-5 Existing Conditions for Salinity 3.2-14

3.2-6 Existing Conditions for Boron (WY 1999) 3.2-15

3.2-7 San Luis Unit Drainage Timeline 3.2-38

3.5-1 Westlands Fallow and Idle Acreage Trends 3.5-11

3.8-1 Geohydrologic Section of Western San Joaquin Valley 3.8-7

3.9-1 CVP South of Delta Agricultural Allocation Exceedance Chart 3.9-3

3.9-2 CVP South of Delta M&I Allocation Exceedance Chart 3.9-3

3.9-3 San Luis Unit Surface Water Resources – Natural Water Courses 3.9-9

Appendices

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

B Major San Luis Unit Facilities and Operations

C Water Needs Assessment Summaries for the Seven San Luis Unit Contractors

D Endangered Species Recovery Program Land Use and Habitat Maps

E Common and Scientific Names of Plant and Animal Species Cited in the Environmental Impact Statement

F Distribution List

Abbreviations and Acronyms

1955 Act	Public Law 84-386
1984 Act	Trinity River Basin Fish and Wildlife Management Act (Public Law 98-541)
1995 Bay-Delta Plan	Water Quality Control Plan for the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary
1995 Use Agreement	"Agreement for Use of the San Luis Drain" (Agreement No. 6-07-20-w1319) between Reclamation and the San Luis and Delta-Mendota Water Authority
2000 AHCC Report	*Evaluation of the 1990 Drainage Management Plan for the Westside San Joaquin Valley, California*
2001 Use Agreement	Proposed Use Agreement for the Grassland Bypass Project
AAQS	Ambient air quality standards
AD	anno Domini
April 24, 2000 Technical Memorandum	*Economic Analysis of November 1999 Tiered Pricing Proposal for PEIS Preferred Alternative*
BA	Biological Assessment
Bay-Delta	San Francisco Bay and the Sacramento-San Joaquin River Delta
BP	before present
C	Celsius
CAAQSs	California ambient air quality standards
CALFED	CALFED Bay-Delta Program
CARB	California Air Resources Board
CBDA	California Bay-Delta Authority
CDFG	California Department of Fish and Game
Central Valley Board	Central Valley Regional Water Quality Control Board
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
cfs	cubic feet per second
CNPS	California Native Plant Society
CPOU EIR	Draft Program Environmental Impact Report for the Consolidated and Conformed Place of Use
CO	carbon monoxide
COA	Agreement between the United States of America and the State of California for Coordinated Operation of the Central Valley Project and the State Water Project (PL 99-546, 110 Stat 3050)
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVPM	Central Valley Production Model

D-1485	State Board Decision 1485
D-1641	State Board Decision 1641
Delta	Sacramento-San Joaquin Delta
Drainage Plan of Action	Plan of Action for Drainage to the San Luis Unit, Central Valley Project
DWR	California Department of Water Resources
EA	Environmental Assessment
EBMUD	East Bay Municipal Utilities District
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESU	evolutionarily significant units
EWA	Environmental Water Account
F	Fahrenheit
FERC	Federal Energy Regulatory Commission
FONSI	Finding of No Significant Impact
FRWA	Freeport Regional Water Authority
FRWP	Freeport Regional Water Project
GBP	Grasslands Bypass Project
GDA	Grassland Drainage Area
HORB	Head of Old River barrier
IDP	Interagency Drainage Program
Interior	Department of the Interior
Intertie	Delta-Mendota Canal/California Aqueduct Intertie
JPOD	joint point of diversion
M&I	municipal and industrial
mg/m^3	milligrams per cubic meter
mgd	million gallons per day
MSWD Assignment	CVP Water Supply Partial Contract Assignment from Mercy Springs Water District (Contract No. 14-06-200-3365A) to Pajaro Valley Water Management Agency, Santa Clara Valley Water District, and Westlands Water District
NAAQSs	National ambient air quality standards
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOAA Fisheries	National Oceanic and Atmospheric Administration, Fisheries (formerly, National Marine Fisheries Service)
NO_x	nitrogen oxides

NRHP	National Register of Historic Places
O&M	operation and maintenance
O_3	ozone
OCAP	Operations Criteria and Plan
Ops Group	CALFED Operation Coordination Group
Pb	lead
PCB	polychlorinated biphenyl
PEIS	Programmatic Environmental Impact Statement
PL	public law
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
Reclamation	U.S. Bureau of Reclamation
Reclamation Board	Reclamation Board of the State of California
Regional Board	Regional Water Quality Control Board
San Luis BA	West San Joaquin Division, San Luis Unit Draft Biological Assessment Long-Term Contract Renewal
SCWA	Sacramento County Water Agency
Secretary	Secretary of the Interior
SHPO	State Historic Preservation Office
SJVAB	San Joaquin Valley Air Basin
SJVDIP	San Joaquin Valley Drainage Implementation Program
SJVDP	San Joaquin Valley Drainage Program
SJVUAPCD	San Joaquin Valley Unified Air Pollution Control District
SLWRI	Shasta Lake Water Resources Investigation
SO_2	sulfur dioxide
Special Study	San Luis Unit Special Study
State Board	State Water Resources Control Board
SWP	State Water Project
TRCF	Tracy Fish Collection Facility
TMDL	Total Maximum Daily Load
TRD	Trinity River Division
TRFES	Trinity River Flow Evaluation Study
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VAMP	Vernalis Adaptive Management Program
Water Forum	Sacramento Area Water Forum
WQCP	Water Quality Control Plan for the Delta and Suisun Marsh

$\mu g/m^3$	micrograms per cubic meter

SAN LUIS UNIT

DRAFT ENVIRONMENTAL IMPACT STATEMENT
LONG-TERM CONTRACT RENEWAL

Chapter 1:
Purpose and Need

September 2005

CHAPTER 1

PURPOSE AND NEED

INTRODUCTION

Reclamation proposes to renew long-term water service contracts delivering CVP water for agricultural irrigation and/or for M&I uses to the nine water service contractors within the San Luis Unit. These contractors and the San Luis Unit are located in Fresno, Kings, and Merced Counties (Figure 3.1-1). The San Luis Unit contractors currently receive CVP water under contracts that will expire between 2007 and 2024. Table 1-1 lists the nine San Luis Unit contractors and their respective contract amounts and terms under long-term contract renewal.

Table 1-1
San Luis Unit Water Service Contracts

San Luis Unit Contractors	Maximum Contract Amount (acre-feet/year)	Term
California Department of Fish and Game	10	3/1/06 – 2/28/46
City of Avenal	3,500	3/1/06 – 2/28/46
City of Coalinga	10,000	3/1/06 – 2/28/46
City of Huron	3,000	3/1/06 – 2/28/45
Pacheco Water District	10,080	3/1/06 – 2/28/31
Panoche Water District	94,000	3/1/06 – 2/28/31
San Luis Water District	125,080	3/1/06 – 2/28/31
Westlands Water District	1,186,490	3/1/06 – 2/28/31
Westlands Water District – Distribution District #2	4,198	3/1/06 – 2/28/31

This Environmental Impact Statement (EIS) has been prepared pursuant to and in accordance with the National Environmental Policy Act (NEPA) of 1969 [42 United States Code (USC) Section 4321-4370d] and the Council on Environmental Quality (CEQ) regulations on implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508).

PURPOSE AND NEED FOR THE ACTION

Reclamation is responsible for operational control of the CVP, including operation and maintenance of federal facilities and securing payment for the cost of water delivered pursuant to water service contracts with the Federal government. In addition, as a duly

authorized representative of the Secretary of the Interior, Reclamation administers all actions pertaining to the establishment of water service contracts.

The purpose of the federal action is to renew long-term water service contracts delivering CVP water for agricultural irrigation or for M&I uses to the nine water service contractors within the San Luis Unit, consistent with and as required by Reclamation authority and all applicable state and federal laws, including the Central Valley Project Improvement Act (CVPIA).

The long-term contract renewals are needed to:

- Continue the beneficial use of water in the San Luis Unit
- Incorporate certain administrative conditions into the renewed contracts to ensure continued CVP compliance with current federal Reclamation law and other applicable statutes
- Allow the continued reimbursement to the federal government for costs related to CVP construction and operation, and
- Satisfy the statutory requirements for renewal of the existing San Luis Unit water service contracts.

BASIS OF CVP WATER SERVICE CONTRACT RENEWALS

The Reclamation Act of 1902 authorized funds from the sale of public lands to be set aside in the "reclamation fund," to be used for the construction and maintenance of irrigation works and for the storage, diversion and development of waters for the reclamation of arid and semiarid states. The Act required the Secretary to comply with laws of the State relating to the control, appropriation, use, or distribution of water used in irrigation or vested rights acquired thereunder.

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

Public Law 88-44, the Reclamation Project Act of 1939, provided for repayment of construction charges and authorized sale of CVP water to municipalities and other public corporations and agencies, plant investment, and certain irrigation water deliveries to leased lands. Repayment was authorized to be accomplished either through "repayment contracts" or through water service contracts that provide for the payment of water rates.

The Reclamation Project Act of July 2, 1956 also provided that the Secretary include provision for contract renewal upon request of the other party to any long-term contract entered into pursuant to subsections (d) and (e) of section 9 of the Reclamation Project Act of August 4, 1939. The contract renewal would be subject to renegotiation of: (1) the charges set forth in the contract in the light of circumstances prevailing at the time of renewal; and (2) any other matters with respect to which the right to renegotiate is reserved in the contract. The Act also states that the Secretary shall provide that the other party to the contract shall, during the term of the contract and of any renewal (subject to fulfillment of other obligations), have a first right to a stated share or quantity of the CVP water supply available for beneficial use on irrigable lands.

Sections 9(c) of the Reclamation Project Act of 1939 authorized the Secretary to enter into contracts to furnish water for municipal water supply or miscellaneous purposes, provided that such contracts require repayment to the United States over a period not to exceed 40 years. Section 9(e) of the Reclamation Project Act of 1939 allowed the Secretary to enter into either short- or long-term contracts to furnish water for irrigation purposes, with each such contract to be for a period not to exceed 40 years.

The Reclamation Project Act of July 2, 1956 provided the right of renewal of long-term repayment or water service contracts for irrigation contractors for a term not to exceed 40 years. The Reclamation Project Act of June 21, 1963, Renewal of Water Supply Contracts, extended the right of renewal of long-term repayment or water service contracts to M&I contractors.

On October 30, 1992, the President signed into law the Reclamation Projects Authorization and Adjustment Act of 1992 (Public Law 102-575) that included Title XXXIV, the CVPIA. The CVPIA amended the previous authorizations of the CVP to include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority with irrigation and domestic uses, and fish and wildlife enhancement as a project purpose equal to power generation. Section 3409 of the CVPIA required the Secretary to prepare a Programmatic EIS (PEIS) to evaluate the direct and indirect impacts and benefits of implementing the CVPIA. That PEIS was prepared under NEPA by Reclamation and U.S. Fish and Wildlife Service (Service or USFWS). Reclamation released a Draft PEIS on November 7, 1997. An extended comment period closed on April 17, 1998. Reclamation and the Service released the Final CVPIA PEIS in October 1999 and the joint Record of Decision in January 2001.

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

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

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

Section 3404(c) of the CVPIA provides for long-term renewal of interim and existing long-term CVP water service contracts. The long-term renewal contract language recognizes thatthe deliveries of CVP water supplies are necessary to achieve repayment of the CVP as required by law.

RELATION TO THE CVPIA PEIS

Section 3404 of the CVPIA required the Secretary to prepare a PEIS to evaluate the direct and indirect adverse impacts and benefits of implementing the CVPIA. The PEIS was prepared under NEPA by Reclamation and the Service.

The CVPIA PEIS provides a programmatic evaluation and addresses the potential impacts of alternatives developed to implement the CVPIA. Congress identified the general purposes of the actions to implement the CVPIA in Section 3402 as follows:

> (a) to protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley and Trinity River basins of California
>
> (b) to address impacts of the CVP on fish, wildlife, and associated habitats
>
> (c) to improve the operational flexibility of the CVP
>
> (d) to increase water-related benefits provided by the CVP to the State of California through expanded use of voluntary water transfers and improved water conservation
>
> (e) to contribute to the State of California's interim and long-term efforts to protect the San Francisco Bay/Sacramento-San Joaquin Delta Estuary; and

> (f) to achieve a reasonable balance among competing demands for the use of CVP water, including the requirements of fish and wildlife, agriculture, M&I and power contractors.

The alternatives considered in the PEIS were developed to evaluate a range of actions, or programs, to meet the objectives of CVPIA and implement provisions of CVPIA. The following core programs are included in each of the alternatives:

- Renew all CVP water service, water rights, and exchange contracts
- Implement water measurement
- Implement (b)(1) "other" program
- Upgrade Tracy and Contra Costa pumping plants fish protection facilities
- Construct Shasta Temperature Control Device
- Complete improvements to the Coleman National Fish Hatchery
- Implement Non-Flow Stream Restoration Actions in Central Valley streams
- Complete modifications to Anderson-Cottonwood Irrigation District and Glenn-Colusa Irrigation District diversion facilities for fish protection
- Implement Seasonal Field Flooding
- Increase Instream Fish Flow releases in the Trinity River
- Purchase 30,000 acres of retired land

Actions with multiple implementation methods formed the basis for differentiating the PEIS alternatives. The following actions were considered in multiple implementation methods:

- Implement Fish and Wildlife actions per Sections 3406(b)(2) and (3) of CVPIA
- Provide Level 2 and Level 4 refuge water supplies
- Implement water pricing actions
- Modify Red Bluff Diversion Dam
- Construct Delta Fish Barriers
- Provide for water transfers
- Revegetate retired lands

The Record of Decision (ROD) based on the PEIS documents the decision for implementing provisions of the CVPIA. The decision is a hybrid of alternatives that were analyzed in the PEIS, and reflects an action intended to achieve the purposes of the CVPIA.

The decision for CVPIA implementation embodied in the ROD achieves the greatest level of a reasonable balance among competing demands because it renews CVP contracts while

it provides for increased instream flows and Delta outflows, refuge water supplies, and water transfers, consistent with reasonable assumptions utilized in the CVPIA PEIS analyses.

The ROD nevertheless recognizes that prior to implementation, each program and action will be evaluated to determine if additional NEPA analysis is necessary. Depending on that evaluation, either additional NEPA documentation will be prepared, or a finding will be made that no significant changes in actions or circumstances has occurred or substantial new information has been obtained since the Final PEIS.

Following completion of the CVPIA PEIS, Reclamation has prepared additional environmental documentation for the renewal of long-term water service and repayment contracts, including this EIS, which addresses the potential for specific impacts relating to contract renewals within the San Luis Unit of the West San Joaquin Division. Each NEPA document separately supports the renewal of the contracts covered thereby. Accordingly, each document utilizes analysis or conclusions from related documents (including the PEIS) only to the extent such analysis or conclusions were determined to be of continuing relevance and accuracy.

BASIS OF SAN LUIS UNIT WATER SERVICE CONTRACT RENEWALS

The Central Valley Project Authorization Act of 1937 authorized construction of the initial CVP project features for navigation, flood-control, waste storage, construction of distribution systems, and hydropower generation. The River and Harbors Act of 1940 further authorized construction of CVP facilities and mandated that dams and reservoirs be used first for river regulation, improvement of navigation, and flood control; second for irrigation and domestic users; and third for power. This authorization was amended by the American River Division Authorization Act of 1949, the act of September 26, 1950 (64 Stat. 1036) Trinity River Act of 1955, San Luis Unit Authorization Act of 1960, River and Harbors Act of 1962, Auburn-Folsom South Unit Authorization Act of 1967, and San Felipe Division Authorization Act of 1967. These statutes provide authorization for all of the facilities utilized to deliver CVP water to the San Luis Unit. Detailed review of San Luis Unit contract renewal alternatives begin on page 2-1.

PUBLIC INVOLVEMENT PROCESS

Reclamation started the preparation of this EIS during the scoping phase. Scoping served as a fact-finding process that helped identify public concerns and recommendations about the NEPA process, issues that would be addressed in this EIS, and the scope and level of detail for analyses. Scoping activities began in October 1998 after Reclamation issued a

Notice of Intent to prepare the environmental documents on the long-term renewal of CVP water service contracts.

As a result in part of that process, Reclamation decided to prepare this EIS. The basis for preparing an environmental impact statement, instead of an environmental assessment, was due to concern and controversy over the proposed action raised during the public process. The basis was not a finding by Reclamation that the proposed action has the potential to significantly affect the quality of the human environment.

The negotiation of the contracts that will serve the San Luis Unit contractors was conducted as a public process. Throughout the contract renewal process, meetings were held with the contractors, other agencies, interest groups, and the public. Issues raised during public involvement were addressed in the negotiation process.

A more detailed discussion of the public involvement process is provided in Chapter 5 of this EIS.

LOCALIZED IMPACTS OF CVPIA ROD/PEIS PREFERRED ALTERNATIVE

The primary impact to CVP water service contractors in the San Luis Unit, as described in the PEIS, is not due to contract provisions, but rather to the implementation of the CVPIA. The re-allocation of CVP water to fish and wildlife purposes under the CVPIA reduced average annual CVP water deliveries to water service contractors from 2,270,000 acre-feet/year (af\yr) under the PEIS No Action Alternative to 1,933,000 af\yr under all of the PEIS alternatives, including the Preferred Alternative. The reduction occurred differently for various classifications of users and will vary depending on the annual allocated quantity received by the contractors and the system capacity for the deliveries.

Since the PEIS was completed and the ROD was issued, more recent CALSIM II modeling conducted for the CVP-State Water Project (SWP) Operations Criteria and Plan (OCAP) estimates that:

- Average Annual CVP Water Deliveries for South-of-Delta (and therefore San Luis Unit) agricultural water service contractors are expected to decrease from 80 percent of full deliveries in pre-CVPIA (1991) (USBR 2004b) conditions to approximately 61 percent (USBR 2004j) under long-term CVPIA implementation.

- Average Annual CVP Water Deliveries for South-of-Delta (and therefore San Luis Unit) M&I water service contractors are expected to decrease from 94 percent of full deliveries under pre-CVPIA (1991) (USBR 2004b) conditions to approximately 87 percent (USBR 2004j) under long-term CVPIA implementation.

The CALSIM II modeling conducted for the OCAP analyses ran six studies to project future deliveries based on historic deliveries. Those six studies were developed for the purposes of evaluating impacts to the CVP and SWP system as operating regimes have changed since the 1992 OCAP. The OCAP document (USBR 2004j) includes detailed descriptions of the assumptions, limitations, and modeling characteristics of each of the six study runs. The studies looked at the period from 1922 through 1994, and made specific analyses of the drought years of (water years) 1929 to 1934.

It is important to note that the CALSIM modeling is an estimate of future deliveries based on an analysis of historic deliveries and is not in any way a mandated delivery schedule. The OCAP modeling is an attempt to demonstrate what the *likely* deliveries may be, not what they are designated to be. The analysis in this EIS assumes that likely future deliveries to the San Luis Unit will be similar to those experienced since 1992.

STUDY AREA

This environmental review and analysis is focused on the renewal of the long-term water service contracts allowing for continued CVP water (up to 1,436,358 af/y) for the San Luis Unit contractors.[1]

The study area for this EIS includes the western portions of Fresno, Kings, and Merced Counties. The study area is further defined as including the water delivery service areas of the Cities of Avenal, Coalinga, and Huron and the Pacheco, Panoche, San Luis, and Westlands Water District, as well as water delivered to the CDFG for domestic use at the Mendota Waterfowl Management Area.

The principal federal facilities of the San Luis Unit are:

- The joint-use facilities (Reclamation and the State of California constructed and operated jointly) of O'Neill Dam and Forebay, B.F. Sisk San Luis Dam, San Luis Reservoir, William R. Gianelli Pumping-Generating Plant, Dos Amigos Pumping Plant, Los Banos and Little Panoche Reservoirs, and San Luis Canal from O'Neill Forebay to Kettleman City, together with the necessary switchyard facilities.

- The federal-only portion of the San Luis Unit, including the O'Neill Pumping Plant and Intake Canal, Coalinga Canal, Pleasant Valley Pumping Plant, and the San Luis Drain.

[1] Annual total represents the sum of maximum contract allocations for each of the nine contractors, as included in Table 1-1, within the San Luis Unit.

The facilities of the San Luis Unit and related operations are discussed within Section 3.9 and Appendix B of this EIS.

CONTRACT PERIOD

The term for agricultural (irrigation) water service contracts will be 25 years, the term for mixed agricultural/M&I water service contracts will be 25 years, and the term for M&I-only long-term water service contracts will be 40 years.

The analysis for this EIS was conducted for projected conditions through February 28, 2045, which extends through the first 40-year renewal period for the long-term M&I water service contracts.

SAN LUIS UNIT

DRAFT ENVIRONMENTAL IMPACT STATEMENT
LONG-TERM CONTRACT RENEWAL

Chapter 2:
Description of Alternatives

September 2005

CHAPTER 2

DESCRIPTION OF ALTERNATIVES

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

LONG-TERM WATER SERVICE CONTRACT NEGOTIATION PROCESS

The Central Valley Project Improvement Act (CVPIA) states that the Secretary of the Interior shall, upon request, renew any long-term irrigation repayment or water service contract for the delivery of Central Valley Project (CVP) water for a 25-year period and may renew such contracts for successive periods of up to 25 years each. Consistent with the Reclamation Project Act of 1963 (76 Stat. 1173), municipal and industrial (M&I) contracts shall be renewed for successive periods up to 40 years, each under mutually agreeable terms and conditions. The CVPIA PEIS (Reclamation and USFWS 1999) provided a programmatic environmental analysis and identified the need for site-specific environmental documents for the long-term contract renewal process.

Contracts that expired prior to completion of the CVPIA PEIS were renewed for interim periods. These interim renewal contracts reflect current Reclamation law, including modifications resulting from the Reclamation Reform Act and applicable CVPIA requirements. The initial interim contract renewals were negotiated in 1994 with subsequent renewals for periods of two years or less to provide for continued water service. Many of the provisions from the interim contracts were assumed to be part of the contract renewal provisions in the description of the CVPIA PEIS Preferred Alternative.

In 1998, the long-term water service contract renewal process was initiated. The U.S. Bureau of Reclamation (Reclamation) reviewed the interim contract provisions that were consistent with Reclamation law and other requirements, comments from the Draft CVPIA PEIS (Reclamation 1997d), and comments obtained during the interim contract renewal process. Reclamation proposed that the overall provisions of the long-term contract would be negotiated with representatives of all CVP water service contractors. Following the acceptance of the CVP-wide provisions, Reclamation proposed that division-specific provisions and, finally, contractor-specific provisions would be negotiated. For CVP contractors served through the Tracy Pumping Plant, the first division-specific level was termed “Delta Division,” with further tailoring for different service areas. Finally, the

division-specific and contractor-specific contract provisions were negotiated as part of the renewal of long-term water service contracts for the San Luis Unit. Negotiations between Reclamation and the San Luis Unit contractors have recently been completed and the draft long-term water service contracts are currently available on Reclamation's website (http://www.usbr.gov/mp/cvpia/3404c/index.html). For eight of the nine San Luis contracts, the 60-day public comment period has been completed. Table 2-1 provides a summary and comparison of the contract provisions for the San Luis Unit contractors that is current as of August 2005. Table 2-1 also indicates whether the provisions, and therefore comparisons of the provisions across all alternatives, are administrative or could be interpreted as "environmental" in nature. Those provisions identified as "Administrative" are not addressed further in this EIS because their implementation would not reasonably be expected to affect the quality of the environment. Provisions identified as "Environmental" could be interpreted as potentially affecting the environment, and are accompanied by a reference to the EIS Chapter and section where they are addressed.

TERMS OF EXPIRING CONTRACTS

All of the San Luis Unit contractors have water service contracts, and some also have repayment contracts with Reclamation. The long-term contracts were entered into between the mid-1950s and late 1970s. Temporary project service had often been provided before the first long-term water service contracts were signed. The long-term water service contract for Westlands Water District expires on December 31, 2007. The contract for Pacheco Water District expires on the last day of February 2024; it is receiving service under an interim contract. All of the other San Luis Unit contracts expire on December 31, 2008.

ISSUES CONSIDERED AS PART OF LONG-TERM CONTRACT RENEWALS

The long-term contract renewal process addresses several other issues in addition to the contract provisions as described in this section.

WATER NEEDS ASSESSMENTS

The water rights granted to the CVP by the State Water Resources Control Board (State Board), and long-term contract renewals, require the federal government to determine whether CVP water is being applied to beneficial use. To these ends, a multiple-step needs assessment methodology was developed for long-term contract renewal analysis to assess whether the contractors' use of the Contract Total supplied under the contract is reasonable and beneficial.. First, existing water demand for the contractor was calculated based on historic water uses.

Table 2-1
Comparison of Contract Provisions Considered in Alternatives

Provision	No Action Alternative Based on PEIS and Interim Contracts	Alternative 1 Based on April 2000 Proposal	Alternative 2 Based on November 1999 Proposal	Preferred Alternative	Administrative or Environmental Provision
Explanatory Recitals	Assumes water rights held by CVP from the State Board for use by water service contractors under CVP policies	Assumes CVP Water Right as being held in trust for project beneficiaries that may become the owners of the perpetual right	Same as No Action Alternative	Same as No Action Alternative	Administrative
	Assumes that CVP is a significant part of the urban and agricultural water supply of users	Assumes CVP as a significant, essential, and irreplaceable part of the urban and agricultural water supply of users	Same as No Action Alternative	Assumes CVP has been relied upon and considered essential by contractors	Administrative
	Assumes increased use of water rights, need to meet water quality standards and fish protection measures, and other measures constrained use of CVP	Assumes that CVPIA impaired ability of CVP to deliver water	Same as No Action Alternative	No recital concerning this issue	Administrative
	Assumes the need for the 3408(j) study	Assumes implementation of yield increase projects per 3408(j) study	Same as No Action Alternative	Assumes Secretary, through coordination, cooperation, and partnership, will pursue measures to improve water supply	Administrative
	Assumes that loss of water supply reliability would have impact on socioeconomic conditions and change land use	Assumes that loss of water supply reliability would have significant adverse socioeconomic and environmental impacts in CVP service area	Same as No Action Alternative	Same as No Action Alternative	Environmental (see Socioeconomics section of Chapter 3)
Definitions					
Base Supply	Not previously defined	Not previously defined	Not previously defined	No longer provides for Base supply. Quantity and reliability is determined by then existing rules and regulations	Administrative
Charges	Charges defined as payments required in addition to Rates	Assumes rewording of definition of Charges to exclude both Rates and Tiered Pricing Increments	Same as No Action Alternative	Same as Alternative 1	Administrative
Category 1 and Category 2	Tiered Pricing as in PEIS	Not included	Tiered Pricing for Categories 1 and 2	Same as article on Tiered Pricing. Assumes 80% and 90% tiers.	Administrative
Contract Total	Contract Total described as Total Contract	Same as No Action Alternative	Described as basis for Category 1 to calculate Tiered Pricing	Assumes maximum entitlement	Administrative
Landholder	Landholder described in existing	Assumes rewording to specifically	Assumes rewording to specifically	Same as No Action Alternative	Administrative

Table 2-1
Comparison of Contract Provisions Considered in Alternatives

Provision	No Action Alternative Based on PEIS and Interim Contracts	Alternative 1 Based on April 2000 Proposal	Alternative 2 Based on November 1999 Proposal	Preferred Alternative	Administrative or Environmental Provision
	Reclamation Law	define Landholder with respect to ownership, leases, and operations	define Landholder with respect to ownership and leases		
Supplemental Supply	Not previously defined	Not included	Not previously defined	Quantity and reliability is determined by then existing rules and regulations	Administrative
M&I water	Assumes rewording to provide water for irrigation of land in units less than or equal to five acres as M&I water unless Contracting Officer is satisfied use is irrigation	M&I water described for irrigation of land in units less than or equal to 2 acres	Same as No Action Alternative	Provides for less than 5 acres	Administrative
Terms of contract—right to use contract	Assumes that contracts may be renewed	States that contract shall be renewed	Same as No Action Alternative	Assumes contracts will be renewed, subject to conditions for agriculture and unconditioned for M&I	Administrative (CVPIA requires renewal)
	Assumes convertibility of contract to a 9(d) contract same as existing contracts	Includes conditions that are related to negotiations of the terms and costs associated with conversion to a 9(d) contract	Same as No Action Alternative	Sets December 31, 2030, as date on which determination on conversion may be made upon mutually agreeable terms	Administrative
Water to be made available and delivered to the contractor	Assumes water availability in accordance with existing conditions	Similar to No Action Alternative	Actual water availability in a year is unaffected by Categories 1 and 2	Assumes water availability subject to operational constraints including CVP legal obligations up to full Contract Total in estimated delivery range set out in CVP OCAP.	Environmental (see Surface Water Resources section of Chapter 3 regarding CVP operational decisions affecting south-of-Delta deliveries)
	Assumes compliance with Biological Opinions and other environmental documents for contracting	Not included	Same as No Action Alternative	Similar to No Action Alternative. Requires contractor to be within legal authority to implement	Environmental (See Agency Consultation section of Chapter 5)
	Assumes that current operating policies strive to minimize impacts to CVP water users	Assumes that CVP operations will be conducted in a manner to minimize shortages and studies to increase yield shall be completed with necessary authorizations	Same as No Action Alternative	Same as No Action Alternative	Environmental (see Surface Water Resources section of Chapter 3 regarding CVP operational decisions affecting south-of-Delta deliveries)
Time for delivery of water	Assumes methods for determining timing of deliveries as in existing contracts	Assumes minor changes related to timing of submittal of schedule	Same as No Action Alternative	Same as No Action Alternative	Administrative
Point of diversion and responsibility for	Assumes methods for determining point of diversion as in existing	Assumes minor changes related to	Same as No Action Alternative	Same as No Action Alternative	Administrative

Table 2-1
Comparison of Contract Provisions Considered in Alternatives

Provision	No Action Alternative Based on PEIS and Interim Contracts	Alternative 1 Based on April 2000 Proposal	Alternative 2 Based on November 1999 Proposal	Preferred Alternative	Administrative or Environmental Provision
distribution of water	contracts	reporting			
Measurement of water within district	Assumes measurement for each turnout or connection for federal facilities that are used to deliver CVP water as well as other water supplies	Assumes measurement at delivery points	Assumes similar actions in No Action Alternative but applies to all water supplies	Same as Alternative 2	Administrative
Rates and method of payment for water	Assumes Tiered Pricing is total water quantity; assumes advanced payment for rates for two months	Assumes Tiered Pricing is total water quantity; and is generated at 80% and 90% of total contract supply. Assumes advanced payment for rates for one month	Assumes Tiered Pricing is total water quantity; assumes advanced payment for rates for six months	Same as No Action Alternative CVP-wide.	Administrative
Non-interest-bearing operation and maintenance deficits	Assumes language from existing contracts	Same as No Action Alternative	Same as No Action Alternative	Same as No Action Alternative	Administrative
Sales, transfers, or exchanges of water	Assumes continuation of transfers with the rate for transferred water being the higher of the seller's or purchaser's CVP cost-of-service rate	Assumes continuation of transfers with the rate for transferred water being the purchaser's CVP cost-of-service rate	Same as No Action Alternative	Assumes continuation of transfers with rate for transferred water being transferor's rate, cost of service rate, and in compliance with water transfer policy	Environmental (see Water Transfers discussion below in Chapter 2 – Transfers are subject to separate NEPA processes)
Application of payments and adjustments	Assumes payments will be applied as in existing contracts	Assumes minor changes associated with methods described for overpayment	Same as No Action Alternative	Similar to Alternative 1, but requires $1,000 or greater overpayment for refund	Administrative
Temporary reduction—return flows	Assumes that current operating policies strive to minimize impacts to CVP water users while meeting all CVP obligation	Assumes minor changes associated with methods described for discontinuance or reduction of payment obligations	Same as No Action Alternative	Same as No Action Alternative	Administrative
Constraints on availability of project water	Assumes that current operating policies strive to minimize impacts to CVP water users while meeting all CVP obligation	Assumes Contractors do not consent to future Congressional enactments which may impact water supply reliability	Same as No Action Alternative	Same as No Action Alternative	Environmental (see Surface Water Resources section of Chapter 3 regarding CVP operational decisions affecting south-of-Delta deliveries)
Unavoidable groundwater percolation	Assumes that some of applied CVP water will percolate to groundwater	Same as No Action Alternative	Same as No Action Alternative	Same as No Action Alternative	Environmental (see Groundwater section of Chapter 3)
Rules and regulations	Assumes that CVP will operate in accordance with then-existing rules	Assumes minor changes with right to not concur with future	Same as No Action Alternative	Same as No Action Alternative	Administrative

Table 2-1
Comparison of Contract Provisions Considered in Alternatives

Provision	No Action Alternative Based on PEIS and Interim Contracts	Alternative 1 Based on April 2000 Proposal	Alternative 2 Based on November 1999 Proposal	Preferred Alternative	Administrative or Environmental Provision
		enactments retained by Contractors			
Water and air pollution control	Assumes that CVP will operate in accordance with then-existing rules	Same as No Action Alternative	Same as No Action Alternative	Same as No Action Alternative	Environmental (see applicable laws, orders, & regulations in Air Quality and Drainage and Water Quality sections of Chapter 3)
Quality of water	Assumes that CVP will operate in accordance with existing rules.	Same as No Action Alternative	Same as No Action Alternative	Same as No Action Alternative	Environmental
Water acquired by the contractor other than from the United States	Assumes that CVP will operate in accordance with existing rules	Assumes changes associated with payment following repayment of funds	Same as No Action Alternative	Same as No Action Alternative	Administrative
Opinions and determinations	PEIS recognizes that CVP will operate in accordance with existing rules	Assumes minor changes with respect to references to the right to seek relief	Same as No Action Alternative	Similar to Alternative 1	Administrative
Coordination and cooperation	Not included	Assumes that coordination and cooperation between CVP operations and users should be implemented and CVP users should participate in CVP operational decisions	Not included	Similar to Alternative 1, except parties retain exclusive decision-making authority	Environmental (see Surface Water Resources section of Chapter 3 regarding CVP operational decisions affecting south-of-Delta deliveries)
Charges for delinquent payments	Assumes that CVP will operate in accordance with existing rules	Same as No Action Alternative	Same as No Action Alternative	Same as No Action Alternative	Administrative
Equal opportunity	Assumes that CVP will operate in accordance with existing rules	Same as No Action Alternative	Same as No Action Alternative	Same as No Action Alternative	Administrative
General obligation	Assumes that CVP will operate in accordance with existing rules	Similar to No Action Alternative	Same as No Action Alternative	Similar to Alternative 1; assumes no requirement for contractor to levy in advance	Administrative
Compliance with civil rights laws and regulations	Assumes that CVP will operate in accordance with existing rules	Same as No Action Alternative	Same as No Action Alternative	Same as No Action Alternative	Administrative
Privacy act compliance	Assumes that CVP will operate in accordance with existing rules	Same as No Action Alternative	Same as No Action Alternative	Same as No Action Alternative	Administrative
Contractor to pay certain miscellaneous costs	Assumes that CVP will operate in accordance with existing rules	Similar to No Action Alternative	Same as No Action Alternative	Same as No Action Alternative	Administrative

Table 2-1
Comparison of Contract Provisions Considered in Alternatives

Provision	No Action Alternative Based on PEIS and Interim Contracts	Alternative 1 Based on April 2000 Proposal	Alternative 2 Based on November 1999 Proposal	Preferred Alternative	Administrative or Environmental Provision
Water conservation	Assumes compliance with conservation programs established by Reclamation and the State of California	Assumes conditions similar to No Action Alternative with the ability to use State of California standards, which may or may not be identical to Reclamation's requirements	Same as No Action Alternative	Same as No Action Alternative	Environmental (see Contractor Service Area Descriptions section of Chapter 3)
Existing or acquired water or water rights	Assumes that CVP will operate in accordance with existing rules	Same as No Action Alternative	Same as No Action Alternative	Same as No Action Alternative	Administrative
Operation and maintenance by non-federal entity	Assumes that CVP will operate in accordance with existing rules and no additional changes to operation responsibilities under this alternative	Assumes minor changes to language that would allow subsequent modification of operational responsibilities	Assumes minor changes to language that would allow subsequent modification of operational responsibilities	Same as Alternative 2	Administrative
Contingent on appropriation or allotment of funds	Assumes that CVP will operate in accordance with existing rules	Assumes minor changes to language	Same as No Action Alternative	Same as No Action Alternative	Administrative
Books, records, and reports	Assumes that CVP will operate in accordance with existing rules	Assumes changes for record keeping for both CVP operations and CVP users	Same as No Action Alternative	Similar to Alternative 1	Administrative
Assignment limited	Assumes that CVP will operate in accordance with existing rules	Assumes changes to facilitate assignments	Same as No Action Alternative	Similar to Alternative 1	Administrative
Severability	Assumes that CVP will operate in accordance with existing rules	Same as No Action Alternative	Same as No Action Alternative	Same as No Action Alternative	Administrative
Resolution of disputes	Not included	Assumes a Dispute Resolution Process	Not included	Similar to Alternative 1	Administrative
Officials not to benefit	Assumes that CVP will operate in accordance with existing rules	Same as No Action Alternative	Same as No Action Alternative	Same as No Action Alternative	Administrative
Changes in contractor's service area	Assumes no change in CVP water service areas absent Contracting Officer consent	Assumes changes to limit rationale used for non-consent and sets time limit for assumed consent.	Same as No Action Alternative	Similar to Alternative 1; however, no time limit for assumed consent	Administrative (Future service area changes are subject to separate NEPA process; this EIS analyzes existing service areas only)
Notices	Assumes that CVP will operate in accordance with existing rules	Same as No Action Alternative	Same as No Action Alternative	Same as No Action Alternative	Administrative

Table 2-1
Comparison of Contract Provisions Considered in Alternatives

Provision	No Action Alternative Based on PEIS and Interim Contracts	Alternative 1 Based on April 2000 Proposal	Alternative 2 Based on November 1999 Proposal	Preferred Alternative	Administrative or Environmental Provision
Confirmation of contract	Assumes Court confirmation of contract	Not included; assumption is Court confirmation not required	Same as No Action Alternative	Similar to Alternative 2; however, provision that contract is not binding until court confirms is deleted. M&I Contractors not required to provide validation	Administrative

Crop acreage, cropping patterns, crop water needs, effective precipitation, and conveyance loss information provided by contractors was reviewed for agricultural water use. Residential, commercial, industrial, institutional, recreational, and environmental uses, along with landscape coefficients, system losses, and landscape acreage information provided by the contractors, were reviewed for M&I water use. Second, future changes in water demands based upon crops, M&I expansion, and anticipated changes in efficiencies were reviewed. Third, current and future water supplies, including groundwater and other surface water supplies, were identified for contractors. The initial calculation of CVP water needs was limited by the assumption that other (non-federal) water supplies would be used first, and groundwater pumping would not exceed the safe yield of the aquifer. Reclamation did not include any deep percolation from fields as recharge. In addition, the actual water needs were calculated at each division or unit level to allow for annual intraregional transfers. The beneficial and efficient future water demands identified for eight of the nine contractors were compared to available non-CVP water supplies to determine the need for CVP water. If the negative amount (unmet demand) is within 10 percent of their total supply for contracts greater than 15,000 acre-feet per year or within 25 percent for contracts less than or equal to 15,000 acre-feet per year, the test of full future need of water supplies is deemed to have been met. Because the CVP supply was initially established as a supplemental water supply for areas with inadequate supplies, the needs for most contractors were at least equal to the CVP water service contracts and frequently exceeded the previous contract amount. Increased total contract amounts were not included in the needs assessment because existing demands on the CVP exceed current project capacity for south of Delta deliveries.

Water needs assessments were completed for those contractors who had more than 2,000 acres of irrigable land and whose contract total was greater than 2,000 acre-feet. All of the contractors in the San Luis Unit, with the exception of the California Department of Fish and Game (CDFG), met these criteria; therefore, water needs assessments were completed for eight of the nine San Luis Unit contractors (Reclamation 2004a)[1]. Tables 2-2 and 2-3 show the total amounts of CVP water delivered to each contractor, along with demand, based on the completed water needs assessments. Included in these tables are the contractor's total water supplies (including any transfers or exchanges into or out of the contractor's service areas), the total water demands, and the amount of the surplus or unmet demand. The water supply, demand, and delivery information in Tables 2-2 and Table 2-3 is based on a normal hydrologic year (Reclamation 2004a).

[1] The water needs assessment for Westlands Water District – Distribution District No. 2 is included in the needs assessment prepared for the Westlands Water District.

The likelihood of the contractors actually receiving their full contract amount in any given year is uncertain. The analysis for the water needs assessment did not consider that the CVP's ability to deliver CVP water has been constrained in recent years and may be constrained in future years due to many factors including hydrologic conditions and the implementation of federal and state laws.

CHANGES IN WATER SERVICE AREAS

The current long-term water service contract renewals require the Contracting Officer's consent to boundary changes. Contract renewal would, therefore, not alter the likelihood of these changes. This EIS does not consider future changes in water service area boundaries for the use of CVP water because it is uncertain at this time where or if such changes would occur and because future changes would be considered discretionary actions not associated with the proposed federal action of long-term contract renewal. Any future requests for such changes would be evaluated in separate technical and environmental analyses. Thus, the potential for environmental effects from such future boundary changes would depend entirely on whether the boundary changes result in any changes from the existing environmental baseline, which can appropriately be evaluated only in the environmental review for those boundary changes.

WATER TRANSFERS

Water transfers are not included in the federal action. The long-term water service contract renewal would continue to permit transfers only with the Contracting Officer's consent. Reclamation would continue with separate environmental documentation for proposed transfers, establishing criteria and protocols to allow rapid technical and environmental review of future proposed transfers (for example, by providing programmatic environmental review and shortened authorization for one-year irrigation-to-irrigation transfers between contractors to adjust supplies when no additional land will be irrigated). Table 2-2 shows the water transfers and exchanges both into and out of the San Luis Unit contractors' service areas for the year 1989. While it is difficult to identify all the water transfer programs that would occur over the next 25 years, Table 2-3 shows the estimated water transfers and exchanges for the San Luis Unit contractors for the year 2025.

Because any future transfers of CVP water to or from the San Luis Unit contractors in response to changed short-term or long-term demands could not occur without the existence of the contract, any such transfers may be considered an indirect result of the CVP contract. However, whether such transfers will result in environmental effects would depend entirely on whether the transfers result in any changes from the existing

environmental baseline, which can appropriately be evaluated only in the project specific environmental review for those transfers.

TERMS & CONDITIONS OF LONG-TERM WATER SERVICE CONTRACTS

Under the Preferred Alternative, contractor-specific provisions were negotiated between Reclamation and each of the nine contractors with long-term water service contracts. In general, the terms and conditions of each contract are very similar. However, there are several terms and conditions that differ slightly between each contract. These differing terms are predominantly administrative in nature and do not alter the intent, obligations or operation of the contract. The following sections identify, by contractor, the specific terms and conditions that create unique responsibilities for the contractor or Reclamation.

CALIFORNIA DEPARTMENT OF FISH AND GAME (MENDOTA WILDLIFE MANAGEMENT AREA)

Terms and conditions unique to the CDFG's long-term water service contract are purely administrative in nature and do not create additional and/or differing obligations or responsibilities for the contractor or Reclamation, and will not impose environmental impacts relative to the No Action Alternative or existing conditions. No additional discussion will be included in this document specific to the details of these purely administrative provisions.

CITY OF AVENAL

Terms and conditions unique to the City of Avenal's long-term water service contract are purely administrative in nature and do not create additional and/or differing obligations or responsibilities for the contractor or Reclamation, and will not impose environmental impacts relative to the No Action Alternative or existing conditions. No additional discussion will be included in this document specific to the details of these purely administrative provisions.

CITY OF COALINGA

Terms and conditions unique to the City of Coalinga's long-term water service contract are purely administrative in nature and do not create additional and/or differing obligations or responsibilities for the contractor or Reclamation, and will not impose environmental impacts relative to the No Action Alternative or existing conditions. No additional discussion will be included in this document specific to the details of these purely administrative provisions.

Table 2-2
Contractors' Water Supply Sources and Quantities for 1989
(in acre-feet and based on a normal hydrologic year)

Contractor	Reclamation Deliveries	Surface Water Supply	Groundwater[1]	Transfers/ Exchanges In	Transfers/ Exchanges Out	Total Supply	Agri-cultural Demand	M&I Demand	Total Demand[2]	Unmet Demand[3]
City of Avenal (for year 1997)	2,432	0	0	0	0	2,432	0	2,433	2,433	1
City of Coalinga (for year 1998)	3,995	0	0	0	0	3,995	0	3,995	3,995	0
City of Huron (for year 1996)	982	0	0	0	0	982	0	982	982	0
Pacheco Water District (for year 1989)	9,362	4,400[4]	0	0	0	13,762	11,846	0	11,846	-1,916
Panoche Water District (for year 1998)	91,887	0	0	1,792	42	93,637	106,772	0	106,772	13,135
San Luis Water District for year 1989)	70,409	0	10,000	4,458	2,894	81,973	97,305	0	97,305	15,332
Westlands Water District (for year 1989)	1,130,463	0	175,000	32,865	5,420	1,332,908	1,447,252	0	1,447,252	114,344

Note: No water needs assessment was completed for CDFG. CDFG receives 10 acre-feet of CVP supply for M&I use.
Source: Reclamation Water Needs Assessment (Reclamation 2004a).
[1]The amount of groundwater recharge is subtracted from the groundwater pumped. Negative numbers represent scenarios where recharge is greater than the amount pumped; groundwater wells are owned and operated by private parties, not CVP contractors, except for some of the wells within the Westlands Water District.
[2] Agricultural demand plus M&I demand.
[3] Total demand less total supply.
[4] Local source is Central California Irrigation District.
[5] Westlands Water District Distribution District No. 2 did not exist in 1989; however, the land has received an allocation from Westlands Water District and was included in their needs assessment.

Table 2-3
Contractors' Water Supply Sources and Quantities for 2025
(in acre-feet and based on a normal hydrologic year)

Contractor	Total Delivery[1]	Surface Water Supply	Groundwater[2]	Transfers/ Exchanges In	Transfers/ Exchanges Out	Total Supply	Agri-cultural Demand	M&I Demand	Total Demand[3]	Unmet Demand[4]
City of Avenal	3,500	0	0	0	0	3,500	0	3,891	3,891	391
City of Coalinga	10,000	0	0	0	0	10,000	0	9,018	9,018	-982
City of Huron	3,000	0	0	0	0	3,000	0	2,266	2,266	-734
Pacheco Water District	10,080	4,399[5]	1,170	0	2,849	11,630	11,630	0	11,630	0
Panoche Water District	94,000	0	0	0	48	93,952	92,816	0	92,816	-1,136
San Luis Water District	125,080	0	5,000[6]	0	4,894	125,180	119,356	20,300[7]	119,356	-5,830
Westlands Water District Distribution District No. 2	4,198									
Westlands Water District	1,150,000	0	175,000	0	4,938	1,320,062	1,394,349	0	1,394,349	74,287

Note: No water needs assessment was completed for CDFG. CDFG receives 10 acre-feet of CVP supply for M&I use.
Source: Reclamation Needs Assessment (Reclamation 2004a).
[1]Also represents the maximum CVP contract amount.
[2]The amount of groundwater recharge is subtracted from the groundwater pumped. Negative numbers represent scenarios where recharge is greater than the amount pumped.
[3]Agricultural demand plus M&I demand.
[4]Total demand less total supply.
[5]Local source is Central California Irrigation District.
[6]Groundwater use would be by private water users within the San Luis Water District, but not the San Luis Water District itself.
[7]Agriculltural water for future growth within the district may be used for M&I demand at agricultural water reliability.

CITY OF HURON

Terms and conditions unique to the City of Huron's long-term water service contract are purely administrative in nature and do not create additional and/or differing obligations or responsibilities for the contractor or Reclamation, and will not impose environmental impacts relative to the No Action Alternative or existing conditions. No additional discussion will be included in this document specific to the details of these purely administrative provisions.

PACHECO WATER DISTRICT

As part of its long-term water service contract with Reclamation, the Pacheco Water District has included a provision through which Reclamation is obligated to, at an unspecified point in the future, "provide drainage service to the contractor at rates established pursuant to the then-existing ratesetting policy for Irrigation Water". The Pacheco Water District and Reclamation understand that adequate drainage service is critical to agricultural production and that the Pacheco Water District is also investing in drainage solutions related hereto.

The timeline associated with the provision of drainage service by Reclamation is indeterminate. When compared to the No Action Alternative, drainage service is not likely to result in adverse environmental impacts, but would instead be directed towards improving water quality within the San Luis Unit. Other proposed actions relating to the development and implementation of drainage service, such as the San Luis Drainage Feature Reevaluation, and other drainage programs requiring NEPA compliance would be subject to separate public comment and then-current regulatory processes to ensure adequate consideration of all potential environmental impacts.

Other terms and conditions unique to the Pacheco Water District's long-term water service contract are purely administrative in nature and do not create additional and/or differing obligations or responsibilities for the contractor or Reclamation, and will not impose environmental impacts relative to the No Action Alternative or existing conditions. No additional discussion will be included in this document specific to the details of these purely administrative provisions.

PANOCHE WATER DISTRICT

As part of its long-term water service contract with Reclamation, the Panoche Water District has included a provision through which Reclamation is obligated to, at an unspecified point in the future, "provide drainage service to the contractor at rates established pursuant to the then-existing ratesetting policy for Irrigation Water". The Panoche Water District and Reclamation understand that adequate drainage service is

critical to agricultural production and that the Panoche Water District is also investing in drainage solutions related hereto.

The timeline associated with the provision of drainage service by Reclamation is indeterminate. When compared to the No Action Alternative, drainage service is not likely to result in adverse environmental impacts, but would instead be directed towards improving water quality within the San Luis Unit. Other proposed actions relating to the development and implementation of drainage service, such as the San Luis Drainage Feature Reevaluation, and other drainage programs requiring NEPA compliance would be subject to separate public comment and then-current regulatory processes to ensure adequate consideration of all potential environmental impacts.

Other terms and conditions unique to the Panoche Water District's long-term water service contract are purely administrative in nature and do not create additional and/or differing obligations or responsibilities for the contractor or Reclamation, and will not impose environmental impacts relative to the No Action Alternative or existing conditions. No additional discussion will be included in this document specific to the details of these purely administrative provisions.

SAN LUIS WATER DISTRICT

As part of its long-term water service contract with Reclamation, the San Luis Water Water District has included a provision through which Reclamation is obligated to, at an unspecified point in the future, "provide drainage service to the contractor at rates established pursuant to the then-existing ratesetting policy for Irrigation Water". The San Luis Water District and Reclamation understand that adequate drainage service is critical to agricultural production and that the San Luis Water District is also investing in drainage solutions related hereto.

The timeline associated with the provision of drainage service by Reclamation is indeterminate. When compared to the No Action Alternative, drainage service is not likely to result in adverse environmental impacts, but would instead be directed towards improving water quality within the San Luis Unit. Other proposed actions relating to the development and implementation of drainage service, such as the San Luis Drainage Feature Reevaluation, and other drainage programs requiring NEPA compliance would be subject to separate public comment and then-current regulatory processes to ensure adequate consideration of all potential environmental impacts.

Other terms and conditions unique to the San Luis Water District's long-term water service contract are purely administrative in nature and do not create additional and/or differing obligations or responsibilities for the contractor or Reclamation, and will not impose

environmental impacts relative to the No Action Alternative or existing conditions. No additional discussion will be included in this document specific to the details of these purely administrative provisions.

WESTLANDS WATER DISTRICT

As part of its long-term water service contract with Reclamation, the Westlands Water Water District has included a provision through which Reclamation is obligated to, at an unspecified point in the future, "provide drainage service to the contractor at rates established pursuant to the then-existing ratesetting policy for Irrigation Water ". The Westlands Water District and Reclamation understand that adequate drainage service is critical to agricultural production and that the Westlands Water District is also investing in drainage solutions related hereto.

The timeline associated with the provision of drainage service by Reclamation is indeterminate. When compared to the No Action Alternative, drainage service is not likely to result in adverse environmental impacts, but would instead be directed towards improving water quality within the San Luis Unit. Other proposed actions relating to the development and implementation of drainage service, such as the San Luis Drainage Feature Reevaluation, and other drainage programs requiring NEPA compliance would be subject to separate public comment and then-current regulatory processes to ensure adequate consideration of all potential environmental impacts.

Other terms and conditions unique to the Westlands Water District's long-term water service contract are purely administrative in nature and do not create additional and/or differing obligations or responsibilities for the contractor or Reclamation, and will not impose environmental impacts relative to the No Action Alternative or existing conditions. No additional discussion will be included in this document specific to the details of these purely administrative provisions.

WESTLANDS WATER DISTRICT – DISTRIBUTION DISTRICT #2

Terms and conditions unique to the Westlands Water District's long-term water service contract are purely administrative in nature and do not create additional and/or differing obligations or responsibilities for the contractor or Reclamation, and will not impose environmental impacts relative to the No Action Alternative or existing conditions. No additional discussion will be included in this document specific to the details of these purely administrative provisions.

DEVELOPMENT OF ALTERNATIVES

REASONABLE RANGE OF ALTERNATIVES

This EIS evaluates the renewal of long-term water service contracts for the San Luis Unit. Three alternatives and the Preferred Alternative were identified for the renewal of long-term water service contracts between Reclamation and the contractors in the San Luis Unit. The alternatives present a reasonable range of water service agreement provisions that could legally be implemented for long-term water service contract renewals. Due to the requirements of the 1956 and 1963 Acts and CVPIA, Reclamation must renew the water service contracts. The Reclamation Project Act of 1956 and Reclamation Project Act of 1963 mandate renewal for existing contract amounts when those amounts are beneficially used. The No Action Alternative is the renewal of existing contracts as required by non-discretionary CVPIA provisions addressed in the CVPIA PEIS. The No Action Alternative, therefore, consists of renewing current water service contracts as described by the Preferred Alternative of the CVPIA PEIS (Reclamation and USFWS 1999).

Because of these legal and regulatory requirements, the "action" alternatives must be developed through a negotiation process to be acceptable to the contractors and Reclamation. Because of these legal and regulatory constraints, the alternatives analyzed in this EIS provide a reasonable range of alternatives for evaluating long-term contract renewals that are potentially acceptable to both parties.

In November 1999, Reclamation published a proposed long-term water service contract (Reclamation 1999). In April 2000, the CVP Contractors presented an alternative long-term water service contract (Reclamation 2000a). The November 1999 proposal serves as the basis for one "bookend" alternative for negotiations and the April 2000 proposal serves as the basis for the other "bookend" alternative. The Preferred Alternative represents the results of the 2004 and 2005 negotiations and also the proposed contract that fits between these two "bookend" alternatives for each of the nine San Luis Unit contractors. This EIS considers these proposals, the preferred alternatives (by contractor) with the No Action Alternative as alternatives to be considered for the environmental documentation that evaluates the impacts and benefits of renewing long-term water service contracts. Reclamation and some CVP contractors have continued to negotiate CVP-wide terms and conditions with these proposals serving as the basis for an analysis of such "bookends." The primary differences between the proposals and the final negotiated contract were previously summarized in Table 2-1. Table 2-4 compares the environmental consequences of long-term contract renewals under Alternative 1, Alternative 2, and the Preferred Alternative to those of the No Action Alternative.

NO ACTION ALTERNATIVE

NO ACTION ALTERNATIVE CONTRACT PROVISIONS

The No Action Alternative assumes that the long-term CVP water service contracts would be renewed for a 25-year or 40-year period in accordance with implementation of the CVPIA as described in the PEIS Preferred Alternative (Reclamation and USFWS 1999) and other legal requirements as discussed in Chapter 1. The CVPIA PEIS Preferred Alternative assumed that most contract provisions would be similar to many of the provisions in the 1997 CVP Interim Renewal Contracts, which included contract terms and conditions consistent with applicable CVPIA requirements. It is important to reiterate that the No Action Alternative effectively renews the nine San Luis Unit contracts on essentially the same terms and conditions as the existing contracts. Practically, this means that water will continue to be delivered to the contractors, and delivered water beneficially used, even under No Action conditions. No Action is not non-renewal of the contracts, which in and of itself would violate the CVPIA[2]. The explanatory recitals of the No Action Alternative recognizes existing water rights held by the CVP from the State Board for use by water service contractors under CVP policies, and assumes that the CVP is a significant part of the urban and agricultural water supply of its users.

In addition, the No Action Alternative assumed tiered pricing provisions and environmental commitments as described in the CVPIA PEIS Preferred Alternative. The contract provisions of the No Action Alternative are summarized in Table 2-1. These provisions were described in the Final CVPIA PEIS (Reclamation and USFWS 1999).

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

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[2] Section 3404(c) of the CVPIA directs the Secretary of the Interior (Secretary) to renew existing CVP water service and repayment contracts following completion of a Programmatic Environmental Impact Statement (PEIS) and other needed environmental documentation by stating that: *... the Secretary shall, upon request, renew any existing long-term repayment or water service contract for the delivery of water ... for a period of 25 years and may renew such contracts for successive periods of up to 25 years each ...* [after] *appropriate environmental review, including preparation of the environmental impact statement required in section 3409* [i.e., the CVPIA PEIS] … *has been completed.*

Tiered Water Pricing

The CVPIA required the implementation of a tiered water pricing component, which is the incremental amount to be paid for each acre-foot of water delivered. The tiered pricing component for the amount of water delivered up to 80 percent of the contract total shall not be less than the established rate/charges for the contractor. The tiered pricing component for the amount of water delivered in excess of 80 percent of the contract total, but less than or equal to 90 percent of the contract total, shall equal one-half of the difference between the rate/charges established for the contractor and the M&I full cost rate. The tiered pricing component for the amount of water that exceeds 90 percent of the contract total shall equal the difference between (1) the rate/charges determined annually by the Contracting Officer in accordance with the then-current applicable Reclamation water rate-setting policies and (2) the M&I full cost water rate.

Tiered water pricing in the No Action Alternative is based upon the use of an "80/10/10 Tiered Water Pricing from Contract Rate to Full Cost" approach including appropriate ability-to-pay limitations. The terms *Contract Rate* and *Full Cost Rate* are defined by CVP rate-setting policies and Public Law 99-546 and the Reclamation Reform Act, respectively. The Contract Rate for irrigation and M&I water includes the contractor's allocated share of CVP main project operation and maintenance (O&M) expenses, O&M deficit, if any, and capital cost. The Contract Rate for irrigation water does not include interest on capital. The Contract Rate for M&I water includes interest on capital, computed at the CVP M&I interest rate. The Full Cost Rate for irrigation and M&I water includes interest at the Reclamation Reform Act interest rate. Under this approach, the first 80 percent of maximum contract amount would be priced at the applicable Contract Rate. The next 10 percent of the contract amount would be priced at a value equal to the average of the Contract Rate and Full Cost Rate. The final 10 percent of the contract amount would be priced at the Full Cost Rate.

In addition to the CVP water rate, contractors are required to tender Restoration Fund[3] payments on all deliveries of CVP water. Reclamation law and policy provides full or partial relief to irrigation contractors on Restoration Payments and the capital rate component of the water rate. Ability-to-pay relief, relative to the irrigation water rate, is

[3] The "Central Valley Project Restoration Fund" (Restoration Fund) was established in the Treasury of the United States by Section 3407(a) of the CVPIA. The Restoration Fund receives revenues provided under CVPIA Sections 3404(c)(3), Renewal of Existing Long-Term Contracts—mitigation and restoration payments; 3405(f), Increased Revenues—from repayments for contracts transferred from irrigation use to M&I use; 3406(c)(1), San Joaquin and Stanislaus Rivers—surcharges for the development of the comprehensive plan for fish, wildlife, and habitat restoration; and 3407(d), Adjustment and Assessment of Mitigation and Restoration Payments.

Table 2-4
Environmental Consequences of Long-Term Contract Renewal Alternatives 1 and 2 as Compared to the No Action Alternative

Affected Resource/Concern	Environmental Consequences of The Preferred Alternative	Environmental Consequences of Alternative 1	Environmental Consequences of Alternative 2
Drainage and Water Quality	The Preferred Alternative is not expected to produce drainage conditions or surface water quality impacts that can be distinguished from those that would exist under the No Action alternative. Because the tiered pricing provisions of the Preferred Alternative are identical to those of the No Action Alternative, it is expected that deliveries of surface water and pumpage of groundwater would be the same for both alternatives. As a result, both alternatives would bring the same volume of water and contaminants into the San Luis Unit, resulting in indistinguishable impacts.	Implementation of this alternative is expected to produce no impacts on drainage or surface water quality. As such, impacts to the San Luis Unit with respect to drainage conditions or surface water quality would be indistinguishable from those that would exist under the No Action Alternative.	Impacts to the San Luis Unit with respect to drainage conditions or surface water quality would be indistinguishable from those that would exist under the No Action Alternative. This is because the distinctions between Alternative 2 and the No Action Alternative with respect to tiered pricing are minor and differences in other areas are not expected to impact drainage or surface water quality.
Agriculture	Impact to San Luis Unit total irrigated acreage would be a 1,000-acre decrease during an average year that follows a dry five-year period. Impact to San Luis Unit value of production would be an $800,000 decrease in total value of production during an average year that follows a dry five-year period. Impacts to San Luis Unit net farm revenues would range from a $6.3 million decrease during a wet year following a wet five-year period to a $7.3 million increase during a dry year following a dry five-year period.	Agricultural resource use is assumed to be similar to the No Action Alternative because the amount of water delivered, the timing of those deliveries, and the rates and methods of payment for deliveries do not substantially differ from the No Action Alternative.	Impact to San Luis Unit total irrigated acreage would be a 1,000-acre decrease during an average year that follows a dry five-year period. Impact to San Luis Unit value of production would be an $800,000 decrease in total value of production during an average year that follows a dry five-year period. Impacts to San Luis Unit net farm revenues would range from a $6.3 million decrease during a wet year following a wet five-year period to a $7.3 million increase during a dry year following a dry five-year period.

Table 2-4
Environmental Consequences of Long-Term Contract Renewal Alternatives 1 and 2 as Compared to the No Action Alternative

Affected Resource/Concern	Environmental Consequences of The Preferred Alternative	Environmental Consequences of Alternative 1	Environmental Consequences of Alternative 2
Socioeconomics/ Power Resources	No impacts to power resources because CVP hydroelectric facilities would continue to be operated as under No Action Alternative conditions. San Joaquin River region total employment would decrease by 120 jobs and income from profits and wages would decrease by $4.2 million under the average-average hydrologic sequence. Region would lose an estimated 250 persons. San Joaquin River region total employment would decrease by 420 jobs and income from profits and wages would decrease by $12.4 million under the dry-average hydrologic sequence. Region would lose an estimated 873 persons.	Socioeconomic and power resources impacts are expected to be similar to the No Action Alternative because the amount of water delivered, the timing of those deliveries, and the rates and methods of payment for deliveries do not substantially differ from the No Action Alternative.	No impacts to power resources because CVP hydroelectric facilities would continue to be operated as under No Action Alternative conditions. San Joaquin River region total employment would decrease by 120 jobs and income from profits and wages would decrease by $4.2 million under the average-average hydrologic sequence. Region would lose an estimated 250 persons. San Joaquin River region total employment would decrease by 420 jobs and income from profits and wages would decrease by $12.4 million under the dry-average hydrologic sequence. Region would lose an estimated 873 persons.
Land Use	No direct adverse impacts to land use. Renewed contract water deliveries continue to accommodate a portion of planned growth and support agricultural land uses as under No Action Alternative conditions.	No direct adverse impacts to land use. Renewed contract water deliveries continue to accommodate a portion of planned growth and support agricultural land uses as under No Action Alternative conditions.	No direct adverse impacts to land use. Renewed contract water deliveries would continue to accommodate a portion of planned growth and support agricultural land uses as under No Action Alternative conditions.
Air Quality	Similar crops, cropping patterns, and total irrigated acreage would not result in substantial fallowed acreage capable of adverse fugitive dust or related air quality impacts when compared to the No Action Alternative.	Similar crops, cropping patterns, and total irrigated acreage would not result in substantial fallowed acreage capable of adverse fugitive dust or related air quality impacts when compared to the No Action Alternative.	Similar crops, cropping patterns, and total irrigated acreage would not result in substantial fallowed acreage capable of adverse fugitive dust or related air quality impacts when compared to the No Action Alternative.

Table 2-4
Environmental Consequences of Long-Term Contract Renewal Alternatives 1 and 2 as Compared to the No Action Alternative

Affected Resource/Concern	Environmental Consequences of The Preferred Alternative	Environmental Consequences of Alternative 1	Environmental Consequences of Alternative 2
Soils and Geology	Increased groundwater pumping could increase land subsidence. Increased soil salinity could result from reductions in surface water available for leaching salts through crop root zones or from poor quality groundwater pumped in response to reduced deliveries.	Increased groundwater pumping could increase land subsidence. Increased soil salinity could result from reductions in surface water available for leaching salts through crop root zones or from poor quality groundwater pumped in response to reduced deliveries.	Increased groundwater pumping could increase land subsidence. Increased soil salinity could result from reductions in surface water available for leaching salts through crop root zones or from poor quality groundwater pumped in response to reduced deliveries.
Groundwater	Increased pumping in response to reduced surface water deliveries could reduce groundwater levels and salinity.	Increased pumping in response to reduced surface water deliveries could reduce groundwater levels and salinity.	Increased pumping in response to reduced surface water deliveries could reduce groundwater levels and salinity.
Surface Water Resources	No impacts to surface water resources. Contract total, water to be made available, time for delivery, point of diversion, responsibility for water diversion, water measurement, and rates and methods of payment would not differ substantially from No Action Alternative.	No impacts to surface water resources. Contract total, water to be made available, time for delivery, point of diversion, responsibility for water diversion, water measurement, and rates and methods of payment do not differ substantially from No Action Alternative.	No impacts to surface water resources. Contract total, water to be made available, time for delivery, point of diversion, responsibility for water diversion, water measurement, and rates and methods of payment would not differ substantially from No Action Alternative.
Biological Resources	No adverse impacts to fish, vegetation and wildlife. Contract renewal would continue water deliveries accommodating land uses existing under the No Action Alternative. No habitat supporting species would be converted to agricultural or, M&I use when compared to the No Action Alternative.	No adverse impacts to fish, vegetation and wildlife. Contract renewal would continue water deliveries accommodating land uses existing under the No Action Alternative. No habitat supporting species would be converted to agricultural or, M&I use when compared to the No Action Alternative.	No adverse impacts to fish, vegetation, and wildlife. Contract renewal would continue water deliveries accommodating land uses existing under the No Action Alternative. No habitat supporting species would be converted to agricultural or, M&I use when compared to the No Action Alternative.

Table 2-4
Environmental Consequences of Long-Term Contract Renewal Alternatives 1 and 2 as Compared to the No Action Alternative

Affected Resource/Concern	Environmental Consequences of The Preferred Alternative	Environmental Consequences of Alternative 1	Environmental Consequences of Alternative 2
Cultural Resources	No impacts to cultural resources. Virtually all of the actions associated with long-term contract renewals are within the range of land uses expected under the No Action Alternative. The area of use, types of use, range of river flows, and range of reservoir fluctuations fall within this range when compared to the No Action Alternative. No changes in land use or additions to contractor service areas would affect cultural resources when compared to the No Action Alternative.	No impacts to cultural resources. Virtually all of the actions associated with long-term contract renewals are within the range of land uses expected under the No Action Alternative. The area of use, types of use, range of river flows, and range of reservoir fluctuations fall within this range when compared to the No Action Alternative. No changes in land use or additions to contractor service areas would affect cultural resources when compared to the No Action Alternative.	No impacts to cultural resources. Virtually all of the actions associated with long-term contract renewals are within the range of land uses expected under the No Action Alternative. The area of use, types of use, range of river flows, and range of reservoir fluctuations fall within this range when compared to the No Action Alternative. No changes in land use or additions to contractor service areas would affect cultural resources when compared to the No Action Alternative.
Recreational Resources	No adverse impacts to recreational resources. Facility operations, recreational opportunities, annual use levels, and reservoir water surface elevations would not differ substantially when compared to the No Action Alternative.	No adverse impacts to recreational resources. Facility operations, recreational opportunities, annual use levels, and reservoir water surface elevations would not differ substantially when compared to the No Action Alternative.	No adverse impacts to recreational resources. Facility operations, recreational opportunities, annual use levels, and reservoir water surface elevations would not differ substantially when compared to the No Action Alternative.
Visual Resources	No adverse impacts to visual resources. Patterns of cultivated and fallowed acreages would remain substantially the same as under No Action Alternative conditions. Agricultural viewsheds, scenic views, and visibility would not be substantially affected when compared to the No Action Alternative.	No adverse impacts to visual resources. Patterns of cultivated and fallowed acreages would remain substantially the same as under No Action Alternative conditions. Agricultural viewsheds, scenic views, and visibility would not be substantially affected when compared to the No Action Alternative.	No adverse impacts to visual resources. Patterns of cultivated and fallowed acreages would remain substantially the same as under No Action Alternative conditions. Agricultural viewsheds, scenic views, and visibility would not be substantially affected when compared to the No Action Alternative.

Table 2-4
Environmental Consequences of Long-Term Contract Renewal Alternatives 1 and 2 as Compared to the No Action Alternative

Affected Resource/Concern	Environmental Consequences of The Preferred Alternative	Environmental Consequences of Alternative 1	Environmental Consequences of Alternative 2
Public Health	No adverse impacts to public health or increases in mosquito breeding. No increase in flows or standing water would result when compared to the No Action Alternative.	No adverse impacts to public health or increases in mosquito breeding. No increase in flows or standing water would result when compared to the No Action Alternative.	No adverse impacts to public health or increases in mosquito breeding. No increase in flows or standing water would result when compared to the No Action Alternative.

fully applicable only to the first 80 percent of the contract total. Ability-to-pay relief is not applicable to the third-tier water rate. The second tier may reflect partial relief. Ability-to-pay relief is equal to the average of the first and third tiers. The relief could be up to 100 percent of the capital cost repayment and is based upon local farm budgets. The ability-to-pay relief does not apply to CVP O&M costs, M&I water costs, or any non-CVP costs. Ability to pay relief has not been established for any San Luis Unit Contractor.

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

Definition of M&I Users

In CVP contracts for irrigation and M&I purposes, including both Alternatives 1 and 2, the definition of *M&I water* has usually been "water other than Irrigation Water." Both a 1982 Reclamation policy and contract terms further indicate that M&I water is water for human use and for purposes such as watering landscaping or animals, as compared to commercial agricultural use.

The definition of M&I users was established in portions of a 1982 Reclamation policy memorandum. In many instances, the term *municipal users* is easily defined. However, with respect to small tracts of land, the 1982 memorandum defined *agricultural water* as agricultural water service to tracts that can support $5,000 gross income for a commercial farm operation. The memorandum indicates that this criterion can be met by parcels greater than five acres. The CVP Contractors can seek a modification for a demonstrated need of agricultural use on parcels less than five acres in size from the Contracting Officer.

Water Conservation

Water Conservation Guidelines implemented under the Reclamation Reform Act of 1982 have been in effect for CVP contractors. Reclamation policy has required contractors under continuing long-term water service contracts to comply with the Water Conservation Guidelines developed under the CVPIA and to submit water conservation plans if applicable. Water conservation plans are not required for districts that use less than 2,000 af of water or for districts with less than 2,000 irrigable acres. The water conservation assumptions in the No Action Alternative include water conservation actions for municipal and on-farm uses assumed in the California Department of Water Resources' Bulletin 160-93 and the water conservation plans. Such criteria address cost-effective Best Management Practices that are "economical and appropriate," including measurement devices, pricing structures, demand management, public information, and financial incentives. While measurement and pricing structures are required, they are not held to the "economical and appropriate" test.

Water Measurement

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

NO ACTION ALTERNATIVE TRENDS AND FUTURE CONDITIONS

In addition to applicable CVPIA Preferred Alternative contract provisions, the No Action Alternative also serves as the "baseline" of future conditions against which the other alternatives/contracts will be compared when analyzing potential environmental consequences. It may be thought of in terms of continuing with the present course of action (i.e. – contracts under the CVPIA PEIS Preferred Alternative with terms similar to those in the interim contracts) until that action is changed (i.e. until Reclamation and the San Luis Unit contractors negotiate changed terms and conditions). Consequently, projected impacts of alternative contracts would be compared in the EIS to those impacts projected for the existing contracts. This analysis provides a benchmark, enabling decision makers to compare the magnitude of environmental effects of the action alternatives.

The development of an appropriately framed benchmark for such comparisons also requires that the No Action Alternative include any actions which are reasonably certain as well as changes that would occur regardless of any proposed alternative. Clearly describing the future without project condition provides the frame of reference necessary to evaluate changes caused by the alternatives. The No Action Alternative conditions include water projects or other actions that are expected to be operating, under construction or authorized and likely to be constructed and/or operated during the next 25 to 40 years — with emphasis on those other reasonably foreseeable projects that could affect, or be affected by the long-term contract renewal alternatives. The No Action Alternative in this EIS therefore projects current conditions, resource trends, and probable actions by others through the 25 to 40-year periods considered for the action alternatives.

Each of the resource categories for which the affected environment and environmental consequences are analyzed in Chapter 3 begins with a discussion of current conditions and existing trends predominating in the area of potential effect. Existing conditions are projected to either remain as currently expressed, or as changing in response to those factors that affect them. In addition to these existing and ongoing trends in the affected environment, the No Action Alternative also includes consideration of several water

projects that could affect environmental trends in the San Luis Unit. Many of these projects are directly or indirectly related to CVP operational decisions that occur prior to, and therefore determine the amount of water delivered south of the Delta. Most, if not all of these projects are reasonably foreseeable because of their continued funding, authorizations, or other enabling statutes or regulations.

In addition, it is important to note that many of the programs, processes, and events that comprise future conditions will be subject to separate NEPA evaluation. For example, the San Luis Drainage Feature Re-evaluation that was under public review from June 30 to September 1, 2005. The Re-evaluation is being evaluated under a separate NEPA process specifically directed towards evaluating alternatives and progressing towards the development of a drainage solution for drainage-impaired lands in the San Luis Unit. Reclamation has acknowledged its obligations to provide such drainage service, and will use that separate NEPA process for addressing it. Similarly, Reclamation is evaluating land retirement in several separate processes, including as one alternative in the San Luis Unit Drainage Feature Reevaluation Study. Again, federal actions related to land retirement are subject to other, separate NEPA processes apart from long-term contract renewals. To the extent that these other programs and processes are reasonably certain, they are considered as part of the future, No Action conditions that will be progressively on paths substantially independent of long-term contract renewals.

ALTERNATIVE 1

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

- The April 2000 proposal includes terms and conditions to provide a highly reliable, high-quality water supply and provisions to improve the water supply capabilities of the CVP facilities and operations to meet this goal. *These issues were not included in Alternative 1 because they would require additional federal actions with separate environmental documentation and could be construed to limit the Secretary of the Interior's efforts to achieve a reasonable balance among competing demands, as required by the CVPIA. Currently, Reclamation is completing a plan to restore project yield in accordance with Section 3408(j) of CVPIA and under the CALFED program.*

- The April 2000 proposal includes language to require renewal of contracts after 25 years upon the request of the contractor. *The study period for this EIS is 25 to 40 years, which coincide with the contract periods applicable to irrigation and M&I contracts, respectively, as required by CVPIA. Each renewal after 25 or 40 years would be a new federal action and would require new environmental documentation.*

- The April 2000 proposal did not include provisions for compliance with biological opinions, but did include a provision requiring compliance with all applicable laws.

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

- The April 2000 acknowledges the current agreement for the transfer of O&M responsibilities for project facilities to a non-federal entity. *There is no federal action involved in that provision of the long-term water service contracts that required analysis in this EIS.*

- The April 2000 proposal includes provisions for resolution of disputes. *Assumptions for resolutions of disputes were not included in Alternative 1 because they do not appear to affect environmental conditions.*

- The April 2000 proposal includes parameters for Reclamation to approve changes in contractor boundaries. *The study area in this EIS for the long-term contract renewal process is defined by the existing service area boundaries of the contractors identified as being in the San Luis Unit. Changes in contractor boundaries that also could propose changes in the contractor's service area would be a new federal action requiring separate environmental documentation and Contracting Officer approval.*

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

The April 2000 proposal included several provisions that were different than the assumptions for the No Action Alternative. These provisions are included in Alternative 1 and summarized in Table 2-1.

The April 2000 proposal also included several language changes that would not significantly modify CVP operations in a manner that would affect the environment as compared to the No Action Alternative, but could affect specific operations of a contractor, as described in Table 2-1.

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

ALTERNATIVE 2

Alternative 2 is based on the proposal presented by Reclamation to CVP water service contractors in November 1999 (Reclamation 1999). However, several provisions included in the November 1999 proposal could not be included in Alternative 2 because they would require a separate federal action, as described below.

- The November 1999 proposal included provisions for the contractor to request Reclamation's approval of proposed O&M transfers. *It is recognized that water transfers will continue and that the CVP long-term contracts will provide the mechanisms for such transfers. However, it would be difficult to identify all of the transfer programs that could occur with CVP water in the next 25 to 40 years. Reclamation would require separate environmental documents for such transfers.*

- The November 1999 proposal includes provisions for transferring O&M responsibilities to third parties. *The November 1999 proposal acknowledged an existing agreement to transfer O&M responsibilities for project facilities to a non-federal entity. There is no federal action involved in that provision of the long-term water service contract that requires analysis in this EIS.*

The November 1999 proposal included several provisions that differ from the assumptions for the No Action Alternative. These provisions are included in Alternative 2 and are summarized below and in Table 2-1. The primary differences are related to tiered pricing and the definition of M&I users.

TIERED WATER PRICING

Tiered water pricing has a separate definition.

The terms *Contract Rate* and *Full Cost Rate* are defined by the Reclamation Reform Act and are discussed under Tiered Pricing for the No Action Alternative. The Contract Rate is equal to O&M expenses, O&M deficit, if any, and capital costs without interest on capital. The Full Cost Rate includes the interest charges. The final 10 percent of the Category 1 volume would be priced at the Full Cost Rate as required by the CVPIA. The Category 2 water, when available, would be the Full Cost Rate tiered component. It should be noted that Category 1 and Category 2 volumes will change every year, based upon the average deliveries for the "most recent 5 years," with limited exception, based upon the findings of the water needs assessment. Alternative 2 assumes that the sum of Category 1 and Category 2 water is equal to the maximum quantity included in the contractor's existing water service contract. The quantity is the same as the No Action Alternative and Alternative 1. The same ability-to-pay adjustments would be applicable to Restoration Fund payments and tiered water rates as described in the No Action Alternative.

DEFINITION OF M&I USERS

The definition of *M&I water* includes all tracts of five acres or less, unless the Contracting Officer is satisfied that the use of such water meets the definition of *irrigation water*.

PREFERRED ALTERNATIVE

The Preferred Alternative is based upon final negotiated contract language. It also represents a negotiated position between Alternative 1 and Alternative 2, the "bookends" for the analysis in this EIS. Some of the key provisions of the Preferred Alternative include:

- The final negotiated contract assumes that CVP water has been relied upon and considered essential by contractors. It also assumes that the Secretary of the Interior, through coordination, cooperation, and partnership, will pursue measures to improve water supply.

- The final negotiated contract includes provisions for water transfers. It assumes that continuation of water transfers with the rate for transferred water being the transferor's cost of service rate for additional or reduced costs related to transfer.

- Similar to Alternative 1, the final negotiated contract applies tiered water pricing to 80 percent and above of the total contract quantity.

- The final negotiated contract assumes that contracts shall be renewed subject to certain conditions for agricultural water and certain conditions for M&I water. Ten years after the date of execution of the contract and every five years thereafter

during the term of the contract, the Contracting Officer shall determine whether the relevant portion of the contract can be converted to a contract under subsection 9(d) of the Reclamation Project Act of 1939, pursuant to the Act of July 2, 1956 (70 Stat 483). Concurrently, the Contra5cting Officer shall also determine whether the relevant portion of this contract could be converted to a contract under subsection 9(c)(1) of the Reclamation Act of 1939.

ALTERNATIVES CONSIDERED BUT ELIMINATED

NONRENEWAL OF LONG-TERM CONTRACTS

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

FUTURE CONTRACT RENEWALS

The analysis in this EIS does not include future subsequent long-term water service contract renewals. Future water service contract renewals will be subject to conditions and mutually agreeable terms and are separate actions. Before any future water service contract is executed, Reclamation and the contractor must comply with all applicable law and additional environmental documentation

REDUCTION IN CONTRACT AMOUNTS

Reduction of contract amounts was considered in certain cases, but rejected from analysis for several reasons. First, water needs assessments have been completed for the seven of the nine San Luis Unit contractors that met the criteria for the completion of a water needs assessment[4]. In all cases, these assessments demonstrate that the entire contract quantity has been put to beneficial use, and in almost all cases, both the current and projected demands equal or exceed the current total contract amounts.

Second, reductions in contract quantities are not required for Reclamation to implement the CVPIA or any other statutory or water rights obligations. The contracts contain shortage provisions that insulate Reclamation from liability when it imposes shortages because of legal obligations. Thus, the contract provides Reclamation with the flexibility to implement such CVPIA provisions as the dedication of water to fish, wildlife, and habitat

[4] Westlands Water District No. 2 was included in the Westlands Water District needs assessment and no needs assessment was completed for CDFG.

restoration under Section 3406(b)(2) and to achieve a reasonable balance between different project purposes as envisioned by the CVPIA.

Third, permanently reducing contract amounts for a 25-year term in order to express current constraints on CVP delivery capability would reduce opportunities for contractors to make investments for good water management, such as in storage or banking facilities, that will be of benefit in higher water years; would inhibit wet year transfer arrangements that can stabilize local demands without requiring new water development; and would negatively impact the contractors' capacity to achieve contract repayment. Similarly, capturing current delivery constraints as permanent reductions in water supplies is inconsistent with related activities, such as the CALFED Record of Decision (CALFED 2000) and CVP Yield Increase Plan.

SAN LUIS UNIT

DRAFT ENVIRONMENTAL IMPACT STATEMENT
LONG-TERM CONTRACT RENEWAL

Chapter 3:
Affected Environment and Environmental Consequences

September 2005

CHAPTER 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter analyzes impacts resulting from the implementation of Alternatives 1, 2, and the Preferred Alternative when compared to the No-Action Alternative. Section 3.1 provides an overview of the San Luis Unit water service contractors for which long-term contract renewals are analyzed. It includes descriptions of the contractors, their facilities, and CVP water use. It also provides information on San Luis Unit transfers. Sections 3.2 through 3.14 analyze the environmental effects associated with long-term water service contract renewals in the areas of drainage and water quality, agriculture, socioeconomics and power resources, land use, air quality, soils and geology, groundwater, surface water resources, biological resources, cultural resources, recreational resources, visual resources, and public health. Each section begins with a discussion of the affected environment for that particular area and then analyzes the environmental impacts of the action alternatives (Alternative 1, Alternative 2, and the Preferred Alternative) as compared to the No-Action Alternative.

SCOPE OF THE ANALYSIS

ELEMENTS OF LONG-TERM CONTRACT RENEWALS WHERE ENVIRONMENTAL EFFECTS WOULD NOT BE REASONABLY EXPECTED

This chapter does not analyze impacts for which it would not be reasonable to assume that adverse impacts could occur. Specifically, potential impacts to transportation, noise, hazards and hazardous materials, public services, utilities, and service systems are not analyzed, because it would not be reasonable to assume that the action of renewing long-term water service contracts could result in substantial impacts to these resources and services. This chapter does not address impacts associated with purely administrative elements of contract renewals that also would not reasonably be expected to result in environmental consequences, as explained in Chapter 2.

LANGUAGE, TERMS, AND CONDITIONS OF LONG-TERM CONTRACTS

Similarly, this EIS does not evaluate the appropriateness of the language, terms, or conditions of the San Luis Unit contracts. It is an environmental analysis of the chiefly

administrative action of renewing existing water service contracts as written. Reclamation is and has been committed to a full and open process for public input. Consistent with that approach, contract negotiations have been held in public, and each session has included an opportunity for public comment. To date, more than 190 such sessions or workshops have been open to the public. Reclamation has also maintained an extensive website (www.usbr.gov/mp/cvpia/3404c/index.html) to inform the public of the status and content of contract negotiations and has posted the relevant environmental documents. That process was available for commenting on the language, terms, and conditions of the contracts, and the rate setting and repayment processes.

OTHER NEPA AND ESA PROCESSES

This EIS does not address other ESA and NEPA processes applicable to other federal actions. It is limited to an analysis of long-term contract renewals for the San Luis Unit.

THE NO-ACTION ALTERNATIVE AND EXISTING CONDITIONS AS AN ENVIRONMENTAL BASELINE

Because it serves as the basis against which the action alternatives are analyzed, the No-Action Alternative in each of sections 3.2 through 3.14 of this EIS is framed as the most likely future environmental conditions expected for each of these resource categories over the water service contract periods. As such, these expected future environmental conditions represent, over the next 25 to 40 years, as appropriate: (1) the continuation of existing conditions characterizing the affected environment in those instances where such conditions are not expected to substantially change as a baseline against which environmental consequences are compared (e.g., visual resources); (2) the continuation of existing environmental trends (e.g. drainage and water quality); and (3) the changing hydrologic, regulatory, and operational environment in which several related projects and trends, independent of contract renewals, will continue to influence the future baseline "No-Action" conditions.

ESTIMATED FREQUENCY OF FULL CONTRACT DELIVERIES

This EIS analyzes potential environmental consequences based on expected future levels of deliveries to the San Luis Unit. Modeling presented in the Long-Term Central Valley Project and State Water Project Operations Criteria and Plan (OCAP) Biological Assessment (USBR 2004j) used CALSIM modeling to conduct five separate simulation studies that estimated south-of-Delta deliveries (USBR 2004j; Table 8-6). In those five studies, estimated average south-of-Delta deliveries to agricultural contractors ranged from approximately 1,056,000 af/y under the "Future b(2)" model simulation study to 1,110,000 af/y under the "Today EWA" (Environmental Water Account) model simulation study. Estimated present and future average south-of-Delta agricultural allocations ranged from

58 to 61 percent of full contract amounts, while estimated present and future dry-year (1929 to 1934) south-of-Delta agricultural allocations ranged from 10 to 15 percent of full contract amounts. Estimated present and future average and dry-year south-of-Delta M&I deliveries ranged from 87 to 88 and 59 to 61 percent, respectively.

Six present ("Today") and "Future" simulations of 1929 to 1934 (drought) conditions resulted in estimated south-of-Delta deliveries ranging from 185,000 to 217,000 af/y. Across all six such studies, this equated to an average of 18% of estimated *average* south-of-Delta deliveries to agricultural contractors when looking at present or future OCAP operational simulations. Simulated M&I deliveries simulated under 1929 to 1934 conditions ranged from 69 to 70 percent of full contract amounts.

In summary, none of the information provided in the OCAP simulation studies/model runs indicates that south-of-Delta deliveries could achieve a consistent level of full contract deliveries under expected hydrologic, regulatory, and operational constraints. Nevertheless, the analysis presented in this EIS—particularly the characterization of ongoing drainage and water quality trends under No-Action Alternative conditions—acknowledges that full contract deliveries may be provided in one or more favorable hydrologic years over the terms of the long-term water service contracts being renewed. To the extent that these statistically infrequent full contract deliveries could occur, and noticeably and substantially contribute to one or more ongoing environmental trends as characterized in the No-Action Alternative, without speculation and independent of the effects of other programs and contributing factors, such contributions are recognized and addressed in this EIS. In most cases, because future south-of-Delta allocations and deliveries are expected to be equal to or perhaps less than those historically allocated and/or delivered, the rates of ongoing environmental trends associated with the No-Action and action alternatives that increase or decrease in some direct proportion to deliveries are similarly expected to be equal to or less than equivalent historic rates.

CUMULATIVE IMPACTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Each resource section concludes with a discussion of cumulative impacts and the potential for the irreversible and/or irretrievable commitment of resources. A cumulative impact is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.8). Irreversible commitments are decisions affecting renewable resources such as soils, wetlands, and waterfowl habitat. Such decisions are

considered irreversible because their implementation would affect a resource that has deteriorated such that renewal can occur only over a long period or at great expense, or because they would cause the resource to be destroyed or removed. Irretrievable commitments of natural resources mean loss of production or use of resources as a result of the decision. They represent opportunities foregone for the period of time that a resource cannot be used.

INCOMPLETE OR UNAVAILABLE INFORMATION

The following information is incomplete, unavailable, or speculative:

The Future Levels of Deliveries to San Luis Unit Contractors: Despite the attempts of the best available models and analysis in the OCAP and related modeling efforts to estimate future deliveries, these estimates are based only a future projection that simulates the frequency of previous conditions in future years. Future hydrologic cycles may result in several successive dry years, or several wetter than normal years that could alter predictions regarding deliveries to San Luis Unit contractors.

The Type of Drainage Service That Will Be Provided By Reclamation to the San Luis Unit: The San Luis Drainage Feature Re-evaluation program is the appropriate forum for addressing future drainage service in the San Luis Unit. The analysis of the effects of long-term contract renewals on drainage, water quality, soils, groundwater, land use, biological resources, and other direct or indirect environmental consequences acknowledges the continuation of existing and ongoing trends associated with future applications of irrigation waters within the unit. However, the timing and level of drainage service are speculative until a final drainage service resolution is achieved through the NEPA, ESA, and related regulatory processes required of the San Luis Drainage Feature Re-evaluation program.

The Extent to Which Other Economic Factors May Affect Agricultural and Land Use Decisions in the San Luis Unit: Agricultural decision making depends on several factors, including market prices that can be taken for crops, labor, equipment, and materials costs and expenses and related trends, additional environmental regulatory requirements, and other land use and real estate trends that drive land use decisions.

This EIS does not attempt to make this information complete, available, or more certain than provided in the best available estimates of future conditions as predicted by the continuation of ongoing trends already documented in the literature. Most, if not all of the trends associated with the more controversial issues of drainage, water quality, land use, biological resources, groundwater levels and quality, and surface water resources have

been addressed in this chapter as appropriate within the context of long-term contract renewals and their chiefly administrative nature.

SECTION 3.1: CONTRACTOR SERVICE AREA DESCRIPTIONS

This section describes the service area for the nine contractors analyzed in this document that receive Central Valley Project (CVP) water from the Delta-Mendota Canal, the San Luis Canal, and the Mendota Pool and that are part of the San Luis Unit. The study area, shown on Figure 3.1-1, includes portions of Merced, Fresno, and Kings Counties. Specifically, the study area includes the service areas of the following nine San Luis Unit contractors:

- City of Avenal
- City of Coalinga
- City of Huron
- Pacheco Water District
- Panoche Water District
- San Luis Water District
- Westlands Water District
- Westlands Water District (Distribution District #2)
- California Department of Fish and Game (CDFG)

SAN LUIS UNIT CONTRACTORS' FACILITIES AND WATER USE

The nine contractors in the San Luis Unit include four water districts (five contracts), three municipalities, and the CDFG. This section provides a general description of the contractors within the San Luis Unit and a discussion of both the CVP and other water supplies available to them. The information provided for the individual districts is for summary information only. The individual contractors have rules regarding the terms for the delivery of water that require the water be put to reasonable and beneficial use and require compliance with Reclamation law.

CITY OF AVENAL'S FACILITIES AND WATER USE

Incorporated in 1979, the City of Avenal is located in western Kings County in the southern portion of the San Joaquin Valley. The urbanized portion of the city is located around the intersection of State Highways 33 and 269. Avenal is located 18 miles southeast of Coalinga and 40 miles southwest of Hanford, the county seat. The City of Avenal encompasses 19.5 square miles, of which 2.5 square miles are urbanized. Its sphere of influence contains an additional 2.25 square miles (Collins and Associates 1992). The City's planning area, both the lands within city limits and its sphere of influence, use all of its CVP water supply for municipal and industrial (M&I) uses. The current population is 16,200 (Department of Finance 2004).

Use of CVP Water

On November 20, 1969, the City of Avenal signed a long-term contract (Contract 14-06-200-4619A) with the U.S. Bureau of Reclamation (Reclamation) for up to 3,500 acre-feet of CVP water annually. This contract will remain in effect through December 31, 2008. Reclamation intends to enter into a long-term renewal of this contract prior to expiration.

Use of Other Available Water Supplies

The City of Avenal's water supply source is CVP water from the San Luis Canal. Under a formal agreement, it supplies Avenal State Prison with 1,411 acre-feet of water annually. Avenal State Prison, located in the southern portion of Avenal, is a Level II, low- to medium-security prison.[1] In 1992 and 2001, the prison housed approximately 4,200 and 7,000 inmates, respectively. The facility could reach a maximum capacity of 9,000 inmates; however, an expansion is not considered in the near future (Collins and Associates 1992). When the prison was constructed in 1987, it almost doubled the city population and also is the major employer in the city.

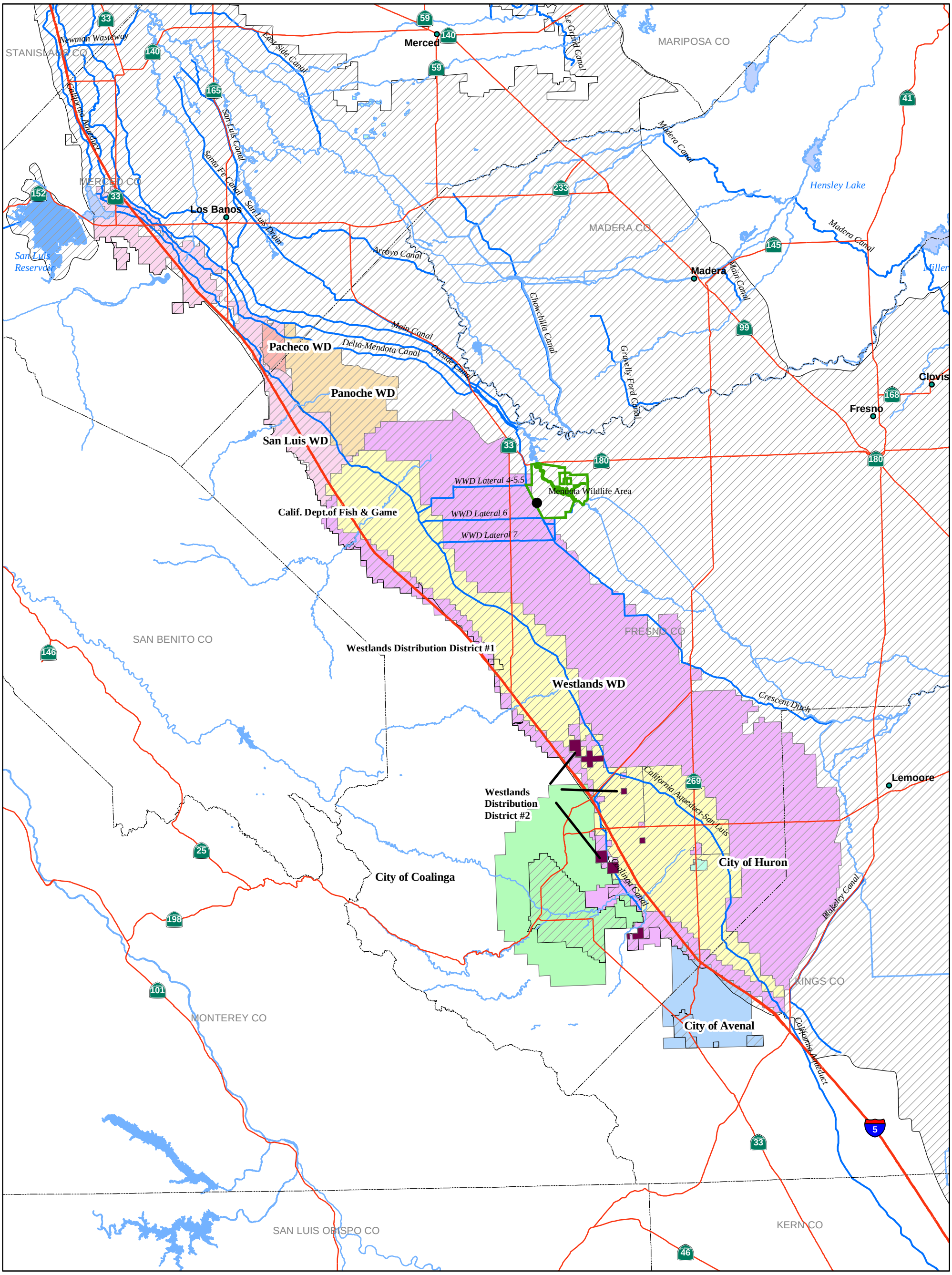
The City of Avenal also provides water service to the urbanized portions of Avenal and a limited number of connections in the northern portion of the community. Because this water is used for M&I purposes, the CVP water is treated before delivery at a City-owned plant and then delivered via a series of underground water pipelines throughout the service area.

Avenal does not pump any groundwater. The poor quality of the groundwater and its high concentrations of sulfate, nitrates, and sodium preclude its use for domestic purposes.

CITY OF COALINGA'S FACILITIES AND WATER USE

The City of Coalinga is a rural city nestled in Pleasant Valley, at the edge of California's Coastal Range in Fresno County. Located about 60 miles southwest of Fresno, Coalinga is the midway point along Interstate 5 for travelers between Los Angeles and San Francisco. It is surrounded by hills, ranches, and agricultural land, and encompasses 4.1 square miles while its sphere of influence encompasses an additional 8.2 square miles. It is expected that the City of Coalinga will expand to 9.4 square miles by 2015 and that this growth will be mostly M&I in nature. The current population of the city is 16,700 (Department of Finance 2004).

[1] The State of California has four levels of security with Level I being a minimum-security prison and Level IV being a maximum-security prison.



Legend

West San Joaquin Division, San Luis Unit

- Avenal, City of
- Coalinga, City of
- Huron, City of
- Pacheco WD
- Panoche WD
- San Luis WD
- Westlands WD
- Westlands Distribution District #1
- Westlands Distribution District #2
- Consolidated Place of Use - USBR
- California Department of Fish & Game Property
  Mendota Wildlife Refuge Headquarters

Figure 3.1-1 San Luis Unit Action Area

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

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Use of CVP Water

On October 28, 1968, the City of Coalinga signed a long-term contract (Contract 14-06-200-4173A) with Reclamation for up to 10,000 acre-feet of CVP water annually. This contract will remain in effect through December 31, 2008. Reclamation intends to enter into a long-term renewal of this contract prior to expiration.

Use of Other Available Water Supplies

The City of Coalinga's sole water supply source is CVP water obtained at a single turnout from the Coalinga Canal, which is fed by the San Luis Canal. Because Westlands Water District owns the lateral, the City of Coalinga pays an operation and maintenance charge to the district for the use of the pipeline to obtain its CVP supply. The City of Coalinga supplies potable water to almost all of the residences within its service area through either a City Council policy or an assessment district. Because it is used for M&I purposes, the CVP water is treated at the City's water treatment plant prior to its delivery. Approximately 80 miles of water transmission and distribution pipeline distribute the treated water throughout the water service area. The current long-term contract required Coalinga to abandon its former source of water supply (i.e., pumping water from groundwater wells) and to depend on its CVP supply as its M&I water supply.

The City of Coalinga participates in transferring water but does not currently have a policy on water transfers. Potential water transfers are considered on a case-by-case basis.

CITY OF HURON'S FACILITIES AND WATER USE

The City of Huron lies in Fresno County and in the vast western region of the San Joaquin Valley, nine miles east of Interstate 5, three miles south of Highway 198, and 60 miles south of Fresno. Founded in 1877, Huron was incorporated in 1951. The City encompasses 1.6 square miles and has a population of approximately 6,975 (Department of Finance 2004); however, the population increases to over 9,000 during the harvest season (i.e., April to November). Westlands Water District surrounds the City of Huron.

Use of CVP Water

On September 26, 1972, the City of Huron signed a long-term contract (Contract 14-06-200-7081A) with Reclamation for a maximum of 3,000 acre-feet of CVP water annually. This contract will remain in effect through December 31, 2008. Reclamation intends to enter into a long-term renewal of this contract prior to expiration.

Use of Other Available Water Supplies

The City of Huron's only water supply is CVP water received from a lateral connection to the San Luis Canal. Because Westlands Water District owns the lateral, the City of Huron pays an operation and maintenance charge for conveyance. The City of Huron's water distribution system consists of approximately 13.5 miles of pipelines with diameters ranging from less than six inches to greater than 10 inches. After the CVP water has been treated at the water treatment plant, which is located within one mile of the San Luis Canal, it is distributed to local water users.

Huron does not pump groundwater. Groundwater in the area is very deep, of poor quality and almost non-potable.

SAN LUIS WATER DISTRICT'S FACILITIES AND WATER USE

The San Luis Water District is located on the western side of the San Joaquin Valley near Los Banos and within both Merced and Fresno Counties. Construction of the Delta-Mendota Canal in the 1950s sparked major development of farmland in the San Joaquin Valley that led to the formation of the San Luis Water District in January 1951. After a series of inclusions and exclusions of land, the district's current size is approximately 66,458 acres.

The district's current population is approximately 700, with most individuals residing in the community of Santa Nella, located in the extreme northern portion of the district. Interstate 5 is the approximate dividing line between the hilly terrain to the west and the relatively level land to the east.

Description of District Facilities

The San Luis Water District's current distribution system consists of 52 miles of pipelines, 10 miles of lined canals, and 7.5 miles of unlined canals. About 200,000 acres within the district, referred to as the Direct Service Area, receive water from 39 turnouts on the Delta-Mendota Canal and 23 turnouts on the San Luis Canal. The Direct Service Area is located almost primarily in Merced County. In addition to the Direct Service Area, three improvement districts are also served through distribution systems branching off the San Luis Canal. Improvement District 1 is located primarily within Fresno County; Improvement District 2 is located entirely with Fresno County; Improvement District 3 is located entirely within Merced County. After the original delivery and distribution systems were constructed, their delivery capacities were increased through the enlargement of pumping plants, the development of new pumping plants, and the installation of additional pipeline laterals. The most significant improvements included the insertion of

automatic control gates[2] to regulate water deliveries based on actual water demands and the lining of earth-bottomed canals with a polyethylene material.

CVP Contracts

On February 25, 1959, San Luis Water District entered into a long-term contract (Contract 14-06-200-7563) with Reclamation for 93,300 acre-feet of CVP supply from the Delta-Mendota Canal. This contract was superseded with a contract executed on June 18, 1974, (Contract 14-06-200-7773A) for a maximum of 125,080 acre-feet of CVP supply from the Delta-Mendota and San Luis Canals. This contract was amended in January 13, 1986 (Contract 14-06-200-7773A). The district's long-term contract will expire on December 31, 2008. Reclamation intends to enter into a long-term renewal of this contract prior to expiration.

Use of Other Available Water Supplies

CVP water is the San Luis Water District's only long-term water supply. The district does not own any groundwater wells and has no other long-term contracts for surface or groundwater supplies. All of the groundwater wells in the area are privately owned and operated. About 20 private agricultural wells provide water to 6,000 acres in the Direct Service Area. There are no agricultural wells within the three improvement districts. The vast majority of the San Luis Water District's water users do not have meaningful access to groundwater that can be used for irrigation, and therefore, supplementation of the CVP supply is nominal.

Although water deliveries by the San Luis Water District historically have been almost exclusively used for agricultural use, substantial development in and around the cities of Los Banos and Santa Nella have resulted in a shift of some water supplies to M&I use. The San Luis Water District currently supplies approximately 800 acre-feet per year to approximately 1,300 homes and businesses. The trend is expected to continue, and the San Luis Water District is expected to provide M&I water deliveries of approximately 20,300 acre-feet to serve a projected population of 63,400 by 2025 if current development trends continue.

Operating Rules and Regulations

The San Luis Water District annually allocates its available CVP supply on a pro rata basis to all eligible parcels. Generally, a water application and deposit billing are required of

[2] The control gates resulted in increased water use efficiency and decreased power costs and created an automated delivery system that has the ability to deliver water upon demand. However, San Luis Water District customers currently cannot take full advantage of the system because operators of the Delta-Mendota Canal and San Luis Canal require at least a 24-hour notice to fill water orders.

each landowner annually. The application allows the landowner to purchase all, a portion, or none of the water available for that particular year.

Water Transfers

Individual landowners within the district get the water they need by performing water transactions. To supplement CVP water, landowners in the district often participate in water transfer arrangements. Even in a year of 100 percent CVP allocation, many landowners would not have the amount of water that they need. The district implements the "free market" approach to water transfers and allows individual water users to maximize the efficient use of their supplies by transferring water both within and outside district boundaries. Very few restrictions are placed on such transfers. Water transfers are for a single year only and must be renewed annually; water transfers cannot be relied upon as a long-term supply.

It is also becoming a common practice in the San Luis Water District for farmers to fallow previously farmed land. Fallowing land allows farmers to transfer that parcel's water rights to another parcel of land that is hoped to be more profitable. Fallowing can occur for a number of reasons including the lack of water or the cost of water being too high to make farming of the land profitable.

Irrigation

The San Luis Water District does not currently maintain detailed records regarding irrigation methods; however, because of the area's hilly terrain and rolling topography, sprinkler irrigation continues to be used quite extensively. It is estimated that sprinklers may be used on approximately 60 percent of the irrigated acreage. During the past ten years, a shift to both drip and micro irrigation systems has paralleled the conversion from row crops to permanent crops (i.e., orchards and vineyards). Drip or micro irrigation systems are currently used on approximately 23 percent of the irrigated acreage. Use of these systems is expected to increase proportionally to the shift to permanent crops.

WESTLANDS WATER DISTRICT'S FACILITIES AND WATER USE

Westlands Water District covers almost 950 square miles of prime farmland between the California Coast Range and the trough of the San Joaquin Valley in western Fresno and Kings Counties. It averages 15 miles in width and stretches 70 miles in length from the Mendota on the north to Kettleman City on the south. Interstate 5 is located near the district's western boundary. Westlands Water District was originally formed under California Water District law in 1952 upon a petition of landowners who were located within the district's proposed boundaries and who urgently needed a surface water supply

to supplement poor quality underground supplies that were being rapidly depleted. Nearly all land within the current Westlands Water District service area was at one time farmed using groundwater. Negotiations between Westlands Water District and Reclamation on a contract to provide a dependable, supplemental supply of surface water through the CVP began shortly after the District's formation. At that time, the federal government was considering the development and construction of the CVP's San Luis Unit. This involved cooperation between federal and state government agencies with regard to shared water storage facilities and conveyance systems. The first deliveries of CVP water from the San Luis Canal to Westlands Water District began in 1968.

When the original Westlands Water District was organized, it included approximately 376,000 acres. In 1965, it merged with its western neighbor, Westplains Water Storage District, adding 210,000 acres to the district boundaries. Approximately 18,000 acres were annexed to the District after the merger with Westplains Water Storage District to form the current 604,000-acre Westland Water District, with an irrigable acreage of 567,800 acres. The original Westlands Water District is now referred to as Priority Area I, and the former Westplains Water Storage District is now referred to as Priority Area II, each under separate water service contracts with Reclamation. Priority Area III (the additional 18,000 acres annexed into the district) does not currently have a firm water service contract and receives water through internal and external water transfers. Most of Priority Area I is located east of the San Luis Canal and has gravity water service. Small recirculating pumps are used to pressurize supply laterals serving land adjacent to the San Luis Canal that is too high to be served through gravity laterals. Much of Priority Area II is west and upslope of the San Luis Canal and is served by pumping from the San Luis Canal and gravity supply from the Coalinga Canal. Approximately one-third of the land between the San Luis Canal and the Coalinga Canal is served by pumping from the San Luis Canal.

The current population within the Westlands Water District is approximately 50,000. The major community entirely within Westlands Water District is Huron, but the communities of Firebaugh, Mendota, Kerman, Tranquillity, San Joaquin, Lemoore, and Stratford lie just outside the district's eastern edge. Coalinga lies to the west of the district, and Kettleman City and Avenal lie to the south. Helm, Cantua Creek, Three Rocks, and Five Points are smaller communities within Westlands Water District. The communities of Five Points and Helm are on the eastern side of the district and within the district's shallow groundwater region, while the communities of Cantua Creek and Three Rocks are on the western side of the district (Westlands Water District 2003).

Westlands Water District Distribution District No. 1

Westlands Water District Distribution District No. 1 consists of Priority Areas II and III and was formed for the purpose of entering into contracts for water service. Specifically, in 1999, Distribution District No. 1, together with the Santa Clara Valley Water District and the Pajaro Valley Water Management Agency, entered into an assignment contract with Reclamation for 6,260 acre-feet of water from Mercy Springs Water District.

Westlands Water District Distribution District No. 2

Two landowners within Westlands Water District and Mercy Springs Water District desired to move water supply from Mercy Springs Water District into Westlands Water District. In response, Westlands Water District Distribution District No. 2 was formed and consisted specifically of those lands owned by the private landowners within Westlands Water District. Westlands Water District Distribution District No. 2 and Mercy Springs Water District then requested that Reclamation assign 4,198 acre-feet of water from Mercy Springs Water District to Westlands Water District Distribution District No. 2, with the supply to be allocated to only those lands within Westlands Water District Distribution District No. 2

Description of District Facilities

Westlands Water District's permanent distribution system consists of 1,034 miles of closed, buried pipeline that conveys CVP water from the San Luis and Coalinga Canals and 7.4 miles of unlined canal that conveys CVP water from the Mendota Pool. The closed, buried pipeline virtually eliminates seepage and evaporation losses in the distribution system. The area served by the system encompasses approximately 88 percent of the irrigable land in the district, including all land lying east of the San Luis Canal. All water is metered at the point of delivery through more than 3,300 metered field turnouts.

Most of the remaining district lands are served by farmer-constructed temporary diversions that are maintained by individual farmers. These diversions include a number of permanent and temporary turnouts and metered piped laterals from the San Luis and Coalinga Canals.

The district also operates and maintains the 12-mile-long, concrete-lined Coalinga Canal, the Pleasant Valley Pumping Plant (both previously described in Chapter 1), and the laterals that supply CVP water to Coalinga and Huron.

CVP Contracts

On June 5, 1963, the Westlands Water District entered into a long-term contract (Contract 14-06-200-495-A) with Reclamation for 1,008,000 acre-feet of CVP supply from the San Luis Canal, Coalinga Canal, and Mendota Pool. In a stipulated agreement dated September 14, 1981, the contractual entitlement to CVP water was increased to 1.15 million acre-feet. The majority of water delivered is used for agricultural purposes. Priority Area I has a contract amount of 900,000 acre-feet and Priority Area II has a contract amount of 250,000 acre-feet. As stated above, Priority Area III, which does not have a water service contract, receives surplus CVP water or hardship water when available from Reclamation during drought periods to preserve trees and vines. The long-term contract will expire on December 31, 2007. Reclamation intends to enter into a long-term renewal of this contract prior to expiration.

Use of Other Available Water Supplies

In addition to the CVP supply, approximately 200,000 acre-feet of water is pumped from the underground aquifers during wet years. Westlands Water District supplies groundwater to some district farmers and owns some groundwater wells, with the remaining wells privately owned by water users in the district. Other water supply sources in the district include flood flows from the Kings River, which are available periodically and diverted from the Mendota Pool.

Operating Rules and Regulations

Farmers in Westlands Water District apply for an allocation of CVP water and may take their allocation as needed and as available throughout the season. The district operates an arranged rate-demand ordering system and farmers must notify the district 24 hours prior to beginning irrigation.

Water Transfers

Westlands Water District often participates in water transfer arrangements with other water districts in order to supplement the CVP water supply. In past years, the district has actively transferred water from many contractors within as well as outside the CVP. Typically, in water-short years, the district would actively transfer water only into the district.

Irrigation

Westlands Water District surveys farmers annually to determine the types of irrigation systems used during the crop season. Recent trends show decreases in the exclusive use of both surface irrigation and sprinkler systems. An increase was found in the acreage

irrigated by sprinkler and furrow systems as well as drip/trickle systems. This change corresponds to the conversion from row crops to permanent crops that has been occurring throughout much of the San Joaquin Region of the CVP.

PACHECO WATER DISTRICT'S FACILITIES AND WATER USE

Pacheco Water District is located on the western edge of the San Joaquin Valley near Los Banos in both Merced and Fresno Counties. The district was formed in 1953 for the purpose of obtaining a CVP water supply. Originally all CVP water was delivered via the Delta-Mendota Canal, until the completion of the California Aqueduct, when the district and the United States entered into letter agreements for conveyance of the CVP supply through the San Luis Canal. Currently, all CVP water for the district is supplied from the San Luis Canal, with the Delta-Mendota Canal serving as a backup source. In 1999, the Pacheco Water District contracted with neighboring Panoche Water District to provide all management services. Currently, Pacheco Water District uses its CVP supply solely for agricultural purposes, although it historically has utilized a few acre-feet for incidental domestic purposes.

Description of District Facilities

Pacheco Water District's current distribution system consists of concrete-lined ditches, earth-lined canals, and pipelines ranging from 10 to 30 inches in diameter. In 1995, the district also completed the construction of a 450 acre-foot regulating reservoir to collect tile drainage water for discharge or reuse. In 1996, a concrete-lined canal and pipeline system was constructed to extend the delivery of CVP water from the San Luis Canal to the entire district. The completion of this latter project helped conserve water and provide flexibility in the management of fresh water supply and recirculated drainwater.

CVP Contracts

On March 24, 1977, Pacheco Water District entered into a long-term contract (Contract 07-07-20-W0005) with Reclamation for 10,080 acre-feet of water supply from the Delta-Mendota and San Luis Canals. This contract was superseded by a contract executed on February 3, 1986. The second contract (Contract 14-06-200-W069) changed some of the contract terms but still provided for the delivery of 10,080 acre-feet of CVP water. The long-term contract will expire on February 29, 2024. Reclamation intends to enter into a long-term renewal of this contract prior to expiration.

Use of Other Available Water Supplies

The CVP supply is Pacheco Water District's primary long-term water supply. The district also has a surface water supply from the Central California Irrigation District, under a

Railroad Commission Order authorizing the service to the land within the district. The district owns one well, but does not pump groundwater because of the poor quality of the underlying groundwater.

Operating Rules and Regulations

At the beginning of each irrigation season, each irrigator is required to submit a written application for water that specifies the number of acres to be irrigated, type of crops, the number of acres to be devoted to each crop, and the projected water usage by month. The application and deposit billing are required each year.

Water Transfers

Pacheco Water District's water transfer policies allow a water user to transfer its allocation to another user within the district. Some landowners in the district also own and farm land in neighboring districts. Pacheco Water District policies also allow a landowner to transfer water to the same landowner in a different district, as long as the landowner pays all outstanding charges. The district also has the right to transfer water supplied under its water service contract outside the district to other CVP contractors, but it has no formal written policy regarding these transfers.

Irrigation

Approximately 80 percent of the lands in the district are furrow-irrigated. Some of the land is irrigated with furrows in conjunction with sprinklers, which are used for pre-irrigation. Pre-irrigation increases the efficiency of water use. This is becoming a more common practice.

PANOCHE WATER DISTRICT'S FACILITIES AND WATER USE

Panoche Water District was formed in 1954 and is located on the western side of the San Joaquin Valley in both Merced and Fresno Counties. The district is comprised of approximately 38,000 acres with a population of approximately 300. A small amount of CVP water is diverted annually to satisfy domestic needs within the district. Panoche Water District provides management services for several neighboring districts including Pacheco and Mercy Springs Water Districts and Charleston Drainage District.

Description of District Facilities

Panoche Water District's conveyance system is composed of approximately 45 miles of canals and pipelines to serve its landowners. This system includes approximately 15 miles of unlined canals, 22 miles of lined canals, and almost 8 miles of pipeline. Approximately

66 percent of the district's conveyance system is either lined canal or pipeline. The district intends to continue lining sections of canal as economically feasible.

Panoche Water District obtains CVP water through two diversion points on the Delta-Mendota Canal and five diversion points on the San Luis Canal. Modifications to the conveyance system made in 1989 allowed a larger portion of water delivery to be made by gravity from the San Luis Canal, in lieu of pumped delivery from the Delta-Mendota Canal. Water obtained from the San Luis Canal is delivered throughout the district by gravity, whereas water obtained from the Delta-Mendota Canal must be pumped for delivery. However, both sources are used to maximize the flexibility, timing, and efficiency of deliveries to different areas and crops within the district, as well as to maintain water quality during periods of drainwater recirculation.

CVP Contracts

On August 16, 1955, Panoche Water District entered into a long-term service contract (Contract 14-06-200-7864) with Reclamation for 93,988 acre-feet of water per year from the Delta-Mendota Canal. On August 30, 1974, the contract with Reclamation was amended (Contract 14-06-200-7864A) to allow a maximum delivery of 94,000 acre-feet of water from either the Delta-Mendota Canal or the San Luis Canal. This contract was further revised on January 13, 1986, and November 14, 1988, in amendatory contracts that revised some contract terms but not the maximum quantity of CVP water to be supplied. The majority of water delivered is used for agricultural purposes. Panoche Water District's long-term contract will expire on December 31, 2008. Reclamation intends to enter into a long-term renewal of this contract prior to expiration.

Use of Other Available Water Supplies

The CVP supply is the Panoche Water District's only long-term water supply. The district does not own or operate any groundwater wells. However, there are 42 privately owned and operated groundwater wells in the district service area. Because of its poor quality, groundwater is only used as a drought contingency water supply source.

Operating Rules and Regulations

Panoche Water District allocates water to users on a pro rata basis, depending on the acreage farmed. Water users are required to file a water application with the district at the beginning of the water year, stating their desire to take all or a portion of their water allocation for the upcoming year. If a water user does not want any portion of its allocation, that amount of water is reallocated to all other water users.

Water Transfers

Panoche Water District often participates in water transfer arrangements with other Delta-Mendota Canal Unit and San Luis Unit contractors to supplement its CVP supply under shortage conditions and as necessary to ensure complete utilization of the CVP supply. The district actively transfers water both into and out of the district. In recent years, primarily due to chronic shortages in contract allocations, the district has actively participated in water transfers with other San Luis Unit and Delta-Mendota Canal Unit contractors including Oro Loma, Mercy Springs, Westlands, Widren, Banta-Carbona, and San Luis Water Districts, as well as in transfer and banking projects involving other types of contractors.

Irrigation

Approximately 20,000 acres in the Panoche Water District are irrigated through the use of sprinklers in conjunction with graded/siphon tube irrigation. Approximately 8,000 additional acres are irrigated exclusively by the graded/siphon tube method. Subsurface trickle irrigation and graded/gated pipe irrigation are also used. Additionally, sprinkler systems are used exclusively on a small percentage of the irrigated acreage.

CDFG'S FACILITIES AND WATER USE

The CDFG currently receives 10 acre-feet of M&I water for domestic use at the headquarters of the Mendota Waterfowl Management Area. The headquarters consists of five houses, a conference hall, and a workshop, all of which are located at 4333 South Santa Fe Grade, Mendota, California, on approximately one acre of land. There is an on-site water treatment facility that is used to treat the CVP water before it is used for landscaping and at the visitor's center and employee residence.

Use of CVP Water

On January 1, 1976, the CDFG signed a long-term contract (Contract 14-06-200-8033A-LTR1) with Reclamation to supply 10 acre-feet of supply for domestic use at the Mendota Waterfowl Management Area headquarters, near the City of Mendota. This contract will remain in effect until December 31, 2008. Reclamation intends to enter into a long-term renewal of this contract prior to expiration.

Use of Other Available Water Supplies

CVP supply is the CDFG's only long-term water supply used at the Mendota Waterfowl Management Area headquarters.

SAN LUIS UNIT CONTRACTORS' TRANSFERS FROM 1993 THROUGH 2004

Table 3.1-1 summarizes the volume of water transfers conducted by the San Luis Unit contractors. Examination of the "Net Transfers" column indicates that the cities of Avenal, Coalinga, and Huron, and Panoche Water District have, in the past 11 years, transferred more water out of their service areas than they've received in transfers. Conversely, the Pacheco and San Luis Water Districts have received slightly more water from transfers than they've transferred in during the same period. Finally, the Westlands Water District is notable in the volume of water received in transfers when compared to the other contractors.

Table 3.1-1
San Luis Unit Contractor Water Transfers: 1993 – 2004[1]
(in acre-feet – 11-year statistics)

Contractor	Total Transfers In[2]	Total Transfers Out[2]	Net Transfers	Average Annual Transfers In	Average Annual Transfers Out
City of Avenal	400	(1,000)	(600)	33	(83)
City of Coalinga	0	(5,351)	(5,351)	0	(446)
City of Huron	0	(1,350)	(1,350)	0	(113)
Pacheco Water District	2,357	(123)	2,234	196	(10)
Panoche Water District	30,763	(123,831)	(93,068)	2,564	(10,319)
San Luis Water District	86,761	(84,087)	2,674	7,230	(7,007)
Westlands Water District	2,744,388	(89,876)	2,654,991	228,699	(7,489)

[1]Complete transfer data for the period of 1993 through 2004 is included herein. Data for 2005, included through the month of May, should not be considered complete and is subject to change, as transfers between parties are ongoing.
[2]Please note that the data presented in Table 3.1-1 includes two entries for each transfer between contractors within the San Luis Unit. Transfers from one SLU contractor to another are included as both a transfer out from the seller and a transfer in to the buyer, resulting in an aggregate over-statement of transferred volumes.

SECTION 3.2: DRAINAGE AND WATER QUALITY

This section discusses the potential effects that the alternatives considered in Chapter 2 would have on drainage and water quality in the San Luis Unit. The methods of analysis used in this section are described below. Information in this section was summarized from the Draft CVPIA PEIS, Groundwater, Technical Appendix Volume 2 (Reclamation, 1997a), Delta-Mendota Canal EA (Reclamation, 2005), and the San Luis Drainage Feature Re-evaluation DEIS (Reclamation, 2005) and also includes information provided by the districts who receive water from the San Luis Unit.

AFFECTED ENVIRONMENT

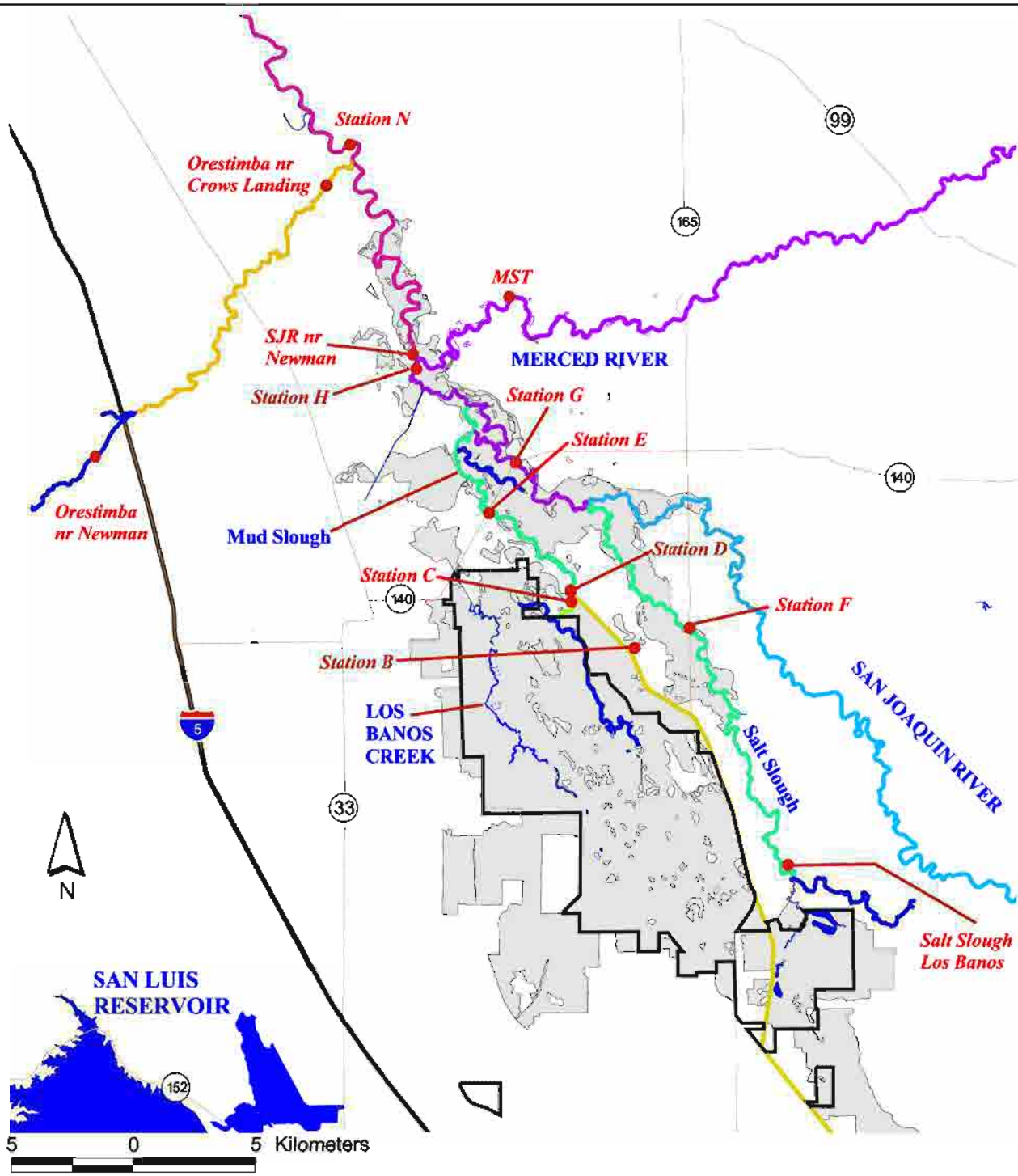
STUDY AREA

The affected environment includes the study area, as described in Chapter 1, an area including the western portions of Fresno, Kings, and Merced counties. The study area is further defined as including the water delivery service areas of the cities of Avenal, Coalinga, and Huron and the Pacheco, Panoche, San Luis, and Westlands Water Districts, as well as water delivered to the CDFG for domestic use at the Mendota Waterfowl Management Area.

SAN JOAQUIN RIVER

The affected environment includes the San Joaquin River because drainage from the Northern San Luis Unit reaches the San Joaquin River in the form of drainage flows discharged to Mud Slough North and the river by the Grassland Bypass Project. There is presently no outlet for drainage discharges from the Westlands area of the San Luis Unit. Flows in and to the San Joaquin River play a major role in dictating its water quality. From a regional perspective, flows in the San Joaquin River are controlled mostly by dams on east-side tributaries and on the main stem upstream from Fresno. Water stored in Millerton Reservoir, located on the San Joaquin River upstream of Fresno, is diverted through the Friant-Kern and Madera canals. Releases from the reservoir infiltrate into the river bottom, and the river is often dry much of the year in a stretch below Gravelly Ford. The channel is usually wet in the area of San Mateo Avenue. Water supply developments on the major east-side tributaries have reduced the flow of the San Joaquin River (SJVDP 1990).

Flow contributions to the San Joaquin River upstream of Crows Landing (Station N) are shown in Figure 3.2-1. Major contributors of flow to the San Joaquin River include the upstream flows in the San Joaquin River above the Salt Slough confluence, Salt and Mud sloughs, the major Westside tributaries of the San Joaquin River, and the Merced River.



Legend

Annual Water Flow (af)

- 30000 - 40000 (af)
- 40000 - 60000 (af)
- 60000 - 100000 (af)
- 100000 - 250000 (af)
- 250000 - 400000 (af)
- 400000 - 750000 (af)
- 750000 - 1100000 (af)
- Unmonitored

- Monitoring Stations
- Canals
- Drains
- Primary roads
- Secondary and connecting road
- Wetlands Habitat
- Grassland Water District Boundary
- Regional Water Bodies

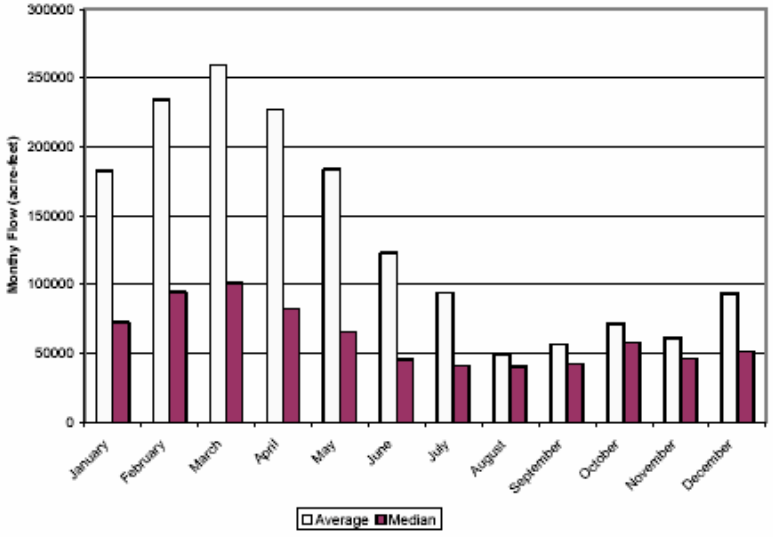
San Luis Drainage Feature Re-evaluation	Mean Annual Water Flow in the San Joaquin River	Figure 3.2-1
17324004		

By far the largest of these sources is the Merced River, which accounts for approximately 50 to 75 percent of the flow in the San Joaquin River measured at Crows Landing. Note that releases from Friant Dam located on Millerton Reservoir upstream from the drainage area are not generally a major source of flow at Crows Landing except during flood releases. Releases from Friant Dam are for riparian water users and flood control. Therefore, most flow in the San Joaquin River above the confluence of Mud Slough North consists of surface return flows or operational outflows from irrigated lands outside the San Luis Unit. In 1999–2005, the Vernalis Adaptive Management Plan (VAMP) (implemented by the San Joaquin River Agreement) on the San Joaquin River has resulted in increased spring releases (April-May) from the dams and reservoirs located on the east side of the San Joaquin Valley.

The largest flows in the San Joaquin River occur during the late winter and spring from January through May. The lowest flows occur during the late summer in August and September. Thirty years of flow records are available at Crows Landing. A review of these records indicates that during winter months the high flows at Crows Landing are strongly influenced by large storm events. During the winter to early summer (January-July) the statistics of the flow record are highly skewed. The average is influenced by a few large events and is not representative of typical flows in the river. Figure 3.2-2 shows the average and median monthly flows at Crows Landing based on the 30-year record.

The affected environment does not extend to the Delta. This is because isolating the impacts of drainage discharges from the San Luis Unit on the Delta is difficult due to the large number of other sources of inflow. In addition, inflows from the San Joaquin River to the Delta are augmented by high quality water from Reclamation's New Melones Reservoir that is released to maintain water quality standards in the Delta. The obligation to comply with Delta water quality standards will continue to govern San Joaquin River flows.

Figure 3.2-2
Average and Median Monthly Flows in the San Joaquin River at Crows Landing (Based on 30 Years of Records)



ENVIRONMENTAL CONSEQUENCES

This section describes the potential environmental consequences or impacts that long-term contract renewals could have on drainage and surface water quality in the San Luis Unit and the affected area.

NO ACTION ALTERNATIVE

The No Action Alternative is based on renewal of water service contracts at the amounts specified in previous contracts. The No Action Alternative in this EIS is not equivalent to the No Action Alternative in the San Luis Unit Drainage Feature Re-Evaluation in that this EIS reflects 2005 existing conditions, as compared to 2001, and it assumes that drainage service will be provided within the term of the contracts as required by law, although the timing and specific form of drainage service cannot be specified with more precision than is identified in the separate proposed federal action analyzed in the San Luis Drainage Feature Re-evaluation DEIS. Thus, with respect to water deliveries and drainage production, the No Action Alternative reflects existing conditions plus trends as described in this section.

Production of Drainage Water

Of the nine San Luis Unit contractors, five districts (i.e., Panoche, Pacheco, San Luis, Westlands Water Districts, and Westlands Distribution District No. 2) apply the majority of their CVP allocations for agricultural use. Because these five districts contribute to CVP drainage, they will be part of the eventual solution to the San Luis Unit's drainage

problems. As discussed below, the water districts have ongoing, district-specific policies and methods for dealing with drainage.

Northern San Luis Unit Area

The Northern Area of the San Luis Unit includes approximately 38,000 acres in the Panoche Water District, 4,100 acres in the Pacheco Water District and 5,300 acres in the San Luis Water District. Of this area, approximately 30,000 acres is presently improved with subsurface drainage systems (SLDFRE DEIS Table C1-4). Drainage water from irrigation within the Northern Area of the San Luis Unit is produced primarily through operation of subsurface tile and deep drain collector systems which remove subsurface water from the plant root zones. Drainage produced within the Northern Area may also result from uncontrolled groundwater intrusion from upslope irrigation, subterranean flows from the Coastal Range, and California Aqueduct seepage. Each of the districts in the Northern Area encourage on-farm drainage management through policies to control surface water discharges, programs to support on-farm irrigation efficiency improvements, and mandatory water conservation planning. Each of the three districts also reuse drainage water within their respective drainage service areas.

All three areas are within the Grassland Drainage Area and participate in the Grassland Bypass Project, which serves a total of 97,000 acres. At present, drainage that leaves each district's boundaries is disposed of by reuse on the 4,000-acre San Joaquin River Water Quality Improvement Project and/or discharged through the Grassland Bypass Project into the San Luis Drain, Mud Slough North and ultimately, the San Joaquin River. In terms of drainage volume, in 2004, Panoche Water District discharged approximately 9,200 af to the Grassland Bypass after drainage reduction through in-district reuse of approximately 2,800 AF and application of approximately 6,300 af for reuse on the San Joaquin River Improvement Project. After the drainage reduction activities within Pacheco and San Luis Water Districts, Pacheco discharged 1,150 af to the Bypass, and the combined San Luis areas discharged, 1,590 af. Thus, a combined Northern Area of 47,400 acres discharged approximately 12,000 af to surface water. It is anticipated that drainage discharges to surface waters from the Northern Area will terminate at the end of 2009, that additional in-valley reuse areas will be in place before 2010, and that by 2015, some additional treatment and disposal will be necessary to maintain the viability of all lands and reuse areas. Should none of these developments occur, some lands within the Northern Area would be likely to experience the consequences of increased saline ground water, especially during the final 15 years of the long term renewal contracts.

Westlands Area

Drainage production in Westlands Water District also results from the application of irrigation water. However, Westlands does not collect subsurface or surface drainage and does not discharge any subsurface agricultural water outside its boundaries. Lack of a drainage outlet has led to an increase in saline groundwater beneath some portions of the District. According to the schedule presented in the San Luis Drainage Feature Re-evaluation DEIS, it is anticipated that drainage service will be provided by the end of 2009 to limit the effects of drainage produced by continued water delivery over the term of the contract.

District Activities

Panoche Water District

Drainage Practices. Panoche Water District receives drainage service from Panoche Drainage District, which is responsible for the disposal of surface and subsurface drainage water from Panoche Water District and also from the neighboring Eagle Field, Mercy Springs, and Oro Loma Water Districts. In 1996, Panoche Drainage District became one of the participants in the Grassland Bypass Project, discussed below, which allowed the District to discharge into the San Luis Drain in exchange for a substantial reduction in discharge volume. Since that time, Panoche Water District, in close coordination with the Drainage District, has implemented many programs and Best Management Practices designed to improve irrigation practices and efficiency, to more efficiently use water, and to reduce drainage outflow from its service area. The Water District invested $4.2 million in a recirculation system to allow subsurface drainage to be redistributed throughout the District, along with projects within the District to apply drainwater for reuse. Its water users also have access to low-interest loan programs for irrigation improvements. These programs plus a shift from field crops to permanent crops or to drip irrigation on field crops has resulted in the conversion of approximately 10,000 acres to drip irrigation with an addition 2,000 to 3,000 acres likely to be converted in the near future. This constitutes a substantial contribution toward source control in a district covering approximately 38,000 acres.

As of May 1997, Panoche Water District does not allow any tailwater (or surface drainage water) in its drainage system. The water is retained on-farm by individual water users, where it is recirculated into the farmer's delivery system and redelivered to the field. This promotes more efficient water use and reduces the volume of drainage water discharged. The District also monitors drainage water coming into and being discharged from its distribution system, while Panoche Drainage District conducts extensive water quality monitoring on water in the drainage system. As part of Panoche Drainage District,

Panoche Water District coordinates with the Westside Watershed Coalition, a participant in the Regional Board's Irrigated Lands Conditional Waiver Program.

Pacheco Water District

Drainage Practices. Pacheco Water District is another one of the districts participating in the Grassland Bypass Project. In Pacheco Water District, both surface and subsurface drainage are recirculated for reuse or discharged. Most return flows are captured by the District and recycled or released as surface drain outflow. In 1995, to improve water conservation and facilitate drain water management, the District constructed a reservoir to store tile drainage water for regulation, discharge, and/or reuse. In 1997, Pacheco Water District obtained a loan from the SWRCB's state revolving fund to construct a district-wide recirculation system. The system transports subsurface drainage water from the district's main discharge point through a half-mile-long pipeline and concrete-lined ditch. The recirculated drain water is then discharged into the district's primary irrigation facilities. Some on-farm return systems also exist within the District, and Pacheco Water District has adopted a policy to encourage the use of more on-farm return systems to reduce drainage discharge. Pacheco coordinates with the Westside Watershed Coalition, a participant in the Regional Board's Irrigated Lands Conditional Waiver Program. The District monitors water quality in its drainage system.

Water discharged from Pacheco Water District is measured by flowmeters at two locations, north of the Outside Canal and at the San Luis Drain. Water quality sampling and testing are completed monthly. At present, all drainage not reused within Pacheco is discharged through the Grassland Bypass Project, and Pacheco also utilizes load trading to comply with its Grassland Bypass Project monthly selenium load targets. Future expansion of the San Joaquin River Improvement Project, discussed below, will allow for direct application of drainage from Pacheco to a reuse area.

San Luis Water District

Drainage Practices. The only water that leaves the San Luis Water District is surface and subsurface drainage from the District's approximately 5,300 acre drainage area. The drainage area makes up less than one-fourth of the portion of the District that is located in Merced County. The drainage area is managed by both public and private entities. Charleston Drainage District measures and manages drainage from the majority of the drainage area in the San Luis Water District, consisting of approximately 4,300 acres; drainage from a smaller portion of the drainage area, approximately 1,000 acres, is measured and managed by Pacheco Water District Drainage in the remainder of the district's drainage area is measured and managed by private landowners.

The 5,300 acre drainage area managed by Pacheco and Charleston has a drainage outlet to the San Joaquin River through participation in the Grassland Bypass Project. Improved on-farm water application techniques and drainwater recycling systems have been installed on lands within the district to limit drainage discharge and to conserve water supplies. These efforts have resulted in a substantial reduction in drainage discharge. The district continues to support programs designed to improve the overall efficiency of water use and decrease drainage flows. The district also provides financial assistance to individual water users for improvement to irrigation and return flow systems. The San Luis Water District is working on a program to participate in the Regional Board's Irrigated Lands Conditional Waiver.

Westlands Water District

Drainage Practices. Since the closing of Kesterson Reservoir in 1985, Westlands Water District has invested more than $5 million to investigate ways to solve its drainage problems including reuse sites, evaporation ponds, and deep well injection To reduce drainage water, Westlands Water District is actively improving irrigation management. It also has approximately 3,300 flow meters, which aid farmers in precisely measuring the amount of water delivered and in calculating irrigation efficiency.

Westlands is in the process of pursuing a short-term land fallowing program as a means to balance demand against a water supply that has diminished in its reliability and to reduce drainage impacts in the district until Reclamation is able to provide drainage service. Currently, Westland has approximately 570,000 irrigable acres. The land fallowing program is being implemented on approximately 45,000 acres and temporarily removes land from irrigated production. The program is not land fallowing in the strictest sense in that, while the land is not being irrigated, it is remaining in dryland agricultural production. As an interim form of drainage service, this program is effective because it removes the requirement for drainage from the participating land and because the continuing dryland farming lowers water table elevations both in the participating area and under surrounding lands. Lands involved in the land fallowing/dryland farming program have been acquired under the settlement agreement for the Sagouspe litigation. The ultimate plan is for a total reduction of about 70,000 acres. By doing so, the lands remaining in production will have a more adequate water supply to ensure the long-term viability of west side communities and preserve the agricultural economy of the district.

Westlands distributes water through a piped conveyance system which essentially eliminates conveyance system seepage as a source of drainage. It does not collect subsurface or surface drainage and, with the closure of Kesterson Reservoir and the drainage collector system, does not discharge any subsurface agricultural drainage water

outside its boundaries. Pending implementation of Reclamation-sponsored drainage service within Westlands, the district is implementing the land fallowing program, as discussed above. Westlands has formed a watershed coalition and participates in the Regional Board's Irrigated Lands Conditional Waiver Program.

Westland Water Distribution District No. 2

Distribution District No. 2, located west of the California Aqueduct, is outside of the drainage service area and is experiencing no drainage problems.

Water Quality Effects of San Luis Unit Drainage

Mud Slough North

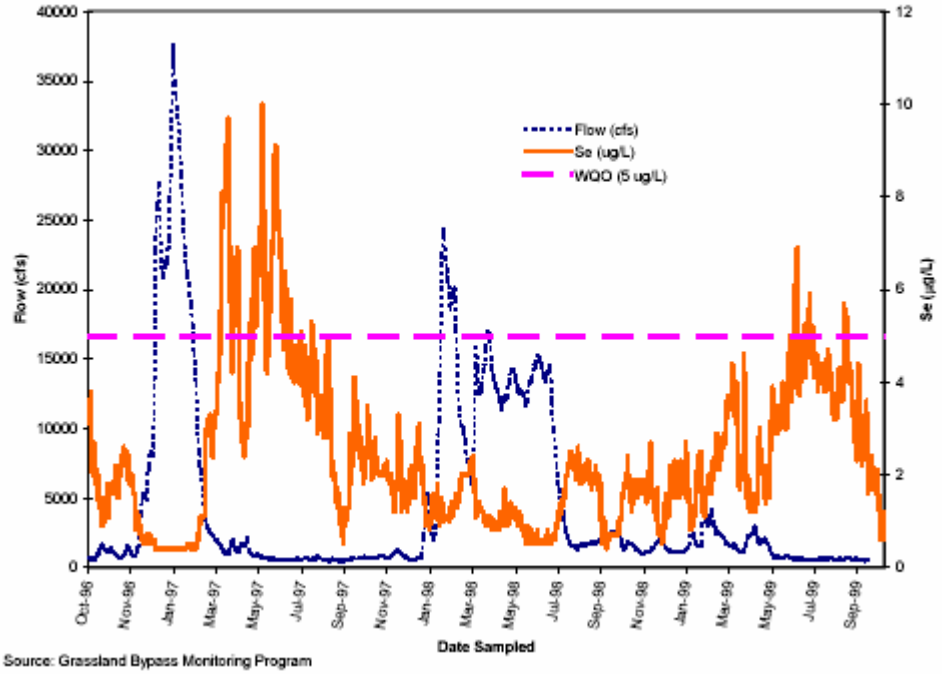
Mud Slough North receives subsurface drainage discharges from the Northern Area of the San Luis Unit through the Grassland Bypass Project. Selenium is a high-priority constituent of concern in Mud Slough North, and compliance with the objective of 5 µg/L 4-day running average is required by October 2010. This is expected to lead to termination of discharge from the Grassland Bypass Project into Mud Slough North. Boron, electrical conductivity (EC), pesticides, and unknown toxicity are all listed as low-priority constituents in Mud Slough.

San Joaquin River - Merced River to Crows Landing (River Miles ~ 118.5 to 100.0)

Downstream of the Merced River confluence, the San Joaquin River at Crows Landing (site of Station N) is a Regional Board compliance point for selenium. Flows at this point in the San Joaquin River are an aggregate of all the flows from Mud Slough, Salt Slough, the San Joaquin River upstream of Salt Slough, and the Merced River. Additional water sources contributing to the San Joaquin River in this reach, include Orestimba Creek and various other surface and subsurface flows. Flows in this portion of the San Joaquin River vary seasonally, with high flows in the winter and low flows during the summer. Figure 3.2-3 presents the daily flow and selenium concentrations in the San Joaquin River at Crows Landing. The monthly mean selenium concentration exceeded 5 µg/L twice in 12 months for Water Years 1996 and 1997, i.e., before and after Grassland Bypass Project implementation and never exceeded 5 µg/L in 2004. The monthly mean standard is the compliance objective through 2009, when a 4-day monthly average objective takes effect. As a 4-day running average, the concentration exceeded 5 µg/L during 2 months in Water Years 2004. Based on the comparison of the mass of selenium discharged from the San Luis Interceptor Drain and selenium mass monitored at Crows Landing, the bulk of the selenium found in the San Joaquin River at Crows Landing originates from the agricultural drainage discharged to Mud Slough.

Monthly total dissolved solid concentrations at Station N in Water Year 2004 ranged between approximately 610 and 970 mg/L (990 and 1,560 microSiemens per centimeter [µS/cm] EC), with an annual average of 800 mg/L (1290 µS/cm EC). The TDS/EC ratio of 0.62 was used to convert between TDS and EC at Station N, based on the value given for the closest location (San Joaquin River near Patterson) in *Loads of Salt, Boron, and Selenium in the Grassland Watershed and Lower San Joaquin River* (Regional Board, Central Valley 1998a).

Figure 3.2-3
Selenium Concentrations and Daily Flow in the San Joaquin River at Crows Landing (Station N)



Source: Grassland Bypass Monitoring Program

San Joaquin River at Vernalis (River Mile <77)

Discharges from the Grassland Drainage Area, together with all other inputs in the watershed, contribute to water quality at Vernalis. Water quality at Vernalis is of concern because this is the current compliance point for EC objectives. The State Board under CWA Section 303(d) has listed this site as an impaired waterbody for salt and dissolved oxygen. The major tributaries including the Merced, Tuolumne, and Stanislaus rivers as well as west-side inputs contribute to flows in this portion of the San Joaquin River. Flow in the San Joaquin River at Vernalis ranges from 66,664 to 206,638 af per month (Water Year 2004 data). Peak discharges generally occur in February to May with low flows occurring in the late summer. Constituents of concern in the San Joaquin River at Vernalis include salt (characterized as EC), boron, dissolved oxygen, and selenium. The 700 µmhos/cm 30-day running average specific conductance (or EC) water quality objective

(WQO) for the San Joaquin River near Vernalis for the April to August period was exceeded 54 percent of the time from 1986 through 1997 and 19 percent of the time in 2004. The l,000 µmhos/cm WQO for the September to March period was not exceeded in 2004 (USGS 2004). Since Water Year 1995, monthly average selenium concentrations have not exceeded the 5 µg/L 4-day average WQO. Since Water Year 1995, boron concentrations have been lower than the 0.8 mg/L monthly mean WQO.

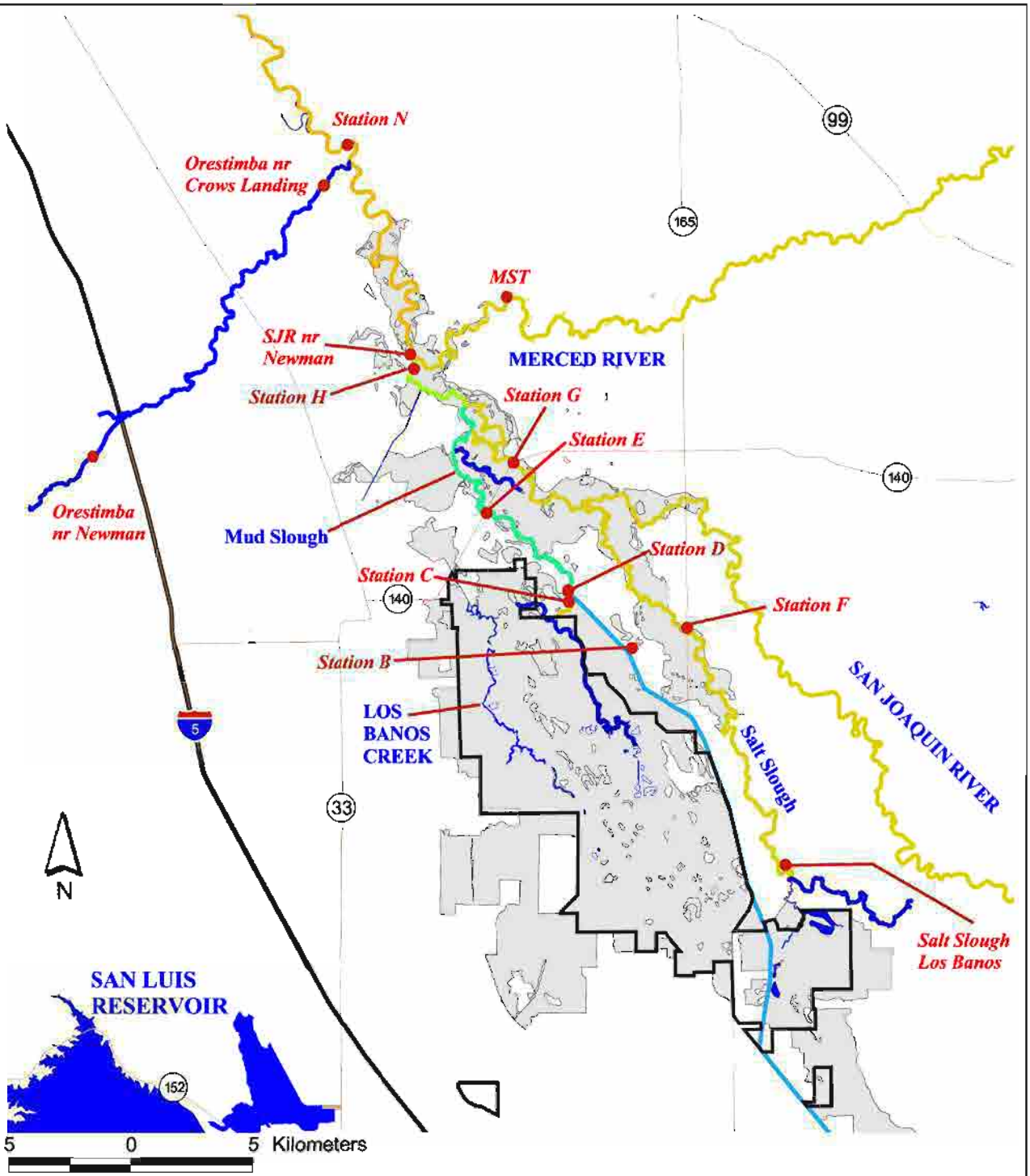
Constituents

Selenium

Selenium is a naturally occurring element found in soils and groundwater along the west side of the San Joaquin Valley, including in the Panoche-Silver Creek watershed**.** Annual runoff from this watershed continues to transport selenium into the San Luis Unit and also regularly contributes selenium to the San Joaquin River. Historically, these flows discharged to the San Joaquin River and at the trough of the valley often formed vernal pools**.** While essential as a nutrient in trace amounts, selenium is known to bioaccumulate in food chain organisms and become toxic. Selenium is carried into surface waters by flooding of certain creeks, but it also occurs in groundwater, particularly in the lower parts of the Coast Range alluvial fans. It can be leached from soils by the application of irrigation water, which can increase the concentration of selenium in groundwater. Selenium in surface water bodies is of concern for various listed species.

Median selenium values in the San Joaquin River at Crow's Landing occasionally exceed the Environmental Protection Agency's (EPA's) ambient water quality criteria of 5 µg/L for protection of aquatic life (SFEI 2002a). In Water Year 1999 selenium concentrations were highest in the San Luis Drain, Mud Slough, and the segment of the San Joaquin River between the Mud Slough and Merced River confluences as shown in Figure 3.2-4. Water quality from upstream Eastside tributaries was generally good (usually below 1 µg/L), providing a source of dilution water for discharges from the Grassland Drainage Area.

In the development of the 1999 Basin Plan, the Regional Board documented the sources of selenium in the San Joaquin River. The Regional Board has also developed a Total Maximum Monthly Load model and allocated loads entering the river to various sources. Additional information on selenium is presented below in the Related Projects and Activities section under the Grassland Bypass Project.



Legend

Selenium (µg/L)

- 0.2 - 2 (µg/L)
- 2 - 5 (µg/L)
- 5 - 10 (µg/L)
- 10 - 30 (µg/L)
- 30 - 60 (µg/L)
- Unmonitored

- Monitoring Stations
- Canals
- Drains
- Primary roads
- Secondary and connecting road
- Wetlands Habitat
- Grassland Water District Boundary
- Regional Water Bodies

San Luis Drainage Feature Re-evaluation	Existing Conditions for Selenium (WY 1999)	Figure 3.2-4
17324004		

Salinity

The salt concentrations in the lower San Joaquin River and south Delta frequently exceed desirable levels for agricultural and other beneficial uses. The 700 µmhos/cm specific conductance (or EC) WQO for the San Joaquin River near Vernalis for April to August has been exceeded over 50 percent of the time from 1986 through 1997 (Reclamation 2001c).

Salt concentrations are mapped for different river reaches in Figure 3.2-5. The distribution of salt is more widespread than the distribution of selenium. Salt concentrations are highest in the San Luis Drain and in the San Joaquin River upstream of Salt Slough. Significant concentrations of salt are also present in Salt Slough. The major source of less saline dilution water is from the Merced River, with annual average TDS concentrations of approximately 100 mg/L. Surface flows and subsurface agricultural drainwaters are the major sources of salt in the lower San Joaquin River Basin.

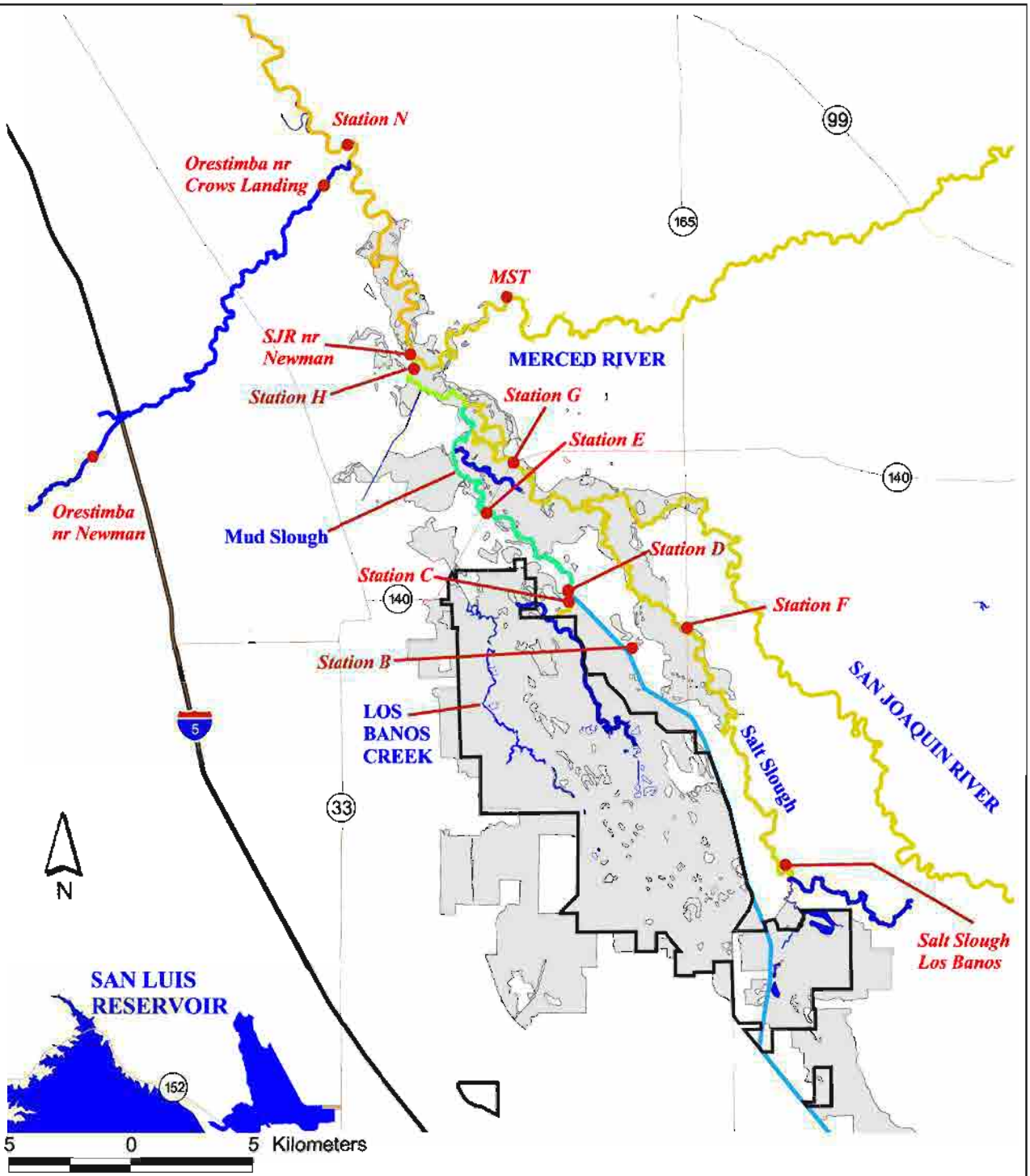
Surface agricultural runoff (tailwater discharges) from the Northern Area of the San Luis Unit contributes a small portion of the salt load to the San Joaquin River. Irrigation water applied to the region from the Delta-Mendota Canal and the California Aqueduct contains dissolved salts imported from the Delta, and tailwater discharges would convey this salt to the river. However, the Northern Area districts have a tailwater discharge prohibition in effect, and any tailwater discharges to the river are limited to equipment malfunctions and operational errors that are quickly repaired.

Storm water dissolves selenium and salt as it passes through the Panoche/Silver Creek watershed. This dissolved selenium and salt is carried to the San Joaquin River through natural channels, drains and canals in the San Luis Unit. Additionally, significant rainfall can increase the hydraulic pressures in the soil profile and increase the subsurface drainage discharges through the Grassland Bypass channel. These subsurface flows are high in both salt and selenium.

This salt loading contributes to impairment of water quality in the lower San Joaquin River and Delta region.

Boron

The distribution of boron in the San Joaquin River Basin is similar to that of selenium (Figure 3.2-6). Boron concentrations were highest in the San Luis Drain, Mud Slough, and the segment of the San Joaquin River between the Salt Slough and Mud Slough confluences. Upstream water quality was generally good (usually below 1 µg/L), providing a source of dilution water for discharges from the Grassland Drainage Area.



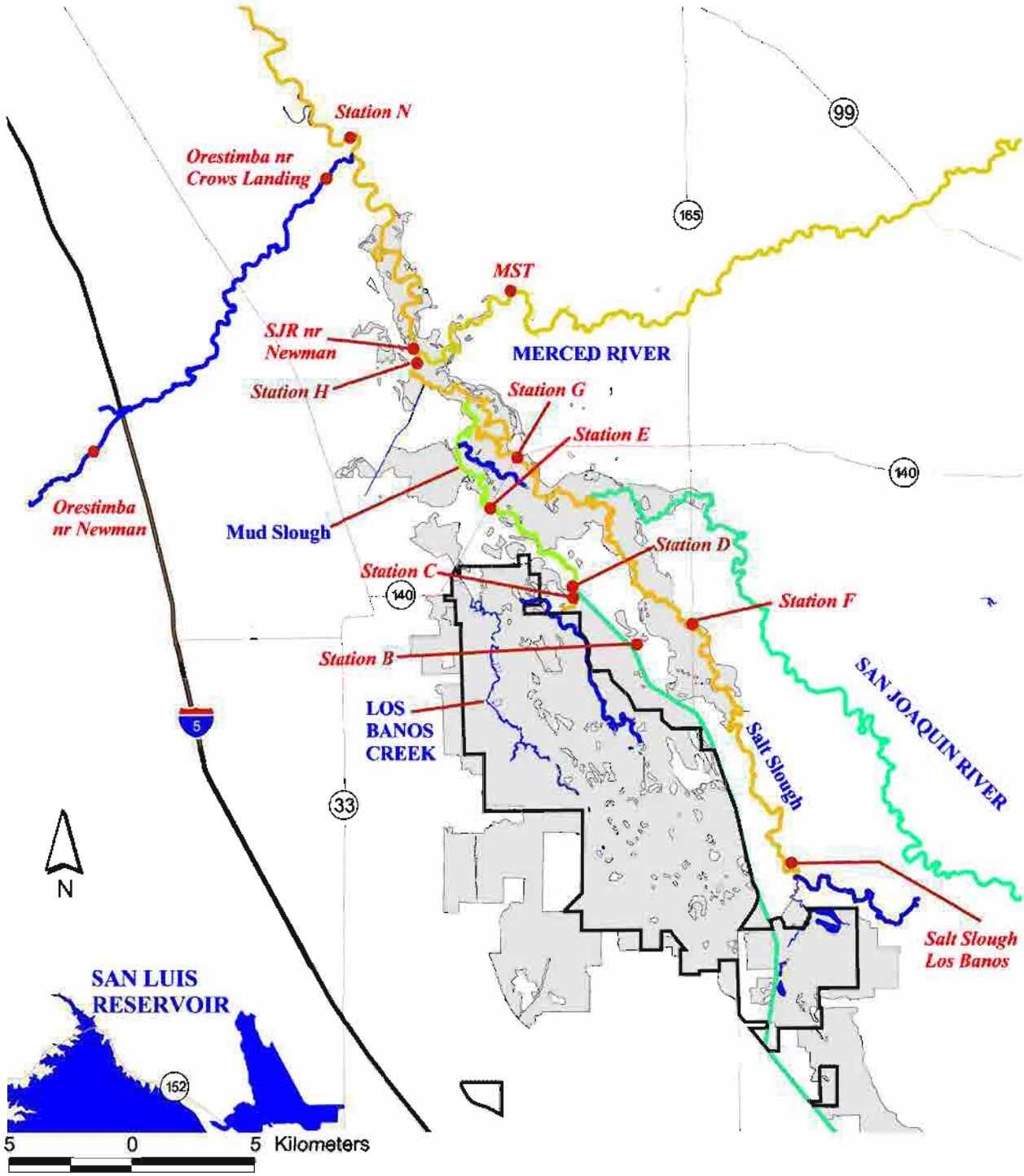
Legend

Selenium (µg/L)

- 0.2 - 2 (µg/L)
- 2 - 5 (µg/L)
- 5 - 10 (µg/L)
- 10 - 30 (µg/L)
- 30 - 60 (µg/L)
- Unmonitored

- Monitoring Stations
- Canals
- Drains
- Primary roads
- Secondary and connecting road
- Wetlands Habitat
- Grassland Water District Boundary
- Regional Water Bodies

San Luis Drainage Feature Re-evaluation 17324004	Existing Conditions for Selenium (WY 1999)	Figure 3.2-5



Legend

Salinity (mg/L)

- 100 - 750 (mg/L)
- 750 - 1500 (mg/L)
- 1500 - 2000 (mg/L)
- 2000 - 4000 (mg/L)
- Unmonitored

- Monitoring Stations
- Canals
- Drains
- Primary roads
- Secondary and connecting road
- Wetlands Habitat
- Grassland Water District Boundary
- Regional Water Bodies

San Luis Drainage Feature Re-evaluation	Existing Conditions for Salinity (WY 1999)	Figure 3.2-6
17324004		

Activities that influence drainage and water quality

The No Action Alternative includes consideration of reasonably foreseeable conditions that are expected to influence both future requirements for drainage and future provision of drainage service in the San Luis Unit, as well as influence water quality in the affected area.

Reasonably foreseeable events affecting drainage and surface water quality that have been incorporated in the No Action Alternative are the following:

1. Delivery of an increasing percentage of contracted water for M&I purposes. While irrigated agriculture requires drainage for sustainable production, M&I uses do not.

2. Irrigated agriculture will continue to be influenced by market forces which will affect demands for irrigation service.

3. Irrigation demands and water supply will continue to be affected by hydrologic and climatological conditions.

4. Irrigation water supplies will be affected by regulatory conditions.

5. Operation of the CVP and the SWP under OCAP will affect delivered water volumes and reliability of deliveries.

6. The contractors will continue existing actions to address drainage issues and will implement additional actions.

7. The quality and quantity of drainage discharges will comply with regulatory requirements.

8. Reclamation will comply with the court order to provide drainage service to San Luis Unit contractors, limited to the reasonably foreseeable condition of the general action of providing drainage service. The No Action Alternative does not make any assumption regarding the nature of Reclamation-supported drainage service, as that decision is not reasonably foreseeable. How the Secretary will meet her legal obligation to provide drainage service is the subject of separate environmental review.

The Final Report of the San Joaquin Valley Drainage Program (1990) notes that many of the valleys' districts and individual growers had already begun to take actions similar to those recommended in that report. The capacity of growers and districts to respond to drainage needs and water quality regulations has continued, as outlined in the District-by-District discussions above.

Central to the districts' activities in drainage management is compliance with water quality regulations being implemented in the San Joaquin River and key tributaries. As noted in the discussion of the Grassland Bypass Project, the actions of Grassland area farmers have had a significant impact in reducing selenium loadings discharged to the San Joaquin River. However, future load limits, coupled with the requirement to comply with water quality objectives by 2010 will make it infeasible, if not impossible to continue significant drainage discharges.

San Luis Unit districts and other districts draining to the San Joaquin River have been recommended for award of grant funding from Proposition 50 for projects to enhance the water quality of the San Joaquin River under the SWRCB-funded Agricultural Water Quality Grant Program. Within the San Luis Unit, the Panoche Drainage District has been awarded $389,500 by the SWRCB for the San Joaquin River Water Quality Improvement Project-Reuse Development Project. Neighboring districts including the Stevinson Water District, the Patterson Irrigation District, and the Grassland Water District were awarded a total of $2,598,329 for projects designed to improve water quality in the San Joaquin River and to contribute to implementation of total maximum daily loads (TMDLs) on the river.

Loan funding awarded to San Luis Unit contractors or to related entities by the SWRCB for drainage improvement activities include the projects listed in Table 3.2-1. The related entities in question are the Charleston Drainage District which lies within the San Luis Water District and the Panoche Drainage District which lies within the Panoche Water District.

Table 3.2-1
Drainage Program Loan Funding
to San Luis Unit Contractors and Drainage Districts

District	Project	Loan Amount
Charleston Drainage District	Recirculation System	$320,000
Pacheco Water District	Drainwater Recirculation System	$1,375,000
Pacheco Water District	Acquisition of Improved Irrigation Equipment	$737,500
Panoche Water District	Drainwater Recirculation System	$4,228,000
Panoche Drainage District	Acquisition of Improved Irrigation Equipment	$4,997,294
San Luis Water District	Irrigation System Improvement Project	$7,500,000
Westlands Water District	Irrigation System Improvement Project	$9,200,000

Districts within the San Luis Unit are also participants in watershed coalitions organized under the Irrigated Lands Conditional Discharge Waiver. Westlands Water District and Westland Water District Distribution District No. 2 are in a single coalition. Panoche Water District and Pacheco Water District are not subject to the waiver program because they are subject to the waste discharge requirements for the Grassland Bypass. They are, however, cooperating agencies with the Westside San Joaquin River Watershed Coalition. The San Luis Water District is considering forming its own watershed coalition. The watershed coalitions of which San Luis Unit districts are members are working with the SWRCB to implement monitoring and compliance programs to report and control discharges of agricultural drainage and storm water runoff from irrigated lands.

Because the combined impact of the selenium objective compliance requirements in Mud Slough North and potentially, implementation of the Lower San Joaquin River Salt and Boron TMDL are expected to effectively eliminate agricultural discharges to the San Joaquin River, districts within the San Luis Unit are responding to the requirements of these regulations in ways that will complement Reclamation's obligation to provide drainage service under the San Luis Act. The approaches being planned and implemented by the districts conform with techniques being considered by Reclamation in the In-Valley disposal alternatives studied in the Drainage Feature Re-evaluation. Regional efforts to address water quality issues that comprise a portion of the District activities described above are considered in more detail under the following heading.

Regional Activities Affecting Discharges to Surface Waters

Grassland Bypass Project

Pacheco Water District, Panoche Water District, and approximately 5,300 acres in the San Luis Water District participate in the Grassland Bypass Project that allows sub-surface drainage water from these districts to be discharged to the San Joaquin River.

The Grassland Bypass Project is administered by the San Luis & Delta-Mendota Water Authority. The Grassland Bypass Project serves approximately 97,000 acres in the Grassland Drainage Area. In addition to the San Luis Unit contractor service areas described above, the Grassland Bypass Project serves approximately 16,500 acres within the Delta-Mendota Canal Unit contractors, including Broadview Water District, Eagle Field Water District, Oro Loma Water District, Mercy Springs Water District, and Widren Water District, as well as 28,000 acres in portions of Firebaugh Canal Water District and Central California Irrigation District, and 5,500 acres that are outside any organized district.

Since October 1996, subsurface agricultural drainage water produced in the 97,000-acre Grassland Drainage Area has been collected and routed into the San Luis Drain pursuant to the Use Agreement[1,2] between the United States and the San Luis & Delta-Mendota Water Authority. From the San Luis Drain, the subsurface drainage water is discharged into Mud Slough, a tributary of the San Joaquin River upstream of the Merced River.

Under the terms of the Use Agreement as well as under Waste Discharge Requirements[3] issued by the Regional Board, a substantial reduction in drainage discharges is required in order to meet load targets for selenium and salinity. Pacheco Water District and Panoche Water District use a variety of drainage management practices to meet their respective shares of Grassland Bypass Project obligations to reduce salt and selenium loads, including:

1. district rules prohibiting tailwater discharges;

[1] U.S. Bureau of Reclamation and the San Luis and Delta-Mendota Water Authority, November 3, 1995. Agreement for Use of the San Luis Drain. Agreement No. 6-07-20-w1319.

[2] U.S. Bureau of Reclamation and the San Luis and Delta-Mendota Water Authority, September 28, 2001. Agreement for Use of the San Luis Drain for the Period October 1, 2001-December 31, 2009. Agreement No. 01-WC-20-2075.

[3] Regional Board, Central Valley Region. September 21, 2001. Order No. 5-01-234. Waste Discharge Requirements for the San Luis & Delta-Mendota Water Authority and U.S. Department of the Interior Bureau of Reclamation, GBP (Phase II). Fresno and Merced Counties.

2. temporary regulating reservoirs;

3. district-wide drainwater recirculation systems;

4. use of incentive programs for on-farm irrigation improvements including tiered water pricing;

5. facilities to recapture and utilize operational spills;

6. drainage reuse on salt-tolerant plantings and other projects;

7. load trading mechanisms; and

8. financial support for a regional drainage management project.

Table 3.2-2 shows the timetable for meeting water quality objectives. In addition to concentration-based standards, monthly and annual selenium load allocations (pounds of selenium) for the Grassland Drainage Area have been adopted and incorporated into the Waste Discharge Requirement and the Grassland Bypass Project Use Agreement. The Grassland Bypass Project has removed subsurface drainage discharged from the Grassland Drainage Area from wetland supply channels, thereby greatly reducing the concentration of selenium in those channels.

Tables 3.2-3 and 3.2-4 show the annual selenium load allocations and the actual discharges from October 1, 1996, through December 30, 2003. The first two years, 1997 and 1998 were impacted by heavy rainfall and regional flooding that caused "unforeseen and uncontrollable" conditions. Discharges from the project exceeded allocations in both years. In the following five years, the monthly and annual discharges were all below the allocations.

Table 3.2-2
Compliance Timetable for Meeting the 4-Day Average
And Monthly Mean Water Quality Objectives for Selenium
Selenium Water Quality Objectives (in **bold**) and Performance Goals (in *italics*)

Water Body/ Water Type	January 1997	October 2002	October 2005	October 2010
Salt Slough and Westland Water Supply Channels	**2 µg/L Monthly mean**			
San Joaquin River below the Merced River, above normal and wet water year types		*5 µg/L Monthly mean*	**5 µg/L 4-day average**	
San Joaquin River below the Merced, critical, dry, and below normal water year types		*8 µg/L Monthly mean*	*5 µg/L Monthly mean*	**5 µg/L 4-day average**
Mud Slough (North) and the San Joaquin River from Sack Dam to the Merced River				**5 µg/L 4-day average**

Source: WDR, Order 5-01-234, Regional Board, Central Valley Region

µg/L – microgram per liter

Farmers in the Grassland Drainage Area formed a regional drainage entity, employed a drainage coordinator, adopted tiered water pricing, adopted a rule for internal selenium load allocation and trades, implemented efforts to improve irrigation efficiency, developed infrastructure to recycle subsurface drainage, and conducted extensive internal monitoring to control and track selenium load discharged from the Grassland Drainage Area. The Grassland Bypass Project also conducts extensive water quality monitoring of affected receiving waters. There is also a biological monitoring program conducted in accordance with a more comprehensive program developed by Reclamation, the Service, United States Geological Survey (USGS), CDFG, and the Regional Board in conjunction with the project participants. Three-species acute and chronic toxicity tests are conducted monthly.

Table 3.2-3
Grassland Bypass Project
October 1, 1996-September 30, 20031
Selenium Load Allocations and Discharge from The San Luis Drain into Mud Slough (North)

Water Year[1]	Actual Discharge (lb)	WDR Load Allocation (lb)
1996-1997	7,097	6,660
1997-1998	9,188	6,660
1998-1999	5,124	6,327
1999-2000	4,603	5,994
2000-2001	4,377	5,661
2001-2002	3,939	5,360
2002-2003	4,029	5,027

Source: San Francisco Estuary Institute
[1]Water Year = October 1 – September 30

Table 3.2-4
Grassland Bypass Project, Phase II, October 1, 2001-December 31, 2009
Selenium Load Allocations and Discharge from the San Luis Drain into Mud Slough (North)*

Calendar Year	Actual Discharge (lb)	All Water Year Types Load Allocation (lb)	Above Normal and Wet Year Type Load Allocation (lb)	Critical, Dry, and Below Normal Year Types Load Allocation (lb)
2002	4,176	5,328		
2003	4,007	4,995		
2004	3,687	4,662		
2005			3,996	3,996
2006			3,088	3,088
2007			3,088	3,088
2008			3,088	2,754
2009			3,088	2,421

Source: Grassland Bypass Project, Use Agreement, Phase II, October 1, 2001-December 31, 2009
*Appendix C of the September 28, 2001 Use Agreement No. 01-WC-20-2075 allows for a revision of the load allocations for 2005 through 2009. The Grassland Basin Drainers have elected this revision starting January 1, 2005 The revised numbers are set out in the Regional Board September 21, 2001 Order No. 5-01-234.

The success of the Grassland Bypass Project in removing selenium from the Grassland wetland supply channels is shown in the reduction of selenium in Salt Slough since October 1996. Prior to the Grassland Bypass Project, the mean selenium concentration in Salt Slough at Lander Avenue (Highway 165) was 16 parts per billion (ppb). Since the implementation of the Grassland Bypass Project, the monthly mean of 2 ppb water quality objective for Salt Slough has been met in 87 of the 88 months (October 1996-December 2003). The only month in which the objective was not met was February 1998, when the monthly mean selenium concentration in Salt Slough was 4 ppb. During February 1998, uncontrollable flood flows were mixed with subsurface drainage water and could not be contained within the Grassland Bypass Project.

The Grassland Area farmers have also implemented the San Joaquin River Water Quality Improvement Project, which irrigates salt tolerant crops and halophytes with subsurface drainage water, with staged plans for concentration monitoring and treatment of significant portions of the drainage generated by participants in the Grassland Bypass Project. The San Joaquin River Water Quality Improvement Project will be needed to achieve the load reductions specified in the Phase II Use Agreement and Waste Discharge Requirements. At present, approximately 4,000 acres have been acquired for the project. This project is discussed in greater detail below under Regional Activities.

Since implementation of the Grassland Bypass Project, all discharges of drainage water from the Grassland Drainage Areas into wetlands and refuges have been eliminated. The Project has reduced the load of selenium discharged from the Grassland Drainage Area by 61 percent (from 9,600 lbs to 3,700 lbs). The load of salts has been reduced by 39-percent (from 187,300 tons to 113,600 tons).

When Phase II of the Grassland Bypass Project ends on December 31, 2009, use of the San Luis Drain for this project will end, unless there is negotiation of a further phase with its own appropriate environmental review. Furthermore, the Waste Discharge Requirement issued for the Grassland Bypass Project will expire and additional water quality objectives will take effect. Therefore, discharges from this area will be prohibited unless the water quality objectives specified in the then-current Basin Plan for the San Joaquin River and its tributaries can be met.

San Joaquin River Water Quality Improvement Project (SJRIP)

In June 1998, as part of its efforts to meet selenium load targets required by the Grassland Bypass Project, Panoche Drainage District began applying drainage water to pasture, alfalfa fields, and other salt tolerant crops. In January 2001, with support from the State of California, Phase I of the SJRIP was implemented. This phase included purchase of approximately 4,000 acres of farmland within the Grassland Drainage Area and is utilized for purposes of the Grassland Bypass Project, serving participating acres both within and outside the San Luis Unit. Throughout the 2001 irrigation season, drain water from the Grassland Drainage Area was used to irrigate these lands, reapplying more than 2,800 acre-feet of CVP deliveries. Reused water volumes increased to approximately 3,700 acre-feet in 2002; 5,400 acre-feet in 2003; and 7,890 acre-feet in 2004. Evapotranspiration of drain water applied to crops within this area reduces the volume of drain discharge.

After complete development, the existing SJRIP is expected to reduce the annual volume of drainage water requiring disposal or treatment by at least 9,000 acre-feet. Panoche Drainage District is initiating environmental review on the acquisition of an additional 2,200 acres to expand the available reuse area. The expansion will allow drainage discharges from Pacheco and San Luis Water Districts to be directly applied for reuse, as well as to assist in meeting load target reductions for Panoche Water District and the non-San Luis Unit participants in the Grassland Bypass Project.

Sustained production of salt tolerant crops will require subsurface drainage of SJRIP lands and a means of treating and disposing of the drain water discharged from these lands. The Panoche Drainage District, the Westlands Water District, Reclamation and the Department of Water Resources are all conducting research on methods to treat salt and selenium in drainage water. Promising techniques include reverse osmosis and biological treatment. The contribution of drain water reuse to the treatment and disposal system is significant because reuse greatly reduces the volume of drain water requiring treatment and the overall cost of the process. For this reason, reuse is a component of each of the alternatives considered by Reclamation in its ongoing San Luis Drainage Feature Re-evaluation DEIS.

Relevant Regulatory Conditions

Water Quality Control Plans

Under the provisions of the Porter-Cologne Act and CWA, the Regional Boards implement water quality regulations in their respective watersheds. Each Regional Board adopts a Water Quality Control Plan (Basin Plan) describing the existing environment, WQOs, and implementation policies. The Basin Plan is updated every five years. The Basin Plan identifies beneficial uses and WQOs for waters of the state, including surface waters and

groundwaters, as well as effluent limitations and discharge prohibitions intended to protect beneficial uses. A summary of regulatory provisions is contained in 23 California Code of Regulations 3912.

The Basin Plan identifies surface waters in each region as consisting of inland surface water (freshwater lakes, rivers, and streams), estuaries, enclosed bays, and ocean waters as applicable to the region. Historical and ongoing wasteloads contributed to the surface waterbodies in the region come from upstream discharges carried into the regions, direct input in the forms of point and nonpoint sources, and indirect input via groundwater seepage.

The Basin Plan describes the water quality control measures that contribute to the protection of the beneficial uses. The Basin Plan identifies beneficial uses for each segment of river, bay ocean and its tributaries, WQOs for the reasonable protection of the uses, and an implementation plan for achieving these objectives.

Westlands and Westlands Distribution District No. 2 fall within the Tulare Lake Basin, and regulations for that study area are described in the Tulare Lake Basin Plan (Regional Board, Central Valley 1995). The San Luis, Panoche and Pacheco Water Districts fall within the San Joaquin River Basin and regulations are described in the *Sacramento River Basin/San Joaquin River Basin Water Quality Control Plan* (Regional Board, Central Valley 1998b).

CWA Section 303 requires the EPA to develop and adopt water quality criteria to protect beneficial uses of receiving waters. The Porter-Cologne Water Quality Control Act also contains similar requirements. WQOs are promulgated and included in periodic updates to the Basin Plans. In California, the EPA developed and adopted standards for certain toxic pollutants in the California Toxics Rule (CTR) as required under CWA Section 303c(2)(B) (40 Code of Federal Regulations Part 131). Numeric water quality criteria contained in the CTR have not currently been incorporated into the Basin Plans.

The Central Valley Regional Board has designated municipal and domestic supply beneficial uses for many waterways in the Central Valley. To protect human health, the Water Quality Control Plan for the Sacramento and San Joaquin rivers specifies narrative WQOs. However, numeric WQOs are not in place for a number of pollutants that may adversely affect drinking water supplies such as organic carbon and specific pathogens. Table 3.2-5 shows WQOs and criteria for the San Joaquin River.

The State Board must also comply with the Federal antidegradation policy. The antidegradation policy requires each State to have a policy which, at a minimum, is

consistent with the Federal antidegradation policy. The antidegradation policy states that increases in pollutant loadings or changes in surface water quality may be permitted only if (1) existing in-stream water uses and adequate levels of water quality are maintained and protected, (2) the State finds that allowing a lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located, and (3) water quality is maintained and protected where high quality waters constitute an outstanding national resource (Attwater 1987).

Waste Discharge Permitting Program

Point source discharges to surface waters are generally controlled through Waste Discharge Requirements issued under Federal National Pollutant Discharge Elimination System (NPDES) permits, whereas non-point source discharges, such as discharges from irrigated agriculture, are subject to California's basin planning and waste discharge reporting requirements.

Under California's Porter-Cologne Water Quality Control Act, any person discharging or proposing to discharge waste within the region (except discharges into a community sewer system) that could affect the quality of the waters of the State is required to file a Report of Waste Discharge. The Regional Board reviews the nature of the proposed discharge and adopts Waste Discharge Requirements to protect the beneficial uses of waters of the State. Waste Discharge Requirements could be adopted for an individual discharge or for a specific type of discharge in the form of a general permit. The Regional Board may waive the requirements for filing a Report of Waste Discharge or issuing Waste Discharge Requirements for a specific discharge where such a waiver is not against the public interest.

The first formal regulation of non-point source discharges from irrigated lands occurred in conjunction with the Grassland Bypass Project, when the San Luis & Delta-Mendota Water Authority and Reclamation jointly obtained waste discharge requirements for the Project.

The Regional Board has also adopted the Irrigated Lands Conditional Waiver Program, in which the San Luis Units participate as described above. This program applies to areas discharging irrigation drainage or flood flows from irrigated lands that are not subject to Waste Discharge Requirements. The program includes requirements for monitoring, development and implementation of best management practices, and a system of reports, including reports on identified water quality objective violations and actions to address those violations.

Table 3.2-5
Selected Water Quality Objectives and Criteria
For the San Joaquin River

Constituent	Units	Receiving WQO/ Criteria	303d Listing	Notes on Limits	Source of Limit
Antimony	µg/L	4300		As total recoverable, 30-day average	CTR value for protection of human health (water + organisms)
Boron (from mouth of Merced River to Vernalis)	mg/L	2.6		maximum, Sept. 16 through Mar. 14	Basin Plan criterion for Trace Element WQOs
		1		monthly mean, Sept. 16 through Mar. 14	
		2		maximum, Mar. 15 through Sept. 15	
		0.8		monthly mean, Mar. 15 through Sept. 15	
		1.3		critical year	
Chlorpyrifos			yes (2005)		1998 California 303(d) List and TMDL Priority Schedule, Central Valley Regional Water Quality Control Board
Copper	µg/L	3.1		As 1-hour or 1-day average concentration	Basin Plan criterion for Trace Elements
		1300		As total recoverable, 30- day average	CTR, human health (water + organisms)
		29[1]		Continuous Conc (4-day average)	CTR, freshwater aquatic life
		50[1]		maximum (1-hour average)	CTR, freshwater aquatic life
Chromium (III)	µg/L	550[1]		Continuous Conc (4-day average)	CTR for protection of freshwater aquatic life CTR for protection of freshwater aquatic life
		1700[1]		maximum (1-hour average)	
DDT			yes (2011)		1998 California 303(d) List and TMDL Priority Schedule, Central Valley Regional Water Quality Control Board
Diazinon			yes (2005)		1998 California 303(d) List and TMDL Priority Schedule, Central Valley Regional Water Quality Control Board
Electrical Conductivity (at Airport Way Bridge, Vernalis)	mmhos/cm	0.7	yes (1999)	April through August, max 30-day running average of mean daily	Basin Plan criterion for Agricultural Uses in the South Delta
	1			September through March, max 30-day running average of mean daily	
Group A Pesticides			yes (2011)		1998 California 303(d) List and TMDL Priority Schedule, Central Valley Regional Water Quality Control Board
Lead	µg/L	11[1]		Continuous Conc (4-day average)	CTR for protection of freshwater aquatic life
		280[1]		Maximum (1-hour average)	CTR for protection of freshwater aquatic life
Molybdenum (Salt Slough and Wetland Water Supply Cannels)	µg/L	50 19		Maximum monthly mean	Basin Plan criterion for Trace Element WQOs

Constituent	Units	Receiving WQO/ Criteria	303d Listing	Notes on Limits	Source of Limit
Molybdenum (Mud Slough, North, and the San Joaquin River from Sack Dam to the Merced River)	µg/L	50 19		Maximum monthly mean	Basin Plan criterion for Trace Element WQOs
Molybdenum (from mouth of Merced River to Vernalis)	µg/L	50 10		Maximum monthly mean	Basin Plan criterion for Trace Element WQOs
Nickel	µg/L	170[1]		Continuous Conc (4-day average)	CTR for protection of freshwater aquatic life
		1500[1]		maximum, (1 hr avg)	CTR for protection of freshwater aquatic life
Selenium (Salt Slough and Wetland Water Supply Channels)	µg/L	20 2	yes (2000)	Maximum monthly mean	CTR and National Toxics Rule for total recoverable Se, applicable to waters of San Francisco Bay, Suisun Marsh, and Delta
Selenium (Mud Slough, North, and the San Joaquin River from Sack Dam to the Merced River)	µg/L	20 5	yes (2000)	Maximum 4-day average	Basin Plan criterion for Trace Element WQOs
Selenium (from mouth of Merced River to Vernalis)	µg/L	12 5	yes (2000)	Maximum 4-day average	Basin Plan criterion for Trace Element WQOs
Silver	µg/L	37		instantaneous maximum	CTR for protection of freshwater aquatic life
Thallium	µg/L	6.3		As total recoverable, 30-day average	CTR value for protection of human health (water + organisms), National Toxics Rule
Unknown Toxicity			yes (2011)		1998 California 303(d) List and TMDL Priority Schedule, Central Valley Regional Water Quality Control Board
Zinc	µg/L	380[1]		Continuous Conc (4-day average)	CTR for protection of freshwater aquatic life
		380[1]		maximum (1-hour average)	CTR for protection of freshwater aquatic life

[1]Based on hardness ceiling of 400 mg/L

Section 303(d) Listed Pollutants

CWA Section 303(d) requires each State to identify waters that will not achieve water quality standards after application of effluent limits. For each water and pollutant, the State is required to propose a priority for development of a load-based (as opposed to concentration-based) limit called the total maximum daily load (TMDL). The TMDL determines how much of a given pollutant can be discharged from a particular source without causing water quality standards to be violated. Priorities for development of

TMDLs are set by the State based on the severity of the pollution and uses of the waters. Table 3.2-6 shows a complete listing of the constituents for TMDL implementation and their priority.

Table 3.2-6
Constituents for TMDL Implementation and Their Priority in the Affected Area

Receiving Water	Boron	Chlordane	Chlorpyrifos	Copper	DDT	Diazinon	Dieldrin	Dioxin Compounds	Electrical Conductivity	Exotic Species	Furan Compounds	Group A Pesticides	Mercury	Nickel	PCBs	PCBs (Dioxin Like)	Pesticides	Se	Unknown Toxicity
Mud Slough	L	-	-	-	-	-	-	-	L	-	-	-	-	-	-	-	L	H	L
San Joaquin River	H	-	H	-	L	H	-	-	-	-	-	L	-	-	-	-	-	H	-

H = High-Priority Constituent
M = Medium-Priority Constituent
L = Low-Priority Constituent

High-priority constituents for TMDL implementation in the San Joaquin River include boron, chlorpyrifos, diazinon, EC, and selenium. EC (salt concentration) in the San Joaquin River is a concern for many water users. The Central Valley Regional Board has recently adopted a salt and boron TMDL for the Lower San Joaquin River designed to reduce the loading of these constituents to the river and subsequently reduce their concentrations). TMDLs for the San Joaquin River are also in place for selenium. Dichlorodiphenyltrichloroe-thane (DDT) and Group A pesticides (aldrin, endrin, heptachlor, heptachlor epoxide, hexachlorocyclohexane, endosulfan, and toxaphene) are low-priority constituents in the San Joaquin River.

Implementation of Total Maximum Daily Loads for Salt, Boron and Selenium

Issues related to salt, boron and selenium in the San Joaquin River are currently being addressed through the Basin Plan Amendments for selenium and for salinity and boron, and the implementation of TMDLs for these contaminants by the Regional Board. The TMDL implementation process includes participation of all dischargers to the river. Under the TMDL, allowable discharge loads for salt, boron, and selenium were developed for all categories of point and nonpoint source dischargers. The allowable loads take into account the assimilative capacity of the receiving water and background sources and margin of safety, and are designed to attain the applicable TDS, boron and selenium WQOs in the San Joaquin River. The Basin Plan Amendments and proposed TMDL have been adopted by the Regional Board but have not yet been approved by the State Water Resources Control Board or the EPA. The compliance schedule for meeting load allocations for these constituents also have not been finalized but is expected to come into effect in 2010.

Compliance with these measures will be required under the Clean Water Act regardless of which of the long-term contract renewal alternatives is implemented.

Related State and Federal Programs Affecting Water Quality

Central Valley Project Improvement Act

The CVPIA amends the previous authorizations of the CVP to include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority with irrigation and domestic uses and fish and wildlife enhancement as a project purpose equal to power generation (Reclamation and Service 1999). In response to these requirements the U.S. Department of the Interior is developing programs to improve environmental conditions and modify operations, management, and physical facilities of the CVP. The primary element in the preferred alternative described in the Final Programmatic EIS potentially affecting the San Luis Unit involves acquisition and delivery of an additional 110,000 AF per year of water for fish and wildlife on the San Joaquin River and tributaries

Refuges in the affected area receive approximately 270,000 af per year and are hydrologically connected to San Joaquin River. Delivery of this additional water to wetlands and its subsequent release back to the San Joaquin River, primarily during April and May, could result in higher river flows that could provide additional assimilative capacity in the San Joaquin River and tributaries for selenium during these months. This is a potential beneficial effect for the San Joaquin River. However, the release of water back into the SJR from wetland areas at times would have a deleterious effect on salinity. A stakeholder group comprised of state, federal and local public agencies known as the San Joaquin River Water Quality Management Group has modeled potential benefits from temporary storage and timed release of water from wetland areas and is committed to working with refuge managers to develop workable programs as a longer-term priority.

CALFED Bay-Delta Program

The CALFED Bay-Delta Program was established in 1995. CALFED is a consortium of five State and 10 Federal agencies with management and regulatory responsibilities in the Bay-Delta. The State and Federal agencies pledged to (1) coordinate their implementation of water quality standards to protect the Bay-Delta, (2) coordinate the operation of the SWP and CVP, which both involve transporting freshwater through the Delta to points south, and (3) develop a process to establish a long-term Bay-Delta solution that will address four categories of problems: ecosystem quality, water quality, water supply reliability, and levee system vulnerability (CALFED 2000a). For water quality the

primary concern was focused on effects to drinking water and agricultural supplies derived from the Bay-Delta due to elevated salts, organic carbon, and bromide.

Vernalis Adaptive Management Plan

The VAMP is designed to provide augmented flows to the San Joaquin River to benefit fish migration. This plan (implemented under the San Joaquin River Agreement) resulted in the planned releases of up to 110,000 AF (or more under some hydrologic conditions) during April and May, and an additional 12,500 AF of flow during the month of October. Approximately 80,000 AF of supplemental flow occurred in Water Year 1999. VAMP releases are generally of high quality and therefore contribute to the water quality in the San Joaquin River and Delta.

Effects of Drainage within the San Luis Unit

The No Action alternative assumes continued delivery of full contract quantities to San Luis Unit contractors for an additional 25-year period, subject to operational and regulatory constraints incorporated into the shortage provisions, in amounts assumed in the OCAP BO. The Northern Area of the San Luis Unit currently has drainage service through the Grassland Bypass Project, but the ability to discharge to surface water is expected to end by 2010. The Westlands area of the San Luis Unit, which has no drainage outlet, already has some lands which are impacted by high groundwater to the extent of decreased agricultural production. Continued delivery of water without additional drainage reduction and drainage management activities therefore could be expected to result in additional drainage effects within the San Luis Unit. Any such effects would not occur immediately but would build up gradually and over the course of the contracts. At the same time, the No Action alternative assumes that Reclamation will comply with current law requiring that it provide drainage service to lands within the San Luis Unit. The San Luis Drain Feature Re-evaluation DEIS is scheduled for completion by 2006, so that execution of a Record of Decision and implementation of a preferred alternative, especially for the first steps of acquiring and planting re-use areas under all of the in-valley alternatives could take effect as early as 2007 and are expected to be in place in 2010. No action also assumes that local activities to reduce drainage through increased irrigation efficiency and seepage reduction projects and to manage drainage in-valley through recycling and reuse will continue to a point where ultimate treatment and disposal will be required. At a point between 2007 and 2010, the federal and local activities will converge to provide drainage service to the San Luis Unit lands. This section therefore examines the potential drainage effects of continued water deliveries in the San Luis Unit only during the period between contract renewal and implementation of drainage service.

During the period preceding implementation of drainage service by Reclamation, the effects of continuing delivery of water to the San Luis Unit can be divided into impacts on the northern districts and impacts on Westlands.

For the northern districts, efforts are continuing to reduce drainage discharges through development of additional lands for reuse of drainage water. This expansion of land area available for drainage water reuse is expected to control the impacts of continuing irrigation service up to the time when drainage service is provided by Reclamation.

For Westlands, the effects of continuing irrigation deliveries are likely to take the form of increased soil salinity in areas already experiencing salinity or an increase in the land area classified as salt affected. Because of the limited period before provision of drainage service, the magnitude of these impacts is expected to be small and their implications on farming practices and crop production are expected to be limited.

The water quality impacts of continued contract deliveries will be governed by requirements to comply with state water quality standards, TMDLs and other instruments regulating water quality and flow in the affected area. Therefore, the No Action Alternative is not expected to impact water quality.

Related Projects and Authorities

San Joaquin Valley Drainage Project and Ongoing Studies

The SJVDP produced its Rainbow Report in September 1990. Since then, several of the recommendations for action have been implemented but not on a scale large enough to address the drainage management and disposal needs in the San Luis Unit. Recommendations in the plan are consistent with features included in the In-Valley Disposal Alternative.

Reclamation, DWR, and other SJVDIP agencies are pursuing new technologies through pilot projects, involving selenium treatment, enhanced solar evaporation, and marketing of salts.

Land Retirement Programs

The CVPIA authorized a Federal Land Retirement Program, as recommended in the San Joaquin Valley Drainage Program Final Report (SJVDP, September 1990). Also, in 1992, the California State Legislature passed Senate bill 1669, the San Joaquin Valley Drainage Relief Act that incorporated the SJVDP recommendations. This state statute authorized a land retirement program (California Water Code, Section 14900) to be administered through the DWR. A comprehensive study of agricultural drainage and drainage-related

problems on the west side of the San Joaquin Valley resulted in the management plan presented in the SJVDP. The recommended drainage management actions included selective retirement of irrigated lands characterized by low productivity, poor drainage, and high selenium concentrations in shallow ground water. This Land Retirement Program will be accomplished cooperatively by the Department of the Interior (Reclamation, U.S. FWS, BLM) and California's DWR through a process in which willing sellers volunteer to remove their lands from irrigated production in return for compensation.

In addition to this land retirement program, other land retirement and land management programs in the affected area will affect drainage and surface water quality. Other actions include the the reassignment of Broadview Water District's CVP contract supply to Westlands Water District and the fallowing/idling of the lands within Broadview; the Britz and Peck settlements which have resulted in those lands being removed from irrigated agriculture; and the Sagouspe settlement which calls for the short term fallowing/idling of lands within Westlands Water District. Each of these actions will proceed independently of long-term contract renewals and the cumulative impacts of these actions will be similar for the No Action Alternative and for each of the action alternatives. Land retirement may ultimately increase water supply reliability for remaining irrigable lands, provide habitat for upland species, reduce agricultural revenues, and in some instances, hasten development pressures.

Permanent land retirement, temporary land fallowing, or temporary conversion of irrigated farmland to dryland farming are all mechanisms which in the vicinity of those affected lands will reduce application of irrigation water; reduce production of drain discharge; reduce import and leaching of salts and other contaminants; and lower groundwater elevations not only directly under the participating fields but to some extent under neighboring areas.

San Joaquin Valley Drainage Implementation Program

The San Joaquin Valley Drainage Implementation Program is a Federal-State interagency organization developed to implement actions needed to effectively manage agricultural drainage. The focus of this program for the past decade is implementation of the Management Plan for Agricultural Drainage Waters for the Western San Joaquin Valley, also known as the Rainbow Report, developed in the 1980s (SJVDP 1990). Development and implementation of the In-Valley Alternative is consistent with the actions planned by the Drainage Program.

Drainage Service Under San Luis Drainage Feature Re-evaluation

The State Water Plan, developed in 1931, included a requirement for valley-wide drainage for all irrigation water delivered in the Central Valley. Drainage management has been a concern of the CVP since the project was proposed in 1949. In Senate Document 113 (81st Congress, First Session), discussions of groundwater storage on the west side of the upper San Joaquin Valley state that "[i]n part of the area it appears that the water-bearing strata are capped by impervious strata, and that local seepage may be trapped in a perched water table. Continued input to this high-level ground water would eventually demand drainage pumps or ditches" (Reclamation 1949).

Soon thereafter, initial facilities of the federal CVP transported water from northern California through the Sacramento-San Joaquin River Delta (Delta) and the Delta-Mendota Canal in 1951 to irrigate 600,000 acres of land in the northern part of the San Joaquin Valley. This water primarily replaced and supplemented San Joaquin River water that was diverted at Friant Dam to the southern San Joaquin Valley.

On June 3, 1960, with the passage of the San Luis Authorization Act, Congress authorized construction of the San Luis Unit of the federal CVP (Public Law [PL] 86-488, Stat. 156 (1960)). The San Luis Unit began delivering water to agricultural lands in the southern San Joaquin Valley in 1968. Authorization of the San Luis Unit also mandated construction of an interceptor drain to collect irrigation drainage water from its service area and carry it to the Delta for disposal (SJVDP 1990). Reclamation's 1956 feasibility report for the San Luis Unit described the drain as an earthen ditch that would drain 96,000 acres. By 1962, Reclamation's plans had changed to a concrete-lined canal to drain 300,000 acres. In 1964, alternative plans added a regulating reservoir to temporarily retain drainage. A decision was made in the mid-1970s to use the reservoir to store and evaporate drainage water until the drainage canal to the Delta could be completed.

At the same time, questions were raised about the potential effects of untreated agricultural drainage on the quality of water in the Delta and San Francisco Bay. Initially, the San Luis Drain was conceived as a state-federal facility, but the State of California twice declined to participate. Reclamation began construction of the drain in 1968 and, by 1975, had completed 85 miles of the main drain and the first phase of the regulating reservoir (i.e., Kesterson Reservoir). In 1970, an interagency agreement between Reclamation and the Bureau of Sport Fisheries and Wildlife [now the U.S. Fish and Wildlife Service (Service)], provided for Service management of the Kesterson lands for waterfowl production, subject to the primary purpose of drain water regulation. In 1976, PL 94-223 provided that all lands managed by the Secretary of the Interior (Secretary) for wildlife purposes, including wildlife production areas, be designated as the National Wildlife Refuge System. Hence,

the Kesterson lands became the Kesterson National Wildlife Refuge. Funding and authorization issues associated with the San Luis Unit, as well as growing environmental concern about releasing irrigation runoff into the Delta, halted work on the reservoir and the drain in 1975. This concern was reflected in a rider added to the CVP appropriations act by Congress in 1965, which stated that "… the final point of discharge for the interceptor drain for the San Luis Unit shall not be determined until development by the Secretary of the Interior and the State of California of a plan which shall conform with the water quality standards of the State of California as approved by the Administrator of the Environmental Protection Agency" (SJVDP 1990). Appropriations riders with similar, but not identical language have been included in nearly every annual appropriations act since 1965.

In 1983, discovery of embryonic deformities of aquatic birds at Kesterson Reservoir significantly changed the approach to drainage solutions in the San Joaquin Valley. Because of the high selenium levels found in the drainwater and its effects at Kesterson Reservoir, the San Luis Unit Special Study was suspended. In 1985, following a Nuisance and Abatement Order issued by the State Board, discharges to Kesterson Reservoir were halted, and feeder drains leading to the San Luis Drain were plugged.

In response to the Kesterson problems, the San Joaquin Valley Drainage Program (SJVDP) was formed by the governor of California and the Secretary. This joint federal/state effort was established to develop solutions to drainage and drainage-related problems. While the initial efforts looked at all possible solutions, a policy decision in 1987 limited studies to in-valley drainage management measures based on a recommendation from a citizens advisory committee consisting of water users, environmental advocates, and public interests. The SJVDP's final report (SJVDP 1990) recommended an in-valley solution that included source reduction, drainage reuse, land retirement, evaporation basins, groundwater management, San Joaquin River discharge, and institutional changes. This plan provided a strategy for managing salts through 2040 and stated that eventually salts may need to be removed from the San Joaquin Valley.

While the SJVDP was preparing its recommendations, a 1986 Federal court order settled a lawsuit among Westlands, Reclamation, and various classes of landowners and water users in Westlands. Named after one of the parties to the lawsuit, the Barcellos Judgment addressed, among other things, the supply of water to Westlands and the provision of drainage service to Westlands. It directed Reclamation to develop, adopt, and submit to Westlands a plan for drainage service facilities by the end of 1991, leading to preparation of the San Luis Unit Drainage Program Plan Formulation Report (PFR) and the related Draft EIS.

Several landowners subsequently sued the Department of the Interior (Interior), seeking completion of the master drain to the Delta. These lawsuits were partially consolidated in 1992 to address the common allegation that Interior was required by law to construct drainage service facilities from certain lands in the Unit. In 1995, the district court issued a partial judgment stating that the San Luis Act established a mandatory duty to provide drainage. The judgment ordered Interior to promptly prepare, file, and pursue an application for a discharge permit with the State Board. Interior appealed this judgment.

Based on litigation brought against Interior in the 1990s and concluded in 2000 (*Firebaugh Canal v. United States of America* 9516641, 9th Cir. F. Cas. No. 95-15300) (opinion for publication), the Ninth Circuit Court of Appeals held that Interior must act to provide drainage service for the San Luis Unit. Although the Ninth Circuit Court concluded that Interior has a duty to provide drainage service under the San Luis Act, congressional action over the past 34 years has given discretion to Interior in creating and implementing a drainage solution. In effect, this means that Reclamation is not required to necessarily complete the master drain (i.e., the San Luis Drain or Valley Drain), but is allowed broader discretion in providing a drainage solution for the San Luis Unit.

In accordance with the court order, Reclamation developed a Plan of Action (April 2001; Reclamation 2001a) outlining its proposed efforts to provide prompt drainage service considering a variety of options:

1. The first phase of the Re-evaluation, consistent with the Plan of Action, identified a list of preliminary alternatives that meet the court's order to provide prompt drainage service to the Unit. The result of the first phase was the Preliminary Alternatives Report (PAR), San Luis Unit Drainage Feature Re-evaluation (SLUDFR), which was published in December 2001 (Reclamation 2001b). The alternatives described in the PAR meet the court order and use proven technology.

2. The second phase of the Re-evaluation was the preparation of the PFR, which included the determination of the lands that require drainage service; the anticipated quantity and quality of drainwater for which Reclamation will need to provide service; the formulation, evaluation, and screening of the preliminary alternatives; the description of the final set of alternative plans; and the selection of the proposed action. The PFR was published in December 2002 (Reclamation 2002).

3. The third phase of the Re-evaluation will refine the components of the proposed action, provide additional engineering detail, and complete the environmental

review of the proposed action and alternatives. The product of this phase is the EIS and the Record of Decision. The DEIS for the SLUDFR was issued in May 2005.

In addition to pursuing the Drainage Plan of Action (Reclamation 2001c), Reclamation is also continuing its partnerships with other state and federal agencies and water users to pursue the development and implementation of drainage management techniques consistent with the ongoing interagency SJVDIP. Immediate or short-term actions are available that will reduce and manage drainage water to sustain the agricultural productivity and environmental quality of the San Joaquin Valley while long-term solutions are evaluated and implemented. These actions have already proven to provide drainage benefits or are likely to provide drainage benefits in the short term (Reclamation 2001c).

The 2002 PFR identified the In-Valley Disposal Alternative as the proposed action to provide drainage service. The In-Valley Disposal Alternative was compared to No Action and the three Out-of-Valley Disposal Alternatives and was selected in 2002 as the proposed action based on cost, implementation, and other environmental information available in 2002.

Land retirement was considered in the 2002 PFR but was excluded as a primary drainage reduction component of the Federal drainage service alternatives under consideration at that time because it did not meet the project purpose of "providing drainage service." The Westside Regional Drainage Plan, submitted to the Secretary in May 2003, included land retirement as an approach to simultaneously address the drainage issues and the reductions in water supply now facing districts in the San Luis Unit.

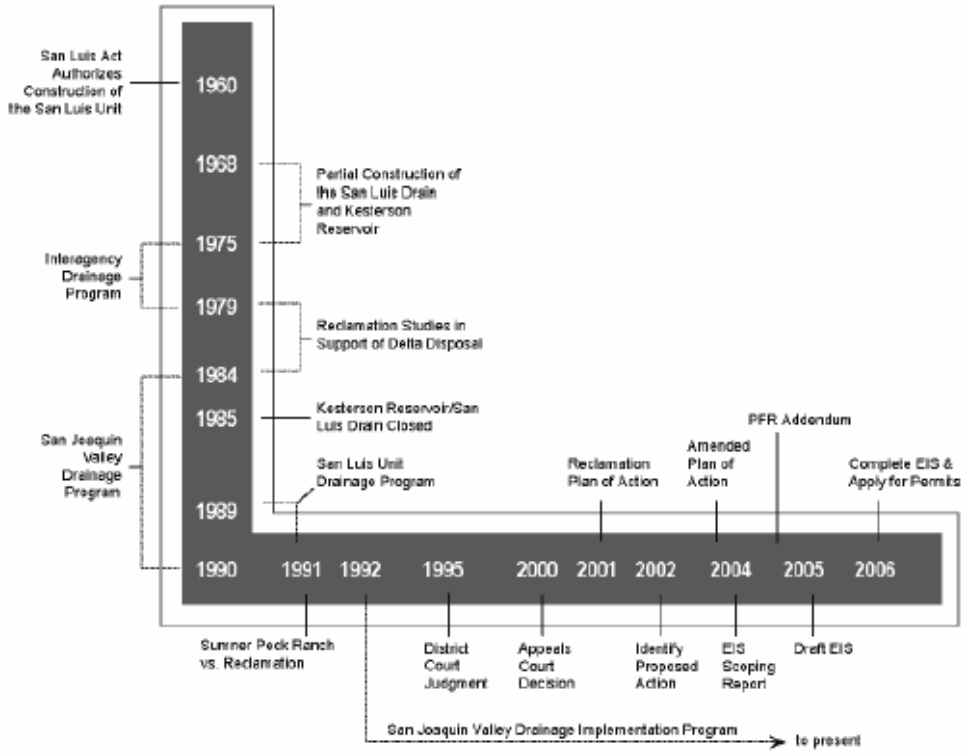
As a result of the Westside Regional Drainage Plan and public and stakeholder input, Reclamation determined that it would broaden the scope of analysis to include land retirement as a major component of some of the action alternatives.

On February 5, 2004, Reclamation submitted to the Court an Amended Plan of Action for Drainage to the San Luis Unit (Reclamation 2004a). The Amended Plan of Action states that Reclamation would continue to refine and evaluate all five alternatives described in the PFR for inclusion in the EIS. Additionally, Reclamation would formulate alternative(s) that use land retirement as a method to control drainage need, by comparing costs, benefits, and impacts for alternatives with different amounts of land retirement.

The analysis presented in the DEIS for the SLUDFR is based upon a period of record ending in 2001. For this reason, assumptions on the extent to which contractors will

provide drainage service independent of Reclamation differ between the DEIS and this document due to activities initiated by the contractors since 2001. Figure 3.2-7 is a timeline displaying notable actions in the development of San Luis Unit drainage.

Figure 3.2-7 San Luis Unit Drainage Timeline
(source: SLUDFR DEIS, May 2005)



Under the San Luis Drainage Feature Re-evaluation, Reclamation is re-evaluating options for providing drainage service to the San Luis Unit. The re-evaluation builds upon previous studies and application of innovative technologies. The objective is to formulate and implement a plan to provide agricultural drainage service to achieve a long-term, sustainable salt and water balance in the root zone of irrigated lands in the San Luis Unit.

The San Luis Drainage Feature Re-evaluation is being conducted independent of long-term contract renewal so that Reclamation's obligation to provide drainage service to San Luis Unit contractors can be addressed separately from Reclamation's obligation to provide water service to the same contractors.

Preferred Alternative

The Preferred Alternative is not expected to produce drainage conditions or surface water quality impacts that can be distinguished from those that would exist under the No Action Alternative. Because the tiered pricing provisions of the Preferred Alternative are identical to those of the No Action Alternative, it is expected that deliveries of surface water and

pumpage of groundwater would be the same for both alternatives and that both alternatives would bring into the San Luis Unit the same volume of water and quality of contaminants. Distinctions between the Preferred Alternative and the No Action Alternative, such as the difference in measurement requirements, are expected to have no impact on drainage or surface water quality.

Alternative 1

Alternative 1 does not significantly differ from the No Action Alternative. Tiered pricing is based upon the contract total at 80 percent and 90 percent of full contract quantity. This is expected to lead to slightly lower application of CVP water during years when tiered pricing is in effect and slightly increased groundwater pumping during those years. Implementation of this alternative is expected to have no impact on drainage or surface water quality.

Alternative 2

Alternative 2 is not expected to produce changes in drainage conditions or surface water quality that can be distinguished from those that would exist under the No Action Alternative. This is because the distinctions between the Alternative 2 and the No Action Alternative with respect to tiered pricing are minor and differences in other areas are not expected to impact drainage or surface water quality.

Cumulative Impacts

All of the long-term contract renewal alternatives, including the No Action alternative, assume continued delivery of water in quantities approximating existing conditions as described in the OCAP BO. Therefore, none of the proposed actions, when considered in combination with other past, present, and reasonably foreseeable future actions and projects, are likely to result in adverse cumulative impacts to drainage and surface water quality when compared to the No Action Alternative and existing conditions. Many of the cumulative effects arising from the combination of long-term contract renewals and other past and present activities have already occurred and are expressed in this EIS as existing conditions and ongoing trends within the Affected Environment and/or No Action Alternative descriptions. The actual extent of any such cumulative effects of long-term contract renewals and the continued application of irrigation water to agricultural lands (and for M&I purposes) may vary depending upon CVP operational decisions in response to implementation of CVPIA programs and other legal and regulatory constraints. Should the CVP water supply to the San Luis Unit become more reliable was anticipated in the OCAP BO, water deliveries could be somewhat higher and result in the production of additional drainage. Conversely, if actual deliveries over the term of the contract are more

constrained than currently analyzed, less water may be applied in the San Luis Unit, with the possible production of less drainage. However, factors other than CVP operations, such as permanent crop selection, continuing conservation and irrigation efficiency improvements may also prevent increased drainage, regardless of variations in water deliveries due to CVP operations, and efforts to analyze all such variables would be speculative. Future drainage management, habitat restoration, land acquisition, land retirement, water conservation, and related CVP programs are expected individually and in combination with long-term contract renewals to reduce cumulative drainage and water quality impacts.

Irreversible and Irretrievable Commitments of Resources

The No Action Alternative is expected to continue existing drainage and water quality trends that could irreversibly commit soil and groundwater resources to "drainage-impaired" and ultimately unusable conditions for agriculture if drainage service is not provided within the term of the long-term renewal contracts. For example, current estimates presented in the San Luis Drainage Feature Re-evaluation (Reclamation 2005) estimate from 44,106 to 308,000 acres that will need to be retired from agricultural production because drainage conditions could lead to these lands' inability to economically support crop growth. The potential irreversible and irretrievable nature of these resource commitments applies only to such resources' ability to support agricultural production and not to all potential uses. However, because the No Action Alternative assumes that Reclamation will implement the statutory requirement to provide drainage service during the term of these contracts, irreversible and irretrievable resource commitments will not occur.

The No Action and action alternatives would all irreversibly and irretrievably commit some surface water resources to be used as agricultural irrigation waters. Commitments of these resources would effectively forego opportunities for allocating these surface water resources to other environmental purposes or beneficial uses. Some of those surface waters applied to drainage-impaired lands would be degraded, resulting in drainage waters polluted with excess salts and selenium. However, the assumed provision of drainage service during the term of the contract will minimize such loss and prevent significant impacts to groundwater, soils, or downstream water quality.

SECTION 3.3: AGRICULTURE

This section discusses the potential effects that the alternatives considered in Chapter 2 would have on agricultural productivity in the San Luis Unit. The methods of analysis used in this section are described below.

AFFECTED ENVIRONMENT

The study area includes the geographic service areas of the CVP water contractors within the San Luis Unit, as described in Section 3.1, Contractor Service Area Descriptions.

The contractor service areas all run roughly along the Interstate 5/California Aqueduct corridor from the San Luis Reservoir in Merced County in the north, through part of Fresno County, to the city of Avenal in Kings County to the south. The farmland served by much of this water lies in the heart of California's Central Valley, one of the most productive agricultural regions in the world.

Agricultural products grown or raised in the San Luis Unit are extremely varied. The Central Valley supports not only a wide variety of agricultural products, but also exceptional productivity of the crops and livestock produced here. From alfalfa to zucchini, if it is grown somewhere in North America, it is probably grown somewhere in the Central Valley. Fruits, nuts, and vegetables are particularly noteworthy crops in the area because of the lack of substitute growing regions elsewhere.

In terms of product volume and value, cotton and hay are the dominant field crops; grapes, almonds, and peaches are the dominant orchard crops; tomatoes are the dominant row crop; and dairy and poultry are the dominant livestock products in Merced, Fresno, and Kings counties.

Agricultural producers in the Central Valley and elsewhere operate under several economic pressures. When it comes to the sale of their products, they are "price-takers." Because no producer has enough market share to exercise any control over the market, the price they receive for their products is determined entirely outside their control.

The agricultural production cycle is not rapid. Decisions regarding a producer's product mix have to be made months or even years in advance. When July arrives and it is evident that corn is going to be more profitable to produce that year than tomatoes would have been, it is too late for producers to change what they will produce for that year. If tomatoes were planted, tomatoes will be harvested. In the case of orchards, the production cycle stretches across many years.

Weather greatly impacts the quantity and quality of agricultural production. Certainly, no producer has control over the weather.

Changes in the cost or availability of production inputs also play a large part in a producer's ability to remain viable. Land, labor, seed, machinery, fertilizers, and water are all important and interrelated components in determining production decisions and enterprise profitability. A decrease in the availability of water or an increase in the cost of water or both can not only decrease or eliminate profits per acre, it can also determine cropping patterns or the ability to use other inputs, such as land.

ENVIRONMENTAL CONSEQUENCES

This section describes the environmental consequences, or impacts, of the action alternatives as compared to the No Action Alternative. Impacts are identified by comparing program components of each action alternative to the No Action Alternative. Environmental consequences are presented for the project area as a whole (i.e. for the entire San Luis Unit). This level of aggregation is required because of the use of the Central Valley Production Model (CVPM) as the best available analytical tool. As further described later in this section's discussion of the No Action Alternative, the CVPM provides output data only at the subregion level, not at the individual contractor, or local, level. As with all impacts within the unit, the concentration of impacts to a smaller geographic area increases the relative impact, while a more uniform dispersion of impacts across the unit decreases the relative impact. While it is highly unlikely that all identified impacts would present themselves within a single water district, it is just as unlikely that a fully uniform dispersion of impacts across the entire unit would occur.

While this assessment is not able to geographically pinpoint the location of impacts within the unit, it is likely that greater impacts could be seen in those areas where fewer opportunities to use substitute water resources occur. If that is the case, then impacts may be more concentrated among those water districts where CVP water is the only available surface water and groundwater resources are limited.

Renewal of the long-term water service contracts could potentially affect the following agricultural resources:

- Income from agricultural production (both gross and net)
- Irrigated acres under production

In the case of agricultural impacts, there can also be the issue of relative severity to individual producers. The same level of change resulting from implementation of an alternative will cause different degrees of impact to different producers. As an example, taking 10 acres of orchard out of production will likely cause a much larger impact to a producer who has only 30 acres in production than it will to a producer who has 1,000 acres in production.

NO ACTION ALTERNATIVE

As described in Chapter 2, the No Action Alternative provides a base condition for comparing Alternatives 1, 2, and the Preferred Alternative. It represents future conditions at a projected level of development without implementation of either alternative. The No Action Alternative reflects the conditions that are expected to be present upon implementation of the Preferred Alternative in the CVPIA PEIS (Reclamation and USFWS 1999).

The data used to describe the No Action Alternative conditions and those of Alternatives 1 and 2 can be found in the April 24, 2000 Technical Memorandum titled *Economic Analysis of November 1999 Tiered Pricing Proposal for PEIS Preferred Alternative* (April 24, 2000 Technical Memorandum) (CH2M Hill 2000), attached as Appendix A. It is important for the reader to understand the key assumptions contained in this memorandum.

The economic analysis in the April 24, 2000 Technical Memorandum evaluates agricultural economics using the CVPM. As previously described, the CVPM provides analyses for specific subregions, not by individual water districts. The CVPM subregions contained in the San Luis Unit are Subregions 10 and 14 (a more detailed description of the subregions can be found in Table 1 of the April 24, 2000 Technical Memorandum, which is included as Appendix A).

Tiered pricing for the No Action Alternative is based on the current contract amount of water. Tiered pricing is further defined in Chapter 2. Contractors may purchase, as available, 80 percent of their full contract amount at the basic Contract Rate (Tier 1). The next 10 percent of the full contract amount (Tier 2) is priced at the midpoint between the basic Contract Rate and the Full Cost Rate (as defined in the Reclamation Reform Act). The last 10 percent of the full contract amount (Tier 3) is priced at the Full Cost Rate. Table 3.3-1 shows the tiered water rates for each of the two CVPM subregions used for the No Action Alternative. These rates are based on the 1992 CVP water rates.

Table 3.3-1
CVP Tiered Water Rates
Used in No Action Alternative
(dollars per acre-foot)

CVPM Subregion	Tier 1	Tier 2	Tier 3
10	$33.46	$40.02	$46.57
14	$39.31	$54.39	$69.46

Source: CH2M Hill 2000

Using the tiered rates described in Table 3.3-1 and the farm budget assumptions within the CVPM, estimates of irrigated acreage and value of production for primary crops in each CVPM subregion were developed under average, wet, and dry water year conditions. An average water year represents the average water delivery during the period 1922-1990 from the CVPIA PEIS Preferred Alternative; a wet water year represents the average delivery from the period 1967-1971 from the CVPIA PEIS Preferred Alternative; and a dry water year represents the average delivery from the period 1928-1934 from the CVPIA PEIS Preferred Alternative.

Table 3.3-2 describes the total irrigated acreage under the No Action Alternative by primary crop and CVPM subregions in average, wet, and dry water years. Table 3.3-3 describes the value of production under the No Action Alternative by primary crop and CVPM subregions in average, wet, and dry "delivery" water years.

It is worth noting that within the No Action Alternative tiered pricing structure and rate levels, very little change is seen in either irrigated acreage or the value of crop production from average to wet to dry water years.

As part of the No Action Alternative, it is also necessary to consider the effects of potential reductions in irrigated acreage that may be retired as part of the CVPIA Land Retirement Program. This voluntary program may lead to contractors removing a portion of their irrigated lands from production in exchange for compensation. Land retirement amounts would help reduce irrigation drainage problems in areas where salts and other solids systemically pass into drain water and would also contribute to beneficial habitat impacts. If future land retirement programs result in substantial reductions in the irrigable land base within the San Luis Unit, those programs will result primarily from voluntary programs wherein individual landowners consider the economic costs and benefits of retiring land from agricultural production. The range of factors that will likely be considered will include crop prices that can be taken in future agricultural markets, the fixed and variable costs of agricultural production (equipment, labor, field preparation, machinery, seed, fertilizer, maintenance, etc.), the cost of water, and other considerations at the specific landowner level. If these and/or subsequent landowners opt to convert the use of retired lands to one or more of several uses (e.g., undeveloped, habitat, residential, commercial, or industrial development), such decisions will occur at the landowner and local (city and

county) land use planning levels where such jurisdiction resides. Reclamation does not have land use planning jurisdiction, and because the chain of such land use decisions associated with future locations and levels of retired lands will rest with landowners and local jurisdictions, it is reasonable to assume that such decisions will occur regardless of whether the No Action or one of the action alternatives is implemented. Although the cost of water is partially controlled by Reclamation, this will be but one of many factors that will be considered, and therefore is substantially indifferent with respect to the alternatives considered in this EIS. Similarly, the effects on agricultural production, revenues, and related economic effects will be made by landowners and local jurisdictions.

There is also a settlement agreement, the Westlands Settlement Agreement, among various classes of water users within Westlands that calls for the temporary retirement of approximately 65,000 acres. Land retirement is obligatory in the event that Reclamation does not provide drainage service. Reclamation's provision of drainage service to this area has been analyzed as part of its San Luis Drainage Facilities Re-evaluation DEIS (May 2005), but the timeline associated with drainage facilities implementation is indeterminate. Therefore, the retirement of these 65,000 acres in Westlands is being considered as part of existing conditions and the No Action Alternative but would not impose meaningful impacts on acreages in agricultural production (in 2003, approximately 25 percent of this land was irrigated) or total agricultural revenues within the San Luis Unit.

PREFERRED ALTERNATIVE

The Preferred Alternative involves a tiered pricing program that is based on the full current contract amount of water and the price structure included in the No Action Alternative. Therefore, the Preferred Alternative with respect to agricultural production would be similar to the No Action Alternative.

Under the Preferred Alternative, there would be no impacts to agricultural production when compared to existing conditions or the No Action Alternative. Agricultural resource use resulting from this alternative is assumed to be similar to the No Action Alternative because, as described in Table 3.3-2, the amount of water delivered, the timing of those deliveries, and the rates and method of payment for water delivered under the Preferred Alternative do not substantially differ from the No Action Alternative.

ALTERNATIVE 1

Alternative 1 involves a tiered pricing program based on the full current contract amount of water. Under Alternative 1, there would be no impacts to agricultural production when compared to existing conditions or the No Action Alternative. Agricultural resource use

resulting from this alternative is assumed to be similar to the No Action Alternative because, as described in Table 3.3-2, the amount of water delivered, the timing of those deliveries, and the rates and method of payment for water delivered under Alternative 1 do not substantially differ from the No Action Alternative.

Table 3.3-2
No Action Alternative Irrigated Acreage by CVPM Subregion and Crop
(thousands of acres)

CVPM Subregion	Crop Category	Average Water Year	Wet Water Year	Dry Water Year
10	Pasture	13.3	13.3	13.3
	Alfalfa	40.8	40.9	40.8
	Sugar Beets	13.9	13.9	13.9
	Other Field Crops	48.2	48.2	48.3
	Rice	2.9	2.9	2.9
	Truck Crops	112.9	112.9	113.0
	Tomatoes	40.2	40.2	40.2
	Deciduous Orchard	36.6	36.6	36.6
	Small Grain	14.0	14.0	14.0
	Grapes	1.0	1.0	1.0
	Cotton	103.1	103.1	103.1
	Subtropical Orchard	0.1	0.1	0.1
	Subtotal	**427.0**	**427.1**	**427.2**
14	Pasture	0.1	0.1	0.1
	Alfalfa	14.0	14.0	13.4
	Sugar Beets	4.8	4.8	4.8
	Other Field Crops	18.4	18.3	17.9
	Truck Crops	136.4	136.4	136.2
	Tomatoes	77.0	77.0	76.2
	Deciduous Orchard	24.9	24.9	24.9
	Small Grain	10.4	10.4	9.7
	Grapes	7.0	7.0	7.0
	Cotton	206.5	206.6	198.8
	Subtropical Orchard	1.0	1.0	1.0
	Subtotal	**500.5**	**500.5**	**490.0**
Total—All Subregions		**927.5**	**927.6**	**917.2**

Source: CH2M Hill 2000

ALTERNATIVE 2

Alternative 2 involves the application of a tiered pricing structure that differs from the No–Action Alternative in a few ways. Tiered pricing for Alternative 2 is based on a rolling five-year average of actual water deliveries, rather than the current contract amount. The five-year rolling average of actual deliveries is referred to as Category 1 water. Contractors may purchase, as available, 80 percent of their Category 1 water at the basic Contract Rate (Tier 1). The next 10 percent of their Category 1 water (Tier 2) is priced at the midpoint between the basic Contract Rate and the Full Cost Rate (as defined in the

Reclamation Reform Act). The last 10 percent of their Category 1 water (Tier 3) is priced at the Full Cost Rate.

Table 3.3-3
No Action Alternative Value of Production by CVPM Subregion and Crop (millions of dollars)

CVPM Subregion	Crop Category	Average Water Year	Wet Water Year	Dry Water Year
10	Pasture	$ 3.1	$ 3.1	$ 3.1
	Alfalfa	23.6	23.6	23.6
	Sugar Beets	12.2	12.2	12.2
	Other Field Crops	31.0	31.0	31.0
	Rice	2.3	2.3	2.3
	Truck Crops	718.0	717.9	718.1
	Tomatoes	60.1	60.1	60.1
	Deciduous Orchard	52.4	52.4	52.4
	Small Grain	7.6	7.5	7.6
	Grapes	1.9	1.9	1.9
	Cotton	102.6	102.7	102.6
	Subtropical Orchard	0.4	0.4	0.4
	Subtotal	**$1,015.2**	**$1,015.1**	**$1,015.3**
14	Pasture	$ 0.0	$ 0.0	$ 0.0
	Alfalfa	8.6	8.6	8.2
	Sugar Beets	3.9	4.0	3.9
	Other Field Crops	11.0	10.9	10.7
	Truck Crops	817.9	817.8	816.9
	Tomatoes	114.6	114.6	113.3
	Deciduous Orchard	38.5	38.5	38.5
	Small Grain	5.2	5.2	4.9
	Grapes	15.1	15.1	15.1
	Cotton	234.6	234.7	225.8
	Subtropical Orchard	3.7	3.7	3.7
	Subtotal	**$1,253.1**	**$1,253.1**	**$1,241.0**
Total—All Subregions		**$2,268.3**	**$2,268.2**	**$2,256.3**

Source: CH2M Hill 2000

Any difference between the full contract amount and the five-year rolling average of actual water deliveries is referred to as Category 2 water. To the extent Category 2 water is available, contractors may purchase such water at Tier 3 prices.

Table 3.3-4 shows the tiered water rates for the two CVPM subregions used for Alternative 2. A key difference between the No Action Alternative and Alternative 2 is that the Alternative 2 rates shown in Table 3.3-4 are based on CVP water rates presented in the November 17, 1999 financial workshop, not the 1992 CVP water rates used in the No Action Alternative. This is done because the implementation of tiered pricing as a result of the CVPIA PEIS means that tiered pricing is the law and that Alternative 2 rates should be compared to the most likely rate structure (in this case, the 1999 proposed CVP water

rates). Alternative 1, a byproduct of the CVPIA PEIS, was compared to 1992 rates, consistent with the CVPIA PEIS.

Table 3.3-4
CVP Tiered Water Rates Used in Alternative 2
(dollars per acre-foot)

CVPM Subregion	Tier 1	Tier 2	Tier 3
10	$31.15	$40.16	$49.16
14	$32.62	$46.48	$60.33

Source: CH2M Hill 2000

Tier 1 prices in Subregions 10 and 14, as well as Tier 2 and Tier 3 prices in Subregion 14, are lower in Alternative 2 than in the No Action Alternative. This difference in price level appears to help offset the more rigorous price structure of Alternative 2.

Another key difference in the analysis of Alternative 2 is the application of blended rates. It is assumed that the contractor will blend the rate of CVP water in any tier or category before selling the water to growers. This differs from the assumption used to assess alternatives in the CVPIA PEIS (Reclamation and USFWS 1999), in which contractors were assumed to sell CVP water to growers at tiered rates.

Blended rates were developed for a series of nine water supply sequences:

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

The blended CVP water rates used for each of these nine sequences are shown in Table 3.3-5.

Table 3.3-5
CVP Blended Water Rates Used in Alternative 2
(dollars per acre-foot)

CVPM Subregion	Water Year Type								
	Average	Wet	Dry	Average	Wet	Dry	Average	Wet	Dry
	Followed by Average			Followed by Wet			Followed by Dry		
10	$33.85	$31.15	$42.94	$38.01	$33.85	$44.63	$31.15	$31.15	$33.85
14	$36.78	$32.62	$50.76	$43.17	$36.78	$53.36	$32.62	$32.62	$36.78

Source: CH2M Hill 2000

Using the blended rates described in Table 3.3-5 and the farm budget assumptions within the CVPM, estimates of irrigated acreage and value of production for primary crops in each CVPM subregion were developed under each of the nine sequences described above. To determine the impacts of Alternative 2, as compared to the No Action Alternative, sequences ending in average, wet, or dry water years are compared to the average, wet, or dry water year No Action Alternative results, respectively.

Table 3.3-6 presents the change in irrigated acreage from the No Action Alternative by primary crop and CVPM subregions in average, wet, and dry years. As can be seen in Table 3.3-6, very little impact (beneficial or adverse) occurs. The majority of impacts are experienced in CVPM Subregion 10. There are no beneficial impacts to the San Luis Unit as a whole. The largest adverse impact to the San Luis Unit is a decrease of 1,100 acres (0.1 percent) in total irrigated acreage during an average water year following a dry five-year period.

Table 3.3-7 presents the change in the value of production from the No Action Alternative by primary crop and CVPM subregions in average, wet, and dry water years. As can be seen in Table 3.3-7, very little impact (beneficial or adverse) occurs. The majority of impacts are experienced in CVPM Subregion 10. There are no beneficial impacts to the San Luis Unit as a whole. The largest adverse impact to the San Luis Unit is a decrease of $800,000 (less than 0.1 percent) in total value of production during an average water year that follows a dry five-year period.

Table 3.3-8 presents the change in net farm revenues from the No Action Alternative by CVPM subregions in average, wet, and dry years. As can be seen in Table 3.3-8, the largest beneficial impact to the San Luis Unit as a whole is an increase of $7.3 million in net farm revenues during either an average or dry water year that follows a dry five-year period. The largest adverse impact to the San Luis Unit as a whole is a decrease of

$6.3 million in net farm revenues during a wet water year that follows a wet five-year period.

Table 3.3-6
Change in Irrigated Acreage from No Action Alternative by CVPM Subregion and Crop Resulting from Implementation of Alternative 2
(thousands of acres)

CVPM Subregion	Crop Category	Change Compared to Average Water Year, No Action Alternative			Change Compared to Wet Water Year, No Action Alternative			Change Compared to Dry Water Year, No Action Alternative		
		Average	Wet	Dry	Average	Wet	Dry	Average	Wet	Dry
		Followed by Average			Followed by Wet			Followed by Dry		
10	Pasture	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0
	Alfalfa	0.0	0.0	-0.3	-0.1	0.0	-0.1	0.0	0.0	0.0
	Sugar Beets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Other Field Crops	0.0	0.0	-0.1	0.1	0.0	0.0	0.0	0.0	0.0
	Rice	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Truck Crops	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Tomatoes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Deciduous Orchard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Small Grain	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0
	Grapes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cotton	0.0	0.0	-0.5	-0.1	0.0	-0.1	0.0	0.0	0.0
	Subtropical Orchard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Subtotal	**0.0**	**0.0**	**-1.1**	**0.0**	**0.0**	**-0.1**	**0.0**	**0.0**	**0.0**
14	Pasture	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Alfalfa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Sugar Beets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Other Field Crops	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Truck Crops	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Tomatoes	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	Deciduous Orchard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Small Grain	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Grapes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cotton	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
	Subtropical Orchard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Subtotal	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total—All Subregions		**0.0**	**0.0**	**-1.1**	**0.0**	**0.0**	**-0.1**	**0.0**	**0.0**	**0.0**

Source: CH2M Hill 2000

Table 3.3-7
Change in Value of Production from No Action Alternative by CVPM Subregion and Crop Resulting from Implementation of Alternative 2
(millions of dollars)

CVPM Subregion	Crop Category	Change Compared to Average Water Year, No Action Alternative			Change Compared to Wet Water Year, No Action Alternative			Change Compared to Dry Water Year, No Action Alternative		
		Average	Wet	Dry	Average	Wet	Dry	Average	Wet	Dry
		Followed by Average			Followed by Wet			Followed by Dry		
10	Pasture	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
	Alfalfa	0.0	0.0	-0.2	-0.1	0.0	-0.1	0.0	0.0	0.0
	Sugar Beets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Other Field Crops	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
	Rice	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Truck Crops	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0
	Tomatoes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Deciduous Orchard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Small Grain	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0
	Grapes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cotton	0.0	0.0	-0.5	-0.1	0.0	-0.1	0.0	0.0	0.0
	Subtropical Orchard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Subtotal	**$0.0**	**$0.0**	**-$0.8**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**
14	Pasture	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
	Alfalfa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Sugar Beets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Other Field Crops	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Truck Crops	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Tomatoes	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	Deciduous Orchard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Small Grain	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Grapes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cotton	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0
	Subtropical Orchard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Subtotal	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**
Total—All Subregions		**$0.0**	**$0.0**	**-$0.8**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**

Source: CH2M Hill 2000

Table 3.3-8
Change in Net Farm Income from No Action Alternative by CVPM Subregion Resulting from Implementation of Alternative 2
(millions of dollars)

CVPM Subregion	Cause of Net Revenue Change	Change Compared to Average Water Year, No Action Alternative			Change Compared to Wet Water Year, No Action Alternative			Change Compared to Dry Water Year, No Action Alternative		
		Average Followed by Average	Wet	Dry	Average Followed by Wet	Wet	Dry	Average Followed by Dry	Wet	Dry
10	Fallowed Land	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
	Groundwater Pumping	0.0	0.0	6.8	8.3	0.8	8.6	-0.1	-0.1	-0.1
	Irrigation Cost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CVP Water Cost	0.1	-0.4	-6.3	-7.9	-0.7	-8.1	-0.2	-0.2	0.1
	Higher Crop Prices	0.0	0.0	0.4	0.0	0.0	0.2	0.0	0.0	0.0
	Net Change	0.1	-0.4	0.8	0.5	0.1	0.7	-0.3	-0.3	0.0
14	Fallowed Land	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Groundwater Pumping	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Irrigation Cost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CVP Water Cost	-1.3	-3.5	6.0	-1.8	-1.8	-6.4	6.3	6.3	7.3
	Higher Crop Prices	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
	Net Change	-1.3	-3.5	6.5	-1.8	-1.8	-6.4	6.3	6.3	7.3
Total—All Subregions		**-1.2**	**-3.9**	**7.3**	**-1.3**	**-1.3**	**-6.3**	**6.0**	**6.0**	**7.3**

Source: CH2M Hill 2000

Is summary, there would be only minor impacts from implementation of Alternative 2. Tables 3.3-6, 3.3-7, and 3.3-8 indicate maximum adverse impacts of a decrease of 0.01 percent in total irrigated acreage, and decreases of less than 0.01 percent in the total value of agricultural production and net farm revenues under varying five-year periods of analysis.

CUMULATIVE IMPACTS

Overall, the cumulative impacts of renewing long-term water service contracts can be both beneficial and potentially adverse to agricultural resources. In the long-term, the renewal of long-term water service and repayment contracts is beneficial in light of past projects that have assisted growers in bringing marginal lands into irrigation and production, including the statutory authorities for long-term contract renewals listed at the start of Chapter 1.[1]

Continued provision of water to agricultural and M&I users in the San Luis Unit beneficially supports the ongoing production of food, fiber, and other agricultural resources that sustain the regional, subregional, and local economies.

[1] Renewal of these contracts is being undertaken in pursuance generally of: the Act of June 17, 1902 (32 Stat. 388), as amended and supplemented, including, but not limited to; the Acts of August 26, 1937 (50 Stat. 844) as amended and supplemented, August 4, 1939 (53 Stat. 1187) as amended and supplemented, July 2, 1956 (70 Stat. 483); June 3, 1960 (74 Stat. 156); June 21, 1963 (77 Stat. 68); October 12, 1982 (96 Stat. 1262); October 27, 1986 (100 Stat. 3050); and Title XXXIV of the CVPIA of October 30, 1992 (106 Stat. 4706).

In contrast, some aspects of long-term contract renewal may have adverse short-term effects on the agricultural viability of some areas. In particular, increased water prices resulting from a tiered pricing structure under some subregions and water-year scenarios, when combined with reduced south-of-Delta water supply reliability resulting from a combination of CVP operational constraints on deliveries to the San Luis Unit, could result in difficult choices regarding the affordability of agricultural production as an enterprise. However, to adequately place the effect of tiered pricing aspects of long-term contract renewals in perspective, one must also consider other factors that may arguably have equal or more bearing on the affordability of agricultural production. In particular, the direction of continued agricultural subsidy and price support programs for selected crops, weather patterns, and market prices for agricultural products affect such decisions. Changes in the cost or availability of production inputs also play a large part in the ability of a producer to remain viable. Land, labor, seed, machinery, fertilizers, and water are all important and interrelated components in determining production decisions and enterprise profitability.

IRREVERSIBLE AND/OR IRRETRIEVABLE COMMITMENT OF RESOURCES

The No Action Alternative is expected to continue existing drainage and water quality trends that will irreversibly commit some soil and groundwater resources to "drainage-impaired" and ultimately unusable conditions for agriculture when compared to existing conditions. Land retirement is defined as the permanent removal of lands from irrigated agricultural production by purchase or lease for other purposes or land uses. Under the No Action and Preferred Alternatives, Reclamation assumes up to 109,106 acres would be retired based on the following:

- CVPIA Land Retirement – Up to 7,000 acres of land are included to be retired within the study area under the existing CVPIA land retirement program (2,091 acres retired to date)

- Westlands Settlement Agreement (*Sagouspe v. Westlands Water District*) – A settlement agreement among various classes of water users within Westlands calls for temporary retirement of land. An estimated 65,000 acres of land would be retired under this settlement agreement. This agreement would allow these lands to come back into production if and when Reclamation provides drainage service.

- Britz Settlement Agreement (*Sumner Peck Ranch, Inc., et al. v. Bureau of Reclamation, et al.*) – An additional 3,006 acres in Westlands are being retired permanently under a settlement agreement dated September 3, 2002, between the United States, Westlands, and the Britz group of plaintiffs in the Sumner Peck lawsuit.

- An additional 34,100 acres from the Sumner Peck Ranch et al. settlement of December 2002 would be retired. Under the non-irrigation covenant placed on the Sumner-Peck lands, no water may be applied to those lands without specific Reclamation approval.

The irreversible and irretrievable nature of these resource commitments applies only to such resources' ability to support agricultural production. Upon retirement, the affected lands, soil and groundwater resources will be potentially usable as habitat, recreational open space, or other uses consistent with landowner and local land use planning decisions. The action alternatives will result in similar levels of irreversible and irretrievable commitments of resources because each of them will similarly continue the delivery of irrigation waters to some drainage-impaired lands that ultimately may need to be retired.

SECTION 3.4: SOCIOECONOMICS AND POWER RESOURCES

This section discusses the potential effects that the alternatives considered in this EIS would have on socioeconomic and power resources within the San Luis Unit. The methods of analysis used in this section are described below.

AFFECTED ENVIRONMENT

The project area includes the geographic service areas of the CVP water contractors within the San Luis Unit. The contractor service areas all run roughly along the Interstate 5/California Aqueduct corridor from the San Luis Reservoir in Merced County in the north, through part of Fresno County, to Avenal in Kings County to the south.

When economic modeling for this analysis was conducted, income and employment information by county was available from the U.S. Department of Commerce, Bureau of Economic Analysis website by industry for 1998. In terms of both earnings (as measured by wages and proprietor earnings) and employment, the largest industries in Fresno, Kings, and Merced counties were services, retail trade, manufacturing, and government. Total earnings by major industry for each of the three counties are shown in Table 3.4-1. Total employment by major industry for each county is shown in Table 3.4-2.

Table 3.4-1
1998 Total Earnings by Industry by County[1]
(thousands of dollars)

Industry	County		
	Merced	Fresno	Kings
Farm Income[2]	$317,439	$554,061	$97,808
Agricultural Services, Forestry & Fishing	90,821	581,149	57,701
Mining	888	14,431	--[3]
Construction	95,963	668,436	49,679
Manufacturing	383,958	1,006,513	126,619
Transportation & Public Utilities	134,501	651,665	43,537
Wholesale Trade	71,671	616,834	40,898
Retail Trade	227,704	1,067,575	121,678
Finance, Insurance & Real Estate	79,922	702,235	--[3]
Services	357,590	2,578,764	190,284
Government	418,045	2,203,822	576,299
Total	**$2,178,502**	**$10,645,485**	**$1,330,634**

Source: U.S. Department of Commerce 1998a
[1]Includes wages, other labor income, and proprietor income.
[2]Farm income consists of proprietors' income; the cash wages, pay-in-kind, and other labor income of hired farm workers; and the salaries of officers of corporate farms.
[3]Not shown to avoid disclosing confidential information, but the estimates for this item are included in the total.

Table 3.4-2
1998 Total Employment by Industry by County[1]
(number of jobs)

Industry	County		
	Merced	**Fresno**	**Kings**
Farm Employment	12,086	34,620	6,604
Agricultural Services, Forestry & Fishing	4,798	41,266	4,322
Mining	52	456	B[2]
Construction	3,074	19,202	1,444
Manufacturing	13,012	28,847	3,410
Transportation & Public Utilities	3,597	15,633	1,152
Wholesale Trade	2,162	16,654	1,126
Retail Trade	13,439	60,941	7,050
Finance, Insurance & Real Estate	4,161	25,906	B[2]
Services	15,353	98,520	8,248
Government	12,506	56,770	14,199
Total	**84,240**	**398,815**	**49,250**

Source: U.S. Department of Commerce 1998b
[1]Includes full-time labor, part-time labor, and proprietor employment.
[2]Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the total.

Agriculture is also a very important industry. If taken together, the farm and agricultural services sectors are important to all three counties. Agriculture takes on additional significance because it is generally considered a "primary" industry (along with mining and manufacturing). A reasonably large portion of activity in non-primary industries can be attributed to support for primary industry activity in an area. Changes in primary industry activity, therefore, usually precipitate additional changes in non-primary or support industries.

Population data could be most closely related to the project area by aggregating individual census tract information. Population and ethnicity breakdowns were available by census tract for 1990, the most recent reported census supporting economic modeling. The California Department of Finance develops population and ethnicity estimates and projections at the county level. Implied growth rates from the California Department of Finance's county estimates were applied to the 1990 tract information to generate estimates and projections from 1990 through 2026 for the aggregated tracts. The following census tracts were used to simulate the San Luis Unit's service area:

Fresno County:	Tracts 78, 79.98, 80, 82, 83, 84.02
Merced County:	Tract 21.98
Kings County:	Tracts 3, 16, 17

Table 3.4-3 shows the estimated and projected population and ethnicity in the San Luis Unit service area. As shown in Table 3.4-3, the Hispanic community makes up a large proportion of the regional population. It is estimated that over 63 percent of the regional population was identified as Hispanic in 2000 and that the percentage will rise to over 76 percent by 2025. These trends are expected to continue through the terms of the long term renewal contracts.

Table 3.4-3
Population and Ethnicity-San Luis Unit Study Area[1]

Year	Population				
	White	Black	Other	Hispanic[2]	Total[3]
1990	27,275	4,842	27,908	34,453	60,025
1995	28,754	5,551	35,983	40,754	67,253
2000	29,639	6,498	41,628	46,428	73,174
2005	30,862	7,241	48,940	52,923	80,257
2010	32,003	8,079	56,382	60,010	87,702
2015	33,015	9,054	63,309	67,309	95,193
2020	34,080	9,930	71,950	76,697	104,231
2026	35,078	10,809	80,993	86,896	113,820

Source: U.S. Census Bureau 1990
[1]Estimated and extrapolated from aggregated census tract data.
[2]Hispanic population is also counted as White, Black, or Other.
[3]Equals the sum of White, Black, and Other.

In addition to the information provided above, regional income, employment, and population can be impacted by changes to the availability, cost, or profitability of agricultural resources, recreational resources, power resources, and M&I water resources.

ENVIRONMENTAL CONSEQUENCES

This section describes the environmental consequences of the action alternatives as compared to the No Action Alternative. Socioeconomic analyses are comprised of two primary analysis types. Regional economics looks at changes to the income and employment levels of the project area. Social analyses look at changes to the demographic or social makeup and well-being of the project area.

Renewal of the long-term water service contracts could potentially affect the following economic and social resources:

- Regional income
- Regional population
- Regional employment
- Area demographics

The project area is defined as the entire San Luis Unit. This level of aggregation is required because it is consistent with the data aggregation level available from the agricultural impacts analysis provided in Section 3.3. Agricultural impacts are the key driver for the socioeconomic impacts described in this section. As described in Section 3.3, regional data are used rather than local data because of the aggregation level of the output from the CVPM.

NO ACTION ALTERNATIVE

The No Action Alternative provides a base condition for comparing the action alternatives The No Action Alternative reflects the conditions that are expected to be present upon implementation of the Preferred Alternative from the CVPIA PEIS (Reclamation and USFWS 1999).

Under No Action Alternative conditions, population and ethnicity projections would parallel the 2025 projections and continuing trends discussed with reference to Table 3.4-3. It is assumed that relative income and employment levels would not differ substantially from existing conditions, if adjusted for inflation.

It is expected that the CVP would continue to provide an important power resource to municipalities and utility districts in the San Luis Unit study area. With respect to energy demand, total energy requirements under the No Action Alternative are not expected to substantially differ from existing conditions as pump loads will remain relatively similar to those currently observed within the San Luis Unit. Any increase in energy demand would be minimal and would be readily met with resources currently owned and operated by several suppliers, including Pacific Gas & Electric Company. CVP hydroelectric facilities would also be expected to operate at levels generally similar to existing conditions.

M&I deliveries would continue to be provided from the CVP. Under average water conditions under the No Action Alternative, the model simulation indicated that 704,000 acre-feet of water is expected to be supplied to M&I users in the San Joaquin River region (CH2M Hill 2000, Table 22). This water includes surface water under water rights (such as used in portions of the cities of Modesto and Stockton) and CVP and SWP water (such as used in portions of the City of Tracy and in Kern County). This value does not include groundwater used by the municipalities. Under dry year conditions, the model simulation indicated that the overall available water from these sources would be reduced to 656,000 acre-feet of M&I water (CH2M Hill 2000, Table 22). The reduction is due only to changes

in CVP and SWP water availability because the model assumed that full amounts of surface water rights would be delivered in all water year types.

PREFERRED ALTERNATIVE

The Preferred Alternative involves a tiered pricing program that is based on the full current contract amount of water. Socioeconomic and power resource use resulting from this alternative is assumed to be similar to existing conditions and the No Action Alternative because the amount of water delivered, the timing of those deliveries, and the rates and method of payment for water delivered under the Preferred Alternative would not substantially differ from the No Action Alternative. Therefore, there would be no impacts to socioeconomic or power resources from implementation of the Preferred Alternative.

ALTERNATIVE 1

Alternative 1 involves a tiered pricing program based on the full current contract amount of water. Socioeconomic and power resource uses resulting from this alternative are assumed to be similar to existing conditions and the No Action Alternative because the amount of water delivered, the timing of those deliveries, and the rates and method of payment for water delivered under Alternative 1 would not substantially differ from the No Action Alternative. Therefore, there would be no impacts to socioeconomic or power resources from implementation of Alternative 1.

ALTERNATIVE 2

Alternative 2 involves the application of a tiered pricing structure based on a rolling five-year average of actual water deliveries, rather than the current contract amount. The tiered pricing structure and the No Action Alternative rates against which it is compared are used because the current law requires the adoption of tiered pricing structures.

A regional economic analysis for four different regions was developed in the April 24, 2000 Technical Memorandum (CH2M Hill 2000) (Appendix A). The region used for this EIS is the San Joaquin River region because the San Luis Unit is included within it. Impacts to the San Joaquin River region may overstate the impacts to the San Luis Unit service area because the region encompasses a geographic area that includes, but is larger than, the San Luis Unit service area.

The regional economic analysis identifies long-term direct and indirect income and employment impacts that would be expected to result from the implementation of Alternative 2. Direct impacts result from changes in agricultural production and profitability and from changes in the cost of M&I water. Had there been any changes in the cost or delivery of CVP power or impacts to recreational resources, such impacts

would also have been direct. Indirect impacts are those impacts to the regional economy that occur to other economic sectors (e.g., trade, services, or manufacturing) as a result of the direct impacts.

As noted above, there would be no direct impacts to power resources (or indirect impacts to recreational resources) because CVP facilities would be required to operate in the same manner, no matter how much agricultural or M&I water is actually diverted for use. Reservoir levels would be similar and conveyance facilities would continue to have similar water flows. This would allow recreational resources to continue to be used at similar levels. It would also allow CVP hydroelectric facilities to operate at the same level, maintaining the same production and price levels that would be seen under the CVPIA PEIS Preferred Alternative (i.e. No Action Alternative conditions for long-term contract renewals.

The M&I water use economic analysis developed in the April 24, 2000 Technical Memorandum (CH2M Hill 2000) assumes that M&I users can afford the calculated water costs described in the CVPIA PEIS (Reclamation and USFWS 1999). Therefore, CVP water deliveries would not change for the M&I water use economic analysis. However, additional costs for M&I water are incurred. In an average water year, an additional cost of $5.2 million would be incurred under Alternative 2 (in the entire San Joaquin River region). In a dry water year, no additional costs are incurred under Alternative 2.

Since the input-output model used in the regional economic analysis developed in the April 24, 2000 Technical Memorandum (CH2M Hill 2000) assumes a long-term equilibrium would be reached, it is appropriate to compare Alternative 2 impacts to average No Action Alternative conditions. In addition, the only hydrologic sequence that truly reflects long-term conditions is the five-year average followed by an average year. The five-year dry period followed by an average year is also examined because, while it is not strictly a long-term scenario, some regions could be permanently impacted by a five-year series of drought years. Because of such potential consequences, the results can be considered representative of long term effects.

Under the average-average hydrologic sequence, total employment would decrease by 120 jobs and income from profits and wages would decrease by $4.2 million. Table 3.4-4 shows the direct and total (direct plus indirect) regional economic impacts to the San Joaquin River region under the average-average hydrologic sequence.

Under the dry-average hydrologic sequence, total employment would decrease by 420 jobs and income from profits and wages would decrease by $12.4 million. Table 3.4-5 shows

the direct and total (direct plus indirect) regional economic impacts to the San Joaquin River region under the dry-average hydrologic sequence.

Population impacts can be expected to occur as a result of the implementation of Alternative 2. The key drivers in determining changes in population are birth rates, death rates, and employment. Alternative 2 would not precipitate any changes in birth or death rates, but employment impacts, as shown in Tables 3.4-4 and 3.4-5, would occur.

Table 3.4-4
Regional Economic Impacts on All Sectors in the San Joaquin River Region for the Average-Average Hydrologic Sequence Compared to the No Action Alternative Average Water Year Conditions

Impact Resulting from:	Employment (number of jobs)		Income[1] (millions of dollars)	
	Direct	Total	Direct	Total
Change in Agricultural Output	0	0	-$0.1	-$0.2
Change in Agricultural Net Income	20	40	0.5	1.0
Change in M&I Water Costs	-80	-150	-2.6	-5.1
Total[2]	**-60**	**-120**	**-$2.2**	**-$4.2**

Source: CH2M Hill 2000
[1]Includes income from wages and profits.
[2]May differ from sum of elements because of rounding.

Table 3.4-5
Regional Economic Impacts on All Sectors in the San Joaquin River Region for the Dry-Average Hydrologic Sequence Compared to the No Action Alternative Average Water Year Conditions

Impact Resulting from:	Employment (number of jobs)		Income[1] (millions of dollars)	
	Direct	Total	Direct	Total
Change in Agricultural Output	-10	-20	-$0.3	-$0.7
Change in Agricultural Net Income	-140	-240	-3.0	-6.5
Change in M&I Water Costs	-80	-150	0.0	0.0
Total[2]	**-230**	**-420**	**-$5.9**	**-$12.4**

Source: CH2M Hill 2000
[1]Includes income from wages and profits.
[2]May differ from sum of elements because of rounding.

Adverse employment impacts would total less than 1 percent for the hydrologic sequences presented in Tables 3.4-4 and 3.4-5. Adverse income impacts are similarly less than 1 percent. These impacts to socioeconomic resources are considered less than significant.

If the same ratio of employment to population is assumed to be present at the county level and within the San Joaquin River region, expected changes in population can be estimated. Using the same data source that was used for Table 3.4-1 (U.S. Department of Commerce

1998a), the 1998 population for the area encompassing Merced, Fresno, and Kings counties is 1,070,979. From Table 3.4-2, total employment in 1998 can be calculated as 532,305 for the area encompassing all three counties. With this information, a population-to-employment ratio of 2.01 is calculated. If this ratio is applied to total employment losses in Table 3.4-4, the expected impact is a loss of 241 persons (2.01 x 120). If this ratio is applied to total employment losses in Table 3.4-5, the expected impact is a loss of 844 persons (2.01 x 420).

Impacts are presented for the San Joaquin River region as a whole. As with all impacts within a project area, the concentration of impacts to a smaller geographic area within the project area increases the relative impact, while a more uniform dispersion of impacts across the project area decreases the relative impact. While it is highly unlikely that all identified impacts would present themselves within a single water district or community, it is just as unlikely that a fully uniform dispersion of impacts across the entire project area would occur.

To the extent that income, employment, and population impacts are concentrated in a smaller geographic area, impacts to local tax bases and public services may also be exacerbated. While a lower population would lessen the strain on current public services (i.e., police and fire protection, schools, and health services) to meet the needs of their service areas, the loss of income would cause a corresponding decrease in local tax revenues used to provide such public services.

More localized impacts than those identified in this analysis are almost certain to occur. However, it is also fair to say that localized impacts are already being felt in areas where the transfer of costs from areas that currently receive water at rates below the value of the water is shifted. Some of this shifting of impacts may, in fact, occur within the regional area. While it is appropriate to analyze impacts at the regional level, it is also appropriate to recognize the potential for greater (both negative and positive) local impacts than are reflected in the analysis.

In addition, more localized employment impacts could also translate into a disproportionate impact on specific groups such as minority or rural populations. It is likely that impacts realized as a result of implementation of Alternative 2 would be greater than impacts realized as a result of implementation of Alternative 1, or in comparison to the Preferred Alternative. However, because of the extremely low likelihood of such a concentrated expression of these impacts, further analysis of related environmental justice impacts would be speculative and not possible to relate to any particular area of concentration.

CUMULATIVE IMPACTS

Overall, the cumulative impacts of renewing long-term water service contracts can be both beneficial and potentially adverse to socioeconomic resources. In the long-term, the renewal of long-term water service and repayment contracts is beneficial in light of past projects that have assisted growers in bringing marginal lands into irrigation and production, including the statutory authorities for long-term contract renewals.[1] Continued provision of water to agricultural and M&I users in the San Luis Unit beneficially supports the ongoing production of food, fiber, and other agricultural resources that sustain the regional, subregional, and local economies.

In contrast, some aspects of long-term contract renewal may have adverse short-term effects on the economic viability of some areas. In particular, increased water prices resulting from a tiered pricing structure under some subregions and water-year scenarios, when combined with reduced south-of-Delta water supply reliability resulting from a combination of CVP operational constraints on deliveries to the San Luis Unit, could result in difficult choices regarding the affordability of agricultural production as an enterprise. However, to adequately place the effect of tiered pricing aspects of long-term contract renewals in perspective, one must also consider other factors that may arguably have equal or more bearing on the affordability of agricultural production. In particular, the direction of continued agricultural subsidy and price support programs for selected crops, weather patterns, and market prices for agricultural products affect such decisions. Changes in the cost or availability of production inputs also play a large part in the ability of a producer to remain viable. Land, labor, seed, machinery, fertilizers, and water are all important and interrelated components in determining production decisions and enterprise profitability.

IRREVERSIBLE AND/OR IRRETRIEVABLE COMMITMENT OF RESOURCES

Based on this analysis, no irreversible and/or irretrievable commitments of socioeconomic or power resources in the San Luis Unit were identified.

[1] Renewal of these contracts is being undertaken in pursuance generally of: the Act of June 17, 1902 (32 Stat. 388), as amended and supplemented, including, but not limited to; the Acts of August 26, 1937 (50 Stat. 844) as amended and supplemented, August 4, 1939 (53 Stat. 1187) as amended and supplemented, July 2, 1956 (70 Stat. 483); June 3, 1960 (74 Stat. 156); June 21, 1963 (77 Stat. 68); October 12, 1982 (96 Stat. 1262); October 27, 1986 (100 Stat. 3050); and Title XXXIV of the CVPIA of October 30, 1992 (106 Stat. 4706).

SECTION 3.5: LAND USE

This section discusses the potential effects that the alternatives considered in this EIS would have on land uses within the San Luis Unit. Information in this section was summarized primarily from county general planning documents, CVP contractor water conservation plans, U.S. Bureau of the Census data, and information obtained in interviews with San Luis Unit contractors and county and local officials.

AFFECTED ENVIRONMENT

Land use can be defined as the human use of land resources for various purposes including but not limited to economic production, natural resources protection, recreation, or institutional uses. Land uses are frequently regulated by management plans, policies, ordinances, and regulations that determine allowable uses. This section discusses lands in the project area at the county level and for the geographic service areas of the nine contractors located in the San Luis Unit. A discussion of Important Farmland and Williamson Act lands is also included.

COUNTY LAND USES

Regional agricultural development and the conversion of natural habitat to agricultural uses began in the early to mid-1800s and intensified in the later 1800s as the railroads provided the means to transport agricultural produce to much larger markets. The San Luis Unit contractors are located in the San Joaquin River Region of the CVP. Land uses in portions of Fresno, Kings, and Merced counties could potentially be affected by the renewal of long-term water service contracts. The following discussion generally focuses on addressing lands located within these counties.

Merced County

Merced County encompasses 1,984 square miles and includes 18 unincorporated communities and the six incorporated cities of Atwater, Dos Palos, Gustine, Livingston, Los Banos, and Merced. Merced is the largest incorporated city in the county. The six cities are evenly distributed, with three along Highway 99 in eastern Merced County and three west of the San Joaquin River. Unincorporated communities are more concentrated in eastern Merced County, reflecting larger population concentrations based on historic growth.

Demographics

According to the U.S. Bureau of the Census (2004), the estimated population in Merced County in 2003 was 231,574. From April 1, 2000, to July 1, 2003, the population in

Merced County grew by approximately 10 percent (from 210,554 to 231,574), exceeding the average statewide increase of approximately 5 percent for the same time period.

Land Use

As outlined in the Land Use section of the Merced County General Plan, the county has used the "urban centered concept" as a basic land use principle since the 1990s. The urban centered concept is directed at utilizing cities and unincorporated communities or centers to accomplish anticipated urban expansion in an orderly manner, based on the ability of these communities to furnish public services along with land needs based on population demands and in a balance with employment-generating land uses. The purpose of using the urban centered concept to plan land use is to ensure that growth occurs in an orderly and logical manner; land is utilized efficiently; agricultural operations are not eliminated prematurely; the county's planning efforts are complementary to those of the cities; and urban development occurs where proper services are available.

Rural areas in Merced County, which are typically used for cropping or pasturing activities, are subject to their own land use designations. When Merced County's general plan was developed in 1990, it was estimated that 80 percent of the population lived in the urban centers and the remaining 20 percent lived on the 95 percent of the land in the county that was considered rural (Merced County 1990). The general plan has not been substantially updated since the 1990 general plan.

According to the 2002 Census of Agriculture for Merced County (National Agricultural Statistics Services 2002a), there were 1,006,127 acres in farms, a 9 percent increase from 920,813 acres in 1997. There were also 2,964 farms in Merced County, an 8 percent decrease from 3,218 farms in 1997 (National Agricultural Statistics Services 2002a).

Fresno County

Fresno County encompasses approximately 6,000 square miles and includes the 15 incorporated cities of Coalinga, Clovis, Firebaugh, Fowler, Fresno, Huron, Kerman, Kingsburg, Mendota, Orange Cove, Parlier, Reedley, San Joaquin, Sanger, and Selma.

Demographics

According to U.S. Bureau of the Census (2004), the estimated population in Fresno County in 2003 was 850,325. From April 1, 2000, to July 1, 2003, the population in Fresno County grew by 6.4 percent (from 799,407 to 850,325), exceeding the average statewide increase of approximately 5 percent for the same time period. According to the County of Fresno General Plan, the combined populations of Fresno and neighboring Clovis also

comprise 61 percent of the total county population and 82 percent of the population of the other incorporated cities combined (County of Fresno 2000a).

Land Use

In 1997, approximately 50 percent of the county's total acreage was used for agriculture. The land uses in Fresno County are shown on Table 3.5-1.

Farming and agriculture-related businesses comprise a major component of the local economy. Factors that contribute to the success of agriculture include excellent soil and climatic growing conditions and the availability of a workforce and transportation.

Table 3.5-1
Fresno County Land Uses in 1997

Land Use	Square Miles
Residential	152
Commercial	7
Industrial	11
Agricultural	2,911
Resource Conservation[1]	2,691
Unclassified[2]	11
Incorporated Cities	154
Total	**5,937**

Source: County of Fresno 1998
[1]Including national forests, parks, and timber preserves
[2]Includes streets, highways, and rivers

According to the 2002 Census of Agriculture for Fresno County (National Agricultural Statistics Service 2002b), there were 1,928,865 acres in farms in Fresno County, a slight decrease from 1,935,922 acres in 1997. There were also 6,281 farms in Fresno County, a 10 percent decrease from 7,040 farms in 1997 (National Agricultural Statistics Services 2002b).

Kings County

Located in the southern half of the Central Valley, Kings County encompasses 1,392 square miles. The county includes the four incorporated cities of Hanford, Lemoore, Corcoran, and Avenal. According to the Kings County General Plan, approximately 67 percent of the county's population lives in the incorporated cities (Kings County Planning Department 1993).

Demographics

According to the U.S. Bureau of the Census (2004), the estimated population in Kings County in 2003 was 138,564. From April 1, 2000, to July 1, 2003, the population in Kings County grew by 7 percent (from 129,461 to 138,564), exceeding the average statewide increase of approximately 5 percent for the same time period. The population figure includes the approximately 15,000 inmates at the Avenal and Corcoran State Prisons (Kings County Planning Department 2004).

Land Use

Kings County's economy has been dominated by agriculture and related industries since its formation in 1893. Kings County has consistently ranked among the top counties in the nation in the production of cotton, barley, and alfalfa seed. The county also produces 39 crops or products, including milk, cattle, and turkeys, that gross over $1 million per year. According to the 2002 Census of Agriculture for Kings County (National Agricultural Statistics Services 2002c), there were 645,598 acres in farms, a 2 percent decrease from 661,363 acres in 1997. There were also 1,154 farms in Kings County, a 5 percent decrease from 1,215 farms in 1997 (National Agricultural Statistics Services 2002c).

Information on land available for urban development in Kings County is shown in Table 3.5-2.

Table 3.5-2
Land Available in Kings County for Urban Development in 1993

Land Use	Acres
Residential	1,696
Commercial	634
Industrial	1,003
Total	**3,333**

Source: Kings County Planning Department 1993

CVP CONTRACTORS

The contractors in the San Luis Unit can receive CVP water from the Delta-Mendota Canal, San Luis Canal, or the Mendota Pool. The following discussion provides information on land uses within each contractor's service area and includes a discussion of current agriculture and future trends in agriculture as applicable. It also includes a discussion of current land use planning and development projects. While this information is indicative of land use and growth trends in the San Luis Unit, it is not intended to be a comprehensive list of every development project planned or proposed.

City of Avenal

The City of Avenal encompasses 19.5 square miles, of which 2.5 square miles are urbanized. Its sphere of influence contains an additional 20.5 square miles (Collins and Associates 1992). Almost one-half of the 19.5 square miles of the City of Avenal's planning area is located in the Kettleman Hills area of the city. This area is unsuitable for development for numerous reasons, including steep slopes and unstable soils, a lack of services and infrastructure, the presence of threatened and endangered plant and animal species, hazardous seismic conditions, federal government land, and land in Williamson Act contracts (Collins and Associates 1992). Also, approximately five square miles of this land are owned by oil companies and are used for oil production.

Almost 40 percent of the Avenal planning area is located in the Kettleman Plain, west of the Kettleman Hills. This portion of the planning area contains the 2.5 square miles of

urbanized area and the Avenal State Prison. The Avenal State Prison is the largest employer in Avenal. The remainder of the planning area is located in the San Joaquin Valley to the east of the Kettleman Hills and is traversed by both Interstate 5 and the California Aqueduct.

Avenal's main industries have historically been oil and gas production and distribution. As these industries have declined, agriculture has taken over as a main industry in the community. Agriculture has provided a strong economic base for the community. As the city continues to grow, however, surrounding agricultural lands could be taken out of production to accommodate residential, commercial, and industrial growth. At present, all of the City of Avenal's CVP water supply is used for M&I purposes. Avenal relies on commercial and light industrial growth as a base for economic stimulation and growth in the area.

The City of Avenal is experiencing growth, similar to that throughout the rest of the San Joaquin Valley. Most of the growth in the city is residential development, primarily on in-fill lots. Near-term residential development includes two subdivisions—one with 28 lots and the other with 12 lots. An additional future subdivision of 40 homes is also expected in the future. There is also a small amount of commercial growth planned. In addition, the City's landfill also has plans to expand, but will still be within its overall footprint (Sopp 2004). Also, in October 2001, Duke Energy Avenal, LLC, filed an Application for Certification to the California Energy Commission for the licensing of the Avenal Energy Project and to construct and operate a 600-megawatt power plant in Avenal. The project has currently been suspended until at least May 1, 2006 (CEC 2005).

City of Coalinga

Surrounded by hills, ranches, and agricultural land, the City of Coalinga encompasses 4.1 square miles, while its sphere of influence currently encompasses an additional 8.2 square miles. Of the approximately one dozen farmers in and near the City of Coalinga's water service area, none receives water from the City for farming purposes, but domestic water is provided because of the very poor domestic quality of the groundwater. Cropping patterns in the Coalinga area include row crops such as cotton, grains, tomatoes, melons, and sugar beets and permanent crops such as almonds and pistachios. At present, all of the City of Coalinga's CVP water supply is used for M&I purposes, and M&I growth is anticipated to increase in the future.

The City of Coalinga is updating its 1992 General Plan, which will include an expansion of its sphere of influence. Adoption of this update is scheduled to occur not later than December 2005.

The City of Coalinga has recently experienced and is also expected to continue to experience significant growth in the short term (1 to 5 years) and long term (5 to 10 years) (Skinner 2004). Projects include land within the current city limits as well as land in the proposed expanded sphere of influence. Short-term planned development in Coalinga includes a recently approved development of 287 single-family and 217 multiple-family residences and multiple commercial developments. Other planned development projects include:

- Construction of the Coalinga State Hospital, 1,500-bed state mental hospital.
- Development of the Old School Farm, a 286-acre master-planned development that would include approximately 779 to 1,120 residential units (single-family homes, multiple-family homes and mixed-use homes) as well as commercial development and a community park.
- Development of a 5-acre neighborhood park.
- Potential development of 356 acres of land to be used for residential development, pending the increase in the city's sphere of influence.
- Conceptual review of residential development of an additional 256 units.
- Relocation and expansion of Coalinga's wastewater treatment plant. The preparation of an environmental impact report for the project is currently under way and the new plant is anticipated to be ready for operation in three to five years.

Potential long-term development plans (5 to 10 years) in Coalinga include:

- Potential development of 20 to 50 acres for commercial use.
- Potential development of 1,600 acres, including 160 acres for industrial development and the remaining acreage to be included in a master-planned community to include residential, commercial, and industrial development, schools, parks, and golf courses.

City of Huron

The City of Huron encompasses 1.6 square miles and is located in the San Joaquin Valley's west-side region. All of the City of Huron's CVP water is used for M&I purposes. M&I, commercial, and residential growth is anticipated in the City of Huron.

Agricultural products in the Huron area are grown by a few large farmers and consist mostly of grains and inedible products including cotton.

Pacheco Water District

The Pacheco Water District is located near the City of Los Banos in both Merced and Fresno counties. Pacheco Water District, a small, entirely agricultural district, has fewer than 10 landowners. The principal crops grown in this district include melons, tomatoes, asparagus, and a small amount of alfalfa. Panoche Water District assumed the management responsibilities of Pacheco Water District in 1999. There is no planned development in Pacheco Water District, which is expected to remain an entirely agricultural district.

Panoche Water District

The Panoche Water District is located in both Merced and Fresno counties. Panoche Water District is primarily an agricultural district. M&I water use is incidental to agricultural use and amounts to less than 50 acre-feet per year. M&I use is not expected to increase because it is not anticipated that agricultural land would be converted to other land uses.

There are approximately 65 water users in the district, which includes 60 landowners. The largest landowner farms approximately 9,000 acres, while the smallest landowner farms less than 20 acres. The landowner base in the district has remained very stable, with the majority of the landowners having been there since the 1940s and 1950s. Approximately 26 percent of the land is leased out; the remaining land is farmed directly by the landowners. The district also participates in an active drainage management program that reduces drain water volumes and constituent loads by altering cropping patterns and/or irrigation methods in targeted areas. Primary crops produced in the district in 1997 included cotton, processing or cannery tomatoes, melons and alfalfa hay (Stoddard & Associates 2000). Despite the district's participation in the active management program, the production of these crops is expected to continue.

San Luis Water District

The San Luis Water District is located near the City of Los Banos and is within both Merced and Fresno counties. The southern section of the district located in Fresno County is primarily agricultural. The land is planted with either row crops, including cotton and melons, or permanent crops, including primarily almonds. In recent years, some parcels in this area of the district have not been farmed because they are of marginal quality or have high water costs or drainage problems.

CVP water is used for both agricultural and M&I uses. M&I use primarily occurs in the northern section of the district, which is located in Merced County. It is anticipated that the conversion from agricultural use to M&I use will occur mostly in this section of the district. Approximately 10,000 acres identified as potential development locations are currently in the planning stages with Merced County and the district.[1] Recent development trends include the construction of a commercial development in 1996 and the approval of a 65-home subdivision and a 392-acre golf course and subdivision. Much of the land targeted for M&I development is currently unused and desolate. All development proposals will be subject to separate analysis under the California Environmental Quality Act (CEQA) and planning policies, ordinances, and regulations administered by Fresno and Merced counties, as appropriate consistent with their respective levels of jurisdiction.

Westlands Water District

Westlands Water District is located in western Fresno and Kings counties. Agricultural production is the predominant land use, because farmers in the district work fertile and productive land, producing food and fiber products and economic wealth. More than 60 different crops are grown commercially in Westlands Water District, with the potential for many others. The primary crops grown include cotton, tomatoes, garlic, almonds, melons, lettuce, grains and safflower. The cropping patterns have changed over the years depending upon water availability, water quality, and the agricultural economy and market factors. Prior to the delivery of CVP water, farmers in Westlands Water District grew primarily cotton and grain along with some vegetables. The acreage trend, however, is that vegetable and permanent crops have become a larger part of the crop acreage and cotton and grain acreage has decreased. Since 1977, approximately 8.8 percent of the land in the district, on average, is idle each year. Since 2000, water supply reductions have resulted in increased land fallowing in the Westlands Water District. Approximately 100,000 acres were fallowed in 2002 (Reclamation 2004). By 2001, a total of 2,091 acres in Westlands Water District had been retired from commercial irrigation.

Unlike many other key growing areas of California, urbanization is not a direct threat to productivity. However, CVP water in the district is used for both agricultural and M&I uses. The majority of CVP supply is used in agriculture, and of the almost 800 water users in the district, approximately 600 are agricultural users and approximately 180 are M&I

[1] It is the San Luis Water District's policy to ensure that development does not jeopardize other water users within the district. Therefore, any potential developer must prove that a dependable long-term water supply can be secured to meet the water needs of the project before that project can be approved for development. In this analysis, the development under consideration must assume that the district receives only 25 percent of its CVP water supply. This percentage is based on the allocations received by the district in 1991 and 1992.

users. The district's M&I deliveries include cities and governmental agencies; however, none of this water is treated by the district before its distribution. Total M&I deliveries are estimated to be 2,000 acre-feet per year and account for only a very small percentage of the district's CVP supplies.

FARMLAND CATEGORIES

Table 3.5-3 contains a description of farmland categories as defined by the U.S. Department of Agriculture, Natural Resources Conservation Service. Some of these farmland categories are found within Fresno, Kings, and Merced counties.

Table 3.5-3
Important Farmland Map Categories

Category	Description
Prime Farmland	Land that has the best combination of physical and chemical characteristics for producing food, seed, forage, fiber, and oilseed crops and is also available for use. It has the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods.
Farmland of Statewide Importance	Land other than Prime Farmland that has a good combination of physical and chemical characteristics for crop production. The land must have been used for production of irrigated crops within the last three years and also meet specific criteria including soil temperature and range.
Unique Farmland	Land that does not meet the criteria for either Prime Farmland or Farmland of Statewide Importance, but that is used for the production of specific high economic value crops. It is land that has a special combination of soil quality, location, growing season, and moisture supply needed to produce sustained high quality or high yields of specific crops.
Farmland of Local Importance	Land that may be important to the local economy because of its productivity.

Source: County of Fresno 2000b.

The California Department of Conservation, Division of Land Resource Protection's Farmland Mapping and Monitoring Program maintains statistical reports on lands by county. These reports contain urban and agricultural land use information as well as information on lands that meet the criteria of Important Farmland as specified in Table 3.5-3. Table 3.5-4 provides land use and farmland information for Fresno, Kings, and Merced counties.

Table 3.5-4
2002 Farmland Conversion Data

Category	Fresno County	Kings County	Merced County
Prime Farmland	731,149	140,876	286,054
Farmland of Statewide Importance	490,353	431,338	158,405

Unique Farmland	102,946	28,313	100,749
Farmland of Local Importance	74,347	7,565	41,772
Grazing	835,120	236,583	578,892
Urban and Built-up Land	107,532	29,795	33,090
Water	4,911	66	16,970

Source: California Department of Conservation 2002a, 2002b, 2002c

Since 1958, the San Luis Unit has experienced the reclassification of approximately 121,000 acres of lands previously qualified as Prime Farmland. This is predominantly due to increased problems related to drainage and salinity. While these lands are no longer classified as Prime Farmland, the acreage is still classified as Farmlands of Statewide Importance and remains in production. During the past 30 years, approximately 6,000 acres of Prime Farmland in the San Luis Unit have been removed from agricultural production due to increased urbanization and issues involving sediment deposition. This equates to an annual Prime Farmland loss of 200 acres or less than 0.03% of the total Prime Farmland in Fresno County alone.

Agricultural Land Use Trends

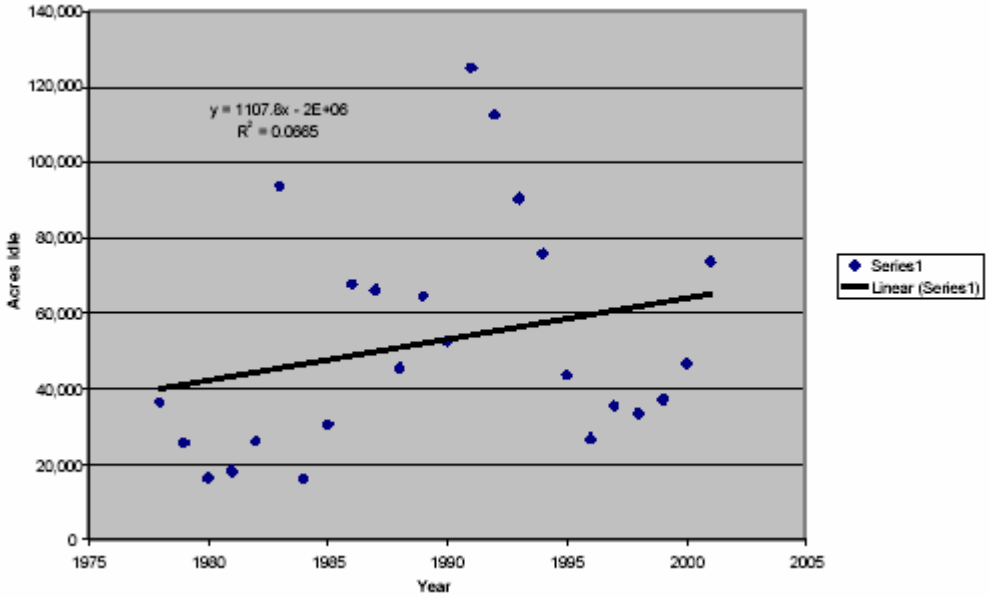
Some previously farmed land in the study area may remain fallow during a particular growing season. It can be assumed that some of this land also meets the Important Farmland criteria previously listed in Table 3.5-3. The specific districts that have fallowed land and the amounts and locations of the fallowed land vary during each growing season. Among the several reasons that land may be fallowed are:

- Water deliveries, reliability, and timing and their relation to pre-planting and management decisions and costs.
- Water availability.
- Water rights being transferred from one parcel of land to another.
- Economics, including cost controls, commodity pricing, and market conditions.
- Foreclosures.
- Marginal agricultural land or poor soil conditions.
- Growth pressures.

Fallowing is but one response to trends in cropping patterns and land use that have changed in the San Luis Unit over the years. While the unit is dominated by irrigated agriculture, and minor urban areas (Huron, Avenal), commercial uses (Harris Ranch complex, food processors) are also present and increasing. Some formerly irrigated lands

are now used for dryland pasture, wildlife habitat, dryland grain, drainwater reuse areas, and sediment settling basins. Westland's crop report indicates that idle and fallow lands have been increasing over the years (Figure 3.5-1). Much of the random variation shown on Figure 3.5-1 is due to annual water supply variability. The systematic variation associated with the slight upward trend over time is associated with declining land productivity in drainage-impaired areas and long-term water availability restrictions. Other factors, such as increased on-farm irrigation efficiencies and reduced acreage in some high-water-use crops such as alfalfa may have also affected the magnitude of the trend. The trendline and equation are not statistically significant but are included to give the reader a general picture of historic land fallowing conditions.

Figure 3.5-1 Westlands Fallow and Idle Acreage Trends



A summary of cropping pattern changes in Westlands between 1978, 1990, and 2001 are listed in Table 3.5-5. The year 1978 coincides with the first water deliveries to the San Luis Unit's distribution system, and 1990 roughly corresponds to the peak of irrigated acres prior to acreage reductions forced by increased drainage-related salinity problems and decreased water supplies. It should be noted that more recent information on the Westlands internet site indicates about 100,000 acres are now idle in the district (Westlands 2002). Retired lands increased from 2,091 acres in 2001 to 20,518 acres in 2002.

Table 3.5-5
Crop Summary Data, Westlands Water District

Crop	1978 acres	1990 acres	2001 acres	General trend
Alfalfa hay	13,771	10,716	9,701	Decrease

Cotton	272,061	235,290	188,569	Decrease
Orchards, vineyards	13,012	25,139	59,495	Increase
Small grain	129,130	34,994	50,631	Decrease-stable
Tomatoes	30,224	95,159	85,122	Increase-stable
Other vegetables	37,839	73,706	88,088	Increase
Sugar beets	6,746	7,393	5,007	Variable-stable
Other Field crops	16,584	14,206	7,484	Decrease
Alfalfa seed	17,337	10,716	2,214	Decrease
Fallow, idle	36,335	52,554	73,802	Increase
Double crop	9,021	7,069	12,873	Variable

Reclamation law prohibits delivery of water to lands that Reclamation considers unsuitable for sustained irrigation pursuant to Reclamation's Irrigation Suitability Land Classification System. Some of this land has been irrigated over the years, but none is irrigated today (Phillips, pers. comm., 2003). Development of new irrigation technology and expensive landowner land development and improvement operations have reduced the Class 6 acreage in the San Luis Unit to about 24,000 acres.

REGULATORY SETTING

Williamson Act

The California Land Conservation Act of 1965 (more commonly known as the Williamson Act) established a voluntary tax incentive program for preserving both agricultural and open space lands. The act reduces property taxes in return for the guarantee that the property will remain in agriculture for not less than 10 years, thereby slowing the conversion rate of agricultural land to other uses. Under the act, property owners enter into 10-year contracts with their respective counties. The county then places restrictions on the land in exchange for tax savings. The property is then taxed according to the income it is capable of generating from agriculture and other compatible uses, rather than being taxed on its full market value. The contract is automatically renewed annually after the first 10 years, unless a written request—called a Notice of Non-Renewal—is prepared.

Merced County first opted to participate in the Williamson Act program in 2000. As of November 2004, there were 429,165 acres of land in Williamson Act contracts in Merced County (King 2004). In Fresno County, 1,494,454 acres of farmland are within Williamson Act agricultural preserves that are located predominantly in unincorporated areas of the county (County of Fresno 2000a). In November 2004, in Kings County, there are 671, 245 acres combined either in Williamson Act contracts (10-year contracts) or

Farmland Security Zone contracts[2] (20-year contracts) (Gatsga 2004). Applications for an additional 505 acres of land are also being considered for inclusion in Williamson Act or Farmland Security Zone contracts in Kings County.

Actions Not Evaluated in This EIS

The authorities and laws governing the renewal of the San Luis Unit long-term water service contracts allow no discretionary control over private land-use activities. The renewal of long-term water service contracts being analyzed in this document, therefore, does not include any actions on private land.

Actions outside the renewal of current water service contracts between Reclamation and the San Luis Unit contractors are also not included within this analysis. In addition, Reclamation's action does not include any discretionary actions relating to land-use questions. Changes in land use will be determined by the actions of individual water users as a result of multiple factors, including many that are unrelated to the federal action of this contract renewal.

For example, the implementation of long-term water service contract renewals would not directly affect land uses or result in any land use changes within the San Luis Unit. It would not require the construction of new facilities that would alter current land uses and would not result in the installation of any structures that would conflict with existing land use plans. The construction of facilities and the installation of structures associated with the operation and maintenance of the San Luis Unit facilities are separate actions, subject to compliance with federal law and separate environmental review. Similarly, the construction of other development projects are governed by local land use planning laws under the jurisdiction of the potentially affected cities and counties.

ENVIRONMENTAL CONSEQUENCES

This section provides an assessment of the potential environmental consequences or impacts that the alternatives considered in this EIS could have on land use in the Fresno, Kings, and Merced counties area, as compared to the No Action Alternative.

The following criteria were used to assess the general potential for the various alternatives to result in adverse impacts to land use. Specifically, the No Action and action alternatives were reviewed to assess whether they could result in one or more of the following effects:

[2] Farmland Security Zone contracts offer even more tax incentives than Williamson Act contracts, at 65 percent of its Williamson Act valuation and are effective for 20-years.

- Convert existing agricultural land to nonagricultural use or impair its agricultural productivity.
- Conflict with established land uses (including recreational, educational, religious, or scientific uses).
- Displace a large number of people.
- Conflict with adopted zoning and proposed or approved development plans.
- Provide access to previously inaccessible environmentally-friendly areas.

M&I, Commercial, and Residential Development

The long-term water service contract renewals alternatives would not directly or indirectly cause land use to change from irrigation to M&I uses. Land use changes could occur regardless of whether the No Action or one of the action alternatives were implemented because only cities and counties have land use jurisdiction. The irrigation or water districts or other agricultural districts have no land use jurisdiction, and thus they cannot control such changes within their boundaries. It is important to emphasize that ongoing and future development pressures in the San Luis Unit may continue to rely on CVP water.

The provision of continued CVP water service pursuant to the renewal of long-term water service contracts and authorized use of water for irrigation or M&I purposes means that M&I development may occur at some level and that some CVP contract water supply could be converted from agricultural to M&I use. This type of analysis, however, is "fact-specific," and the outcome depends in large part on the availability of alternative water supplies and reasonably foreseeable events that are outside the scope of this EIS.

The San Joaquin River Region is experiencing unprecedented growth and considerable development pressures. The Central Valley has become a magnet for those in search of affordable housing within a commuting distance of major employment centers. Increased demand for residential property, combined with low prices for agricultural products and rising costs of farming, has created increased pressure for farmers to sell their land for housing developments. As the population increases and development pressures continue, it is expected that a corresponding increase in urban development and a decrease in agricultural lands in production would also continue.

Some of the San Luis Unit contractors could be directly affected by the increasing growth pressures. While it is the policy of most of these districts to remain entirely or primarily agricultural districts, this could require an area currently within the district to detach from

the district if M&I water is required for development. In the case of some districts, the amount of CVP water used for M&I purposes could increase. It is also expected that growth in the San Luis Unit, primarily in the areas of the cities of Avenal, Coalinga, and Huron, and the Santa Nella community (in the area of the San Luis Water District) would continue. Each of these cities and community have expressed a desire for increased M&I and commercial development, which could include light industrial development, additional correctional facilities, the expansion of existing correctional facilities, or the development of power-generating facilities. They are also experiencing a certain degree of residential growth.

The factors that could limit the potential for growth include the lack of water and physical or other limitations for some areas that cannot economically be developed. Increased development pressures may result in increased pressures for additional M&I supply. In some municipalities, current water restrictions could result in little or no room for growth. For example, in Avenal, only a small percentage of water, even at 100 percent of the City of Avenal's CVP allocation, is available to accommodate new growth. If the City of Avenal cannot supply the water to meet expected growth, other nearby jurisdictions, including Lemoore, Hanford, Visalia, and Fresno, could benefit economically because they have other water supplies to meet new residential and commercial demand. To accommodate growth, other options for water supply would need to be considered, including water transfers and exchanges or additional groundwater pumping if that is a feasible water supply option in the area.

Indirect Impacts/Interrelated Activities

As a result of the federal action evaluated in this EIS, San Luis Unit contractors would continue to receive CVP water supplies in quantities that do not exceed their current contract amounts and that provide for continued agricultural or M&I use in their service areas. To the extent that such uses depend upon CVP supplies to continue, such continued uses are an indirect effect of contract renewal or are an interrelated activity. Much or all of the lands in the San Luis Unit that can be cultivated are cultivated, and therefore continuation of the supply of water or even the addition of water would simply be used on lands currently under production. Thus, contract renewal would not result in increasing the level of agricultural activity within the San Luis Unit above current baseline existing conditions.

In terms of indirect impacts, continued delivery of CVP water in the San Luis Unit will likely support existing trends towards M&I development in only specific, limited areas. The respective percentage and distribution of M&I and agricultural activities in the project

area will be subject to a wide range of economic factors, local land use decisions, and other factors outside Reclamation's control.

Also, depending on the effects of other contract provisions, such as increased prices for water, tiered pricing, or related federal activities that reduce south-of-Delta deliveries of CVP supplies, the amount of CVP water used by irrigation and M&I users may decrease in some years.

NO ACTION ALTERNATIVE

The No Action Alternative provides a baseline condition for comparing the action alternatives and represents future conditions at a projected level of development without the implementation of any action alternative. Under the No Action Alternative, the long-term contracts would be renewed and contractors would still receive their CVP allocation.

The No Action Alternative would not directly impact land uses within the study area. The renewal of long-term contracts in the San Luis Unit would not involve the construction of new facilities that would alter current land uses and would not result in the installation of structures that would conflict with current land use plans.

The long-term provision of CVP water to the study area would only continue to provide water supplies that accommodate a portion of the planned populations and land uses that are identified in the three counties' general planning documents. The renewal of the long-term contracts would beneficially continue the water supply for agricultural and crop production and would therefore contribute to the continued production of these lands. Implementation of this alternative would not directly impact the continued production of agricultural crops or impair the productivity of important farmlands when compared to existing conditions.

As part of the No Action Alternative, it is also necessary to consider the effects of potential reductions in irrigated acreage that may be retired as part of the CVPIA Land Retirement Program. This voluntary program may lead to contractors removing a portion of their irrigated lands from production in exchange for compensation. Land retirement amounts would help reduce irrigation drainage problems in areas where salts and other solids systemically pass into drain water and would also contribute to beneficial habitat impacts.

If future land retirement programs result in substantial reductions in the irrigable land base within the San Luis Unit, those programs will result primarily from voluntary programs wherein individual landowners consider the economic costs and benefits of retiring land from agricultural production. The range of factors that will likely be considered will include crop prices that can be taken in future agricultural markets, the fixed and variable

costs of agricultural production (equipment, labor, field preparation, machinery, seed, fertilizer, maintenance, etc.), the cost of water, and other considerations at the specific landowner level. If these landowners opt to convert the use of retired lands to any of several land uses (e.g., undeveloped, habitat, residential, commercial, or industrial development), such decisions will occur at the landowner and local (city and county) land use planning levels where such jurisdiction resides. Reclamation does not have land use planning jurisdiction, and because the chain of such land use decisions associated with future locations and levels of retired lands will rest with landowners and local jurisdictions, it is reasonable to assume that such decisions will occur regardless of whether the No Action or one of the action alternatives is implemented. Although the cost of water is partially controlled by Reclamation, this will be but one of many factors that will be considered, and therefore is substantially indifferent with respect to the alternatives considered in this EIS.

There is also a settlement agreement, the Westlands Settlement Agreement, among various classes of water users within Westlands that calls for the temporary retirement of approximately 65,000 acres. Land retirement is obligatory in the event that Reclamation does not provide drainage service. Reclamation's provision of drainage service to this area has been analyzed as part of its San Luis Drainage Facilities Re-evaluation Draft Environmental Impact Statement (May 2005), but the timeline associated with drainage facilities implementation is indeterminate. Therefore, the retirement of these 65,000 acres in Westlands is being considered as part of existing conditions and the No Action Alternative but would not impose meaningful impacts on acreages in agricultural production (in 2003, approximately 25 percent of this land was irrigated) or current and future land uses within the San Luis Unit.

PREFERRED ALTERNATIVE

The Preferred Alternative would not result in adverse impacts to land use when compared to existing conditions or the No Action Alternative. The long-term provision of CVP water to the study area would only continue to provide CVP water supplies that accommodate a portion of the planned populations and land uses that are identified in the three counties' general planning documents. The renewal of the long-term contracts would continue the water supply for agricultural and crop production and, therefore, would contribute to the continued production of these lands. Implementation of the Preferred Alternative would not directly impact the continued production of agricultural crops or impair the productivity of important farmlands when compared to the No Action Alternative.

ALTERNATIVE 1

Alternative 1 would not result in adverse impacts to land use when compared to existing conditions or the No Action Alternative. The long-term provision of CVP water to the project area would only continue to provide CVP water supplies that accommodate a portion of the planned populations and land uses that are identified in the three counties' general planning documents. The renewal of the long-term contracts would continue the water supply for agricultural and crop production and, therefore, would contribute to the continued production of these lands. Implementation of this alternative would not directly impact the continued production of agricultural crops or impair the productivity of important farmlands when compared to the No Action Alternative.

ALTERNATIVE 2

Alternative 2 would not result in adverse impacts to land use when compared to existing conditions or the No Action Alternative. The long-term provision of CVP water to the project area would only continue to provide CVP water supplies that accommodate a portion of the planned populations and land uses that are identified in the three counties' general planning documents. The renewal of the long-term contracts would continue the water supply for agricultural and crop production and, therefore, would contribute to the continued production of these lands. Implementation of this alternative would not directly impact the continued production of agricultural crops or impair the productivity of important farmlands when compared to the No Action Alternative.

CUMULATIVE IMPACTS

The cumulative land use impacts of primary concern in the San Luis Unit are associated with ongoing growth pressures that threaten the long-standing agricultural land use base by converting agricultural lands to M&I and residential use. Any conversions from agricultural to M&I land use within the San Luis Unit would not be caused by the terms of the contract renewal, nor by actions of the contractors. Instead, such changes will be the result of individual and cumulative land use planning decisions of affected counties, cities, and individual landowners. Those decisions will be guided by state and possibly local laws that already or may further require cities and counties to demonstrate adequate water supplies for land development projects. Two bills enacted in 2001 by the California Legislature, State Bill (SB) 221 (Kuehl) and SB 610 (Costa), require local governments to prepare water supply assessments that look very closely at long-term water supply reliability when approving land development projects consisting of more than 500 housing units (or their equivalent in demands for commercial and industrial projects). For small jurisdictions, projects representing a 10 percent increase in demand trigger the need for water supply assessments. SB 221 defines "sufficient" water supply as the "total water

supplies available during normal, single-dry, and multiple-dry years within a 20-year projection that would meet the projected demand."

The law does not speak, however, to levels of service, allowing local jurisdictions to define sufficiency in terms of how often and severe water shortages caused by droughts and other events can be. Therefore, one jurisdiction might conclude from its own perspective that a sufficient supply exists, while another, under exactly the same hydrologic conditions, might conclude otherwise.

The ultimate decision on water supply sufficiency in the context of land development approval rests with the land use jurisdiction and not the water supply entity, unless they are the same entity. Therefore, unless a local agency has imposed growth restrictions due to a water supply constraint and has specified a standard of reliability and unless a new supply can be assessed against that standard, determining a specific growth-inducing impact due to the added supply is difficult and highly speculative without knowledge of the facts surrounding specific development situations.

IRREVERSIBLE AND/OR IRRETRIEVABLE COMMITMENT OF RESOURCES

The No Action Alternative is expected to continue existing drainage and water quality trends that will irreversibly commit some soil and groundwater resources to "drainage-impaired" and ultimately unusable conditions for agriculture. Land retirement is defined as the permanent removal of lands from irrigated agricultural production by purchase or lease for other purposes or land uses. Under the No Action and Preferred Alternatives, Reclamation assumes up to 109,106 acres would be retired based on the following:

- CVPIA Land Retirement – Up to 7,000 acres of land are included to be retired within the study area under the existing CVPIA land retirement program (2,091 acres retired to date)

- Westlands Settlement Agreement (*Sagouspe v. Westlands Water District*) – A settlement agreement among various classes of water users within Westlands calls for temporary retirement of land. An estimated 65,000 acres of land would be retired under this settlement agreement. This agreement would allow these lands to come back into production if and when Reclamation provides drainage service.

- Britz Settlement Agreement (*Sumner Peck Ranch, Inc., et al. v. Bureau of Reclamation, et al.*) – An additional 3,006 acres in Westlands are being retired permanently under a settlement agreement dated September 3, 2002, between the

United States, Westlands, and the Britz group of plaintiffs in the Sumner Peck lawsuit.

- An additional 34,100 acres from the Sumner Peck Ranch et al. settlement of December 2002 would be retired. Under the non-irrigation covenant placed on the Sumner-Peck lands, no water may be applied to those lands without specific Reclamation approval.

The irreversible and irretrievable nature of these resource commitments applies only to such resources' ability to support agricultural production. Upon retirement, the affected lands, soil and groundwater resources will be potentially usable as habitat, recreational open space, or other uses consistent with landowner and local land use planning decisions. The action alternatives will result in similar levels of irreversible and irretrievable commitments of resources because each of them will similarly continue the delivery of irrigation waters to some drainage-impaired lands that ultimately may need to be retired.