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December 15, 2005

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

Re: Comments on Draft Environmental Assessment/FONSI (DEA) for Delta-Mendota Canal Unit CVP Long-Term Water Service Contracts

Dear Mr. Thompson:

I am writing to provide general comments on behalf of the Delta-Mendota Canal Unit contractors on the above DEA, and specific comments on behalf of Eagle Field, Laguna, Mercy Springs, and Oro Loma Water Districts and Tranquillity Public Utilities District. I am attaching marked-up pages and suggested inserts for your consideration in finalizing the DEA. Most of the comments involve factual corrections or updated information, although there is a suggested insertion to broaden the discussion of the Cumulative Impacts segment of Chapter 3.4 on Land Use, to deal with possible future M&I development.

Should you have questions on any of the comments or information presented, please feel free to contact me at (209) 392-2141 or by e-mail at drathmann@aol.com. Thank you for the opportunity to present these comments.

Very truly yours,

LINNEMAN, BURGESS, TELLES, VAN ATTA, VIERRA
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By Diane V. Rathmann
Diane V. Rathmann

Enclosures

- Provide water and storage for CALFED's EWA.
- Provide water for CALFED's Ecosystem Restoration Program objectives.

The Glenn-Colusa Irrigation District, Tehama-Colusa Canal Authority, CDFG, the Service, DWR, and Reclamation are working with other local water agencies and other state and federal agencies on this project.

A draft feasibility study and draft environmental documentation for the North of the Delta Offstream Storage project are scheduled for completion in 2006.

GRASSLANDS BYPASS PROJECT

Historically, farmers in the Grasslands area of the western San Joaquin Valley have discharged subsurface agricultural drain water through wetland channels in the San Luis National Wildlife Refuge complex to the San Joaquin River. This drainage contains elevated concentrations of selenium, salt, boron, and other trace elements.

Bypassing 90 miles of wetland channels, a portion of the San Luis Drain was reopened in September 1996 as the Grasslands Bypass Project (GBP). The San Luis Drain has been modified to allow discharge through six miles of Mud Slough, a natural waterway that traverses the San Luis National Wildlife Refuge Complex and a section of the North Grassland Wildlife Area.

Administered by the San Luis and Delta-Mendota Water Authority, the GBP serves approximately 97,000 acres in the Grassland Drainage Area (GDA). The GBP serves approximately 16,500 acres within DMC 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. The balance of the acreage is in the San Luis Unit.

Since October 1996, subsurface agricultural drainage water produced in the 97,000-acre GDA has been collected and routed into the San Luis Drain pursuant to the Use Agreement Between the United States and the San Luis and Delta-Mendota Water Authority. From the San Luis Drain, the subsurface drainage water is discharged into Mud Slough (north), 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 issued by the Regional Water Quality Control Board (Regional Board), a substantial reduction in drainage discharges is required in order to meet load targets for selenium and salinity.

Phase I of the GBP occurred between October 1996 and September 2001. Phase II began in October 2001 and will continue through December 31, 2009. Reclamation and the San Luis and Delta-Mendota Water Authority prepared an environmental impact statement/ environmental impact report that examined the environmental effects of the Phase II use agreement. The waste discharge requirement from the Regional Board were adopted on September 7, 2001 (Order No. 5-01-234). A Biological Opinion was issued for Phase II of the GBP on September 28, 2001 (Service 2001e).

In addition to concentration-based standards, monthly and annual selenium load allocations (pounds of selenium) for the GDA have been adopted and incorporated into the WDR and the GBP use agreement.

Farmers in the GDA 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 GDA. The GBP Monitoring Program conducts extensive water quality monitoring of affected receiving waters and is a joint effort of Reclamation, the San Luis and Delta-Mendota Water Authority, the Service, USEPA, U.S. Geological Survey, the Regional Board, and CDFG. Monitoring data are reviewed monthly by the Data Collection and Reporting Team and published by the San Francisco Estuary Institute (Reclamation 2000d). A biological monitoring program is conducted in accordance with a more comprehensive program developed by Reclamation, the Service, U.S. Geological Survey, CDFG, and the Regional Board in conjunction with the project participants. See Insert Page 1-41

OTHER RELATED ACTIVITIES AFFECTING SOUTH-OF-DELTA WATER SUPPLY RELIABILITY

In addition to these related activities, several other projects will have some effect on south-of-Delta deliveries, including, but not limited to, additional Endangered Species Act listings, Mendota Pool transfer pumping operations, conditional waivers of waste discharge requirements for discharges from irrigated lands, and other projects that place additional demands on water originating north of the Delta, the Delta, or those sources of supply that were historically relied upon for south-of-Delta deliveries.

The waste discharge requirements for the GBP also require a long term drainage management plan, which has been submitted to the Regional Board. Furthermore, the EIS included a study of the San Joaquin River Improvement Project, an in-valley regional drainage management program for collection of subsurface drainage water for application to salt tolerant crops. The Panoche Drainage District is developing and implementing that project for the benefit of GBP participants and expects to subsequent phases of the project to provide long-term drainage service following the end of the GBP. Environmental impacts will be evaluated for such Independent future phases.

Page 1-41 INSERT

Add to end of final paragraph on Grassland Bypass Project on page 1-41, the following update:

The waste discharge requirements for the GBP also require a long-term drainage management plan, which has been submitted to the Regional Board and is periodically updated. Furthermore, the GBP EIS included assessment of the initial phase of an in-valley drainage management project, the San Joaquin River Improvement Project. The Project is being developed by Panoche Drainage District for the collection and application of subsurface drainage to salt-tolerant crops and is made available to contractors participating in the GBP in order to achieve load reduction targets. Subsequent phases of the project will provide a long-term in-valley drainage plan for the lands currently participating in the GBP, to be available upon termination of the GBP. Additional environmental reviews will be conducted for future phases of the long-term drainage management actions.

districts regarding problems arising from tailwater leaving district boundaries and will take necessary actions to remedy such problems.

The district's policy on water transfers is to allow transfers of allocated water supply between parcels of land, either within the district or between districts, when the supply is associated with lands owned by the same landowner. Therefore, the only water transfers outside the district are transfers from a landowner to itself.

EAGLE FIELD WATER DISTRICT'S FACILITIES AND WATER USE

Eagle Field Water District is approximately 1,372 acres in size, of which 1,366 acres are irrigable. Because of its small size, the district is exempt from Section 3405(e) of the CVPIA, which requires the preparation of a water conservation plan. The district is located in both Merced and Fresno Counties between the Outside Canal and the Delta-Mendota Canal. Figures 3.1-14 and 3.1-15 show the current land use/land cover and boundary for the Eagle Field Water District service area.

Eagle Field Water District receives its CVP water supply directly from two turnouts on the Delta-Mendota Canal. The district has no additional conveyance facilities.

Use of CVP Water

On April 10, 1958, the district signed a long-term contract (Contract 14-06-200-7754) with Reclamation for 4,550 acre-feet of CVP water. The contract expired on February 25, 1995. Since then, a series of interim renewal contracts have been executed. The most recent interim renewal contract (Contract 14-06-200-7754-IR8) was executed on February 27, 2004, and can remain in effect for two years.

Use of Other Available Water Supplies

In addition to CVP supply, Eagle Field Water District has groundwater wells that provide a supplemental supply in dry years.

Operating Rules and Regulations

Eagle Field Water District is part of the Panoche Drainage District. The drainage district, which is composed of Panoche, Eagle Field, Oro Loma, and Mercy Springs Water Districts, was formed in the late 1950s to transport subsurface drainage water and tailwater from district lands. Historically, the Panoche Drainage District has been able to drain its discharge water through the Grassland Water District and into the San Joaquin River. Currently, as part of the GBP, the drainage district is required to remove its drainage water from the Grasslands Channels and convey the water through the San Luis Drain and into the San Joaquin River at the same point. drainage participates in the GBP and the land within Eagle Field is operated to reduce and manage drainage to meet the load targets for the GBP.

The CVP water is lifted from the Fresno Slough and Mendota Pool and is distributed to the approximately 32 farmable acres within the District.

Use of CVP Water

Since the expiration of the original contract, which was assumed by Tranquillity Public Utility District in 2003, a series of interim renewal contracts have been executed. The most recent interim renewal contract (Contract 14-06-200-3537-A-IR2) was executed on February 27, 2004, and can remain in effect for two years.

Use of Other Available Water Supplies

The District has no other source of water supply other than the CVP allocation.

Mercy Springs Water District's Facilities and Water Use

Mercy Springs Water District is approximately 3,390 acres in size, of which 3,336 acres are irrigable. The district is located in Fresno County and spans the Main Canal, Outside Canal, and the Delta-Mendota Canal. Figures 3.1-24 and 3.1-25 show the current land use/land cover and boundary for the Mercy Springs Water District service area.

The district receives its CVP water directly from a turnout on the Delta-Mendota Canal and has no additional conveyance facilities.

Use of CVP Water

On June 21, 1967, the district signed a long-term contract (Contract 14-06-20-3365A) with Reclamation for 13,300 acre-feet of CVP water. This contract expired on February 28, 1995. Since then, a series of interim renewal contracts have been executed. On May 14, 1999, the district assigned 6,260 acre-feet of its contract water supply to the Pajaro Valley Water Management Agency, Westlands Water District, and Santa Clara Valley Water District, leaving a balance of 7,040 acre-feet of supply subject to this long-term contract. On March 1, 2003, the district assigned an additional 4,198 acre-feet of its contract supply to the Westlands Water District Distribution District No. 2, leaving a balance of 2,842 acre-feet of supply subject to this long-term contract. The most recent interim renewal contract (Contract 14-06-200-3365A-IR8A) was executed on February 27, 2004, and can remain in effect for two years.

Use of Other Available Water Supplies

In addition to its CVP supply, Mercy Springs Water District has groundwater wells that provide a supplemental supply in dry years.

Operating Rules and Regulations

Mercy Springs Water District is part of the Panoche Drainage District. The Panoche Drainage District, which is composed of Panoche, Eagle Field, Oro Loma, and Mercy Springs Water Districts, was formed in the late 1950s to transport subsurface drainage water and tailwater from district lands. Historically, the drainage district had been able to drain its discharge water through the Grassland Water District and into the San Joaquin River. Currently, the Panoche Drainage District is required to remove its drainage water from the Grasslands Channel and convey the water through the San Luis Drain and into the San Joaquin River at the same point. Mercy Springs Water District decided not to participate in the GBP; therefore, the district, which is drained by deep drainage ditches, currently lacks a drainage outlet. As part of a land management program to reduce drain water and improve wildlife habitat that was implemented with a Reclamation grant, Panoche Water District will now develop portions of the Mercy Springs Water District into alternative land management by changing historical cropping rotations. Portions of the district will be planted to alfalfa, bermuda grass, and other salt-tolerant grasses that will be irrigated with CVP water, well water, and subsurface drainage water from Panoche Water District. The area will be used to establish the sustainability and feasibility of salt-tolerant grass for the continuous use of blended subsurface drainage water.

Mercy Springs Water District is active in water transfers, and in past years has transferred 4,198 acre-feet to other contractors and 2,842 acre-feet is applied in the district.

Oro Loma Water District's Facilities and Water Use

Oro Loma Water District is located in Fresno County between the Outside Canal and the Delta-Mendota Canal. It contains 1,080 irrigable acres. Because of its small size, the district is exempt from Section 3405(e) of the CVPIA, which requires the preparation of a water conservation plan. Figures 3.1-26 and 3.1-27 show the current land use/land cover and boundary for the Oro Loma Water District service area.

Oro Loma Water District receives its CVP water directly from two turnouts on the Delta-Mendota Canal and has no additional conveyance or distribution facilities.

Use of CVP Water

On April 7, 1959, the district signed a long-term contract (Contract 14-06-200-7823) with Reclamation for 4,600 acre-feet of CVP water. This contract expired on February 28, 1995. Since then, a series of interim renewal contracts have been executed. The most

recent interim renewal contract (Contract 14-06-200-7823-IR8) was executed on February 7, 2004, and can remain in effect for two years.

Use of Other Available Water Supplies

In addition to CVP supply, Oro Loma Water District has groundwater wells that provide a supplemental supply in dry years.

Operating Rules and Regulations

Oro Loma Water District is part of the Panoche Drainage District. The drainage district, which is composed of Panoche, Eagle Field, Oro Loma, and Mercy Springs Water Districts, was formed in the late 1950s to transport subsurface drainage water and tailwater from district lands. Historically, the Panoche Drainage District ~~had been able to drain its~~ discharge drainage water through the Grassland Water District and into the San Joaquin River. Currently, the Panoche Drainage District ~~is required to remove its drainage water from the Grasslands Channels and convey the water through the San Luis Drain and into the San Joaquin River at the same point.~~ participates in the GBP and the land within Oro Loma is operated to reduce and manage drainage to meet ~~GBP~~ the load targets for the GBP. Oro Loma Water District is active in water transfers and in past years has transferred water to other districts, including Panoche Water District.

Patterson Irrigation District's Facilities and Water Use

The Patterson Water District was formed in November 1955 at an original size of approximately 15,000 acres. After a series of exclusions, the size of the district in 1996 was 13,543.7 acres, all of which is irrigated. After being formed, Patterson Water District later changed to Patterson Irrigation District[5]. Patterson Irrigation District is located in Stanislaus County and is adjacent to West Stanislaus Irrigation District to the northwest and Del Puerto Water District to the southwest. The district includes 425 landowners and over 600 water users. Figures 3.1-28 and 3.1-29 show the current land use/land cover and boundary for the Patterson Irrigation District service area.

The Patterson Irrigation District distribution system consists of 3.8 miles of unlined canal, 51.8 miles of concrete-lined canal, and 84 miles of pipeline. The main canal flows from east to west and the main laterals that come off the main canal and flow to the north and south. The district also has a series of lift pump stations, four reservoirs that are located off the main canal, and two smaller reservoirs located off the main laterals. Originally

[5] The primary differences between irrigation and water districts are the range of purposes underlying their formation, eligible lands, and voting systems.

foot of water supplied to the city landfill each month for dust suppression. All remaining CVP supplies are used for agriculture. Despite the urban sprawl in the area resulting from the growth of Patterson and Tracy and along the Interstate 5 corridor, Del Puerto Water District would like to continue to remain primarily an agricultural district. The district does not intend to increase the amount of CVP water used for M&I purposes.

More than 30 different crops have been grown commercially in the district over the years. Principal crops grown include row crops (cannery tomatoes, alfalfa, large limas, and dry beans). However, almost one-half of the agricultural production in the district is permanent crops (almonds, apricots, and walnuts). Typical irrigation methods in the district include primarily furrow irrigation for row crops and sprinkler, sprinkler with less frequent use of drip, and micro-misters for permanent crops. Historically, areas of the district have remained fallow during the growing season.

Eagle Field Water District

Eagle Field Water District is entirely an agricultural district. Because it is located in a rural area away from major development pressures, the conversion from agricultural to M&I uses is unlikely. The crops produced in the district include cotton, cannery tomatoes, and rice. In the past, some of the land has also been farmed with sugar beets and dry onions. ~~All administrative functions for the Eagle Field Water District are currently being performed by Panoche Water District.~~ Ouch Wrong !

Fresno Slough Water District

Fresno Slough Water District is entirely an agricultural district and does not supply water for M&I use. It is also located in the area of the Interstate 5 Business Development Corridor, nearest to the town of Tranquillity. While the area is currently experiencing small amounts of growth, this growth is not expected to affect the district's ability to remain entirely an agricultural district.

There are about 10 landowners in the district. Most of these landowners have farmed in the district for a number of years, contributing to its stable landowner base. Crops grown in the district are predominantly row crops (cotton, seed alfalfa, and sugar beets). There are few, if any permanent crops in the district and no major land conversions to permanent crops are anticipated. The main reason for the reliance on row crops rather than permanent crops is that soils are typically heavy clays and suitable only for row crops. Irrigation methods in the district include mostly furrow irrigation and a few solid-set sprinklers. Historically, small areas of the district have remained fallow during the growing season.

James Irrigation District

James Irrigation District is entirely an agricultural district and currently does not supply any water for M&I use. The district is also located in the area of the Interstate 5 Business Development Corridor and nearest to the city of San Joaquin in Fresno County. While the area is currently experiencing small amounts of growth, this growth is not expected to affect James Irrigation District's ability to remain entirely an agricultural district.

There are approximately 200 farms in James Irrigation District and about 23,233 acres of the 26,103-acre district were irrigated in 1996. The principal crops grown in the district include cotton and seed alfalfa with smaller amounts of alfalfa hay and tomatoes. Also, a small parcel of land (less than 500 acres) produces barley and wheat in rotation. Soil types in the areas of row crops include heavy Merced clay. Soil types in small areas of the district include light sandy loam soil types; these areas are planted with permanent crops (almonds and grapes). The trend in the district has been a gradual shift from larger farms to smaller family-owned farms. The typical irrigation method in the district is furrow irrigation. Drip irrigation was used for grapes. Historically, areas of the district have remained fallow during the growing season.

Laguna Water District

Laguna Water District is entirely an agricultural district with only one landowner. Because it is located in a rural area away from major development pressures, the conversion from agricultural to M&I uses is unlikely. Primary crops produced in the district include alfalfa hay, cotton, oats, sugar beets, and wheat. All the land in the district is irrigable agriculture.

Tranquillity Public Utilities District

A portion of the property is occupied by the wastewater treatment plant, and the balance

The Tranquillity Public Utilities District includes approximately 32 farmable acres located adjacent to Fresno Slough. ~~The property~~ is used ~~entirely~~ for agriculture and is located in the area of the Interstate 5 Business Development Corridor. The nearby area is currently experiencing small amounts of growth; however, this growth is not expected to affect the Tranquillity Public Utilities District property operations in the short term.

Mercy Springs Water District

Mercy Springs Water District is entirely an agricultural district. Because it is located in a rural area away from major development pressures, the conversion from agricultural to M&I uses is unlikely. The crops typically produced in the district include cotton and alfalfa. All administrative functions for the district are currently being provided by Panoche Water District. ~~However~~ Also, most of the District has been acquired by the Panoche ~~water District~~ Drainage District for use as a regional drainage management facility for application of subsurface drainwater to salt tolerant crops. The CVP contract supply for this area has been assigned to 37 other CVP Districts. Administrative functions for the Mercy Springs are performed by Panoche Water Distri

Oro Loma Water District

Oro Loma Water District is entirely an agricultural district with only one landowner. Because it is located in a rural area away from major development pressures, the conversion from agricultural to M&I uses is unlikely. The crops typically produced in the district include rice, and historically, some of the land has also been farmed with cotton. ~~All administrative functions for Oro Loma Water District are currently being provided by Panoche Water District.~~ Not correct

Patterson Irrigation District

Patterson Irrigation District is entirely an agricultural district. The district provides no M&I water. It is anticipated that as Patterson and the Interstate 5 corridor continue to grow, any new proposed development requiring M&I water would be detached from the district. Patterson Irrigation District policy requires water users requesting M&I water to detach from the district. Therefore, despite neighboring growth pressures, Patterson Irrigation District is expected to remain entirely an agricultural district.

In the last 15 years, the primary crops have included apricots, beans, and alfalfa. Because the district is located in the heart of dairy country, crops like alfalfa will continue to be staple crops. However, there is a continued conversion from these row crops to higher valued permanent crops (almonds). Patterson Irrigation District does not currently maintain detailed records regarding irrigation methods. The best estimates show that the main irrigation methods used between 1986 and 1996 were primarily furrow/border followed by sprinklers and trickle irrigation.

Plain View Water District

Plain View Water District is primarily an agricultural district. In 1990, a small portion of the district's CVP supply was allocated for M&I use to service commercial and residential development. The water provided by the district was treated and delivered by the City of Tracy. The district also intends to continue to provide M&I water to increasing urban development within its boundaries. This water will also be treated and delivered by the City of Tracy. Since 1990, approximately 500 acres of land have been converted to M&I use. The water allocated for the converted land will continue to be used to serve the new land use through the City of Tracy water supply system. It is possible that as Tracy continues to grow, the amount of CVP water used for M&I purposes could increase. It is also possible that the growth could result in some areas currently within the district being detached and annexed to the City of Tracy.

Summary of Other Effects

Insert for Chapter 3.4, page 3-147,
Cumulative Impacts, following existing text:

M&I Development

The proposed long-term renewal contracts would not directly result in any land use change from irrigation to M&I uses. The land use changes also are not an indirect effect of the renewal. Land use changes could occur regardless of the renewal, in part, because the irrigation or water districts or other agricultural districts have no land use jurisdiction, they cannot control such changes within their boundaries. Moreover, the renewals are only for the maximum quantity available to each contractor under its preceding long-term contract and any interim contracts. Therefore, there would be no substantive change from the supply provided in the existing contracts. However, the provision of continued CVP water service pursuant to the long-term renewal contracts and authorized use of water for irrigation or M&I purposes means that at some level, M&I development may occur, and this CVP contract water supply could be converted from irrigation to M&I use. This type analysis however is "fact specific" and the outcome depends in large on availability of alternative water supplies, and reasonably foreseeable events.

Some of the DMC Unit contractors that are primarily agricultural could be affected by increasing growth pressures as California's population and economy continue to expand and to locate in the San Joaquin Valley. Most likely to be affected are those contractors located in San Joaquin and Stanislaus Counties and along the portion of the Interstate 5 corridor near the cities of Tracy and Patterson, such as Banta-Carbona Irrigation District, Del Puerto Water District, Patterson Irrigation District, Plain View Water District, The West Side Irrigation District, and, to a lesser extent, West Stanislaus Irrigation District.

Contractors in the I-5 Business Development Corridor, such as Tranquility Irrigation District, James Irrigation District, Reclamation District #1606, and the Coehlo Family Trust and Mardella Hughes property, could also be affected, although the growth pressure is far less evident in that area. It is the present policy of most of these districts to remain entirely agricultural districts and to require an area currently within the district to detach from the district, if the land is to be converted from irrigated land to an M&I purpose of use of CVP water. The only exception is the Plain View Water District, which has overlapping boundaries in some instances with the City of Tracy and has entered into arrangements for the City of Tracy to treat and deliver some of the district's M&I water to areas within the district's boundaries. Because the City of Tracy is already an M&I-only contractor, continued CVP service under its renewal contract would not cause a change.

In summary, any conversions from agricultural to M&I land use within the DMC Unit would not be caused by the terms of the renewal contract, nor by actions of the contractors that have no land use planning jurisdiction. Instead, such changes will be the result of land use planning decisions of individual landowners. Some guidance as to the likely effect of future development is found in the conservation policies of the agencies in the area with

land use planning jurisdiction as previously discussed in the Environmental Baseline section, "Current Management Direction of Local Agencies" in this BA. For example, the policies set forth in the City of Tracy General Plan and the opportunities for participation in the San Joaquin County Multi-Species Habitat Conservation Plan indicate that parties converting land to M&I uses in the area that is under the greatest development pressure will only be able to do so after appropriate assessment of and mitigation for impacts to threatened or endangered species environmental impacts.

In order to evaluate how changes in land use from agricultural to M&I could affect the threatened or endangered species environment, it is necessary to know both the current use of the existing parcel of land and the species associated with that specific parcel or area. The location of the converted land and the nature of the proposed M&I use are also highly relevant factors. Such information cannot be identified until specific changes have been proposed, and the locations of such changes are too uncertain to conclude that such changes from the existing environmental baseline would have an effect on threatened or listed species. as part of the environmental review of the specific projects.

A related concern if CVP water is converted from irrigation purposes to M&I purposes in the DMC Unit is that the water used for M&I purposes would be accorded a higher priority for reliability of delivery than the water delivered for irrigation. This higher M&I reliability could cause competition for limited available supplies south of the Delta between M&I uses and fish and wildlife purposes. As discussed previously in the Environmental Baseline section "Project History" Reclamations policies and commitments under various BO's ensure that there will be no impact to threatened or endangered species from increased M&I priority.

Selenium in the DMC Unit

Although contract renewals would continue surface water deliveries to the four districts that have selenium associated with subsurface drainage and, therefore, would contribute to such drainage discharges, there would be no increased effect over baseline conditions. All four districts participate in the Grassland Bypass Project. Loads of selenium being discharged from the Grassland Bypass Project, including from the four districts, are required to be reduced, consistent with ongoing regulatory requirements. There is an extensive Grassland Bypass Project monitoring program, and the terms and conditions implementing reasonable and prudent measures associated with the Use Agreement. The September 2001 Biological Opinion requires the development of additional information and decreased incidental take. The protections of the Use Agreement reach beyond its term, in that the project participants are required to develop by 2006 a plan for meeting water quality objectives in Mud Slough by 2010, the year in which critical year objectives must be implemented. An important component of reaching those objectives is the San Joaquin River Water Quality Improvement Project (SJRIP) alternative addressed in the BO. That alternative is also subject to terms and conditions to protect threatened and

Selenium in the soil is primarily a concern on the west side of the San Joaquin Valley. When the soils in this area are irrigated, selenium, other salts, and trace elements dissolve and leach into the groundwater (Gilliom et al. 1989). Over the past 30 to 40 years of irrigation, most soluble selenium has been leached from the soils into the shallow groundwater. It is drained from those soils when growers try to protect crop roots from salts and the high water table.

In areas with high selenium concentrations, selenium leached from the soils enters irrigation return flows and subsurface drainage flows. Irrigation of these soils further mobilizes selenium, facilitating its movement into shallow groundwater that is retained in poorly drained or mechanically drained soils. In the absence of adequate drainage facilities, leaching cannot fully remove the salts from these soils because water cannot percolate beyond one or more confining clay layers under the shallow groundwater aquifer.

GEOLOGY

The San Joaquin Valley is part of a large, northwest-to-southeast-trending asymmetric trough of the Central Valley, which has been filled with up to six vertical miles of sediment. This sediment includes both marine and continental deposits ranging in age from Jurassic to Holocene. The San Joaquin Valley lies between the Coast Ranges on the west, the Sierra Nevada on the east, and extends northwestward from the San Emigdo and Tehachapi Mountains to the Delta near the City of Stockton. The San Joaquin Valley is 250 miles long and 50 to 60 miles wide. The relatively flat alluvial floor is interrupted occasionally by low hills.

The San Joaquin Valley floor is divided into several geomorphic land types including dissected uplands, low alluvial fans and plains, river floodplains and channels, and overflow lands and lake bottoms. The alluvial plains cover most of the valley floor and comprise some of the most intensely developed agricultural lands in the San Joaquin Valley. In general, alluvial sediments of the western and southern parts of the San Joaquin Valley tend to have lower permeability than eastside deposits.

Near the valley trough, fluvial deposits of the east and west sides grade into fine-grained deposits. The San Joaquin Valley has several thick lakebed deposits. The deposit that most notably affects groundwater and confinement is the Corcoran Clay Member, deposited about 600,000 years ago. This clay bed, which is found in the western and southern portions of the valley, separates the upper semi-confined to unconfined aquifer from the lower confined aquifer (Page 1986). The clay bed covers approximately 5,000 square miles and is up to 160 feet thick beneath the present bed of Tulare Lake.

could decline with no or little recharge and land subsidence could increase over present rates. Soils may increase in salinity as salts concentrate as a result of an insufficient surface water supply for adequate leaching or poor quality, pumped groundwater.

ALTERNATIVE 2

Alternative 2 could have impacts similar to those discussed above for the No-Action Alternative. Groundwater pumping and land subsidence will continue in the project area as they have historically. However, to the extent that deliveries of CVP surface water are reduced, especially in one or more successive dry years, groundwater pumping may prove to be more economical than obtaining surface water at the higher tiered price or through transfers. If this becomes the case, groundwater pumping would increase over present levels, especially in service areas that will tend to rely heavily on groundwater pumping because of limited, affordable surface water options. As a result, the groundwater levels could decline with no or little recharge and land subsidence could increase over present rates. Soils may increase in salinity as salts concentrate as a result of an insufficient surface water supply for adequate leaching or poor quality, pumped groundwater.

CUMULATIVE IMPACTS

Long-term contract renewals, when considered in combination with other past, present, and reasonably foreseeable future actions, will not likely result in cumulative impacts to soils and geologic resources. Some DMC Unit soils may be subject to growth and development pressures that indirectly lead to the conversion of their current uses to commercial, residential, or industrial use. However, these decisions are made at the individual and local levels, and are difficult to estimate because of the speculative nature of the real estate market and locations where such pressures may arise, the ability of local jurisdictions to enforce best management practices encouraging wind and water erosion control, and the localized effectiveness of such practices. Long-term contract renewals continue the delivery of water to predominantly irrigated lands in the DMC Unit. Deliveries support the continued beneficial impacts of current farming practices that encourage erosion control from an economic standpoint. Erosion control measures practiced by DMC Unit farmers conserve topsoil that is rich in nutrients and water-holding capacity—qualities that are expensive to replace—thereby maintaining the agricultural quality of potentially affected soil resources.

* Area is fully developed. No land clearing wiles you mow remaining trees or other crops.

SECTION 3.8: SURFACE WATER RESOURCES

This section discusses the effects that the alternatives considered in Chapter 2 may have on surface water resources for the CVP contractors in the DMC Unit.

AFFECTED ENVIRONMENT

WATER RIGHTS

The DMC Unit is composed of two different types of water rights holders: (1) Exchange Contractors, who have a previous San Joaquin River water right that is now supplied by Reclamation, and (2) water service contractors, who have acquired water through the CVP. The CVP has developed different reliability criteria for each type of contractor. Typically, Exchange Contractors have a more reliable water supply because of their pre-CVP water right.

WATER SUPPLY

Prior to the CVP, irrigators in the Central Valley depended primarily on groundwater for agricultural irrigation. As the groundwater quantity and quality declined and land subsidence increased, it became apparent that an additional source of water was needed for agriculture to continue. The CVP was implemented in part to supply irrigators, primarily in the Central Valley, with a more consistent water supply than the existing groundwater resources. Groundwater resources were previously discussed in Section 3.7.

CVP water is used for irrigation of agricultural areas, M&I uses, and more recently, to restore fisheries and aquatic habitat in the waterways that have been affected by water development. The largest use of CVP water is for agricultural irrigation. The greatest demand for irrigation water occurs in mid- to late summer, as crops mature and crop water use increases. During the winter, farmers also use water for frost control and pre-irrigation of fields to saturate the upper soil. This saturation process loosens the soil for plowing and provides adequate moisture for seed germination. Natural winter precipitation is usually insufficient for these pre-irrigation needs at the lower elevations typical of the DMC Unit.

Reclamation makes water from the CVP available to contractors for reasonable and beneficial uses, but this water is generally insufficient to meet all of the contractors' needs. In the DMC Unit service area, contractors without a sufficient CVP water supply may extract groundwater if pumping is feasible or negotiate water transfers with other contractors. Alternate supplies from groundwater pumping and/or transfers are accessed when CVP surface water deliveries become more expensive than pumping or transfer costs. However, increased groundwater pumping can cause overdraft conditions and land

subsidence. Shallow aquifers have been contaminated by years of irrigation in the valley. The application of pesticides and herbicides and the increased solubility of naturally occurring trace elements in the soil, including selenium, boron, and arsenic, contribute to groundwater contamination.

The CVPIA PEIS developed estimates of maximum water contract deliveries for the year 2026 (Reclamation and Service 1999). These estimates were based on previous use, existing contract amount, and appropriate general plan environmental documentation relevant to CVP water use. The estimates for the two types of contracts, depending on the type of service, include the following:

- **Agricultural Water Service Contracts:** The maximum annual use between 1980 and 1993 or the projected use as addressed in the appropriate environmental documentation, limited by the maximum contract amount.

- **Water Rights and Exchange Contractors:** The maximum annual use between 1980 and 1993 or projected use as addressed in relevant environmental documentation, limited by the maximum contract amount.

- **M&I Water Service Contracts:** Total demand based on 2020 demands in DWR Bulletin 160-93 (DWR 1994) or the current M&I shortage criteria. Since 1991, Reclamation has been attempting to develop an M&I shortage policy applicable to as many CVP contractors as possible. Current M&I shortage criteria are detailed in the CVP Draft M&I Water Shortage Policy (Reclamation 2001f).

WATER QUALITY

Surface water quality in the San Joaquin River Basin is affected by many factors, most notably, the upstream development of Friant Dam, which has withheld most of the natural flow of the river, except during flood conditions. Other factors affecting San Joaquin River surface water quality include natural runoff, agricultural return flows, biostimulation, construction, logging, grazing, operations of flow-regulating facilities, urbanization, and recreation. In addition, irrigated crops grown in the western portion of the San Joaquin Valley have accelerated the leaching of minerals from soils, altering water quality conditions in the San Joaquin River system.

In the western part of the San Joaquin Valley, soils are derived mainly from the marine sediments that make up the Coast Range and are high in salts and trace elements such as selenium, molybdenum, arsenic, and boron. As a result of extensive land development in the San Joaquin Valley, erosion and drainage patterns have been altered, thereby

accelerating the rate at which these trace elements have been dissolved from the soil to accumulate in groundwater, streams, and the San Joaquin River.

Water quality in the San Joaquin River varies considerably along the river's length. Above Millerton Lake and downstream toward the Mendota Pool, water quality is generally excellent. The reach from Gravelly Ford to the Mendota Pool (about 17 miles) is frequently dry except during flood control releases, because all water released from Millerton Lake is diverted upstream to satisfy water rights agreements or percolated to groundwater. During the irrigation season, most of the water released from the Mendota Pool to the San Joaquin River is imported from the Delta via the Delta-Mendota Canal and generally has a higher concentration of total dissolved solids than that of the water in the upper reaches of the San Joaquin River. Most of the water released from the Mendota Pool to the San Joaquin River is diverted at or above Sack Dam for agricultural uses. Between Sack Dam and the confluence with Salt Slough, the San Joaquin River is often dry. From Salt Slough to Fremont Ford, most of the flow in the river is derived from irrigation returns carried by Salt and Mud Sloughs. This reach typically has the poorest water quality of any reach of the river.

As the San Joaquin River progresses downstream from Fremont Ford, water quality generally improves at successive confluences, specifically at those with the Merced, Tuolumne, and Stanislaus Rivers. In the relatively long reach between the Merced and Tuolumne Rivers, however, mineral concentrations tend to increase as a result of agricultural drainage water, other wastewaters, and effluent groundwater (DWR 1965). Total dissolved solids in the San Joaquin River near Vernalis have historically ranged from 52 mg/L (at high stages) to 1,220 mg/L from 1951 to 1962 (DWR 1965). During the mid- to late 1960s, San Joaquin River water quality continued to decline. In 1972, the State Board included a provision in Decision 1422 that Reclamation maintain average monthly total dissolved solid concentrations in the San Joaquin River at Vernalis of 500 mg/L as a condition of the operating permit for New Melones Reservoir on the Stanislaus River. The State Board's Decision 1641 implementing the 1995 Bay-Delta Plan requires both the CVP and SWP to meet Delta water quality standards. The Regional Board has developing a proposed Basin Plan Amendment dealing with salinity and boron on the San Joaquin River, which is currently pending before the State Board. In addition, extensive water quality monitoring and implementation of best management practices to address water quality is being implemented through the Regional Board's Irrig. Lands Conditional Waiver Program. The West side San Joaquin River Watershed Coalition has obtained an approved waiver, with most contractors in the DMC unit participating.

In drier years, CVP water quality and reliability decreases. First, the salinity and the concentration of organic materials from upstream soils and return flows increase in the Delta in drier years because the flow volumes from the Sacramento and San Joaquin Rivers decrease and salt water intrudes further upstream in the Delta.