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## **4. Environmental Consequences and Mitigation Measures**

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### **4.6 LAND USE**

This section evaluates the impact of the proposed action and alternative on land uses and the economy in the project area and vicinity. As described in Section 3.6, agricultural land uses and the agricultural sector of the economy are important resources in the project area and vicinity.

#### **4.6.1 Key Impact Issues and Evaluation Criteria**

With respect to land use, the primary issue is the extent to which the water from the San Joaquin River Group Authority's willing sellers (up to 137,500 acre-feet as shown in table 4.1-1) would affect agricultural land uses and, therefore, the agricultural economy in counties in the project area and vicinity. During public scoping, both San Joaquin and Stanislaus counties expressed concern over potential impacts to agricultural land uses. A related issue is whether the use of agricultural water supplies for instream flow enhancements for fish would be in conflict with public policies such as zoning and the Williamson Act which seeks to preserve agricultural lands for agricultural use. This issue of conflicts with local land use policies is addressed in Section 6.3 on local compliance requirements, while impacts to agricultural lands are evaluated here.

Evaluation criteria for determining impact thresholds of significance include the following:

- Reductions in municipal water supplies that could affect local populations;
- Permanent or long-term reduction in jobs in the agricultural sector of the economy; and/or
- Permanent or long-term reduction in agricultural acreage within the San Joaquin River area.

#### **4.6.2 Environmental Consequences**

This analysis relies on information provided by the willing sellers regarding water uses potentially affected by the proposed action. Similar information is not available for the Water Right Priority System alternative, so the analysis of this alternative is qualitative. The analysis also relies on economic information provided in Reclamation's Draft PEIS on the CVPIA and its Technical Appendix, Volume 5 (USBR 1997d, 1997i), the CALFED Draft PEIS/EIR (1998), and the SWRCB's Draft EIR on the 1995 Water Quality Control Plan (1998) in addition to information presented in Section 3.6.

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### 4.6.2.1 Socioeconomic Impacts

#### Population

The concern is to what extent the resident population would experience any water shortages as a result of implementation of the project alternatives. Water shortages could constrain planned growth in the affected areas.

**No Action.** Under the No Action alternative, both CVP (New Melones Reservoir) and non-CVP (New Don Pedro Reservoir and Lake McClure) facilities would operate consistent with 1997 conditions. Over time, the expansion of urban development to accommodate population growth and the conversion of agricultural lands to residential and other uses would occur to the extent permitted by local zoning and county/city general plans.

**Proposed Action.** The proposed project does not rely on water supplies used to meet the needs of municipal customers of the willing sellers (shown previously, Table 4.1-1). Most of the available water for the proposed action (126,500 acre-feet out of the total of 137,500 acre-feet) comes from carryover storage in project area reservoirs and would not affect deliveries to irrigation customers.

In future years, some of this “irrigation water” could be needed for municipal users; but the only district with municipal users at present is MID. MID’s maximum contribution to the pulse flows is 11,000 acre-feet or only 3 percent of its surface water supplies. Consequently, there would be no direct or indirect adverse impact on local populations, nor would local population growth be affected.

**Alternative Action.** The Water Right Priority System alternative requires flows for fish to come from sources with junior appropriative rights before senior appropriative right holders are affected.

The list of major San Joaquin Basin water rights is contained in the SWRCB’s Draft EIR (1998, p. II-28). Water available for exports could be affected, since waters for export are junior to all in-basin water rights. However, the New Melones project is assumed to be an in-basin project. Also, San Joaquin water right holders with storage rights in New Don Pedro and Lake McClure do not have delivery reductions because, through reservoir operations, they have adequate storage to meet flow obligations plus full deliveries (SWRCB 1998, p. V-18). For those districts and water users who would be affected, the proportion who are municipal water users cannot be determined quantitatively from information presently available in the Draft EIR (SWRCB 1998). However, it is probable that there are users with junior rights who serve municipal users who would have to curtail deliveries 20 to 60 percent of the time in April-May (SWRCB 1998, Figure V-19, V-20). As a result, the impact is adverse and considered potentially significant. Increased groundwater pumping could offset reductions in surface water deliveries.

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##### **Population Density**

The density of population (persons per square kilometer) would be affected if the alternatives constrained development of land for residential uses and spurred population growth as infill development on vacant parcels within the urbanized area/agency sphere of influence. Formal spheres of influence are established for cities and service districts by Local Agency Formation Commissions. These are used as urban limit lines in order to control annexations and promote the orderly expansion of urban services.

**No Action.** Under no action, current trends towards urbanization foster higher population density. However, the operation of existing water projects under the no action alternative assumptions does not encourage unplanned urban development.

**Proposed Action.** The proposed action does not affect municipal water users as explained above in Section 4.6.2.1. Consequently, there is no impact to population density.

**Alternative Action.** Based on Section 4.6.2.1 above, municipal users would likely be affected. If municipal supplies were constrained, population growth would be constrained in that new development would not be able to get water connections. However, the impact on population density would be insignificant, because densities under constrained growth would remain stable.

##### **4.6.2.2 Regional Economy and Employment**

The economic importance of agriculture to the communities of the Sacramento Valley, Delta and San Joaquin Valley is greater than just the gross value of farm products or the number of direct farm-related jobs. There are two ways in which the agricultural industry impacts local and regional economies.

- First, direct economic activity is what is required to produce and harvest a crop: several products, goods, and services. Prior to harvest this includes seed, fertilizer, water, equipment, fuel, and labor. Once the crop has been harvested, it needs to be transported, stored, processed, packaged, and marketed.
- The second way in which the agricultural industry affects the economy is through distribution of the income obtained through the initial direct economic activity. Farm and farm-related incomes may be spent on food, housing, and other consumer items. Therefore, every unit of direct economic activity results in a multiplier effect (secondary economic activity) which can range from 1.8 to 4, with a general average of 2.7.

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For example, a total farm income of \$8,397,000,000 for the San Joaquin River Region in 1992 is worth about \$22,671,900,000 in related economic activity assuming a multiplier of 2.7. (CALFED 1998)

Reductions in water deliveries to agriculture could lead to reduced farm production which generally results in the hiring of fewer workers. The following analysis evaluates the effect of reducing water deliveries to irrigation customers on the regional economy.

**No Action.** With no reductions in surface water deliveries, irrigated agriculture in the willing sellers' service areas would continue to rely primarily on surface water from carryover storage and from diversions. Changes in farm production and related economic activity would occur due to other economic factors such as the change in demand for agricultural products. The structure of the regional economy would be similar to existing conditions, 1992-1995, depending on the source of data.

**Proposed Action.** The proposed action relies on willing sellers; and OID, SSJID, and Merced ID together could provide up to 104,500 acre-feet of water that otherwise could be made available for irrigation uses. If deliveries are reduced, any subsequent impacts on total jobs from reduced farm production would be less than-significant, because (1) this full amount of water would be needed in only a few years (short term), and (2) the potential impact would be substantially avoided through the use of groundwater to substitute for reduced surface water supplies to irrigate agriculture.

**Alternative Action.** The SWRCB does not provide a detailed economic analysis of Flow Alternative 3 in the DEIR (SWRCB 1998). Potential output and income losses could be significant. However, with similar assumptions of no land fallowing and the use of groundwater to replace surface water supplies, the economic impacts would be similar to the proposed action, i.e., less than significant.

##### **4.6.2.3 Agricultural Land Use**

Agricultural land use can be described for this analysis as irrigated acreage, but it is also described by its cropping pattern (see Table 3.6-6).

###### **No Action**

For the Authority's six willing sellers, Table 4.6-1 shows total acres and the number of irrigated acres currently within each district. Under the No Action alternative, most of the irrigated acreage would continue in agricultural use. With the overall trend in the Valley towards development of agricultural land near urban centers for residential, commercial, and industrial uses, some of this acreage could be lost to agriculture over the 1999-2010 period. The No Action alternative assumes that prime farmland including land under Williamson Act contracts would not be urbanized.

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**Table 4.6-1: AGRICULTURAL LAND USE IN WILLING SELLER DISTRICTS**

Willing Seller	Land Area (acres)	Irrigated Area (acres)	Percent Irrigated (acres)
Exchange Contractors	240,000	225,562	94.0
Oakdale ID	72,345	62,000	85.7
South San Joaquin ID	71,112	62,000	87.2
Modesto ID	108,000	64,000	59.2
Turlock ID	192,000	149,000	77.6
Merced ID	140,000	98,000	70.0
<b>Total for All Districts</b>	<b>823,457</b>	<b>660,562</b>	<b>80.2</b>

#### Proposed Action

The districts that would potentially reduce deliveries to irrigation customers are OID, SSJD, and Merced ID (Table 4.1-1). These districts together contain 222,000 irrigated acres, 34 percent of the total irrigated acres (660,562 acres) within the service areas of the Authority's willing sellers).

When irrigation water is reduced, farmers have several options: (1) obtain alternative sources of supply to supplement reduced surface water allocations; (2) increase water use efficiency including the reduction in deep percolation; and (3) match land use and cropping patterns to available water supplies through a combination of fallowing and shifts in crop type (SWRCB 1998). A cropping pattern is the share of acres within a region planted to individual crops or categories of crops, including fallowed land. Cropping patterns are important to agricultural and regional economics (see Table 3.6-8). If total irrigation water supplies are reduced and groundwater substitution does not occur, farmers can change their cropping patterns by fallowing a portion of their lands receiving irrigation water, by planting crops that require less irrigation water, or by adopting conservation measures that reduce irrigation losses. All of these measures affect farm profits (USBR 1997i).

- Option 1: The most probable option for the San Joaquin River Area is to replace surface water deliveries with groundwater. Farmers may pump groundwater directly or purchase groundwater from other suppliers. If the 104,500 acre-feet of potential reduced water deliveries to farmers in the San Joaquin River Area are offset by groundwater supplies, then there would be no significant impact to crops produced (either cropping pattern or productivity of the land) or to the amount of irrigated acreage. The weighted average cost of groundwater ranges from \$30-\$80 per acre-foot in the San Joaquin River Region, while surface water's weighted average price is \$20-\$85 per acre-foot (CALFED 1998). Use of groundwater or use of carryover storage would be the most likely outcomes for replacing the

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irrigation water diverted into the San Joaquin River system, and the overall adverse impact to agriculture would be less than significant.

- Option 2: The Authority's willing sellers are currently practicing water use efficiencies through the implementation of conservation measures that are responsible for providing some of the water proposed for diversion into the San Joaquin River system. Irrigation efficiencies by farmers are also being practiced. An additional measure that may be implemented over the long term is Merced ID's conjunctive use project to store surface water in underground aquifers.
- Option 3: Changes in cropping patterns, including land fallowing, are not expected as a direct or indirect result of the curtailed water deliveries in the San Joaquin River Area. Located in Merced County, Merced ID is the largest provider of surface water under the proposed action. All of its irrigated acreage would be affected by reduced deliveries in the short term if the full allotment of 67,500 acre-feet was required. Reduced deliveries could adversely affect almond production in the short term, depending on hydrologic conditions (Van Camp 1998, personal communication). Over the long term, Merced ID's conjunctive use project would replace the delivery shortage and mitigate a potentially significant impact to agricultural production in Merced County to a less-than-significant level.

**Alternative Action.** Agricultural land uses for the Water Right Priority System alternative are likely to be similar to the proposed action. The SWRCB's DEIR assumed that water right holders in the San Joaquin Basin would pump groundwater if their diversions were curtailed. The above described analysis of the proposed action is based on information from the willing sellers who indicate their irrigation customers are unlikely to withdraw land from production. Rather, farmers would use groundwater to maintain crop production and minimize production losses. Other water right holders for the alternative action would likely include some farmers who would reduce production. In the absence of more definitive data, the impact is assumed to be adverse and potentially significant.

#### **4.6.3 Impact Summary and Mitigation of Impacts**

##### **4.6.3.1 Socioeconomic Impacts**

###### **Population and Population Density**

###### **Proposed Action**

- There is no adverse impact on local populations, and local population growth would not be affected. No mitigation is necessary.

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- There is no impact to municipal users, so there is no impact to population density. No mitigation is required.

#### **Alternative Action**

- Users with junior rights who serve municipal water users would have to curtail deliveries 20 to 60 percent of the time in April-May, a potentially significant impact. Mitigation measures such as conservation and greater efficiencies may be applied to partially reduce the impact, but not sufficiently to reduce the impact to less than significant.
- The effect on population density is less than significant, because densities under constrained growth would remain stable.

#### **Regional Economy and Employment**

#### **Proposed Action**

- Impacts on jobs from reduced farm production in some years would be substantially avoided through the use of groundwater to substitute for any surface water delivery reductions. The impacts are less than significant.

#### **Alternative Action**

- Job losses would be less than significant. Potential output and income losses could be significant but mitigated through measures to reduce surface water losses to irrigated agriculture, i.e., groundwater substitution, conjunctive use, conservation, and tailwater recovery.

#### **Agricultural Land Use**

#### **Proposed Action**

- The potential reduction of 104,500 acre-feet of the Authority's water to irrigation customers could adversely affect cropping patterns and productivity. However, most of this surface water would be replaced by groundwater, including conjunctive use water, or come from surface water supplies (carryover storage), and the adverse impact on agriculture would be less than significant.

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- Reduced deliveries by Merced ID could adversely affect agricultural production in the short term, but this decline in productivity would be mitigated through a conjunctive use project and by groundwater pumping by individual farmers. After mitigation, the impact would be less than significant.

#### **Alternative Action**

- Some farmers may change their cropping patterns and reduce crop production, a potentially significant impact. Mitigation measures include alternative sources of water (including groundwater) to offset declines in surface water deliveries.

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