

## **SECTION 3.2: AGRICULTURE**

This section discusses the potential effects that the alternatives considered in Chapter 2 would have on agricultural productivity in the DMC Unit. Methods of analysis are described below.

### **AFFECTED ENVIRONMENT**

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

The study area includes the geographic service areas of the 20 CVP water contractors within the DMC Unit, as previously described in Section 3.1.

The contractor service areas all run roughly along the Interstate 5/California Aqueduct corridor from the City of Tracy in San Joaquin County in the north, through parts of Stanislaus and Merced Counties, to the northern portion of Fresno County, just south of U.S. Highway 180 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 unit are extremely varied. The Central Valley of California boasts 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, hay, corn silage, sugar beets, and cotton are the dominant field crops; grapes and almonds are the dominant orchard crops; tomatoes are the dominant row crop; and dairy and poultry are the dominant livestock products in San Joaquin, Stanislaus, Merced, and Fresno Counties.

Agricultural producers in the Central Valley and elsewhere operate under several economic pressures. When it comes to the sale of their product, 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 be, it is too late for the producer 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 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. 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 utilize other inputs, such as land.

## **ENVIRONMENTAL CONSEQUENCES**

This section describes the environmental 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. The project alternatives are described more fully in Chapter 2.

Impacts are presented for the project area as a whole (i.e., for the entire DMC Unit). This level of aggregation is required due to the use of the Central Valley Production Model (CVPM) as the best available analytical tool. As further described later in this section (under the No-Action Alternative discussion), the CVPM provides output data only at the subregion level, not at the individual contractor or local level. As with all impacts within the 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, it is just as unlikely that a fully uniform dispersion of impacts across the entire project area would occur.

While this assessment is not able to geographically pinpoint the location of impacts within the project area, it is likely that greater impacts could be seen in those areas where fewer opportunities to 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 source and where groundwater resources are limited. Such districts include

Broadview Water District, Centinella Water District, Del Puerto Water District, Laguna Water District, Plain View Water District, Reclamation District #1606, Tranquillity Public Utilities District, and Widren Water District.

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 ten 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 and 2 and 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 from the CVPIA PEIS.

The data used to describe the No-Action Alternative conditions and those of the two renewal alternatives can be found in the April 24, 2000 Technical Memorandum titled *Economic Analysis of November 1999 Tiered Pricing Proposal for PEIS Preferred Alternative* (CH2M Hill, 2000), attached as Appendix A. It is important for the reader to understand the key assumptions contained in the April 24, 2000 Technical 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 district. The CVPM subregions contained in the DMC Unit are subregions 9, 10, and 15 (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 defined further in Chapter 2. Contractors may purchase, as available, 80 percent of their full contract amounts 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 as defined in the Reclamation Reform Act. Table 3.2-1 shows the tiered water rates for each of the three CVPM subregions used for the No-Action Alternative. These rates are based on the 1992 CVP water rates.

**Table 3.2-1  
CVP Tiered Water Rates  
Used in No-Action Alternative  
(in dollars per acre-foot)**

<b>CVPM Subregion</b>	<b>Tier 1</b>	<b>Tier 2</b>	<b>Tier 3</b>
9	\$28.54	\$35.25	\$41.95
10	\$33.46	\$40.02	\$46.57
15	\$28.16	\$34.88	\$41.59

Source: CH2M Hill 2000, Table 3.

Using the tiered rates described in Table 3.2-1 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 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 3.2-2 describes the total irrigated acreage under the No-Action Alternative by primary crop and CVPM subregion in average, wet, and dry years. Table 3.2-3 describes the value of production under the No-Action Alternative by primary crop and CVPM subregion in average, wet, and dry 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 for the subregion or the value of crop production for the subregion from average to wet to dry water years.

**ALTERNATIVE 1**

Alternative 1 involves a tiered pricing program that is based on the full current contract amount of water. A complete description of Alternative 1 is provided in Chapter 2.

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

**Table 3.2-2**  
**No-Action Alternative Irrigated Acreage by CVPM Subregion and Crop**  
**(in thousands of acres)**

<b>CVPM Subregion</b>	<b>Crop Category</b>	<b>Average Year</b>	<b>Wet Year</b>	<b>Dry Year</b>
9	Pasture	24.6	24.6	23.4
	Alfalfa	43.8	43.8	43.1
	Sugar Beets	28.6	28.6	28.5
	Other Field Crops	114.9	115.0	113.6
	Rice	0.9	0.9	0.9
	Truck Crops	46.0	46.0	46.0
	Tomatoes	42.5	42.5	42.3
	Deciduous Orchard	21.3	21.3	21.3
	Small Grain	96.8	97.5	93.7
	Grapes	5.8	5.8	5.8
	<b>Subtotal</b>	<b>425.2</b>	<b>426.0</b>	<b>418.6</b>
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
	<b>Subtotal</b>	<b>427.0</b>	<b>427.1</b>	<b>427.2</b>
15	Pasture	3.9	3.9	3.7
	Alfalfa	83.1	83.4	80.6
	Sugar Beets	5.0	5.0	5.0
	Other Field Crops	86.0	86.1	84.2
	Rice	0.1	0.1	0.1
	Truck Crops	12.0	12.0	12.0
	Tomatoes	2.0	2.0	2.0
	Deciduous Orchard	38.0	38.0	38.0
	Small Grain	71.0	71.6	67.9
	Grapes	56.0	56.0	56.0
	Cotton	242.1	242.7	235.5
	Subtropical Orchard	1.0	1.0	1.0
	<b>Subtotal</b>	<b>600.2</b>	<b>601.8</b>	<b>586.0</b>
<b>Total – All Subregions</b>		<b>1,452.4</b>	<b>1,454.9</b>	<b>1,431.8</b>

Source: CH2M Hill 2000, Table 17.

**Table 3.2-3  
No-Action Alternative Value of Production by CVPM Subregion and Crop  
(in millions of dollars)**

<b>CVPM Subregion</b>	<b>Crop Category</b>	<b>Average Year</b>	<b>Wet Year</b>	<b>Dry Year</b>
9	Pasture	3.6	3.6	3.4
	Alfalfa	25.6	25.7	25.2
	Sugar Beets	22.0	22.0	21.9
	Other Field Crops	55.9	56.0	55.3
	Rice	0.7	0.7	0.7
	Truck Crops	190.8	190.8	190.6
	Tomatoes	64.9	65.0	64.8
	Deciduous Orchard	22.7	22.7	22.7
	Small Grain	30.7	30.9	29.7
	Grapes	10.0	10.0	10.0
	<b>Subtotal</b>	<b>426.9</b>	<b>427.4</b>	<b>424.3</b>
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
	<b>Subtotal</b>	<b>1,015.2</b>	<b>1,015.1</b>	<b>1,015.3</b>
15	Pasture	0.9	0.9	0.9
	Alfalfa	51.3	51.4	49.7
	Sugar Beets	4.1	4.1	4.0
	Other Field Crops	51.2	51.3	50.2
	Rice	0.1	0.1	0.1
	Truck Crops	72.0	72.0	71.9
	Tomatoes	3.0	3.0	3.0
	Deciduous Orchard	58.7	58.7	58.7
	Small Grain	41.6	41.9	39.7
	Grapes	121.7	121.7	121.7
	Cotton	275.0	275.7	267.5
	Subtropical Orchard	3.7	3.7	3.7
	<b>Subtotal</b>	<b>683.3</b>	<b>684.5</b>	<b>671.1</b>
<b>Total – All Subregions</b>		<b>2,125.4</b>	<b>2,127.0</b>	<b>2,110.7</b>

Source: CH2M Hill 2000, Table 18.

## **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 the Alternative 2 is based on a rolling five-year average of actual water deliveries, rather than the current contract amount of water. 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 (as defined in the Reclamation Reform Act).

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

Table 3.2-4 shows the tiered water rates for each of the three 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 3.2-4 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 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 by-product of the PEIS, was compared to 1992 rates, consistent with the PEIS.

**Table 3.2-4  
CVP Tiered Water Rates Used in Alternative 2  
(in dollars per acre-foot)**

<b>CVPM Subregion</b>	<b>Tier 1</b>	<b>Tier 2</b>	<b>Tier 3</b>
9	\$24.79	\$55.14	\$85.50
10	\$31.15	\$40.16	\$49.16
15	\$32.71	\$41.91	\$51.10

Source: CH2M Hill 2000, Table 2.

Tier 1 prices in subregions 9 and 10 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 PEIS, 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 the nine sequences described above are shown below in Table 3.2-5.

**Table 3.2-5  
CVP Blended Water Rates Used in Alternative 2  
(in dollars per acre-foot)**

CVP Subregion	Average	Wet	Dry	Average	Wet	Dry	Average	Wet	Dry
	Followed by Average			Followed by Wet			Followed by Dry		
9	33.89	24.79	64.53	55.27	33.89	73.22	24.79	24.79	33.89
10	33.85	31.15	42.94	38.01	33.85	44.63	31.15	31.15	33.85
15	35.47	34.55	38.10	36.34	35.47	38.82	33.07	32.71	35.47

Source: CH2M Hill 2000, Table 2.

Using the blended rates described in Table 3.2-5 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 an average, wet, or dry year are compared to the average, wet, or dry year No-Action Alternative results, respectively.

Table 3.2-6 presents the change in subregion 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 3.2-6, the majority of impacts, adverse and beneficial, are experienced in CVPM subregion 9. The largest beneficial impact to the DMC Unit as a whole is a 3,000-acre increase (0.2 percent) in total irrigated acreage during a dry year. The largest adverse impact to the DMC Unit is a 1,600-acre decrease (0.1 percent) in total irrigated acreage during a wet year. Again, this can be explained partially because Tier 1 prices in

subregions 9 and 10 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.

**Table 3.2-6**  
**Change in Irrigated Acreage from No-Action Alternative by CVPM Subregion and Crop**  
**Resulting from Implementation of Alternative 2**  
**(in thousands of acres)**

CVPM Subregion	Crop Category	Change Compared to Average Year No-Action Alternative			Change Compared to Wet Year No-Action Alternative			Change Compared to Dry Year No-Action Alternative		
		Average	Wet	Dry	Average	Wet	Dry	Average	Wet	Dry
		Followed by Average			Followed by Wet			Followed by Dry		
9	Pasture	-0.2	-0.2	-0.1	-0.4	-0.4	-0.4	0.7	0.7	0.7
	Alfalfa	-0.1	-0.1	0.0	-0.3	-0.3	-0.2	0.4	0.4	0.4
	Sugar Beets	0.0	0.0	0.0	-0.1	-0.1	0.0	0.1	0.1	0.1
	Other Field Crops	-0.2	-0.2	-0.2	-0.5	-0.5	-0.5	0.7	0.7	0.7
	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	0.1	0.1	0.1
	Deciduous Orchard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Small Grain	-0.1	-0.1	-0.1	-0.3	-0.3	-0.3	1.0	1.0	1.0
	Grapes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	<b>Subtotal</b>	<b>-0.6</b>	<b>-0.6</b>	<b>-0.4</b>	<b>-1.6</b>	<b>-1.6</b>	<b>-1.4</b>	<b>3.0</b>	<b>3.0</b>	<b>3.0</b>
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
<b>Subtotal</b>	<b>0.0</b>	<b>0.0</b>	<b>-1.1</b>	<b>0.0</b>	<b>0.0</b>	<b>-0.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	
15	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	0.0	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	0.0	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	0.0	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	0.0	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	-0.2	0.0	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
<b>Subtotal</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	
<b>Total – All Subregions</b>	<b>-0.6</b>	<b>-0.6</b>	<b>-1.5</b>	<b>-1.6</b>	<b>-1.6</b>	<b>-1.5</b>	<b>3.0</b>	<b>3.0</b>	<b>3.0</b>	

Source: CH2M Hill 2000, Table 17.

Table 3.2-7 presents the change in the value of production from the No-Action Alternative by primary crop and CVPM subregions in average, wet, and dry years. As can be seen in Table 3.2-7, the majority of impacts, adverse and beneficial, are experienced in CVPM

subregion 9. The largest beneficial impact to the DMC Unit as a whole is a \$1.2 million (less than 0.1 percent) increase in total value of production during a dry year. The largest adverse impact to the DMC Unit is a \$1.0 million decrease (less than 0.1 percent) in total value of production during an average year that follows a dry five-year period.

**Table 3.2-7**  
**Change in Value of Production from No-Action Alternative by CVPM Subregion and Crop**  
**Resulting from Implementation of Alternative 2**  
**(in millions of dollars)**

CVPM Subregion	Crop Category	Change Compared to Average Year No-Action Alternative			Change Compared to Wet Year No-Action Alternative			Change Compared to Dry Year No-Action Alternative		
		Average	Wet	Dry	Average	Wet	Dry	Average	Wet	Dry
		Followed by Average			Followed by Wet			Followed by Dry		
9	Pasture	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.1	0.1	0.1
	Alfalfa	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.2	0.2	0.2
	Sugar Beets	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	Other Field Crops	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	0.3	0.3	0.3
	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	0.1	0.1	0.1
	Tomatoes	0.0	0.0	0.0	-0.1	-0.1	0.0	0.1	0.1	0.1
	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	-0.1	-0.1	0.3	0.3	0.3
	Grapes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	<b>Subtotal</b>	<b>-0.2</b>	<b>-0.2</b>	<b>-0.1</b>	<b>-0.6</b>	<b>-0.6</b>	<b>-0.5</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
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
<b>Subtotal</b>	<b>0.0</b>	<b>0.0</b>	<b>-0.8</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	
15	Pasture	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Alfalfa	0.0	0.0	0.1	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
	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	0.0	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	-0.2	0.0	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
<b>Subtotal</b>	<b>0.0</b>	<b>0.0</b>	<b>-0.1</b>	<b>0.0</b>	<b>0.0</b>	<b>-0.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	
<b>Total – All Subregions</b>	<b>-0.2</b>	<b>-0.2</b>	<b>-1.0</b>	<b>-0.6</b>	<b>-0.6</b>	<b>-0.6</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	

Source: CH2M Hill 2000, Table 18.

Table 3.2-8 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 3.2-8, the

largest beneficial impact to the DMC Unit as a whole is a \$2.2 million increase in net farm revenues during a dry year that follows a dry five-year period. The largest adverse impact to the DMC Unit as a whole is a \$700,000 decrease in net farm revenues during a wet year that follows a wet five-year period.

**Table 3.2-8**  
**Change in Net Farm Income from No-Action Alternative by CVPM Subregion**  
**Resulting from Implementation of Alternative 2**  
**(in millions of dollars)**

CVPM Subregion	Cause of Net Revenue Change	Change Compared to Average Year No-Action Alternative			Change Compared to Wet Year No-Action Alternative			Change Compared to Dry Year No-Action Alternative		
		Average	Wet	Dry	Average	Wet	Dry	Average	Wet	Dry
		Followed by Average			Followed by Wet			Followed by Dry		
9	Fallowed Land	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.2	0.2	0.2
	Groundwater Pumping	0.6	0.6	0.6	1.2	1.2	1.2	0.3	0.3	0.3
	Irrigation Cost	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	CVP Water Cost	-1.2	-1.2	-1.2	-2.0	-2.0	-2.0	-0.5	-0.5	-0.5
	Higher Crop Prices	0.0	0.0	0.5	0.0	0.0	0.2	0.0	0.0	0.0
	Net Change	-0.4	-0.4	0.1	-0.7	-0.7	-0.5	0.4	0.4	0.3
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
15	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	-0.3	-0.3	-0.3	1.5	1.5	1.5
	Irrigation Cost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CVP Water Cost	0.3	0.2	0.4	0.2	0.2	0.3	0.4	0.4	0.5
	Higher Crop Prices	0.0	0.0	0.4	0.1	0.0	0.2	0.0	0.0	0.0
	Net Change	0.3	0.2	0.8	-0.1	-0.1	0.2	1.9	1.9	1.9
<b>Total – All Subregions</b>		<b>0.0</b>	<b>-0.6</b>	<b>1.7</b>	<b>-0.3</b>	<b>-0.7</b>	<b>0.4</b>	<b>2.0</b>	<b>2.0</b>	<b>2.2</b>

Source: CH2M Hill 2000, Table 19.

### CUMULATIVE IMPACTS

Overall, the cumulative impacts of renewing long-term contracts can be either beneficial or 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.<sup>1</sup>

<sup>1</sup> 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); and October 27, 1986 (100 Stat. 3050); and Title XXXIV of the CVPIA of October 30, 1992 (106 Stat. 4706).

Continued provision of water to agricultural and M&I users in the DMC 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 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 DMC Unit (as discussed in Chapter 1), 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. As stated in the introduction to this section, 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, interrelated components in determining production decisions and enterprise profitability.