Chapter 16
Socioeconomics

16.1 Environmental Setting/Affected Environment

16.1.1 Potential Socioeconomics Effects Area

16.1.1.1 Statutory Delta

County Profiles

Key socioeconomic characteristics of each county and the main communities in the Delta region are described based on available data, as presented in Section 16.1.1.2 through Section 16.1.1.7.

Contra Costa County

The southwestern portion of the Delta lies in Contra Costa County, which extends from the Delta on its eastern and northeastern boundary to San Francisco Bay and San Pablo Bay on the west. Identified communities in Contra Costa County that are in the statutory Delta are Bay Point, Discovery Bay, and Knightsen. Communities in Contra Costa County that are partially in the statutory Delta include Antioch, Bethel Island, Brentwood, Byron, Oakley, and Pittsburg.

In 2010, more than 290,000 people, almost 28% of the county's population, resided in communities located partially or completely in the Delta. Of these, Antioch has the largest population, at 102,372 residents, and Byron has the smallest, at 1,277 residents.

As shown in Table 16-~~3~~31, approximately 60% of the county's population is between the ages of 20 and 64. The county as a whole is 52% minority,[1] with communities that are partially located in the Delta ranging from 20 to 80% minority composition (U.S. Census Bureau 2011). The minority population in these communities ranges from 20% in Bethel Island to a high of 80% in Pittsburg.

More than 20% of residents in the communities of Antioch, Bay Point, Brentwood, Knightsen, Oakley, and Pittsburg were in the age range of 5 to 19 years, with larger proportions between the ages of 20 and 64. In contrast, Bethel Island, an age-restricted community, was the only one of these communities with more than 20% in the age range of 65 years and above. Most residents in these communities live in owner-occupied housing (U.S. Census Bureau 2011).

[1] The Council on Environmental Quality (CEQ) defines the term "minority" as persons from any of the following U.S. Census Bureau categories for race: Black/African American, Asian, Native Hawaiian and Other Pacific Islander, and American Indian or Alaska Native. Additionally, for the purposes of this analysis, "minority" also includes all other nonwhite racial categories, such as "some other race" and "two or more races." The CEQ also concluded that persons identified by the U.S. Census Bureau as ethnically Hispanic, regardless of race, should be included in minority counts (CEQ 1997).

The 2006-2010 average per capita income in Contra Costa County was $37,818, and the median household income was $78,385, with 9% of the population living below the poverty level.[2] The communities that are partially located in the Delta are similar in income profile to the county as a whole, and have from 3 to 22% of the population living below the poverty line. Both the per capita income and median household income of the county were higher than the state as a whole, and the percentage of persons living below the poverty level was lower than that of the state (U.S. Census Bureau 2012a).

From 2000 through 2012, the county's labor force grew at a rate of 0.5%, with 525,400 residents in the labor force as of 2012. Of these, 474,900 are employed, resulting in a current unemployment rate of 9.6%, lower than the statewide unemployment rate (California Employment Development Department 2012a). Contra Costa County is home to a wide range of businesses. Various major corporations have their headquarters in the county, including Chevron, The PMI Group Inc., and Bio-Rad. The county has a substantial heavy industrial and manufacturing sector. Business, professional, and financial services are another large portion of the economy (California Employment Development Department 2008).

Sacramento County

Sacramento County extends from the low Delta lands between the Sacramento and San Joaquin Rivers north to about 10 miles beyond the State Capitol and east to the foothills of the Sierra Nevada. The Sacramento, Mokelumne, and San Joaquin Rivers form the southern border of Sacramento County in the Delta.

The Delta lies in the southwestern region of the county. Sacramento County communities completely within the Delta include Courtland, Freeport, Hood, Isleton, Locke, and Walnut Grove. Additionally, small portions of the cities of Sacramento and Elk Grove lie partially within the Delta. In 2010, 469,498 people, or 33% of Sacramento County's population, resided in communities lying at least partially within the Delta. Most of the county population resides in Sacramento and its suburbs outside the statutory Delta. Of Sacramento County's eight communities in the Delta, Sacramento has the largest population, with 466,488 residents; however, most of the population does not live within the Delta. Freeport and Hood have the smallest populations, each with fewer than 1,000 residents.

As shown in Table 16-~~3~~31, approximately 60% of the county's population is between the ages of 20 and 64. The total minority population in the county is about 52%; however, in the communities that are totally located in the Delta, the percentage of the population identified as minority ranges from 21% (Freeport) to 66% (Hood).

More than 20% of residents in the communities of Courtland, Hood, Isleton, Sacramento, and Walnut Grove were in the age range of 5 to 19 years, with larger proportions between the ages of 20 and 64. In contrast, the community of Freeport was the only one of these communities with more than 20% in the age range of 65 years and above. In Courtland, Freeport, Sacramento, and Walnut Grove, fewer than half of residents live in owner-occupied housing units. In Hood and Isleton, a majority of residents live in owner-occupied units (U.S. Census Bureau 2011).

[2] The U.S. Census Bureau defines the term "poverty level" by using the Office of Management and Budget's Statistical Policy Directive 14. Income thresholds are used to determine who is in poverty. If a family's total income is less than a specified threshold, the family is considered in poverty. Poverty levels do not vary geographically (U.S. Census Bureau 2010b).

The 2006-2010 per capita income in Sacramento County was $26,953, and the median household income was $56,439, with 14% of the population living below the poverty line (U.S. Census Bureau 2012a). While the income averages are lower than those of the state, the level of poverty roughly matches the state average percentage of persons living below the poverty limit. The communities in the Delta have a range in percentages of persons living below the poverty line, ranging from 10% to about 17%.

From 2000 to 2012, the Sacramento County labor force annual growth rate was 0.9%, with 667,800 residents in the labor force as of 2012 with an unemployment rate of 11.2%, slightly lower than the state unemployment rate of 11.3% (California Employment Development Department 2012a, 2012b). In addition to the State of California, major employers include school districts, healthcare facilities, and the agricultural industry (County of Sacramento 2009a).

San Joaquin County

Communities in San Joaquin County that are located in the Delta include French Camp, Terminous, Thornton, and the cities of Lathrop, Stockton, and Tracy. In 2010, the San Joaquin County population living in communities lying at least partially within the Delta was more than 393,000, about 57% of the county's population. Of San Joaquin County's communities partially or entirely located in the Delta, Stockton has the largest population at 291,707, followed by Tracy with 82,922 residents. Terminous is smallest, with a population of 381.

As shown in Table 16-~~3~~1, approximately 57% of the county's population is between the ages of 20 and 64. The total minority population of the county is about 64%. In communities that lie at least partially within the Delta, the minority population ranges from 18% in Terminous to 77% in Stockton.

More than 25% of residents in the communities of Lathrop, Stockton, and Tracy were in the age range of 5 to 19 years, with larger proportions between the ages of 20 and 64. In contrast, the community of Terminous was the only one of these communities with more than 20% in the age range of 65 years and above. In all of these communities, more than half of residents live in owner-occupied housing units (U.S. Census Bureau 2011).

The 2006–2010 per capita income in San Joaquin County was $22,851, and the median household income was $54,341, with 14% of the population living below poverty level (U.S. Census Bureau 2012a). These income figures are lower than the California average and this poverty rate is higher than the state's as a whole. Of the communities that are located in the Delta, the percentage of persons living in poverty ranged from 8% in Lathrop to about 20% in Stockton.

In 2012, there were 299,400 residents in the county's labor force. Of these, 249,900 persons were employed, resulting in an unemployment rate of 16.5%. This was far greater than the state's unemployment rate of 11.3% (California Employment Development Department 2012a and 2012b). Major employment sectors in the county include agriculture, manufacturing, and wholesale and retail trade (County of San Joaquin 2009a; California Employment Development Department 2009).

Solano County

Located approximately 45 miles northeast of San Francisco and 45 miles southwest of Sacramento, Solano County supports a mix of agricultural and suburban areas. It covers 909 square miles, including 84 square miles of open water and 675 square miles of rural land (County of Solano 2009a). The southeastern part of Solano County lies in the Delta. Rio Vista is the only community in

Solano County identified in this analysis as lying partially or completely within the Delta and representing only about 2% of the county's population. As shown in Table 16-~~3~~1, approximately 61% of the county's population is between the ages of 20 and 64. The total minority population of the county is about 59% while minorities comprise 26% of the population of Rio Vista. In communities that lie at least partially within the Delta, the minority population ranges from 18% in Terminous to 77% in Stockton.

Fewer than 15% of residents in Rio Vista were in the age range of 5 to 19 years, with 50% between the ages of 20 and 64 and more than 32% aged 65 or older. More than 75% of residents of Rio Vista live in owner-occupied housing units (U.S. Census Bureau 2011).

The county's 2006–2010 per capita income was $28,649, and the median household income was $68,409. The percentage of persons living below the poverty level was 10% (U.S. Census Bureau 2012a). While the per capita income of Solano County is lower than the state average, the median household income surpasses that of the state and the poverty rate is lower that the statewide rate. The community of Rio Vista had 10% of residents living below the poverty line.

In 2012, Solano County reported 217,900 residents in the labor force. Of these, 194,300 persons were employed, resulting in an unemployment rate of 10.8%, lower than the state unemployment rate of 11.3% (California Employment Development Department 2012a). Solano County restricts urban residential and commercial development outside cities, thus preserving approximately 80% of the land for open space or agricultural use. In addition to agriculture, the Solano County is home to biotechnology and other growth industries.

Yolo County

The southeast portion of Yolo County lies in the Delta. The communities in Yolo County that are in the Delta include Clarksburg and West Sacramento. In 2010, the population of these communities was more than 49,000, accounting for about 24% of the county population. Of Yolo County's two communities in the Delta, West Sacramento has the larger population, with 48,744 residents, while Clarksburg supports 418 residents.

As shown in Table 16-~~3~~1, approximately 62% of the county's population is between the ages of 20 and 64. The total minority population of the county is about 50%. In communities that lie at least partially within the Delta, the minority population ranges from 33% in Clarksburg to 53% in West Sacramento.

About 20% of residents in the communities of Clarksburg and West Sacramento were in the age range of 5 to 19 years, with larger proportions between the ages of 20 and 64. In both of these communities, more than half of residents live in owner-occupied housing units (U.S. Census Bureau 2011).

Table 16-1. Delta Counties and California Age Distribution, 2010

Population Segment	Contra Costa County	Sacramento County	San Joaquin County	Solano County	Yolo County	Delta Counties	California
Total Population	1,049,025	1,418,788	685,306	413,344	200,849	3,767,312	37,253,956
<5 years[a]	67,018 6.4%	101,063 7.1%	54,228 7.9%	26,852 6.5%	12,577 6.3%	261,738 6.9%	2,531,333 6.8%
5–19 years[a]	220,495 21.0%	303.612 21.4%	169,357 24.7%	86,370 20.9%	44,246 22.0%	824,080 21.9%	7,920,709 21.3%
20–64 years[a]	631,074 60.2%	855,562 60.3%	390,540 57.0%	253,275 61.3%	124,255 61.9%	2,254,706 59.8%	22,555,400 60.5%
65+ years[a]	130,438 12.4%	158,551 11.2%	71,181 10.4%	46,847 11.3%	19,771 9.8%	426,788 11.3%	4,246,514 11.4%
Median Age	38.5	34.8	32.7	36.9	30.4	35.4	35.2

Source: U.S. Census Bureau 2011.
[a] Percentages are of the total population.

The 2006–2010 per capita income in Yolo County was $27,420, and the median household income was $57,077 (U.S. Census Bureau 2012a). The percentage of persons living below the poverty level was 17%, compared with the state average of 14% (U.S. Census Bureau 2012a). Additionally, the per capita income and median household income for Yolo County are lower than the state averages. West Sacramento had a similar percentage of residents living below the poverty line, at 17%.

In 2012, Yolo County had 99,300 persons in the labor force, and an unemployment rate of 13.9%, more than two percentage points higher than the unemployment rate of the state (California Employment Development Department 2012a). Yolo County is home to the Port of Sacramento, which ships out 1.3 million tons of the county's agricultural products, such as rice, wheat, and safflower seed, to worldwide markets (County of Yolo 2009a). Agriculture, education, health care, and services are leading sources of employment.

16.1.1.2 Population of the Delta

Population and Growth Trends

The Delta Protection Commission's *Economic Sustainability Plan for the Sacramento-San Joaquin Delta* reported a growth rate of about 54% within the statutory Delta between 1990 and 2010, as compared with a 25% growth rate statewide during the same period (Delta Protection Commission 2012). The report also indicated that population growth had occurred in the Secondary Zone of the Delta but not in the Primary Zone (see Figure 13-1 for a map of the Primary and Secondary Zones of the Delta, as defined by the DPC), and that population in the central and south Delta areas had decreased since 2000.

Table 16-~~1~~ 2 illustrates past, current, and projected population trends for the five counties in the Delta. As of 2010, the combined population of the Delta counties was approximately 3.8 million. Sacramento County contributed 37.7% of the population of the Delta counties, and Contra Costa

County contributed 27.8%. Yolo County had the smallest population (200,849 or 5.3%) of all the Delta counties.

Table 16-~~1~~2. Delta Counties and California Population, 2000–2050

Area	2000 Population (millions)	2010 Population (millions)	2020 Projected Population (millions)	2025 Projected Population (millions)	2050 Projected Population (millions)
Contra Costa County	0.95	1.05	1.16	1.21	1.50
Sacramento County	1.23	1.42	1.56	1.64	2.09
San Joaquin County	0.57	0.69	0.80	0.86	1.29
Solano County	0.40	0.41	0.45	0.47	0.57
Yolo County	0.17	0.20	0.22	0.24	0.30
Delta Counties	3.32	3.77	4.18	4.42	5.75
California	34.00	37.31	40.82	42.72	51.01

Sources: California Department of Finance 2012a.

For the 10-year period between 2000 and 2010, the population of the Delta counties increased at an average annual rate of 1.37% (13.7% in total), with the greatest rate of population growth occurring in San Joaquin County. Population growth in Solano County during this 10-year period was the slowest (0.43% per year). The state showed about a 1% annual growth rate in population during this period, slower than that of the Delta counties combined.

Growth projections through 2050 indicate that all counties overlapping the Delta are projected to grow at a faster rate than the state as a whole. Total population in the Delta counties is projected to grow at an average annual rate of 1.2% through 2030 (California Department of Finance 2012a).

Table 16-~~2~~3 presents more detailed information on populations of individual communities in the Delta. Growth rates from 2000 to 2010 were generally higher in the smaller communities than in larger cities such as Antioch and Sacramento. This is likely a result of these communities having lower property and housing prices, and their growth being less constrained by geography and adjacent communities.

Population density varies widely across the Delta region. Analysis done for the Delta Risk Management Strategy (California Department of Water Resources 2008c) indicated several Delta islands with fewer than 20 residents. In contrast, some cities are wholly or partly within the statutory Delta (e.g., Sacramento and Stockton) and have densities exceeding 3,000 residents per square mile. Smaller communities in the Delta, such as Walnut Grove, have population densities as low as 200 residents per square mile (U.S. Census Bureau 2000).

~~**Age Distribution**~~

~~The *Economic Sustainability Plan for the Sacramento-San Joaquin Delta* described a relatively young age class throughout the Delta with a slightly older population within the Primary Zone (Delta Protection Commission 2012). The report also indicated that there were a higher percentage of households with two or fewer residents in the Primary Zone than in the rest of the Delta or statewide.~~

~~Age distribution in the Delta is shown in Table 16-3. The age composition of people residing in the Delta was generally similar to that of the state. The median ages in the five Delta counties ranged from 30 to 38, consistent with the state's median age of 34.5.~~

Table 16-~~2~~3. Delta Communities Population, 2000 and 2010

Community	2000	2010	Average Annual Growth Rate 2000–2010
Contra Costa County			
Incorporated Cities and Towns			
Antioch	90,532	102,372	1.3%
Brentwood	23,302	51,481	12.1%
Oakley	25,619	35,432	3.8%
Pittsburg	56,769	63,264	1.1%
Small or Unincorporated Communities			
Bay Point	21,415	21,349	-0.0%
Bethel Island	2,252	2,137	-0.5%
Byron	884	1,277	4.5%
Discovery Bay	8,847	13,352	5.1%
Knightsen	861	1,568	8.2%
Sacramento County			
Incorporated Cities and Towns			
Isleton	828	804	-0.3%
Sacramento	407,018	466,488	1.5%
Small or Unincorporated Communities			
Courtland	632	355	-4.4%
Freeport and Hood	467	309[a]	-3.4%
Locke	1,003	Not available	—
Walnut Grove	646	1,542	13.9%
San Joaquin County			
Incorporated Cities and Towns			
Lathrop	10,445	18,023	7.3%
Stockton	243,771	291,707	2.0%
Tracy	56,929	82,922	4.6%
Small or Unincorporated Communities			
Terminous	1,576	381	-7.6%
Solano County			
Incorporated Cities and Towns			
Rio Vista	4,571	7,360	6.1%
Yolo County			
Incorporated Cities and Towns			
West Sacramento	31,615	48,744	5.4%
Small or Unincorporated Communities			
Clarksburg	681	418	-3.9%

Sources: U.S. Census Bureau 2000; U.S. Census Bureau 2011.

[a] Freeport had a population of 38; Hood had a population of 271.

~~**Table 16-3. Delta Counties and California Age Distribution, 2010**~~

~~Population Segment~~	~~Contra Costa County~~	~~Sacramento County~~	~~San Joaquin County~~	~~Solano County~~	~~Yolo County~~	~~Delta Counties~~	~~California~~
~~Total Population~~	~~1,049,025~~	~~1,418,788~~	~~685,306~~	~~413,344~~	~~200,849~~	~~3,767,312~~	~~37,253,956~~
~~<5 years[a]~~	~~67,018~~	~~101,063~~	~~54,228~~	~~26,852~~	~~12,577~~	~~261,738~~	~~2,531,333~~
	~~6.4%~~	~~7.1%~~	~~7.9%~~	~~6.5%~~	~~6.3%~~	~~6.9%~~	~~6.8%~~
~~5–19 years[a]~~	~~220,495~~	~~303.612~~	~~169,357~~	~~86,370~~	~~44,246~~	~~824,080~~	~~7,920,709~~
	~~21.0%~~	~~21.4%~~	~~24.7%~~	~~20.9%~~	~~22.0%~~	~~21.9%~~	~~21.3%~~
~~20–64 years[a]~~	~~631,074~~	~~855,562~~	~~390,540~~	~~253,275~~	~~124,255~~	~~2,254,706~~	~~22,555,400~~
	~~60.2%~~	~~60.3%~~	~~57.0%~~	~~61.3%~~	~~61.9%~~	~~59.8%~~	~~60.5%~~
~~65+ years[a]~~	~~130,438~~	~~158,551~~	~~71,181~~	~~46,847~~	~~19,771~~	~~426,788~~	~~4,246,514~~
	~~12.4%~~	~~11.2%~~	~~10.4%~~	~~11.3%~~	~~9.8%~~	~~11.3%~~	~~11.4%~~
~~Median Age~~	~~38.5~~	~~34.8~~	~~32.7~~	~~36.9~~	~~30.4~~	~~35.4~~	~~35.2~~

~~Source: U.S. Census Bureau 2011.~~

~~[a] Percentages are of the total population.~~

Age Distribution

The *Economic Sustainability Plan for the Sacramento-San Joaquin Delta* described a relatively young age class throughout the Delta with a slightly older population within the Primary Zone (Delta Protection Commission 2012). The report also indicated that there were a higher percentage of households with two or fewer residents in the Primary Zone than in the rest of the Delta or statewide.

Age distribution in the Delta is shown in Table 16-1, above. The age composition of people residing in the Delta was generally similar to that of the state. The median ages in the five Delta counties ranged from 30 to 38, consistent with the state's median age of 34.5.

Most communities in the Delta had an age distribution consistent with that of the counties and state as a whole. However, a few communities, such as Bethel Island, Terminous, and Rio Vista, had a greater percentage of the population at or near retirement age (U.S. Census Bureau 2012a).

16.2 Regulatory Setting

16.2.3 Regional and Local Plans, Policies, and Regulations

16.2.3.4 Solano County General Plan

The following are excerpts from the *Solano County General Plan* (County of Solano 2009b).

- **GOAL.** It is the county's goal to promote and ensure adequate housing in a satisfying environment for all residents of Solano County.

Agriculture

- **GOAL AR.G-1.** Recognize, value, and support the critical roles of all agricultural lands in the stability and economic well-being of the county.
- **GOAL AR.G-2.** Preserve and protect the county's agricultural lands as irreplaceable resources for present and future generations.
- **GOAL AR.G-3.** Support the ability of farmers to earn sufficient income and expand the county's agricultural base by allowing for a wide range of economic activities that support local agriculture.
- **GOAL AR.G-5.** Reduce conflict between agricultural and nonagricultural uses in Agriculture-designated areas.
- **GOAL AR.G-6.** Recognize, support, and sustain agricultural water resources for farmlands.

Housing Conservation and Rehabilitation

- An important aspect of ensuring adequate housing in a satisfying environment in Solano County is the conservation and rehabilitation of the existing housing supply. Conserving and improving the County's housing supply not only requires the rehabilitation of substandard structures, but also the continued maintenance and upkeep of existing structures in fair to sound condition.

Economic Development ~~Goal 3~~

- **GOAL ED.G-1.** Maintain and improve the County's strong, diversified economic base and provide for a wide range of employment opportunities and support services, such as job training and child care.
- **GOAL ED.G-3.** Develop and maintain a favorable business environment in Solano County through recruitment, expansion, and retention of businesses to promote a closer match between local jobs and labor force skills.
- **GOAL ED.G-6.** Preserve and expand the county's agricultural base by allowing for a wide range of economic activities that support local agriculture.

16.3 Environmental Consequences

16.3.3 Effects and Mitigation Approaches

16.3.3.2 Alternative 1A—Dual Conveyance with Pipeline/Tunnel and Intakes 1–5 (15,000 cfs; Operational Scenario A)

Impact ECON-1: Temporary Effects on Regional Economics and Employment in the Delta Region during Construction of the Proposed Water Conveyance Facilities

The regional economic effects on employment and labor income during construction in the Delta region were evaluated. Changes are shown relative to Existing Conditions and the No Action Alternative in Table 16-19. The table shows the direct and total (direct, indirect, and induced effects) changes that would result from conveyance-related spending. Spending on conveyance

construction would result in substantial local economic activity in the region. As shown, direct construction employment is anticipated to vary over the 8-year construction period, with an estimated 2,433 FTE in the first year and 165 FTE in the final year of the construction period. Construction employment is estimated to peak at 4,390 FTE in year 4. Total employment (direct, indirect, and induced) would peak in year 3, at 12,716 FTE.

Table 16-19. Regional Economic Effects on Employment and Labor Income during Construction (Alternative 1A) Regional Economic Impact[a]

	Year								
	1	2	3	4	5	6	7	8	Total
Employment Full Time Equivalent (FTE)									
Direct	2,433	2,714	4,004	4,390	3,658	3,636	676	165	21,675
Total[b]	12,348	10,582	12,716	11,935	8,915	7,389	1,136	235	65,256
Labor Income (million $)									
Direct	327.7	249.0	262.6	215.1	142.1	88.1	7.8	0.4	1,292.9
Total[b]	596.7	465.3	509.6	435.9	300.4	208.8	24.4	3.4	2,544.5

Note: Labor income is reported in 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Conditions or the No Action Alternative.

[b] Includes direct, indirect, and induced effects; numbers may not sum to the total due to rounding. Detailed estimates are presented in Appendix 16A, *Regional Economic Impacts of Water Conveyance Facility Construction*.

The footprint of conveyance and related facilities such as roads and utilities would remove some existing agricultural land from production, so the effects on such removals on agricultural employment and income would be negative. The regional economic effects on employment and income in the Delta region from the change in agricultural production are reported in Table 16-20. As shown, direct agricultural employment would be reduced by an estimated 27 FTE, while total employment (direct, indirect, and induced) associated with agricultural employment would fall by 100 FTE. Based on the crop production values changes described in Impact ECON-6 for construction effects, the direct agricultural job losses would more likely be concentrated in the vegetable, truck, orchard, and vineyard crops sectors, which are relatively labor intensive, than in the grain, field, and forage crop sectors, where more jobs are mechanized. Note that direct agricultural job losses could be higher than the 27 FTE jobs shown in Table 16-20 because many agricultural jobs are seasonal rather than year-round, FTE jobs, suggesting that more than one seasonal job could be lost per every FTE job lost as a result of construction of conveyance facilities construction. Mapbook Figures M14-1 and M14-2 display areas of Important Farmland and lands under Williamson Act contracts that could be converted to other uses due to the construction of water conveyance facilities for the Pipeline/Tunnel alignment. Note that not all of these structures would be constructed under this alternative.

Table 16-20. Regional Economic Effects on Agricultural Employment and Labor Income during Construction (Alternative 1A)

Regional Economic Impact[a]	Impacts on Agriculture
Employment (FTE)	
Direct	-27
Total[b]	-100
Labor Income (million $)	
Direct	-3.3
Total[b]	-6.4

Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Conditions or the No Action Alternative.

[b] Includes direct, indirect, and induced effects.

Additionally, the Alternative 1A construction footprint would result in the abandonment of an estimated six producing natural gas wells in the study area, as described in Chapter 26, *Mineral Resources*, Section 26.3.3.2, Impact MIN-1. This could result in the loss of employment and labor income associated with monitoring and maintaining these wells. Generally, small crews perform ongoing monitoring and maintenance of several wells at a time. As shown in Chapter 26, *Mineral Resources*, Table 26-~~3~~2, 516 active producer wells are located in the study area. Even if all six producing wells in the Alternative 1A construction footprint were abandoned and not replaced with new wells installed outside the construction footprint, the percentage reduction in the number of natural gas wells would be very small. As a result, the employment and labor income effects associated with well abandonment, while negative, would be minimal.

NEPA Effects: Because construction of water conveyance facilities would result in an increase in construction-related employment and labor income, this would be considered a beneficial effect. However, these activities would also be anticipated to result in a decrease in agricultural-related employment and labor income, which would be considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.

***CEQA Conclusion*:** Construction of the proposed water conveyance facilities would increase total employment and income in the Delta region, temporarily (during the construction period). The increase in employment and income that would result from expenditures on construction would be greater than the reduction in employment and income attributable to losses in agricultural production. Changes in recreational expenditures and natural gas well operations could also affect regional employment and income, but these have not been quantified. The total change in employment and income is not, in itself, considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such physical impacts are discussed in other chapters throughout this EIR/EIS. Costs are addressed in Chapter 8 of the BDCP, *Implementation Costs and Funding Sources*; removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impacts AG-1 and AG-2; changes in recreation related activities are addressed in Chapter 15, *Recreation*, Section 15.3.3.2, REC-1 through REC-4; abandonment of natural gas wells is addressed in Chapter 26, *Mineral Resources*, Section 26.3.3.2, MIN-1. When required, the BDCP proponents would provide compensation to property owners for economic losses due to

implementation of the alternative. While the compensation to property owners would reduce the severity of economic effects related to the loss of agricultural land, it would not constitute mitigation for any related physical impact. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an Agricultural Lands Stewardship Plan (ALSP) to preserve agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.

Impact ECON-7: Permanent Regional Economic and Employment Effects in the Delta Region during Operation and Maintenance of the Proposed Water Conveyance Facilities

In the Delta region, ongoing operation and maintenance of BDCP facilities would result in increased expenditures relative to the Existing Conditions and the No Action Alternative (regional economic conditions do not differ across Existing Conditions and No Action Alternative). The increased project operation and maintenance expenditures are expected to result in a permanent increase in regional employment and income (Table 16-22) relative to the Existing Conditions and the No Action Alternative, including an estimated 187 direct and 269 total (direct, indirect, and induced) FTE. Potential changes in the value of agricultural production result in changes to regional employment and income in the Delta region under the Alternative 1A relative to the Existing Conditions and the No Action Alternative.

Table 16-22. Regional Economic Effects on Employment and Labor Income in the Delta Region during Operations and Maintenance (Alternative 1A)

Regional Economic Impact[a]	Impacts from Operations and Maintenance
Employment (FTE)	
Direct	187
Total[b]	269
Labor Income (million $)	
Direct	11.4
Total[b]	15.3

Note: Labor income is reported in 2011 dollars (U.S. Department of Commerce 2012).
[a] IMPLAN results are changes relative to Existing Conditions or the No Action Alternative.
[b] Includes direct, indirect & induced effects.

The operation and maintenance of conveyance and related facilities such as roads and utilities would result in the permanent removal of agricultural land from production following construction, and the effects on employment and income would be negative, including the loss of an estimated 31 agricultural and 86 total (direct, indirect, and induced) FTE jobs. The regional economic effects on employment and income in the Delta region from the change in agricultural production are reported in Table 16-23. Based on the permanent crop production value changes described in Impact ECON-12, the agricultural job losses would more likely be concentrated in the vegetable, truck, orchard, and vineyard crops sectors, which are relatively labor intensive, than in the grain, field, and forage crop sectors, where more jobs are mechanized. Note that direct agricultural job losses could be higher than the 31 FTE jobs shown in Table 16-23 because many agricultural jobs are seasonal rather than year-round, FTE jobs, suggesting that more than one seasonal job could be lost per every FTE job lost as a result of permanent agricultural production changes. Mapbook Figures M14-1 and

M14-2 display areas of Important Farmland and lands under Williamson Act contracts that could be converted to other uses due to the construction of water conveyance facilities for the Pipeline/Tunnel alignment. Note that not all of these structures would be constructed under this alternative.

Table 16-23. Regional Economic Effects on Agricultural Employment and Labor Income during Operations and Maintenance (Alternative 1A)

Regional Economic Impact[a]	Impacts on Agriculture
Employment (FTE)	
Direct	-31
Total[b]	-86
Labor Income (million $)	
Direct	-2.5
Total[b]	-4.8

Note: Labor income is reported in 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Conditions or the No Action Alternative.

[b] Includes direct, indirect & induced effects.

NEPA Effects: Because continued operation and maintenance of water conveyance facilities would result in an increase in operations-related employment and labor income, this would be considered a beneficial effect. However, the long-term footprint of facilities would lead to a continued decline in agricultural-related employment and labor income, which would be considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.

***CEQA Conclusion*:** Operation and maintenance of the proposed water conveyance facilities would increase total employment and income in the Delta region. The net change would result from expenditures on operation and maintenance and from changes in agricultural production. The total change in income and employment is not, in itself, considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout this EIR/EIS. Costs are addressed in Chapter 8 of the BDCP, *Implementation Costs and Funding Sources*; removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources,* Section 14.3.3.2, Impacts AG-1 and AG-2; changes in recreation related activities are addressed in Chapter 15, *Recreation,* Section 15.3.3.2, Impacts REC-5 through REC-8. When required, DWR would provide compensation to landowners as a result of acquiring lands for the proposed conveyance facilities. While the compensation to property owners would reduce the severity of economic effects related to the loss of agricultural land, it would not constitute mitigation for any related physical impact. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an ALSP to preserve agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.

Impact ECON-18: Effects on Agricultural Economics in the Delta Region as a Result of Implementing ~~the Proposed Conservation Measures 2–22~~CM2–CM21

~~Conservation Measures 2–22~~CM2–CM21 would convert land from existing agricultural uses. These direct effects on agricultural land are described qualitatively in Chapter 14, *Agricultural Resources,* Section 14.3.3.2, Impacts AG-3 and AG-4. Effects on agricultural economics would include effects on crop production and agricultural investments resulting from restoration actions on agricultural lands. The effects would be similar in kind to those described for lands converted due to construction and operation of the conveyance features and facilities. The total acreage and crop mix of agricultural land potentially affected is not specified at this time, but when required, the BDCP proponents would provide compensation to property owners for losses due to implementation of the alternative.

The *Yolo Bypass Flood Date and Flow Volume Agricultural Impact Analysis*, as described in Impact ECON-13, also evaluates the expected losses in gross farm revenue that could result from implementing CM2 (Howitt et al. 2012) (see Chapter 3, *Description of Alternatives*, Section 3.6.2, for a description of conservation measures). CM2 would lower a portion of the Fremont Weir to allow Sacramento River water to flow into the Yolo Bypass to reduce migratory delays for fish and enhance fish rearing habitat, with flows ranging between 3,000 and 6,000 cfs through an operable gate at the weir. An increase in flooding in the Yolo Bypass could result in economic losses to farmers and the local economy, dependent on timing, frequency, volume, and duration. Additionally, according to the report, flooding may increase the costs of late season rains, potentially affecting land values, lending institutions, and farming in the bypass.

The magnitude of economic effects resulting from implementing CM2 would be driven by the total acres of farmland inundated, reduced crop yields, and increased land fallowing. As the last day of flooding through the proposed weir gate increases, farmers must delay field preparation and planting, resulting in reduced crop yields and increased land fallowing. As agricultural revenues decrease, losses to the regional economy, including employment, increase. According to the economic impact assessment in the report, annual reductions in agricultural employment under the CM2 scenario are expected to range from 9 FTE at 3,000 cfs to 21 FTE at 6,000 cfs. ~~Direct gross farm revenue losses are expected to be less than $1.5 million per year.~~ Total output value (gross farm revenue) expected losses for the CM2 scenario, which corresponds to supplemental releases only in years where natural flooding occurs, range from $1.2 to $2.8 million per year. Expected losses are zero in years when there is no natural flooding and substantial in years when there is late natural flooding. Expected loss estimates are sensitive to changes in area inundated, yield loss and crop prices. It assumed that the costs of production in the Bypass remain constant even with late flooding; however, if production costs go up, for example, due to overtime labor or increased preparation costs, loss estimates would increase.

The report also evaluates the loss to total value added, or the net value of agricultural production in the Yolo Bypass to the Yolo County economy. Recognizing that many inputs/outputs are produced or consumed outside of Yolo County, those factors are not considered in the analysis. For example, total value added does include compensation for employees, income to business and landowners, and other business specific to Yolo County, but does not include food production that is exported out of the county. A proportion of Yolo Bypass production and crop consumption occurs within Yolo County; therefore, the expected annual losses to value added for Yolo County is expected to range from $0.63 to $1.5 million per year.

NEPA Effects: Because implementation of ~~Conservation Measures 2–22~~CM2–CM21 would be anticipated to lead to reductions in crop acreage and in the value of agricultural production in the Delta region, this is considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.***CEQA Conclusion*:** Implementation of ~~Conservation Measures 2–22~~CM2–CM21 would reduce the total value of agricultural production in the Delta region. The permanent removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources,* Section 14.3.3.2, Impacts AG-3 and AG-4. The reduction in the value of agricultural production is not considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout this EIR/EIS. When required, the BDCP proponents would provide compensation to property owners for economic losses due to implementation of the alternative. While the compensation to property owners would reduce the severity of economic effects related to the loss of agricultural land, it would not constitute mitigation for any related physical impact. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an ALSP to preserve agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.

16.3.3.3 Alternative 1B—Dual Conveyance with East Alignment and Intakes 1–5 (15,000 cfs; Operational Scenario A)

Impact ECON-1: Temporary Effects on Regional Economics and Employment in the Delta Region during Construction of the Proposed Water Conveyance Facilities

The regional economic effects on employment and income in the Delta region during construction were evaluated, both for the unlined and lined canal options. Changes are shown relative to the Existing Conditions and the No Action Alternative (regional economic conditions do not differ between Existing Conditions and No Action Alternative). The effects on employment and income for the unlined option are displayed in Table 16-25. The table shows the direct and total change that would result from conveyance-related spending. As evident in Table 16-25, spending on conveyance construction results in substantial, though temporary, local economic activity in the region. As shown, direct construction employment is anticipated to vary over the 8-year construction period, with an estimated 2,599 FTE jobs in the first year and 245 FTE jobs in the final year of the construction period. Construction employment is estimated to peak at 6,279 FTE jobs in year 4. Total employment (direct, indirect, and induced) would also peak in year 4, at 11,045 FTE jobs.

Table 16-25. Regional Economic Effects on Employment and Labor Income during Construction (Alternative 1B)

Regional Economic Impact[a]	Year 1	2	3	4	5	6	7	8	Total
Employment (FTE)									
Direct	2,599	3,011	5,735	6,279	5,512	4,702	1,543	245	29,627
Total[b]	7,208	7,673	12,484	12,985	11,045	8,499	3,028	370	63,292
Labor Income (million $)									
Direct	132.6	129.3	169.2	160.2	127.9	75.8	33.5	1.3	829.8
Total[b]	266.9	268.0	380.3	374.3	307.0	205.6	82.0	6.3	1,890.4

Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Conditions or the No Action Alternative.

[b] Includes direct, indirect, and induced effects; numbers may not sum to the total due to rounding. Detailed estimates are presented in Appendix 16A, *Regional Economic Impacts of Water Conveyance Facility Construction*.

The employment and income effects under the lined option would be higher than for the unlined option. Direct and total employment estimates over the 8-year construction period for the lined option would be 29,852 and 63,847, respectively. Direct and total income effects would be also higher under the lined option, with direct and total income over the construction period of $838.8 million and $1,909.3 million, respectively.

The footprint of conveyance and related facilities such as roads and utilities would remove some existing agricultural land from production, so the effects on employment and income from such removals would be negative. The regional economic effects on employment and income in the Delta region from the change in agricultural production are reported in Table 16-26. As shown, direct agricultural employment would be reduced by an estimated 90 FTE jobs, while total employment (direct, indirect, and induced) associated with agricultural employment would fall by 340 FTE jobs. Based on the crop production values changes described in Impact ECON-6 for construction effects, the direct agricultural job losses would more likely be concentrated in the vegetable, truck, orchard, and vineyard crops sectors, which are relatively labor intensive, than in the grain, field, and forage crop sectors, where more jobs are mechanized. Note that direct agricultural job losses could be higher than the 90 FTE jobs shown in Table 16-26 because many agricultural jobs are seasonal rather than year-round, FTE jobs, suggesting that more than one seasonal job could be lost per every FTE job lost as a result of construction of conveyance facilities construction. Mapbook Figures M14-3 and M14-4 display areas of Important Farmland and lands under Williamson Act contracts that could be converted to other uses due to the construction of water conveyance facilities for the East alignment. Note that not all of these structures would be constructed under this alternative.

Table 16-26. Regional Economic Effects on Agricultural Employment and Labor Income during Construction (Alternative 1B)

Regional Economic Impact[a]	Impacts on Agriculture
Employment (FTE)	
Direct	-90
Total[b]	-340
Labor Income (million $)	
Direct	-11.4
Total[b]	-21.9

Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Conditions or the No Action Alternative.

[b] Includes direct, indirect, and induced effects.

Additionally, the Alternative 1B construction footprint would result in the abandonment of an estimated two producing natural gas wells in the study area, as described in Chapter 26, *Mineral Resources*, Section 26.3.3.3, Impact MIN-1. This could result in the loss of employment and labor income associated with monitoring and maintaining these wells. Generally, small crews perform ongoing monitoring and maintenance of several wells at a time. As shown in Chapter 26, *Mineral Resources*, Table 26-23, 516 active producer wells are located in the study area. Even if both producing wells in the Alternative 1B construction footprint were abandoned and not replaced with new wells installed outside the construction footprint, the percentage reduction in the number of natural gas wells would be very small. As a result, the employment and labor income effects associated with well abandonment, while negative, would be minimal.

NEPA Effects: Because construction of water conveyance facilities would result in an increase in construction-related employment and labor income, this would be considered a beneficial effect. However, these activities would also be anticipated to result in a decrease in agricultural-related employment and labor income, which would be considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.

***CEQA Conclusion*:** Construction of the proposed water conveyance facilities would increase total employment and income in the Delta region. The change would result from expenditures on BDCP construction and from a modest decrease in agricultural production. Changes in recreational expenditures and natural gas well operations could also affect regional employment and income, but these have not been quantified. The total change in employment and income is not, in itself, considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout this EIR/EIS. Costs are addressed in Chapter 8 of the BDCP, *Implementation Costs and Funding Sources*; removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources,* Section 14.3.3.3, Impacts AG-1 and AG-2; changes in recreation related activities are addressed in Chapter 15, *Recreation,* Section 15.3.3.3, REC-1 through REC-4; abandonment of natural gas wells is addressed in Chapter 26, *Mineral Resources*, Section 26.3.3.3, Impact MIN-1. When required, DWR would provide compensation to property owners for economic losses due to implementation of the alternative. While the compensation to property owners would reduce the severity of economic effects related to the loss of agricultural land, it would not

constitute mitigation for any related physical impact. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an ALSP to preserve agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.

Impact ECON-7: Permanent Regional Economic and Employment Effects in the Delta Region during Operation and Maintenance of the Proposed Water Conveyance Facilities

In the Delta region, ongoing operation and maintenance of BDCP facilities would result in increased expenditures relative to the Existing Conditions and the No Action Alternative (regional economic conditions do not differ across Existing Conditions and No Action Alternative). The increased expenditures are expected to result in a permanent increase in regional employment and income, including an estimated 204 direct and 294 total (direct, indirect, and induced) FTE jobs (Table 16-28). Since operation and maintenance expenditures for the unlined and lined options were not differentiated, the results summarized in this section are assumed to apply to both the unlined and lined options. Potential changes in the value of agricultural production result in changes to regional employment and income in the Delta region under Alternative 1B relative to the Existing Conditions and the No Action Alternative.

Table 16-28. Regional Economic Effects on Employment and Labor Income during Operations and Maintenance (Alternative 1B)

Regional Economic Impact[a]	Impacts from Operations and Maintenance
Employment (FTE)	
Direct	204
Total[b]	294
Labor Income (million $)	
Direct	12.6
Total[b]	16.8

Note: Labor income is reported in 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Conditions or the No Action Alternative.

[b] Includes direct, indirect, and induced effects.

The operation and maintenance of conveyance and related facilities such as roads and utilities would result in the permanent removal of agricultural land from production following construction, and the effects on employment and income would be negative, including the loss of an estimated 117 agricultural and 321 total (direct, indirect, and induced) FTE jobs. The regional economic effects on employment and income in the Delta region from the change in agricultural production are reported in Table 16-29. Based on the permanent crop production value changes described in Impact ECON-12, the agricultural job losses would more likely be concentrated in the vegetable, truck, orchard, and vineyard crops sectors, which are relatively labor intensive, than in the grain, field, and forage crop sectors, where more jobs are mechanized. Note that direct agricultural job losses could be higher than the 117 FTE jobs shown in Table 16-29 because many agricultural jobs are seasonal rather than year-round, FTE jobs, suggesting that more than one seasonal job could be lost per every FTE job lost as a result of permanent agricultural production changes. Mapbook Figures M14-3 and M14-4 display areas of Important Farmland and lands under Williamson Act

contracts that could be converted to other uses due to the construction of water conveyance facilities for the East alignment. Note that not all of these structures would be constructed under this alternative.

Table 16-29. Regional Economic Effects on Agricultural Employment and Labor Income during Operations and Maintenance (Alternative 1B)

Regional Economic Impact[a]	Impacts on Agriculture
Employment (FTE)	
Direct	-117
Total[b]	-321
Labor Income (million $)	
Direct	-9.3
Total[b]	-17.9

Note: Labor income is reported in 2011 dollars (U.S. Department of Commerce 2012).
[a] IMPLAN results are changes relative to Existing Conditions or the No Action Alternative.
[b] Includes direct, indirect, and induced effects.

NEPA Effects: Because continued operation and maintenance of water conveyance facilities would result in an increase in operations-related employment and labor income, this would be considered a beneficial effect. However, the long-term footprint of facilities would lead to a continued decline in agricultural-related employment and labor income, which would be considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.

***CEQA Conclusion*:** Operation and maintenance of the proposed water conveyance facilities would decrease total employment and income in the Delta region. The change would result from expenditures on BDCP operation and maintenance, increasing employment, and from changes in agricultural production, decreasing employment. The total change in income and employment is not, in itself, considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout this EIR/EIS. Costs are addressed in Chapter 8 of the BDCP, *Implementation Costs and Funding Sources*; removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources,* Section 14.3.3.3, Impacts AG-3 and AG-4; changes in recreation related activities are addressed in Chapter 15, *Recreation,* Section 15.3.3.3, Impacts REC-5 through REC-8. When required, DWR would provide compensation to property owners for economic losses due to implementation of the alternative. While the compensation to property owners would reduce the severity of economic effects related to the loss of agricultural land, it would not constitute mitigation for any related physical impact. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an ALSP to preserve agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.

16.3.3.4 Alternative 1C—Dual Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario A)

Impact ECON-1: Temporary Effects on Regional Economics and Employment in the Delta Region during Construction of the Proposed Water Conveyance Facilities

The regional economic effects on employment and income in the Delta region during construction were evaluated for both the unlined and lined canal options. Changes are shown relative to the Existing Conditions and the No Action Alternative (regional economic conditions do not differ between Existing Conditions and No Action Alternative). The effects on employment and income for the unlined option are displayed in Table 16-31. Table 16-31 shows the direct and total change that would result from conveyance-related spending. As evident in Table 16-31, spending on conveyance construction results in substantial local economic activity in the region. As shown, direct construction employment is anticipated to vary over the 8-year construction period, with an estimated 2,747 FTE jobs in the first year and 236 FTE jobs in the final year of the construction period. Construction employment is estimated to peak at 5,300 FTE jobs in year 4. Total employment (direct, indirect, and induced) would also peak in year 4, at 11,559 FTE jobs.

Table 16-31. Regional Economic Effects on Employment and Labor Income during Construction (Alternative 1C)

Regional Economic Impact[a]	Year								Total
	1	2	3	4	5	6	7	8	
Employment (FTE)									
Direct	2,747	3,016	4,915	5,300	4,794	4,194	1,128	236	26,329
Total[b]	9,209	8,411	11,698	11,559	9,867	7,767	2,126	352	60,989
Labor Income (million $)									
Direct	197.6	155.8	181.1	156.9	120.7	74.3	21.3	1.1	908.8
Total[b]	379.1	312.7	386.9	352.5	283.0	194.8	54.6	5.8	1,969.4

Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.

[b] Includes direct, indirect, and induced effects; numbers may not sum to the total due to rounding. Detailed estimates are presented in Appendix 16A, *Regional Economic Impacts of Water Conveyance Facility Construction*.

The employment and income effects under the lined option are higher than for the unlined option. Direct and total employment estimates over the 8-year construction period for the lined option are 29,019 and 62,693, respectively. Direct and total income effects are also higher under the lined option, with direct and total income over the construction period of $936.3 million and $2,027.3 million, respectively.

The footprint of conveyance and related facilities such as roads and utilities would remove some existing agricultural land from production, so the effects on employment and income from those removals would be negative. The regional economic effects on employment and income in the Delta region from the change in agricultural production are reported in Table 16-32. As shown, direct agricultural employment would be reduced by an estimated 64 FTE jobs, while total employment (direct, indirect, and induced) associated with agricultural employment would fall by 240 FTE jobs.

Based on the crop production values changes described in Impact ECON-6 for construction effects, the direct agricultural job losses would more likely be concentrated in the vegetable, truck, orchard, and vineyard crops sectors, which are relatively labor intensive, than in the grain, field, and forage crop sectors, where more jobs are mechanized. Note that direct agricultural job losses could be higher than the 64 FTE jobs shown in Table 16-32 because many agricultural jobs are seasonal rather than year-round, FTE jobs, suggesting that more than one seasonal job could be lost per every FTE job lost as a result of construction of conveyance facilities construction. Mapbook Figures M14-5 and M14-6 display areas of Important Farmland and lands under Williamson Act contracts that could be converted to other uses due to the construction of water conveyance facilities for the West alignment. Note that not all of these structures would be constructed under this alternative.

Table 16-32. Regional Economic Effects on Agricultural Employment and Labor Income, during Construction (Alternative 1C)

Regional Economic Impact[a]	Impacts on Agriculture
Employment (FTE)	
Direct	-64
Total[b]	-240
Labor Income (million $)	
Direct	-8.1
Total[b]	-15.5

Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.

[b] Includes direct, indirect, and induced effects.

Additionally, the Alternative 1C construction footprint would result in the abandonment of an estimated four producing natural gas wells in the study area, as described in Chapter 26, *Mineral Resources*, Section 26.3.3.4, Impact MIN-1. This could result in the loss of employment and labor income associated with monitoring and maintaining these wells. Generally, small crews perform ongoing monitoring and maintenance of several wells at a time. As shown in Chapter 26, *Mineral Resources*, Table 26-~~3~~2, 516 active producer wells are located in the study area. Even if all four producing wells in the Alternative 1C construction footprint were abandoned and not replaced with new wells installed outside the construction footprint, the percentage reduction in the number of natural gas wells would be very small. As a result, the employment and labor income effects associated with well abandonment, while negative, would be minimal.

NEPA Effects: Because construction of water conveyance facilities would result in an increase in construction-related employment and labor income, this would be considered a beneficial effect. However, these activities would also be anticipated to result in a decrease in agricultural-related employment and labor income, which would be considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.

***CEQA Conclusion*:** Construction of the proposed water conveyance facilities would increase total employment and income in the Delta region. The change would result from expenditures on construction, increasing employment, and from changes in agricultural production, decreasing employment. Changes in recreational expenditures and natural gas well operations could also affect regional employment and income, but these have not been quantified. The total change in

employment and income is not, in itself, considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout this EIR/EIS. Costs are addressed in Chapter 8 of the BDCP, *Implementation Costs and Funding Sources*; removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources,* Section 14.3.3.4, Impacts AG-1 and AG-2; changes in recreation related activities are addressed in Chapter 15, *Recreation,* Section 15.3.3.4, REC-1 through REC-4; abandonment of natural gas wells is addressed in Chapter 26, *Mineral Resources*, Section 26.3.3.4, Impact MIN-1. When required, DWR would provide compensation to property owners for economic losses due to implementation of the alternative. While the compensation to property owners would reduce the severity of economic effects related to the loss of agricultural land, it would not constitute mitigation for any related physical impact. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an ALSP to preserve agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.

Impact ECON-7: Permanent Regional Economic and Employment Effects in the Delta Region during Operation and Maintenance of the Proposed Water Conveyance Facilities

In the Delta region, ongoing operation and maintenance of BDCP facilities would result in increased expenditures relative to the Existing Conditions and the No Action Alternative (regional economic conditions do not differ across Existing Conditions and No Action Alternative). The increased expenditures are expected to result in a permanent increase in regional employment and income, including an estimated 187 direct and 269 total (direct, indirect, and induced) FTE jobs (Table 16-34). Since operation and maintenance expenditures for the unlined and lined options were not differentiated, the results summarized in this section are assumed to apply to both the unlined and lined option. Potential changes in the value of agricultural production result in changes to regional employment and income in the Delta region under the Alternative 1C relative to the Existing Conditions and the No Action Alternative.

Table 16-34. Regional Economic Effects on Employment and Labor Income during Operations and Maintenance (Alternative 1C)

Regional Economic Impact[a]	Impacts from Operations and Maintenance
Employment (FTE)	
Direct	187
Total[b]	269
Labor Income (million $)	
Direct	11.4
Total[b]	15.3

[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.

[b] Includes direct, indirect, and induced effects.

Note: Labor income is reported in 2011 dollars (U.S. Department of Commerce 2012).

The operation and maintenance of conveyance and related facilities such as roads and utilities would result in the permanent removal of agricultural land from production following construction, and the effects on employment and income would be negative, including the loss of an estimated 75

agricultural and 216 total (direct, indirect, and induced) FTE jobs. The regional economic effects on employment and income in the Delta region from the change in agricultural production are reported in Table 16-35. Based on the permanent crop production value changes described in Impact ECON-12, the agricultural job losses would more likely be concentrated in the vegetable, truck, orchard, and vineyard crops sectors, which are relatively labor intensive, than in the grain, field, and forage crop sectors, where more jobs are mechanized. Note that direct agricultural job losses could be higher than the 75 FTE jobs shown in Table 16-35 because many agricultural jobs are seasonal rather than year-round, FTE jobs, suggesting that more than one seasonal job could be lost per every FTE job lost as a result of permanent agricultural production changes. Mapbook Figures M14-5 and M14-6 display areas of Important Farmland and lands under Williamson Act contracts that could be converted to other uses due to the construction of water conveyance facilities for the West alignment. Note that not all of these structures would be constructed under this alternative.

Table 16-35. Regional Economic Effects on Agricultural Employment and Labor Income during Operations and Maintenance (Alternative 1C)

Regional Economic Impact[a]	Impacts on Agriculture
Employment (FTE)	
Direct	-75
Total[b]	-216
Labor Income (million $)	
Direct	-6.5
Total[b]	-12.4

[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.

[b] Includes direct, indirect, and induced effects.

Note: Labor income is reported in 2011 dollars (U.S. Department of Commerce 2012).

NEPA Effects: Because continued operation and maintenance of water conveyance facilities would result in an increase in operations-related employment and labor income, this would be considered a beneficial effect. However, the long-term footprint of facilities would lead to a continued decline in agricultural-related employment and labor income, which would be considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.

***CEQA Conclusion*:** Operation and maintenance of the proposed water conveyance facilities would increase total employment and income in the Delta region. The change would result from expenditures on operation and maintenance and from changes in agricultural production. The total change in income and employment is not, in itself, considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout this EIR/EIS. Costs are addressed in Chapter 8 of the BDCP, *Implementation Costs and Funding Sources*; removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources,* Section 14.3.3.4, Impacts AG-3 and AG-4; changes in recreation related activities are addressed in Chapter 15, *Recreation,* Section 15.3.3.4, Impacts REC-5 through REC-8. When required, DWR would provide compensation to property owners for economic losses due to implementation of the alternative. While the compensation to property owners would reduce the severity of economic effects related to the loss

of agricultural land, it would not constitute mitigation for any related physical impact. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an ALSP to preserve agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.

16.3.3.8 Alternative 3—Dual Conveyance with Pipeline/Tunnel and Intakes 1 and 2 (6,000 cfs; Operational Scenario A)

Impact ECON-1: Temporary Effects on Regional Economics and Employment in the Delta Region during Construction of the Proposed Water Conveyance Facilities

The regional economic effects on employment and income in the Delta region during construction were evaluated. Changes are shown relative to the Existing Conditions and the No Action Alternative (regional economic conditions do not differ between Existing Conditions and No Action Alternative). The effects on employment and income are displayed in Table 16-37. The table shows the direct and total change that would result from conveyance-related spending. As evident in Table 16-37, spending on conveyance construction results in substantial local economic activity in the region. As shown, direct construction employment is anticipated to vary over the 8-year construction period, with an estimated 1,818 FTE jobs in the first year and 111 FTE jobs in the final year of the construction period. Construction employment is estimated to peak at 2,849 FTE jobs in year 4. Total employment (direct, indirect, and induced) would also peak in year 4, at 6,787 FTE jobs.

Table 16-37. Regional Economic Effects on Employment and Labor Income during Construction (Alternative 3)

Regional Economic Impact[a]	Year								Total
	1	2	3	4	5	6	7	8	
Employment (FTE)									
Direct	1,818	2,034	2,713	2,849	2,578	2,320	482	111	14,904
Total[b]	10,297	8,515	9,634	8,656	6,787	5,013	813	157	49,872
Labor Income (million $)									
Direct	282.5	207.7	214.8	172.5	118.3	67.0	5.7	0.2	1,068.8
Total[b]	507.2	384.4	407.4	338.5	242.4	151.5	17.6	2.2	2,051.2

Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.

[b] Includes direct, indirect, and induced effects; numbers may not sum to the total due to rounding. Detailed estimates are presented in Appendix 16A, *Regional Economic Impacts of Water Conveyance Facility Construction*.

The footprint of conveyance and related facilities such as roads and utilities would remove some existing agricultural land from production, so the effects on employment and income would be negative. The regional economic effects on employment and income in the Delta region from the change in agricultural production are reported in Table 16-38. As shown, direct agricultural employment would be reduced by an estimated 23~~2~~ FTE jobs, while total employment (direct, indirect, and induced) associated with agricultural employment would fall by 88 FTE jobs. Based on the crop production values changes described in Impact ECON-6 for construction effects, the direct

agricultural job losses would more likely be concentrated in the vegetable, truck, orchard, and vineyard crops sectors, which are relatively labor intensive, than in the grain, field, and forage crop sectors, where more jobs are mechanized. Note that direct agricultural job losses could be higher than the 23 FTE jobs shown in Table 16-38 because many agricultural jobs are seasonal rather than year-round, FTE jobs, suggesting that more than one seasonal job could be lost per every FTE job lost as a result of construction of conveyance facilities construction. Mapbook Figures M14-1 and M14-2 display areas of Important Farmland and lands under Williamson Act contracts that could be converted to other uses due to the construction of water conveyance facilities for the Pipeline/Tunnel alignment. Note that not all of these structures would be constructed under this alternative.

Table 16-38. Regional Economic Effects on Agricultural Employment and Labor Income during Construction (Alternative 3)

Regional Economic Impact[a]	Impacts on Agriculture
Employment (FTE)	
Direct	-23
Total[b]	-88
Labor Income (million $)	
Direct	-2.9
Total[b]	-5.6

Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.

[b] Includes direct, indirect, and induced effects.

Additionally, the Alternative 3 construction footprint would result in the abandonment of an estimated six producing natural gas wells in the study area, as described in Chapter 26, *Mineral Resources*, Section 26.3.3.8, Impact MIN-1. This could result in the loss of employment and labor income associated with monitoring and maintaining these wells. Generally, small crews perform ongoing monitoring and maintenance of several wells at a time. As shown in Chapter 26, *Mineral Resources*, Table 26-~~3~~2, 516 active producer wells are located in the study area. Even if all six producing wells in the Alternative 3 construction footprint were abandoned and not replaced with new wells installed outside the construction footprint, the percentage reduction in the number of natural gas wells would be very small. As a result, the employment and labor income effects associated with well abandonment, while negative, would be minimal.

NEPA Effects: Because construction of water conveyance facilities would result in an increase in construction-related employment and labor income, this would be considered a beneficial effect. However, these activities would also be anticipated to result in a decrease in agricultural-related employment and labor income, which would be considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.

***CEQA Conclusion*:** Construction of the proposed water conveyance facilities would increase total employment and income in the Delta region during the construction period. The change would result from expenditures on construction, increasing employment, and from changes in agricultural production, decreasing employment. Changes in recreational expenditures and natural gas well operations could also affect regional employment and income, but these have not been quantified.

The total change in employment and income is not, in itself, considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout the EIR/EIS. Costs are addressed in Chapter 8 of the BDCP, *Implementation Costs and Funding Sources*; removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources,* Section 14.3.3.8, Impacts AG-1 and AG-2; changes in recreation related activities are addressed in Chapter 15, *Recreation,* Section 15.3.3.8, REC-1 through REC-4; abandonment of natural gas wells is addressed in Chapter 26, *Mineral Resources*, Section 26.3.3.8, Impact MIN-1. When required, DWR would provide compensation to property owners for economic losses due to implementation of the alternative. While the compensation to property owners would reduce the severity of economic effects related to the loss of agricultural land, it would not constitute mitigation for any related physical impact. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an ALSP to preserve agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.

16.3.3.9 Alternative 4—Dual Conveyance with Modified Pipeline/Tunnel and Intakes 2, 3, and 5 (9,000 cfs; Operational Scenario H)

Alternative 4 would result in temporary effects on lands and communities associated with construction of three intakes ~~and intake pumping plants,~~ and ~~other~~ associated facilities; an intermediate forebay; ~~conveyance pipelines;~~ tunnels; an operable barrier at the head of Old River~~,~~; pumping plants and an ~~new 600 acre Byron Tract Forebay, adjacent to and south of~~expanded and modified Clifton Court Forebay. Nearby areas would be altered as work or staging areas, concrete batch plants, fuel stations, or be used for spoils storage areas. Transmission lines, access roads, and other incidental facilities would also be needed for operations, and construction of these structures would also have effects on lands and communities.

The following impact analysis is divided into four subsections: effects of construction of facilities under CM1 in the Delta region, effects of operations of facilities under CM1 in the Delta region, effects of implementation of other conservation measures, and effects in hydrologic regions outside of the Delta as a result of changes in water deliveries.

Impact ECON-1: Temporary Effects on Regional Economics and Employment in the Delta Region during Construction of the Proposed Water Conveyance Facilities

The regional economic effects on employment and income in the Delta region during construction were evaluated. Changes are shown relative to the Existing Conditions and the No Action Alternative (regional economic conditions do not differ between Existing Conditions and No Action Alternative). The effects on employment and income are displayed in Table 16-41. The table shows the direct and total changes that would result from conveyance-related spending. As evident in Table 16-41, spending on conveyance construction would result in substantial economic activity in the region. As shown, direct construction employment is anticipated to vary over the ~~8~~14-year construction period, with an estimated ~~2,437~~66 FTE jobs in the first year and ~~132~~ 486 FTE jobs in the final year of the construction period. Construction employment is estimated to peak at ~~3,937~~2,278 FTE jobs in year ~~3~~9. Total employment (direct, indirect, and induced) would peak in year ~~1~~12, at ~~16,029~~8,673 FTE jobs.

Table 16-41. Regional Economic Effects on Employment and Labor Income during Construction (Alternative 4)

Regional Economic Impact[a]	Year 1	2	3	4	5	6	7	8
Employment (FTE)								
Direct	66	747	2,427	1,743	1,124	1,572	2,207	2,272
Total[b]	90	1,025	7,988	6,644	5,402	6,451	8,185	8,274
Labor Income (million $)								
Direct	0.0	0.5	168.6	153.3	139.0	154.8	185.9	185.9
Total[b]	1.1	13.0	324.6	287.8	253.4	287.4	350.6	351.7

Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.

[b] Includes direct, indirect, and induced effects; numbers may not sum to the total due to rounding. Detailed estimates are presented in Appendix 16A, *Regional Economic Impacts of Water Conveyance Facility Construction*.

Regional Economic Impact[a]	Year 9	10	11	12	13	14	Total
Employment (FTE)							
Direct	2,278	2,194	2,114	2,248	1,723	486	23,202
Total[b]	8,320	8,187	8,113	8,673	4,964	795	83,111
Labor Income (million $)							
Direct	187.4	186.7	187.9	201.5	94.0	4.8	1,850.3
Total[b]	354.2	351.6	352.4	377.5	187.2	16.1	3,508.5

Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.

[b] Includes direct, indirect, and induced effects; numbers may not sum to the total due to rounding. Detailed estimates are presented in Appendix 16A, *Regional Economic Impacts of Water Conveyance Facility Construction*.

~~**Table 16-41. Regional Economic Effects on Employment and Labor Income during Construction (Alternative 4)**~~

~~Regional Economic Impact[a]~~	~~Year 1~~	~~2~~	~~3~~	~~4~~	~~5~~	~~6~~	~~7~~	~~8~~	~~Total~~
~~**Employment (FTE)**~~									
~~Direct~~	~~2,437~~	~~2,944~~	~~3,937~~	~~3,825~~	~~3,533~~	~~2,682~~	~~769~~	~~132~~	~~20,259~~
~~Total[b]~~	~~16,029~~	~~13,707~~	~~15,254~~	~~13,086~~	~~10,240~~	~~6,351~~	~~1,295~~	~~186~~	~~76,147~~
~~**Labor Income** (million $)~~									
~~Direct~~	~~459.0~~	~~350.4~~	~~357.4~~	~~284.4~~	~~196.0~~	~~97.5~~	~~8.9~~	~~0.2~~	~~1,753.7~~
~~Total[b]~~	~~815.6~~	~~640.5~~	~~668.7~~	~~543.7~~	~~389.5~~	~~209.0~~	~~27.8~~	~~2.5~~	~~3,297.2~~

~~Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).~~

~~[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.~~

~~[b] Includes direct, indirect, and induced effects; numbers may not sum to the total due to rounding.~~

~~Regional Economic~~ ~~Year~~

~~Detailed estimates are presented in Appendix 16A, *Regional Economic Impacts of Water Conveyance Facility Construction*.~~

The footprint of conveyance and related facilities such as roads and utilities would remove some existing agricultural land from production, so the effects on employment and income would be negative. The regional economic effects on employment and income in the Delta region from the change in agricultural production are reported in Table 16-42. As shown, direct agricultural employment would be reduced by an estimated 16 FTE jobs, while total employment (direct, indirect, and induced) associated with agricultural employment would fall by 57 FTE jobs. Based on the crop production values changes described in Impact ECON-6 for construction effects, the direct agricultural job losses would more likely be concentrated in the vegetable, truck, orchard, and vineyard crops sectors, which are relatively labor intensive, than in the grain, field, and forage crop sectors, where more jobs are mechanized. Note that direct agricultural job losses could be higher than the 16 FTE jobs shown in Table 16-42 because many agricultural jobs are seasonal rather than year-round, FTE jobs, suggesting that more than one seasonal job could be lost per every FTE job lost as a result of construction of conveyance facilities construction. Mapbook Figures M14-7 and M14-8 display areas of Important Farmland and lands under Williamson Act contracts that could be converted to other uses due to the construction of water conveyance facilities for the Modified Pipeline/Tunnel alignment. ~~Note that not all of these structures would be constructed under this alternative.~~

Table 16-42. Regional Economic Effects on Agricultural Employment and Labor Income during Construction (Alternative 4)

Regional Economic Impact[a]	Impacts on Agriculture
Employment (FTE)	
Direct	-16
Total[b]	-57
Labor Income (million $)	
Direct	~~-1.8~~-2.4
Total[b]	~~-3.5~~-4.2

Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.

[b] Includes direct, indirect, and induced effects.

~~Additionally, t~~The Alternative 4 construction footprint would not result in the abandonment of any ~~estimated six~~active producing natural gas wells in the study area, as described in Chapter 26, *Mineral Resources*, Section 26.3.3.9, Impact MIN-1. ~~This could~~Therefore, this alternative would not be anticipated to result in the loss of employment ~~and~~ or labor income associated with monitoring and maintaining these wells. ~~Generally, small crews perform ongoing monitoring and maintenance of several wells at a time. As shown in Chapter 26, *Mineral Resources*, Table 26-32, 516 active producer wells are located in the study area. Even if all six producing wells in the Alternative 4 construction footprint were abandoned and not replaced with new wells installed outside the construction footprint, the percentage reduction in the number of natural gas wells would be very~~

~~small. As a result, the employment and labor income effects associated with well abandonment, while negative, would be minimal.~~

NEPA Effects: Because construction of water conveyance facilities would result in an increase in construction-related employment and labor income, this would be considered a beneficial effect. However, these activities would also be anticipated to result in a decrease in agricultural-related employment and labor income, which would be considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.

***CEQA Conclusion*:** Construction of the proposed water conveyance facilities would temporarily increase total employment and income in the Delta region. The change would result from expenditures on construction, increasing employment, and from changes in agricultural production, decreasing employment. Changes in recreational expenditures and natural gas well operations could also affect regional employment and income, but these have not been quantified. The total change in employment and income is not, in itself, considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout this EIR/EIS. Costs are addressed in Chapter 8 of the BDCP, *Implementation Costs and Funding Sources*; removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources,* Section 14.3.3.9, Impacts AG-1 and AG-2; changes in recreation related activities are addressed in Chapter 15, *Recreation,* Section 15.3.3.9, REC-1 through REC-4; abandonment of natural gas wells is addressed in Chapter 26, *Mineral Resources*, Section 26.3.3.9, Impact MIN-1. When required, DWR would provide compensation to property owners for economic losses due to implementation of the alternative. While the compensation to property owners would reduce the severity of economic effects related to the loss of agricultural land, it would not constitute mitigation for any related physical impact. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an ALSP to preserve agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.

Impact ECON-2: Effects on Population and Housing in the Delta Region during Construction of the Proposed Water Conveyance Facilities

Population

Construction of conveyance facilities would require an estimated peak of ~~3,937~~2,278 workers in year ~~3~~ 9 of the assumed ~~8~~14-year construction period. It is anticipated that many of these new jobs would be filled from within the existing five-county labor force. However, construction of the tunnels may require specialized worker skills not readily available in the local labor pool. As a result, it is anticipated that some specialized workers may be recruited from outside the five-county region.

Considering the multi-year duration of conveyance facility construction, it is anticipated that non-local workers would temporarily relocate to the five-county region, thus adding to the local population. As discussed in Chapter 30, *Growth Inducement and Other Indirect Effects*, Section 30.3.2.1, Direct Growth Inducement, an estimated 30 percent of workers could come from out of the Delta region, suggesting that approximately ~~1,180~~690 workers could relocate to the Delta region at the peak of the construction period. However, this additional population would constitute a minor increase in the total 2020 projected regional population of 4.6 million and be distributed throughout

the region. Changes in demand for public services resulting from any increase in population are addressed in Chapter 20, *Public Services and Utilities,* Section 20.3.3.9, Impact UT-1 through UT-6.

Housing

Changes in housing demand are based on changes in supply resulting from displacement during facilities construction and changes in housing demand resulting from employment associated with construction of conveyance facilities. As described in Chapter 13, *Land Use,* Section 13.3.3.9, Impact LU-2, construction of water conveyance facilities under Alternative 4 would conflict with approximately 19 residential structures. The physical footprints of the three intake facilities, along with associated work areas, are anticipated to create the largest disruption to structures, conflicting with 12 of these residences.

The construction workforce would most likely commute daily to the work sites from within the five-county region; however, if needed, there are about 53,000 housing units available to accommodate workers who may choose to commute to on a workweek basis or who may choose to temporarily relocate to the region for the duration of the construction period, including the estimated ~~1,180~~690 workers who may temporarily relocate to the Delta region from out of the region. In addition to the available housing units, there are recreational vehicle parks and hotels and motels within the five-county region to accommodate any construction workers. As a result, and as discussed in more detail in Chapter 30, *Growth Inducement and Other Indirect Effects*, Section 30.3.2.1, Direct Growth Inducement, construction of the proposed conveyance facilities is not expected to substantially increase the demand for housing within the five-county region.

NEPA Effects: Within specific local communities, there could be localized effects on housing. However, given the availability of housing within the five-county region, predicting where this impact might fall would be speculative. In addition, new residents would likely be dispersed across the region, thereby not creating a burden on any one community.

Because these activities would not result in permanent concentrated, substantial increases in population or new housing, they would not be considered to have an adverse effect.

CEQA Conclusion: Construction of the proposed water conveyance facilities would result in minor population increases in the Delta region with adequate housing supply to accommodate the change in population. Therefore, the minor increase in housing is not anticipated to lead to adverse physical changes ~~to~~ constituting a significant impact on the environment.

Impact ECON-3: Changes in Community Character as a Result of Constructing the Proposed Water Conveyance Facilities

NEPA Effects: Throughout the five-county Delta region, population and employment would expand as a result of the construction of water conveyance facilities, as discussed under Impacts ECON-1 and ECON-2. Agricultural contributions to the character and culture of the Delta would be likely to decline commensurate with the projected decline in agricultural-related acreage, employment, and production. This could result in the closure of agriculture-dependent businesses or those catering to agricultural workers, particularly in areas where conversion of agricultural land would be most concentrated, including near the intakes ~~pumping plants~~ in the vicinity of Clarksburg and Hood and the expanded Clifton Court Forebay east of Byron. Similar effects on community character could result from anticipated changes to recreation in the study area. However, social influences associated with the construction industry would grow during the multi-year construction period for

water conveyance structures under Alternative 4. To the extent that this anticipated economic shift away from agriculture and towards construction results in demographic changes in population, employment level, income, age, gender, or race, the study area would be expected to see changes to its character, particularly in those Delta communities most substantially affected by demographic changes based on their size, ability to accommodate growth, or proximity to BDCP activities. In comparing the existing demographic composition of agricultural workers and construction laborers within the five-county Delta Region, men make up a large proportion of both occupations: 84 percent of agricultural workers were male, compared with 98 percent of construction laborers. Approximately 92 percent of agricultural workers made less than $35,000, while 60 percent of construction laborers made less than $35,000. Additionally, 87 percent of agricultural workers within the study area report Hispanic origin, while 54 percent of construction laborers claim Hispanic origin within the five-county area (U.S. Census Bureau 2012b).

Legacy communities in the Delta, which are those identified as containing distinct historical and cultural character, include Locke, Bethel Island, Clarksburg, Courtland, Freeport, Hood, Isleton, Knightsen, Rio Vista, Ryde, and Walnut Grove. These communities provide support services and limited workforce housing for the area's agricultural industry. Some housing is also provided to retirees and workers commuting to nearby urban areas including Sacramento. Construction activities associated with BDCP water conveyance facilities would be anticipated to result in changes to the rural qualities of these communities during the construction period (characterized by predominantly agricultural land uses, relatively low population densities, and low levels of associated noise and vehicular traffic), particularly for those communities in proximity to water conveyance structures, including Clarksburg, Hood, and Walnut Grove. Effects associated with construction activities could also result in changes to community cohesion if they were to restrict mobility, reduce opportunities for maintaining face-to-face relationships, or disrupt the functions of community organizations or community gathering places (such as schools, libraries, places of worship, and recreational facilities). Under Alternative 4, several gathering places that lie in the vicinity of construction areas could be indirectly affected by noise and traffic associated with construction activities, including Delta High School, the Clarksburg Library, Clarksburg Community Church, Resurrection Life Community Church, Citizen Land Alliance, Discovery Bay Chamber of Commerce, Courtland Fire Department, and several marinas or other recreational facilities (see Chapter 15, *Recreation*, Table 15-15).

In addition to potential changes in the demographic composition of communities in the study area, construction of water conveyance facilities under Alternative 4 could also affect the size of the communities, as suggested above. Based upon the projections developed under Impacts ECON-1 and ECON-2, the total population and employment base of the study area would expand during water facility construction. This expansion could provide economic opportunities during this period, which could support community stability by increasing investment in Delta communities. However, as noted under the discussion of housing above, predicting the specific location of such investments within the study area would be speculative.

Under Alternative 4, additional regional employment and income could create net positive effects on the character of Delta communities. In addition to potential demographic effects associated with changes in employment, however, property values may decline in areas that become less desirable in which to live, work, shop, or participate in recreational activities. For instance, negative visual- or noise-related effects on residential property could lead to localized abandonment of buildings. While water conveyance construction could result in beneficial effects relating to the economic welfare of a community, adverse social effects could also arise as a result of declining economic stability in

communities closest to construction effects and in those most heavily influenced by agricultural and recreational activities. Implementation of mitigation measures and environmental commitments related to noise, visual effects, transportation, agriculture, and recreation, would reduce adverse effects (see Appendix 3B, *Environmental Commitments*). Specifically, these include commitments to ~~include Develop~~ develop and ~~Implement~~ implement ~~Erosion~~ erosion and ~~Sediment~~ sediment ~~Control~~ control ~~Plans~~plans, ~~Develop~~ develop and ~~Implement~~ implement ~~Hazardous~~ hazardous ~~Materials~~ materials ~~Management~~ management ~~Plans~~plans, ~~Notification~~ provide notification of ~~Construction and Maintenance~~ maintenance ~~Activities~~ activities in ~~Waterways~~waterways, ~~Noise~~ develop and implement a noise ~~Abatement~~ abatement ~~Plan~~plan, develop and implement a f~~F~~ire ~~Prevention~~ prevention and ~~Control~~ control ~~Plan~~plan, and ~~Prepare~~ prepare and ~~Implement~~ implement ~~Mosquito~~ mosquito ~~Management~~ management ~~Plans~~plans.

***CEQA Conclusion*:** Construction of water conveyance facilities under Alternative 4 could affect community character in the Delta region. However, because these impacts are social in nature, rather than physical, they are not considered impacts under CEQA. To the extent that changes to community character would lead to physical impacts involving population growth, such impacts are described under Impact ECON-2 and in Chapter 30, *Growth Inducement and Other Indirect Effects,* Section 30.3.2*.* Furthermore, notable decreases in population or employment, even if limited to specific areas, sectors, or the vacancy of individual buildings, could result in alteration of community character stemming from a lack of maintenance, upkeep, and general investment. However, implementation of mitigation measures and environmental commitments related to noise, visual effects, transportation, agriculture, and recreation, would reduce the extent of these effects such that a significant impact would not occur (see Appendix 3B, *Environmental Commitments*). Specifically, these include commitments to develop and implement erosion and sediment control plans, develop and implement hazardous materials management plans, provide notification of maintenance activities in waterways, develop and implement a noise abatement plan, develop and implement a fire prevention and control plan, and prepare and implement mosquito management plans.~~commitments include Develop and Implement Erosion and Sediment Control Plans, Develop and Implement Hazardous Materials Management Plans, Notification of Construction and Maintenance Activities in Waterways, Noise Abatement Plan, Fire Prevention and Control Plan, and Prepare and Implement Mosquito Management Plans.~~

Impact ECON-4: Changes in Local Government Fiscal Conditions as a Result of Constructing the Proposed Water Conveyance Facilities

NEPA Effects: Under Alternative 4, publicly-owned water conveyance facilities would be constructed on land of which some is currently held by private owners. Property tax and assessment revenue forgone as a result of water conveyance facilities is estimated at $~~8.2~~7.3 million over the construction period. These decreases in revenue could potentially result in the loss of a substantial share of some agencies' tax bases, particularly for smaller districts affected by the BDCP, such as reclamation districts where conveyance facilities and associated work areas are proposed. This economic effect would be considered adverse; however, the BDCP proponents would make arrangements to compensate local governments for the loss of property tax or assessment revenue for land used for constructing, locating, operating, or mitigating for new Delta water conveyance

facilities.[3] Additionally, as discussed under Impact ECON-1, construction of the water conveyance facilities would be anticipated to result in a net temporary increase of income and employment in the Delta region. This would also create an indirect beneficial effect through increased sales tax revenue for local government entities that rely on sales taxes.

***CEQA Conclusion*:** Under Alternative 4, construction of water conveyance facilities would result in the removal of a portion of the property tax base for various local government entities in the Delta region. Over the construction period, property tax and assessment revenue forgone is estimated at $~~8.2~~7.3 million. However, the Sacramento-San Joaquin Delta Reform Act commits the entities receiving water from the State Water Project and federal Central Valley Project to mitigate for lost property tax and assessment revenue associated with land needed for the construction of new conveyance facilities (Water Code Section 85089). Additionally, any losses could be offset, at least in part, by an anticipated increase in sales tax revenue. CEQA does not require a discussion of socioeconomic effects except where they would result in reasonably foreseeable physical changes. If an alternative is not anticipated to result in a physical change to the environment, it would not be considered to have a significant impact under CEQA (CEQA Guidelines Sections 15064(f) and 15131). Here, any physical consequences resulting from fiscal impacts are too speculative to ascertain.

Impact ECON-5: Effects on Recreational Economics as a Result of Constructing the Proposed Water Conveyance Facilities

NEPA Effects: As described and defined in Chapter 15, *Recreation*, 15.3.3.9, Impacts REC-1 through REC-4, construction of water conveyance facilities under Alternative 4 would include elements that would be permanently located in two existing recreation areas. Additionally, substantial disruption of other recreational activities considered temporary and permanent would occur in certain areas during the construction period. The quality of recreational activities including boating, fishing, waterfowl hunting, and hiking in the Delta could be affected by noise, lighting, traffic, and visual degradation in proximity to water conveyance construction. For example, in-water construction activities associated with the intakes or temporary barge areas could restrict navigation and create noise and vibration that could lead to lower fishing success rates. Were it to occur, a decline in visits to Delta recreational sites as a result of facility construction would be expected to reduce recreation-related spending, creating an adverse effect throughout the Delta region. Additionally, if construction activities shift the relative popularity of different recreational sites, the BDCP may carry localized beneficial or adverse effects.

Access would be maintained to all existing recreational facilities, including marinas, throughout construction. As part of Mitigation Measure REC-2, BDCP proponents would enhance nearby fishing access sites and would incorporate public recreational access into design of the intakes along the Sacramento River. Implementation of this measure along with separate, non-environmental commitments as set forth in Appendix 3B, *Environmental Commitments*, relating to the enhancement of recreational access and control of aquatic weeds in the Delta would reduce these effects. Environmental commitments would also be implemented to reduce some of the effects of

[3] Under the Sacramento-San Joaquin Delta Reform Act of 2009 (85089), construction of a new conveyance facility cannot begin until "the persons or entities that contract to receive water from the State Water Project and the federal Central Valley Project or a joint powers authority representing those entities have made arrangements or entered into contracts to pay for… (b) Full mitigation of property tax or assessments levied by local governments or special districts for land used in the construction, location, mitigation, or operation of new Delta conveyance facilities."

construction activities upon the recreational experience. These include providing notification of maintenance activities in waterways and developing and implementing a noise abatement plan, as described in Appendix 3B, *Environmental Commitments*. Similarly, mitigation measures proposed throughout other chapters of this document, and listed under Impact REC-2 in Chapter 15, *Recreation*, would also contribute to reducing construction effects on recreational experiences in the study area. These include Chapter 12, *Terrestrial Biological Resources*, Chapter 17, *Aesthetics and Visual Resources*, Chapter 19, *Transportation,* and Chapter 23, *Noise*.

Construction of water conveyance structures would be anticipated to result in a lower-quality recreational experience in a number of localized areas throughout the Delta, despite the implementation of environmental commitments. With a decrease in recreational quality, particularly for boating and fishing (two of the most popular activities in the Delta), the number of visits would be anticipated to decline, at least in areas close to construction activities. Under this alternative, small areas of the Cosumnes River Preserve on Staten Island would be affected by the construction of tunnels and associated activities~~, including processing and storage of RTM~~. ~~While RTM areas are considered permanent surface impacts for the purposes of impact analysis, it is anticipated that the RTM would be removed from these areas and reused, as appropriate, as bulking material for levee maintenance, as fill material for habitat restoration projects, or other beneficial means of reuse identified for the material, as described in Appendix 3B, *Environmental Commitments.*~~ In the Clifton Court Forebay, permanent siphons, canals, forebay embankment areas, a control structure, and a forebay overflow structure would be built. New pumping plants would also be constructed at the northeast corner of the forebay. There are no formal recreation facilities at Clifton Court Forebay, although well-established recreation, mostly fishing and hunting, takes place at the southern end of the forebay along the embankment. This access would be lost during construction, but once new embankments are built, recreation could again occur. Six other recreational sites or areas would experience periods of construction-related effects, including noise, access, visual disturbances, or a combination of these effects. As described in Chapter 15, *Recreation*, 15.3.3.9, Impact REC-2, these include Clarksburg Boat Launch (fishing access), Stone Lakes National Wildlife Refuge, Wimpy's Marina, ~~Westgate Landing Park,~~ Delta Meadows River Park, ~~and~~ Bullfrog Landing Marina, and Lazy M Marina. Fewer visits to these sites or areas would lead to less spending, creating an adverse effect. While visitors can adjust their recreational patterns to avoid areas substantially affected by construction activities (by boating or fishing elsewhere in the Delta, for instance), recreation-dependent businesses including marinas and recreational supply retailers may not be able to economically weather the effects of multiyear construction activities and may be forced to close as a result, even while businesses in areas that become more popular could benefit. Overall, the multi-year schedule and geographic scale of construction activities and the anticipated decline in recreational spending would be considered an adverse effect. The commitments and mitigation measures cited above would contribute to the reduction of this effect.

***CEQA Conclusion*:** Construction of the proposed water conveyance facilities under Alternative 4 could impact recreational revenue in the Delta region if construction activities result in fewer visits to the area. Fewer visits would be anticipated to result in decreased economic activity related to recreational activities. This section considers only the economic effects of recreational changes brought about by construction of the proposed water conveyance facilities. Potential physical changes to the environment relating to recreational resources are described and evaluated in Chapter 15, *Recreation,* Section 15.3.3.9, Impacts REC-1 through REC-4.

Impact ECON-6: Effects on Agricultural Economics in the Delta Region during Construction of the Proposed Water Conveyance Facilities

Construction of conveyance facilities would convert land from existing agricultural uses to uses that include direct facility footprints, construction staging areas, borrow/spoils areas, RTM storage, temporary and permanent roads, and utilities. Agricultural land could also be affected by changes in water quality and other conditions that would affect crop productivity. These direct effects on agricultural land are described in Chapter 14, *Agricultural Resources,* Section 14.3.3.9, Impacts AG-1 and AG-2.

Changes in crop acreage were used to describe the associated changes in economic values. Unit prices, yields, and crop production and investment costs were presented in Section 16.1, *Environmental Setting/Affected Environment*. Table 16-43 summarizes the changes in acreage and value of agricultural production that would result in the Delta region as a result of Alternative 4 construction. Changes are shown relative to the Existing Conditions and the No Action Alternative by aggregate crop category (agricultural resources under Existing Conditions and in the No Action Alternative were assumed to be the same). The table also includes a summary of changes in crop acreages that are reported in greater detail in Appendix 14A, *Individual Crop Effects as a Result of BDCP Water Conveyance Facility Construction*.

Total value of irrigated crop production in the Delta would decline on average by $~~5.2~~5.3 million per year during the construction period, with total irrigated crop acreage declining by about ~~5,600~~4,700 acres~~,~~. These estimates are not dependent on water year type.

Table 16-43. Crop Acres and Value of Agricultural Production in the Delta during Construction (Alternative 4)

Analysis Metric	Alternative 4	Change from Existing Conditions and No Action Alternative
Total Crop Acreage (thousand acres)	479.0	-4.7
Grains	58.0	-0.7
Field crops	189.5	-1.6
Forage crops	111.3	-1.5
Vegetable, truck, and specialty crops	76.6	-0.6
Orchards and vineyards	43.7	-0.4
Total Value of Production (million $)	644.8	-5.3
Grains	23.9	-0.3
Field crops	112.9	-1.0
Forage crops	72.0	-1.1
Vegetable, truck, and specialty crops	266.9	-1.5
Orchards and vineyards	169.2	-1.4

Note: Value of production is based on prices received by farmers, in 2011 dollars (U.S. Department of Commerce 2012).

Analysis Metric	Alternative 4	Change from Existing Conditions and No Action Alternative
Total Crop Acreage (thousand acres)	478.1	-5.6
Grains	58.1	-0.6
Field crops	188.4	-2.7
Forage crops	111.2	-1.6
Vegetable, truck, and specialty crops	76.8	-0.4
Orchards and vineyards	43.7	-0.3
Total Value of Production (million $)	644.8	-5.2
Grains	24.0	-0.2
Field crops	112.2	-1.7
Forage crops	72.0	-1.1
Vegetable, truck, and specialty crops	267.3	-1.0
Orchards and vineyards	169.2	-1.3
Note: Value of production is based on prices received by farmers, in 2011 dollars (U.S. Department of Commerce 2012).		

Alternative 4 may also affect production costs on lands even if gross revenues are largely unaffected. Costs could be increased by operational constraints and longer travel times due to facilities construction. Construction designs and costs have provided for such costs in two ways. In most cases, affected lands fall within the facilities footprint, and are included in the agricultural acreage and value of production described elsewhere in this chapter and in Chapter 14, *Agricultural Resources,* Section 14.3.3.9, Impacts AG-1 and AG-2. For potentially affected lands not included in the facilities footprint, conveyance construction costs include temporary and permanent roads, bridges, and other facilities as needed to service agricultural lands (California Department of Water Resources 2010a, 2010b). There could be some additional travel time and other costs associated with using these facilities, but such costs are not environmental impacts requiring mitigation.

Loss of investments in production facilities and standing orchards and vineyards would occur as a result of facilities construction. The value of structures and equipment potentially affected would vary widely across parcels. Much of the equipment is portable (e.g., machinery, tools, portable sprinkler pipe), and could be sold or used on other lands. Shop and storage buildings and permanent irrigation and drainage equipment plus orchards and vineyards may have little or no salvage value. The negotiated purchase of lands for the conveyance and associated facilities would compensate for some, but perhaps not all of that value. According to Cooperative Extension cost of production studies (University of California Cooperative Extension 2003a, 2003b, 2004, 2005, 2006a, 2006b, 2007a, 2007b, 2008a, 2008b, 2008c, 2008d), permanent structures, irrigation systems, and drainage systems can represent a wide range of investment, from less than $100 per acre for field and vegetable crops up to over $3,000 per acre for some orchards. Most such investments would not be new, so their depreciated values would be substantially lower.

Investment in standing orchards and vineyards would also be considered during negotiations for land purchases. Typical investments required to bring permanent crops into production are shown in Section 16.1, *Environmental Setting/Affected Environment*. For example, the establishment of wine grapes requires an investment of over $15,000 per acre and Bartlett pears require over $20,000 per acre. Forage crops such as irrigated pasture and alfalfa may require an establishment cost of about

$400 per acre. The depreciated values of the growing stock could be substantially below these establishment costs, depending on the ages of the stands that would be affected.

Only minor changes in salinity of agricultural water supply are expected during construction. Consequently, costs related to salinity changes would also be minor. Further discussion of effects from changes in salinity is presented in Chapter 14, *Agricultural Resources,* Section 14.3.3.9, Impacts AG-1 and AG-2.

NEPA Effects: Because construction of the proposed water conveyance facilities would lead to reductions in crop acreage and in the value of agricultural production in the Delta region, this is considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.

***CEQA Conclusion*:** Construction of the proposed water conveyance facilities would reduce the total value of agricultural production in the Delta region. The removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources,* Section 14.3.3.8, Impacts AG-1 and AG-2. The reduction in the value of agricultural production is not considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout this EIR/EIS. When required, DWR would provide compensation to property owners for economic losses due to implementation of the alternative. While the compensation to property owners would reduce the severity of economic effects related to the loss of agricultural land, it would not constitute mitigation for any related physical impact. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an ALSP to preserve agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.

Impact ECON-7: Permanent Regional Economic and Employment Effects in the Delta Region during Operation and Maintenance of the Proposed Water Conveyance Facilities

In the Delta region, ongoing operation and maintenance of BDCP facilities would result in increased expenditures relative to the Existing Conditions and the No Action Alternative (regional economic conditions do not differ across Existing Conditions and No Action Alternative). The increased project operation and maintenance expenditures are expected to result in a permanent increase in regional employment and income, including an estimated 129 direct and 183 total (direct, indirect, and induced) FTE jobs (Table 16-44), relative to the Existing Conditions and the No Action Alternative. Potential changes in the value of agricultural production result in changes to regional employment and income in the Delta region under the Alternative 4 relative to the Existing Conditions and the No Action Alternative.

Table 16-44. Regional Economic Effects on Employment and Labor Income in the Delta Region during Operations and Maintenance (Alternative 4)

Regional Economic Impact[a]	Impacts from Operations and Maintenance
Employment (FTE)	
Direct	129
Total[b]	183
Labor Income (million $)	
Direct	7.8
Total[b]	10.3

Note: Labor income is reported in 2011 dollars (U.S. Department of Commerce 2012).
[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.
[b] Includes direct, indirect & induced effects.

The operation and maintenance of conveyance and related facilities such as roads and utilities would result in the permanent removal of agricultural land from production following construction, and the effects on employment and income would be negative, including the loss of an estimated ~~12~~ 11 agricultural and ~~41~~ 39 total (direct, indirect, and induced) FTE jobs. The regional economic effects on employment and income in the Delta region from the change in agricultural production are reported in Table 16-45. Based on the permanent crop production value changes described in Impact ECON-12, the agricultural job losses would more likely be concentrated in the vegetable, truck, orchard, and vineyard crops sectors, which are relatively labor intensive, than in the grain, field, and forage crop sectors, where more jobs are mechanized. Note that direct agricultural job losses could be higher than the ~~12~~11 FTE jobs shown in Table 16-45 because many agricultural jobs are seasonal rather than year-round, FTE jobs, suggesting that more than one seasonal job could be lost per every FTE job lost as a result of permanent agricultural production changes. Mapbook Figures M14-7 and M14-8 display areas of Important Farmland and lands under Williamson Act contracts that could be converted to other uses due to the construction of water conveyance facilities for the Modified Pipeline/Tunnel alignment. ~~Note that not all of these structures would be constructed under this alternative.~~

Table 16-45. Regional Economic Effects on Agricultural Employment and Labor Income during Operations and Maintenance (Alternative 4)

Regional Economic Impact[a]	Impacts on Agriculture
Employment (FTE)	
Direct	-11
Total[b]	-39
Labor Income (million $)	
Direct	-1.6
Total[b]	-2.8

Note: Labor income is reported in 2011 dollars (U.S. Department of Commerce 2012).
[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.
[b] Includes direct, indirect & induced effects.

~~Regional Economic Impact[a]~~	~~Impacts on Agriculture~~
~~**Employment (FTE)**~~	
~~Direct~~	~~-12~~
~~Total[b]~~	~~-41~~
~~**Labor Income** (million $)~~	
~~Direct~~	~~-1.2~~
~~Total[b]~~	~~-2.4~~

~~Note: Labor income is reported in 2011 dollars (U.S. Department of Commerce 2012).~~
~~[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.~~
~~[b] Includes direct, indirect & induced effects.~~

NEPA Effects: Because continued operation and maintenance of water conveyance facilities would result in an increase in operations-related employment and labor income, this would be considered a beneficial effect. However, the long-term footprint of facilities would lead to a continued decline in agricultural-related employment and labor income, which would be considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.

***CEQA Conclusion*:** Operation and maintenance of the proposed water conveyance facilities would increase total employment and income in the Delta region. The net change would result from expenditures on operation and maintenance and from changes in agricultural production. The total change in income and employment is not, in itself, considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout this EIR/EIS. Costs are addressed in Chapter 8 of the BDCP, *Implementation Costs and Funding Sources*; removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources,* Section 14.3.3.9, Impacts AG-~~3~~ 1 and AG-~~4~~2; changes in recreation related activities are addressed in Chapter 15, *Recreation,* Section 15.3.3.9, Impacts REC-5 through REC-8. When required, DWR would provide compensation to landowners as a result of acquiring lands for the proposed conveyance facilities. While the compensation to property owners would reduce the severity of economic effects related to the loss of agricultural land, it would not constitute mitigation for any related physical impact. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an ALSP to preserve agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.

Impact ECON-8: Permanent Effects on Population and Housing in the Delta Region during Operation and Maintenance of the Proposed Water Conveyance Facilities

Population

Operations and maintenance of conveyance facilities would require approximately 130 permanent new workers. Given the nature of those operation and maintenance jobs, the existing water conveyance facilities already in the five-county region, the large workforce in the region, and the large water agencies with headquarters in that region, it is anticipated that most of these new jobs would be filled from within the existing five-county labor force. However, operation and

maintenance may require specialized worker skills not readily available in the local labor pool. As a result, it is anticipated that workers with specialized skills may be recruited from outside the five-county region.

It is anticipated that non-local workers would relocate to the five-county region, thus adding to the local population. However, this additional population would constitute a minor increase in the total 2020 projected regional population of 4.6 million and be distributed throughout the region. Changes in demand for public services resulting from any increase in population are addressed in Chapter 20, *Public Services and Utilities,* Section 20.3.3.9, Impact UT-7.

Housing

It is anticipated that most of the operational workforce would be drawn from within the five-county region. Consequently, operation of the conveyance facilities would not result in impacts on housing. There are about 53,000 housing units available to accommodate any nonlocal workers who relocate to the five-county region. In addition, new residents would likely be dispersed across the region, thereby not creating a burden on any one community. As a result, operation and maintenance of the proposed conveyance facilities is not expected to increase the demand for housing.

NEPA Effects: Because these activities would not result in concentrated, substantial increases in population or new housing, they would not be considered to have an adverse effect.

***CEQA Conclusion*:** Operation and maintenance of the proposed water conveyance facilities would result in minor population increases in the Delta region with adequate housing supply to accommodate the change in population and therefore significant ~~changes in~~impacts on the physical environment are not anticipated.

Impact ECON-9: Changes in Community Character during Operation and Maintenance of the Proposed Water Conveyance Facilities

NEPA Effects: Throughout the five-county Delta region, population and employment could slightly expand as a result of continued operation and maintenance of the water conveyance facilities. Agricultural contributions to the character and culture of the Delta would be likely to decline commensurate with the projected decline in agricultural-related employment and production. This could result in the closure of agriculture-dependent businesses or those catering to agricultural employees, particularly in areas where conversion of agricultural land would be most concentrated, including near the intakes ~~pumping plants and forebays~~ in the vicinity of Clarksburg and Hood and near the expanded Clifton Court Forebay. Similar effects could accrue to areas disproportionately dependent upon existing recreational activities. However, influences associated with those hired to operate, repair, and maintain water conveyance facilities would grow. To the extent that this anticipated economic shift away from agriculture results in demographic changes in population, employment level, income, age, gender, or race, the study area would be expected to see changes to its character, particularly in those Delta communities most substantially affected by demographic changes based on their size or proximity to BDCP facilities.

While some of the rural qualities of Delta communities, including relatively low noise and traffic levels, could return to near pre-construction conditions during the operational phase, other effects would be lasting. For instance, the visual appearance of intakes and other permanent features would compromise the predominantly undeveloped and agricultural nature of communities like Clarksburg, Courtland, and Hood, which would be located closest to the permanent water

conveyance features. Lasting effects on areas made less desirable in which to live, work, shop, or participate in recreational activities as a result of BDCP operations could lead to localized abandonment of buildings. Such lasting effects could also result in changes to community cohesion if they were to restrict mobility, reduce opportunities for maintaining face-to-face relationships, or disrupt the functions of community organizations or community gathering places (such as schools, libraries, places of worship, and recreational facilities). While ongoing operations could result in beneficial effects relating to the economic welfare of a community, adverse social effects could linger in communities closest to character-changing effects and in those most heavily influenced by agricultural and recreational activities. Implementation of mitigation measures and environmental commitments related to noise, visual effects, transportation, agriculture, and recreation would reduce adverse effects (see Appendix 3B, *Environmental Commitments*). Specifically, these commitments include ~~Notification~~ notification of ~~Construction and Maintenance~~ maintenance ~~Activities~~ activities in ~~Waterways~~waterways, development and implementation of a ~~Noise~~ noise ~~Abatement~~ abatement ~~Plan~~plan, and ~~Prepare~~preparation and ~~Implement~~ implementation of ~~Mosquito~~ mosquito ~~Management~~ management ~~Plans~~plans.

***CEQA Conclusion*:** Operation and maintenance of water conveyance facilities under Alternative 4 could affect community character in the Delta region. However, because these impacts are social in nature, rather than physical, they are not considered impacts under CEQA. To the extent that changes to community character would lead to physical impacts involving population growth, such impacts are described under Impact ECON-8 and in Chapter 30, *Growth Inducement and Other Indirect Effects,* Section 30.3.2*.* Furthermore, notable decreases in population or employment, even if limited to specific areas, sectors, or the vacancy of individual buildings, could result in alteration of community character stemming from a lack of maintenance, upkeep, and general investment. However, implementation of mitigation measures and environmental commitments related to noise, visual effects, transportation, agriculture, and recreation, would reduce the extent of these effects such that a significant impact would not occur (see Appendix 3B, *Environmental Commitments*). Specifically, these include commitments to develop and implement erosion and sediment control plans, develop and implement hazardous materials management plans, provide notification of maintenance activities in waterways, develop and implement a noise abatement plan, develop and implement a fire prevention and control plan, and prepare and implement mosquito management plans.

Impact ECON-10: Changes in Local Government Fiscal Conditions during Operation and Maintenance of the Proposed Water Conveyance Facilities

NEPA Effects: Effects on tax revenue as a result of ongoing water conveyance operations under Alternative 4 would be similar to those described under Alternative 1A, Impact ECON-10. However, with the construction of fewer intake facilities and a modified alignment, forgone revenue is estimated at $~~49.3~~44.1 million over the 50-year permit period. These decreases in revenue could potentially result in the loss of a substantial share of some agencies' tax bases, particularly for smaller districts affected by the BDCP. This economic effect would be adverse; however, the BDCP proponents would make arrangements to compensate local governments for the loss of property tax or assessment revenue for land used for constructing, locating, operating, or mitigating for new Delta water conveyance facilities. Additionally, as discussed under Impact ECON-7, continued operation and maintenance of the water conveyance facilities would be anticipated to result in a net increase of income and employment in the Delta region. This could also create an indirect beneficial effect through increased sales tax revenue for local government entities that rely on sales taxes.

***CEQA Conclusion*:** Under Alternative 4, the ongoing operation and maintenance of water conveyance facilities would restrict property tax revenue levels for various local government entities in the Delta region. Over the 50-year permit period, property tax and assessment revenue forgone is estimated at $~~49.3~~44.1 million. However, the Sacramento-San Joaquin Delta Reform Act commits the entities receiving water from the State Water Project and federal Central Valley Project to mitigate for lost property tax and assessment revenue associated with land needed for the construction of new conveyance facilities (Water Code Section 85089). Additionally, any losses could be offset, at least in part, by an anticipated increase in sales tax revenue. CEQA does not require a discussion of socioeconomic effects except where they would result in reasonably foreseeable physical changes. If an alternative is not anticipated to result in a physical change to the environment, it would not be considered to have a significant impact under CEQA (CEQA Guidelines Sections 15064(f) and 15131). Here, any physical consequences resulting from fiscal impacts are too speculative to ascertain.

Impact ECON-11: Effects on Recreational Economics during Operation and Maintenance of the Proposed Water Conveyance Facilities

NEPA Effects: As discussed in Chapter 15, *Recreation,* Section 15.3.3.9, Impacts REC-5 through REC-8, operation and maintenance activities associated with the proposed water conveyance facilities under Alternative 4 are anticipated to create minor effects on recreational resources. Maintenance of conveyance facilities, including intakes, would result in periodic temporary but not substantial adverse effects on boat passage and water-based recreational activities. As discussed in Impact REC-7, most intake maintenance, such as painting, cleaning, and repairs, would be done with barges and divers, and could cause a temporary impediment to boat movement in the Sacramento River in the immediate vicinity of the affected intake structure and reduce opportunities for waterskiing, wakeboarding, or tubing in the immediate vicinity of the intake structures. However, boat passage and navigation on the river would still be possible around any barges or other maintenance equipment and these effects would be expected to be short-term (2 years or less). Although water-based recreation (i.e. boating, waterskiing, wakeboarding, etc.) may be restricted at and in the vicinity of intakes, many miles of the Sacramento River would still be usable for these activities during periodic maintenance events. Additionally, implementation of the environmental commitment to provide notification of ~~construction and~~ maintenance activities in waterways (Appendix 3B, *Environmental Commitments*) would reduce these effects. Because effects of facility maintenance would be short-term and intermittent, substantial economic effects are not anticipated to result from operation and maintenance of the facilities.

***CEQA Conclusion*:** Operation and maintenance activities associated with the proposed water conveyance facilities under Alternative 4 are anticipated to create minor effects on recreational resources and therefore, are not expected to substantially reduce economic activity related to recreational activities. This section considers only the economic effects of recreational changes. Potential physical changes to the environment relating to recreational resources are described and evaluated in Chapter 15, *Recreation,* Section 15.3.3.9, Impacts REC-5 through REC-8.

Impact ECON-12: Permanent Effects on Agricultural Economics in the Delta Region during Operation and Maintenance of the Proposed Water Conveyance Facilities

During operation and maintenance of conveyance facilities existing agricultural land would be in uses that include direct facility footprints and associated permanent roads and utilities. Agricultural land could also be affected by changes in water quality and other conditions that would affect crop

productivity. These direct effects on agricultural land are described in Chapter 14, *Agricultural Resources,* Section 14.3.3.9, Impacts AG-1 and AG-2.

Changes in crop acreage were used to estimate the associated changes in economic values. Unit prices, yields, and crop production and investment costs were presented in Section 16.1, *Environmental Setting/Affected Environment*. Table 16-46 summarizes the changes in acreage and value of agricultural production that would result in the Delta region during operation of Alternative 4. Changes are shown relative to the Existing Conditions and the No Action Alternative by aggregate crop category (agricultural resources under Existing Conditions and in the No Action Alternative were assumed to be the same). The changes in crop acreages are reported in greater detail in Appendix 14A, *Individual Crop Effects as a Result of BDCP Water Conveyance Facility Construction*.

Total value of irrigated crop production in the Delta region would decline on average by $~~3.8~~3.6 million per year during operation and maintenance, with total irrigated crop acreage declining by about ~~4,500~~3,400 acres. These estimates are not dependent on water year type.

Table 16-46. Crop Acres and Value of Agricultural Production in the Delta during Operations and Maintenance (Alternative 4)

Analysis Metric	Alternative 4	Change from Existing Conditions and No Action Alternative
Total Crop Acreage (thousand acres)	480.2	-3.4
Grains	58.2	-0.4
Field crops	189.9	-1.2
Forage crops	111.5	-1.3
Vegetable, truck, and specialty crops	76.8	-0.4
Orchards and vineyards	43.8	-0.2
Total Value of Production (million $)	646.5	-3.6
Grains	24.0	-0.2
Field crops	113.1	-0.7
Forage crops	72.2	-0.9
Vegetable, truck, and specialty crops	267.4	-1.0
Orchards and vineyards	169.8	-0.8
Note: Value of production is based on prices received by farmers, in 2011 dollars (U.S. Department of Commerce 2012).		

Analysis Metric	Alternative 4	Change from Existing Conditions and No Action Alternative
Total Crop Acreage (thousand acres)	479.2	-4.5
Grains	58.2	-0.4
Field crops	188.7	-2.4
Forage crops	111.4	-1.3
Vegetable, truck, and specialty crops	76.9	-0.2
Orchards and vineyards	43.8	-0.2
Total Value of Production (million $)	646.3	-3.8
Grains	24.1	-0.1
Field crops	112.4	-1.5
Forage crops	72.2	-0.9
Vegetable, truck, and specialty crops	267.8	-0.6
Orchards and vineyards	169.8	-0.7
Note: Value of production is based on prices received by farmers, in 2011 dollars (U.S. Department of Commerce 2012).		

Alternative 4 may also affect production costs on lands even if gross revenues are largely unaffected. Costs could be associated with operational constraints and longer travel times due to permanent facilities. In most cases, affected lands fall within the facilities footprint, and are included in the agricultural acreage and value of production described elsewhere in this Chapter and in Chapter 14, *Agricultural Resources,* Section 14.3.3.9.

Crop yields and crop selection on lands in the Delta could be affected by changes in salinity of agricultural water supply during operation and maintenance activities. If operation of the proposed conveyance facilities increases salinity in part of the Delta, crops that are more sensitive to salinity could shift to other lands in the five-county Delta region. See Chapter 14, *Agricultural Resources*, Section 14.3.3.9, Impact AG-2, for further discussion of effects from changes in salinity.

NEPA Effects: The footprint of water conveyance facilities would result in lasting reductions in crop acreage and in the value of agricultural production in the Delta region; therefore, this is considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.

***CEQA Conclusion*:** During operation and maintenance of the proposed water conveyance facilities the value of agricultural production in the Delta region would be reduced. The permanent removal agricultural land from production is addressed in Chapter 14, *Agricultural Resources,* Section 14.3.3.9, Impacts AG-1 and AG-2. The reduction in the value of agricultural production is not considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout this EIR/EIS. When required, DWR would provide compensation to property owners for economic losses due to implementation of the alternative. While the compensation to property owners would reduce the severity of economic effects related to the loss of agricultural land, it would not constitute mitigation for any related physical effect. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an ALSP to preserve agricultural productivity and mitigate for

loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.

Impact ECON-13: Effects on the Delta Region's Economy and Employment Due to the Implementation of ~~the Proposed Conservation Measures 2–22~~CM2–CM21

operation and maintenance operation and maintenanceThe *Yolo Bypass Flood Date and Flow Volume Agricultural Impact Analysis,* a report created for Yolo County, evaluates the expected losses of agricultural employment that could result from implementing CM2 (Howitt et al. 2012) (see Chapter 3, *Description of Alternatives*, Section 3.6.2, for a description of conservation measures). CM2 would lower a portion of the Fremont Weir to allow Sacramento River water to flow into the Yolo Bypass to reduce migratory delays for fish and enhance fish rearing habitat. However, it may also translate into financial losses for farmers and the regional economy. Annual reductions in agricultural employment under the CM2 scenario are expected to range from 9 FTE at 3,000 cfs to 21 FTE at 6,000 cfs.

As discussed in Chapter 26, *Mineral Resources*, Section 26.3.3.2, Impact MIN-5, operations of natural gas wells in the Delta region would be affected where wells are located in restoration areas to be inundated under ~~Conservation Measures 4, 5, and 10~~CM4, CM5, and CM10. In areas that would be permanently inundated under these conservation measures, producing natural gas wells may be abandoned. There are approximately 233 active wells in these areas (Table 26-~~5~~ 6 in Chapter 26, *Mineral Resources*); an unknown number of these wells would likely be abandoned. (Specific inundation areas have not been identified for ~~Conservation Measures 2–22~~CM2–CM21 at this time, and there is potential for some of these wells to be modified and to remain in production.) In permanently flooded areas, the active wells could be relocated and replaced using conventional or directional drilling techniques at a location outside of inundation zones to maintain production. However, if a large number of wells had to be abandoned and could not be redrilled, there could be an adverse effect related to the permanent elimination of employment and income generated by well monitoring and maintenance activities. Generally, small crews perform ongoing monitoring and maintenance of several wells at a time. Assuming none of the wells in inundation areas are redrilled, the abandonment of 233 natural gas wells would represent 37 percent of the 629 producing wells in the Delta region (see active producer, dual, and new wells in Table 26-2 in Chapter 26, *Mineral Resources*). According to 2011 data available through the U.S. Census Bureau's *2011 County Business Patterns* report (2013), an estimated 255-310 jobs are supported by the two sectors of the Delta region economy that could be affected by well abandonment: crude petroleum and natural gas extraction, and support activities for oil and gas operations. (Note that these jobs include non-natural gas production jobs and non-operations and maintenance jobs, so the number of jobs solely related to operations and maintenance of natural gas wells would be smaller.) Assuming a worst-case scenario in which the loss of 37 percent of the Delta region's natural gas wells would result in the loss of a similar percentage of the region's employment in these two sectors, an estimated 95-115 jobs would be lost as the result of implementing ~~Conservation Measures 4, 5, and 10~~CM4, CM5, and CM10. However, considering that this estimate is high and that some wells would be relocated, the actual job losses probably would be somewhat lower.

NEPA Effects: Because implementation of ~~Conservation Measures 2–22~~CM2–CM21 would be anticipated to result in an increase in construction and operation and maintenance-related employment and labor income, this would be considered a beneficial effect. However, implementation of these components would also be anticipated to result in a decrease in agricultural-related and natural gas production-related employment and labor income, which would

be considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site. Additionally, measures to reduce impacts on natural gas wells are discussed in Chapter 26, *Mineral Resources*, Section 26.3.3.2, Impact MIN-5.

***CEQA Conclusion*:** Implementation of the proposed ~~Conservation Measures 2–22~~CM2–CM21 would affect total employment and income in the Delta region. The change in total employment and income in the Delta region is based on expenditures resulting from implementation of the proposed ~~Conservation Measures 2–22~~CM2–CM21 and any resulting changes in agricultural production, recreation, and natural gas production. The total change in employment and income is not, in itself, considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout this EIR/EIS. Removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources*, Section 14.3.3.9, Impacts AG-3 and AG-4; changes in recreation-related activities are addressed in Chapter 15, *Recreation,* Section 15.3.3.9, Impacts REC-9 through REC-11; abandonment of natural gas wells is addressed in Chapter 26, *Mineral Resources*, Section 26.3.3.9, Impact MIN-5. When required, the BDCP proponents would provide compensation to property owners for economic losses due to implementation of the alternative. While the compensation to property owners would reduce the severity of economic effects related to the loss of agricultural land, it would not constitute mitigation for any related physical impact. Measures to reduce these impacts and impacts on natural gas wells are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and Chapter 26, *Mineral Resources*, Section 26.3.3.2, Impact MIN-5.

Impact ECON-14: Effects on Population and Housing in the Delta Region as a Result of Implementing ~~the Proposed Conservation Measures 2–22~~CM2–CM21

convert land from existing uses, including possible displacement of residential housing and business establishments. operation and maintenance Because these activities would not result in concentrated, substantial increases in population or new housing, they would not be considered to have an adverse effect.***CEQA Conclusion*:** Implementation of the proposed ~~Conservation Measures 2–22~~CM2–CM21 would impact total population and housing in the Delta region. The change in total population and housing in the Delta region is based on employment resulting from implementation of the proposed ~~Conservation Measures 2–22~~CM2–CM21. The change in population and housing is expected to be minor relative to the five-county Delta region, and dispersed throughout the region. Therefore, significant ~~changes in~~impacts on the physical environment are not anticipated to result.

Impact ECON-15: Changes in Community Character as a Result of Implementing ~~the Proposed Conservation Measures 2–22~~CM2–CM21

NEPA Effects: As noted under Impacts ECON-13, and ECON-14, conservation measures designed to restore, conserve, or enhance natural habitat would be anticipated to create economic effects similar in kind, if not in magnitude, to those described for the water conveyance facilities, including increases to employment and changes in land use that could trigger the disruption of agricultural and recreational economies. They could also affect the possible displacement of residences and businesses. The effects these activities would create with regard to community character would depend on the nature of each measure along with its specific location, size, and other factors that are not yet defined.

Under Alternative 4, temporary construction associated with implementation of these measures could lead to demographic changes and resulting effects on the composition and size of Delta communities. Earthwork and site preparation associated with conservation measures could also detract from the rural qualities of the Delta region; however, their implementation would take place in phases over the 50-year permit period, which would limit the extent of effects taking place at any one point in time.

Implementation of these measures could also alter community character over the long term. Conversion of agricultural land to restored habitat would result in the erosion of some economic and social contributions stemming from agriculture in Delta communities. However, in the context of the Delta region, a substantial proportion of land would not be converted. Additionally, restored habitat could support some rural qualities, particularly in terms of visual resources and recreational opportunities. These effects could attract more residents to some areas of the Delta, and could replace some agricultural economic activities with those related to recreation and tourism. To the extent that agricultural facilities and supportive businesses were affected and led to vacancy, alteration of community character could result from these activities. However, the cultivated lands natural community strategy of CM3 would ensure the continuation of agricultural production on thousands of acres in the Delta (see Chapter 3, *Description of Alternatives,* Section 3.6.2, for a description of conservation measures).

While implementation of ~~Conservation Measures 2–22~~CM2–CM21 could result in beneficial effects relating to the economic welfare of a community, adverse social effects could also arise in those communities closest to character-changing effects and those most heavily influenced by agricultural activities. Noise, visual effects, air pollution, and traffic associated with earthwork and site preparation for the restoration, enhancement, protection, and management of various natural community types could alter the rural characteristics of Delta communities, where they occur in close proximity to these communities. Additionally, changes in the extent and nature of regional agricultural and recreational activities could also be anticipated to alter the character of communities in the Delta and result in changes to community cohesion. If necessary, implementation of mitigation measures and environmental commitments related to transportation, agriculture, and recreation would be anticipated to reduce these adverse effects (see Appendix 3B, *Environmental Commitments*). Specifically, these include commitments to ~~Develop~~ develop and ~~Implement~~ implement ~~Erosion~~ erosion and ~~Sediment~~ sediment ~~Control~~ control ~~Plans~~plans, ~~Develop~~ develop and ~~Implement~~ implement ~~Hazardous~~ hazardous ~~Materials~~ materials ~~Management~~ management ~~Plans~~plans, provide ~~Notification~~ notification of ~~Construction and Maintenance~~ maintenance ~~Activities~~ activities in ~~Waterways~~waterways, develop and implement a ~~Noise~~ noise ~~Abatement~~ abatement ~~Plan~~plan, develop and implement a ~~Fire~~ fire ~~Prevention~~ prevention and ~~Control~~ control ~~Plan~~plan, and ~~Prepare~~ prepare and ~~Implement~~ implement ~~Mosquito~~ mosquito ~~Management~~ management ~~Plans~~plans.

***CEQA Conclusion*:** Implementation of ~~Conservation Measures 2–22~~CM2–CM21 under Alternative 4 could affect community character within the Delta region. However, because these impacts are social in nature, rather than physical, they are not considered impacts under CEQA. To the extent that changes to community character are related to physical impacts involving population growth, these impacts are described in Chapter 30, *Growth Inducement and Other Indirect Effects,* Section 30.3.2. Furthermore, notable decreases in population or employment, even if limited to certain areas, sectors, or the vacancy of individual buildings, could result in decay and blight stemming from a lack of maintenance, upkeep, and general investment. However, implementation of mitigation measures and environmental commitments related to noise, visual effects, transportation,

agriculture, and recreation, would reduce the extent of these effects such that a significant impact would not occur (see Appendix 3B, *Environmental Commitments*). Specifically, these include commitments to develop and implement erosion and sediment control plans, develop and implement hazardous materials management plans, provide notification of maintenance activities in waterways, develop and implement a noise abatement plan, develop and implement a fire prevention and control plan, and prepare and implement mosquito management plans.

Impact ECON-16: Changes in Local Government Fiscal Conditions as a Result of Implementing ~~the Proposed Conservation Measures 2–22~~CM2–CM21

As discussed in relation to construction of water conveyance facilities, habitat restoration and implementation of ~~Conservation Measures 2–22~~CM2–CM21 under Alternative 4 would also take place, in part, on land held by private owners and from which local governments derive revenue through property taxes and assessments. In particular, conservation measures related to protection of natural communities (CM3) and restoration of tidal habitat (CM4), seasonally inundated floodplain (CM5), grassland communities (CM8), vernal pool complex (CM9), and nontidal marsh (CM10) would require the acquisition of multiple parcels of land (see Chapter 3, *Description of Alternatives,* Section 3.6.2, for a description of conservation measures).

The *Yolo Bypass Flood Date and Flow Volume Agricultural Impact Analysis*, as described under Impact ECON-13, evaluates the expected losses of total Yolo County revenue and state tax revenue for implementing CM2 (Howitt et al. 2012) (see Chapter 3, *Description of Alternatives*, Section 3.6.2, for a description of conservation measures). The total expected annual losses in state and local tax revenues under the CM2 proposed inundation scenarios can range from $.057 million under the 3,000 cfs flow scenario to $.13 million under the 6,000 cfs flow scenario that extends flooding as late as May 15.

The loss of a substantial portion of an entity's tax base would represent an adverse effect on an agency, resulting in a decrease in local government's ability to provide public goods and services. Under Alternative 4, property tax and assessment revenue forgone as a result of conservation measure implementation is estimated to reach $176.7 million over the BDCP's 50-year permit period (in 2012 undiscounted dollars; see BDCP Chapter 8, *Implementation Costs and Funding Sources*, Table 8-28 for further detail). Decreases in revenue could potentially represent a substantial share of individual agency tax bases, partiularly for smaller districts affected by large, contiguous areas identified for habitat restoration.

Additionally, other conservation measures related to control of invasive species, expansion of fish hatchery facilities, installation of non-physical fish barriers, modification of water diversions, or treatment of urban stormwater may also require that land currently on property tax rolls be acquired and eventually removed from the tax base. The fiscal effects stemming from these conservation measures are, however, anticipated to be minor based upon the relatively small areas of land necessary for their implementation.

NEPA Effects: Overall, ~~Conservation Measures 2–22~~CM2–CM21 would remove many acres of private land from local property tax and assessment rolls. This economic effect would be considered adverse; however, the BDCP proponents would offset forgone property tax and assessments levied by local governments and special districts on private lands converted to habitat. As described under Impact ECON-13, regional economic effects from the implementation of ~~Conservation Measures 2–22~~CM2–CM21 would be mixed. While activities associated with construction and establishment of habitat areas could boost regional expenditures and sales tax revenue, reducedagricultural activities

may offset these gains. Changes in recreation spending and related sales tax revenue could be positive or negative, depending on the implementation of the measures.

***CEQA Conclusion*:** Under Alternative 4, implementation of ~~Conservation Measures 2–22~~CM2–CM21 would result in the removal of a portion of the property tax base for various local government entities in the Delta region. Over the 50-year permit period, property tax and assessment revenue forgone is estimated to reach $176.7 million, compared with annual property tax revenue of more than $934 million in the Delta counties (California State Controller's Office 2012). Projected over the 50-year period, these removals would likely represent less than 1% of these counties' property tax revenue. However, the BDCP proponents would compensate local governments and special districts for forgone revenue. CEQA does not require a discussion of socioeconomic effects except where they would result in physical changes. If an alternative is not anticipated to result in a physical change to the environment, it would not be considered to have a significant impact under CEQA (CEQA Guidelines Sections 15064(f) and 15131).

Impact ECON-17: Effects on Recreational Economics as a Result of Implementing ~~the Proposed Conservation Measures 2–22~~CM2–CM21

NEPA Effects: Implementation of the ~~Conservation Measures 2–22~~CM2–CM21 under this alternative would be anticipated to create an adverse effect on recreational resources by limiting access to facilities, restricting boat navigation and disturbing fish habitat while restoration activities are taking place. These measures may also permanently reduce the extent of upland recreation sites. However, over the 50-year permit period, these components could also create beneficial effects by enhancing aquatic habitat and fish abundance, expanding the extent of navigable waterways available to boaters, and improving the quality of existing upland recreation opportunities. Therefore, the potential exists for the creation of adverse and beneficial effects related to recreational economics. Adverse effects would be anticipated to be primarily limited to areas close to restoration areas and during site preparation and earthwork phases. These effects could result in a decline in visits to the Delta and reduction in recreation-related spending, creating an adverse economic effect throughout the Delta. Beneficial recreational effects would generally result during later stages of the BDCP permit period as ~~Conservation Measures 2–22~~CM2–CM21 are implemented and environmental conditions supporting recreational activities are enhanced. These effects could improve the quality of recreational experiences, leading to increased economic activities related to recreation, particularly in areas where conservation measure implementation would create new recreational opportunities.

***CEQA Conclusion*:** Site preparation and earthwork activities associated with a number of conservation measures would limit opportunities for recreational activities where they occur in or near existing recreational areas. Noise, odors, and visual effects of construction activities would also temporarily compromise the quality of recreation in and around these areas, leading to potential economic impacts. However, over time, implementation could improve the quality of existing recreational opportunities, leading to increased economic activity. This section considers only the economic effects of recreational changes brought about by conservation measure implementation. CEQA does not require a discussion of socioeconomic effects except where they would result in reasonably foreseeable physical changes. Potential physical changes to the environment relating to recreational resources are described and evaluated in Chapter 15, *Recreation,* Section 15.3.3.9, Impacts REC-9 through REC-11.

Impact ECON-18: Effects on Agricultural Economics in the Delta Region as a Result of Implementing ~~the Proposed Conservation Measures 2–22~~CM2–CM21

NEPA Effects: ~~Conservation Measures 2–22~~CM2–CM21 would convert land from existing agricultural uses. These direct effects on agricultural land are described qualitatively in Chapter 14, *Agricultural Resources,* Section 14.3.3.9, Impacts AG-3 and AG-4. Effects on agricultural economics would include effects on crop production and agricultural investments resulting from restoration actions on agricultural lands. The effects would be similar in kind to those described for lands converted due to construction and operation of the conveyance features and facilities. The total acreage and crop mix of agricultural land potentially affected is not specified at this time, but when required, the BDCP proponents would provide compensation to property owners for losses due to implementation of the alternative. Because implementation of the ~~Conservation Measures 2–22~~CM2–CM21 would be anticipated to lead to reductions in crop acreage and in the value of agricultural production in the Delta region, this is considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.

The *Yolo Bypass Flood Date and Flow Volume Agricultural Impact Analysis*, as described in Impact ECON-13, also evaluates the expected losses in gross farm revenue that could result from implementing CM2 (Howitt et al. 2012) (see Chapter 3, *Description of Alternatives*, Section 3.6.2, for a description of conservation measures). ~~).~~ CM2 would lower a portion of the Fremont Weir to allow Sacramento River water to flow into the Yolo Bypass to reduce migratory delays for fish and enhance fish rearing habitat, with flows ranging between 3,000 and 6,000 cfs through an operable gate at the weir. An increase in flooding in the Yolo Bypass could result in economic losses to farmers and the local economy, dependent on timing, frequency, volume, and duration. Additionally, according to the report, flooding may increase the costs of late season rains, potentially affecting land values, lending institutions, and farming in the bypass.

The magnitude of economic effects resulting from implementing CM2 would be driven by the total acres of farmland inundated, reduced crop yields, and increased land fallowing. As the last day of flooding through the proposed weir gate increases, farmers must delay field preparation and planting, resulting in reduced crop yields and increased land fallowing. As agricultural revenues decrease, losses to the regional economy, including employment, increase. According to the economic impact assessment in the report, annual reductions in agricultural employment under the CM2 scenario are expected to range from 9 FTE at 3,000 cfs to 21 FTE at 6,000 cfs.~~Direct gross farm revenue losses are expected to be less than $1.5 million per year.~~ Total output value (gross farm revenue) expected losses for the CM2 scenario, which corresponds to supplemental releases only in years where natural flooding occurs, range from $1.2 to $2.8 million per year. Expected losses are zero in years when there is no natural flooding and substantial in years when there is late natural flooding. Expected loss estimates are sensitive to changes in area inundated, yield loss and crop prices. It assumed that the costs of production in the Bypass remain constant even with late flooding; however, if production costs go up, for example, due to overtime labor or increased preparation costs, loss estimates would increase.

The report also evaluates the loss to total value added, or the net value of agricultural production in the Yolo Bypass to the Yolo County economy. Recognizing that many inputs/outputs are produced or consumed outside of Yolo County, those factors are not considered in the analysis. For example, total value added does include compensation for employees, income to business and landowners, and other business specific to Yolo County, but does not include food production that is exported out

of the county. A proportion of Yolo Bypass production and crop consumption occurs within Yolo County; therefore, the expected annual losses to value added for Yolo County is expected to range from $0.63 to $1.5 million per year.

***CEQA Conclusion*:** Implementation of ~~Conservation Measures 2–22~~CM2–CM21 would reduce the total value of agricultural production in the Delta region. The permanent removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources,* Section 14.3.3.9, Impacts AG-3 and AG-4. The reduction in the value of agricultural production is not considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout this EIR/EIS. When required, the BDCP proponents would provide compensation to property owners for economic losses due to implementation of the alternative. While the compensation to property owners would reduce the severity of economic effects related to the loss of agricultural land, it would not constitute mitigation for any related physical impact. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an ALSP to preserve agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.

Impact ECON-19: Socioeconomic Effects in the South-of-Delta Hydrologic Regions

As described in Chapter 30, Growth Inducement and Other Indirect Effects, Section 30.3.2, the operational components of BDCP ~~Conservation Measure~~ CM1 could result in a number of effects in areas receiving SWP and CVP water deliveries outside of the Delta.

Changes in the amount, cost, or reliability of water deliveries could create socioeconomic effects in the hydrologic regions. To the extent that unreliable or insufficient water supplies currently represent obstacles to agricultural production, Alternative 4 may support more stable agricultural activities by enabling broader crop selection or by reducing risk associated with uncertain water deliveries. As a result of an increase in water supply and supply reliability, farmers may choose to leave fewer acres fallow and/or plant higher-value crops. While the locations and extent of any increases in production would depend on local factors and individual economic decisions, a general increase in production would be anticipated to support growth in seasonal and permanent on-farm employment, along with the potential expansion of employment in industries closely associated with agricultural production. These include food processing, agricultural inputs, and transportation.

In contrast, decreased water deliveries may affect socioeconomics in hydrologic regions through mechanisms similar to those described above; however, the effects would generally be reversed. For example, it is reasonable to expect that reduced or less reliable water deliveries would result in decreased agricultural production and, in turn, a reduction in both direct and indirect agricultural employment. Economic and social patterns tied to predominant agricultural industrial activities and land uses could erode, changing the character of agricultural communities in hydrologic regions. If operation of water conveyance facilities under Alternative 4 reduced M&I deliveries to the extent that it would, in the long run, constrain population growth, its implementation could reinforce a socioeconomic status quo or limit potential economic and employment growth in hydrologic regions. A detailed discussion of these potential effects is found in Appendix 5B, *Responses to Reduced South of Delta Water Supplies*. Such changes to agricultural production and population growth with its associated economic activity could also lead to shifts in the character of communities in the hydrologic regions with resultant beneficial or adverse effects.

Generally, these effects (both beneficial and adverse) would be most concentrated in hydrologic regions where agriculture is a primary industry and where agricultural operations depend most heavily on SWP and CVP deliveries.

Changes in SWP Deliveries Compared to No Action Alternative

Based on Chapter 30, *Growth Inducement and Other Indirect Effects,* Section 30.3.2.3, compared to the No Action Alternative (2060), implementation of operational Scenario H1 under Alternative 4 would increase SWP deliveries to all hydrologic regions except for the San Joaquin River Region, which would experience no change in deliveries. Compared to No Action Alternative (2060), the South Coast Region would receive the largest net increase in deliveries under Scenario H1 (up to 251 TAF of Table A plus Article 21 deliveries) among the regions, which represents 55% of the net increase in M&I deliveries. Compared to No Action Alternative (2060), Scenario H4 would decrease deliveries to all hydrologic regions except for the Tulare Lake Region, which would receive an increase and the San Joaquin River Region, which would experience no change in deliveries. Compared to the No Action Alternative (2060), the South Coast Region would receive the largest net decrease in deliveries under Scenario H4 (a decrease of up to 114 TAF of Table A deliveries) among the regions while Tulare Lake would receive the only net increase in deliveries (up to 61 TAF of Table A plus Article 21 deliveries) among the regions. The other two operational scenarios (H2 and H3) would have effects that would fall within the range of Scenario H1 and Scenario H4 (refer to Chapter 30, *Growth Inducement and Other Indirect Effects,* Table 30-16, for more information).

Changes in CVP Deliveries Compared to No Action Alternative

The operational scenarios under Alternative 4 would not change CVP M&I deliveries for the Sacramento River, South Coast, South Lahontan and Colorado River Regions because there are no affected CVP contractors located in these regions. Compared to the No Action Alternative (2060), Scenario H1 would increase CVP deliveries to the other hydrologic regions. San Francisco Bay is projected to receive the largest potential increase (5 TAF) among the affected hydrologic regions. Compared to the No Action Alternative (2060), Scenario H4 would also increase deliveries to the other hydrologic regions and San Francisco Bay is projected to receive the largest potential increase (2 TAF) among the affected hydrologic regions. The other two operational scenarios (H2 and H3) would have effects that would fall within the range of Scenario H1 and Scenario H4 (refer to Chapter 30, *Growth Inducement and Other Indirect Effects,* Table 30-17, for more information).

NEPA Effects: Increases in average annual water deliveries to service areas could induce population growth and new housing to accommodate growth. Such deliveries could also provide support for water-intensive industries. As discussed in Chapter 30, *Growth Inducement and Other Indirect Effects*, Section 30.3.2.5, long-term water supply reliability is an important component in enabling long-term population increases. However, other factors—including natural growth, employment opportunities, local policy, and quality of life—are more likely to determine population growth. Nonetheless, population growth could stimulate economic activity resulting from increased demand for goods and services. This increased demand could create broad economic benefits for regions whose growth is supported by increased deliveries under BDCP.

Social changes, including changes in community character, could also result from an expansion in population or economic activity linked to changes in water deliveries. For example, more stable agricultural production and associated economic activities in areas where agriculture is a predominant industry could strengthen and reinforce existing economic and social patterns and institutions. Increased production could also intensify existing socioeconomic challenges, including

seasonal cycles in employment, housing demand, and provision of social services. In areas where population growth would be enabled by increased water supplies or reliability, changes to community character could result from an increased population, including the potential for changes in urban form, environmental factors such as traffic or noise, demographic composition, or the rise of new or broader economic or social opportunities. Again, the nature and extent of such changes would be predominantly influenced by prevailing socioeconomic forces, rather than any specific change associated with implementation of the BDCP.

Changes in agricultural production and population growth could also affect local government fiscal conditions. Population growth would be anticipated to result in higher property and sales tax revenue while increased agricultural activity could result in higher sales tax receipts for a local jurisdiction. However, growth would also require expanded public services to meet the needs of a larger population and a larger economic base. Expansion could require additional spending on education, police and fire protection, medical services, and transportation and utility infrastructure. Whether such growth would result in a long-term net benefit or cost would depend on a number of factors including prevailing local service levels and tax rates, as well as the characteristics of the growth.

Changes in water deliveries associated with operation of Alternative 4 could result in beneficial or adverse socioeconomic effects in areas receiving water from the SWP and CVP. In hydrologic regions where water deliveries are predicted to increase when compared with the No Action Alternative, more stable agricultural activities could support employment and economic production associated with agriculture. Where M&I deliveries increase, population growth could lead to general economic growth and support water-intensive industries. Such changes could also lead to shifts in the character of communities in the hydrologic regions with resultant beneficial or adverse effects. Likewise, growth associated with deliveries could require additional expenditures for local governments while also supporting increases in revenue.

***CEQA Conclusion*:** As described above, the operational components of BDCP ~~Conservation Measure~~ CM1 could result in a number of effects in areas receiving SWP and CVP water deliveries outside of the Delta; these effects are detailed below.

Changes in SWP Deliveries Compared to Existing Conditions

Compared to Existing Conditions, Scenario H1 would increase deliveries to all hydrologic regions except for the San Joaquin River Region, which would experience no change in deliveries. Compared to Existing Conditions, under Scenario H1, South Coast would receive the largest net increase in deliveries (up to 189 TAF of Table A deliveries) among the regions, which represents 57% of the net increase in M&I deliveries. Compared to Existing Conditions, Scenario H4 would decrease deliveries to all hydrologic regions except for the Tulare Lake Region, which would receive an increase and the San Joaquin River Region, which would experience no change in deliveries. Compared to Existing Conditions, under Scenario H4, South Coast would receive the largest net decrease in deliveries (a decrease of up to 170 TAF of Table A deliveries) among the regions while Tulare Lake would receive the only net increase in deliveries (up to 52 TAF of Table A plus Article 21 deliveries) among the regions. The other two operational scenarios (H2 and H3) would have effects that would fall within the range of Scenario H1 and Scenario H4 (refer to Chapter 30, *Growth Inducement and Other Indirect Effects,* Table 30-16, for more information).

Changes in CVP Deliveries Compared to Existing Conditions

The operational scenarios under Alternative 4 would not change M&I deliveries for the Sacramento River, South Coast, South Lahontan and Colorado River regions because there are no affected CVP contractors located in these regions. Compared to Existing Conditions, Scenario H1 would decrease deliveries to the other hydrologic regions. San Francisco Bay is projected to receive the largest potential decrease (2 TAF) among the affected hydrologic regions. Compared to Existing Conditions, Scenario H4 would also decrease deliveries to the other hydrologic regions. San Francisco Bay is projected to receive the largest potential decrease (5 TAF) among the affected hydrologic regions. The other two operational scenarios (H2 and H3) would have effects that would fall within the range of Scenario H1 and Scenario H4 (refer to Chapter 30, *Growth Inducement and Other Indirect Effects,* Table 30-17 for more information).

Summary

Operation of water conveyance facilities under Alternative 4 could affect socioeconomic conditions in the hydrologic regions receiving water from the SWP and CVP. However, because these impacts are social and economic in nature, rather than physical, they are not considered environmental impacts under CEQA. To the extent that changes in socioeconomic conditions in the hydrologic regions would lead to physical impacts, such impacts are described in Chapter 30, *Growth Inducement and Other Indirect Effects,* Section 30.3.2.

16.3.3.10 Alternative 5—Dual Conveyance with Pipeline/Tunnel and Intake 1 (3,000 cfs; Operational Scenario C)

Impact ECON-1: Temporary Effects on Regional Economics and Employment in the Delta Region during Construction of the Proposed Water Conveyance Facilities

The regional economic effects on employment and income in the Delta region were evaluated during construction. Changes are shown relative to the Existing Conditions and the No Action Alternative (regional economic conditions do not differ between Existing Conditions and No Action Alternative). The effects on employment and income are displayed in Table 16-47. The direct and total change is shown that would result from conveyance-related spending. As evident in Table 16-47, spending on conveyance construction results in substantial local economic activity in the region. As shown, direct construction employment is anticipated to vary over the 8-year construction period, with an estimated 886 FTE jobs in the first year and 52 FTE jobs in the final year of the construction period. Construction employment is estimated to peak at 1,372 FTE jobs in year 4. Total employment (direct, indirect, and induced) would peak in year 3, at 4,780 FTE jobs.

Table 16-47. Regional Economic Effects on Employment and Labor Income during Construction (Alternative 5)

Regional Economic Impact[a]	Year 1	2	3	4	5	6	7	8	Total
Employment (FTE)									
Direct	886	1,004	1,317	1,372	1,254	987	249	52	7,123
Total[b]	5,073	4,277	4,780	4,290	3,370	2,191	422	73	24,475
Labor Income (million $)									
Direct	139.6	105.2	108.0	87.4	60.0	30.6	3.0	0.1	533.9
Total[b]	250.5	194.2	204.1	170.4	122.1	67.9	9.2	1.0	1,019.4

Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.

[b] Includes direct, indirect, and induced effects; numbers may not sum to the total due to rounding. Detailed estimates are presented in Appendix 16A, *Regional Economic Impacts of Water Conveyance Facility Construction*.

The footprint of conveyance and related facilities such as roads and utilities would remove some existing agricultural land from production, so the effects on employment and income would be negative. The regional economic effects on employment and income in the Delta region from the change in agricultural production are reported in Table 16-48. As shown, direct agricultural employment would be reduced by an estimated 22 FTE jobs, while total employment (direct, indirect, and induced) associated with agricultural employment would fall by 83 FTE jobs. Based on the crop production values changes described in Impact ECON-6 for construction effects, the direct agricultural job losses would more likely be concentrated in the vegetable, truck, orchard, and vineyard crops sectors, which are relatively labor intensive, than in the grain, field, and forage crop sectors, where more jobs are mechanized. Note that direct agricultural job losses could be higher than the 22 FTE jobs shown in Table 16-48 because many agricultural jobs are seasonal rather than year-round, FTE jobs, suggesting that more than one seasonal job could be lost per every FTE job lost as a result of construction of conveyance facilities construction. Mapbook Figures M14-1 and M14-2 display areas of Important Farmland and lands under Williamson Act contracts that could be converted to other uses due to the construction of water conveyance facilities for the Pipeline/Tunnel alignment. Note that not all of these structures would be constructed under this alternative.

Table 16-48. Regional Economic Effects on Agricultural Employment and Labor Income during Construction (Alternative 5)

Regional Economic Impact[a]	Impacts on Agriculture
Employment (FTE)	
Direct	-22
Total[b]	-83
Labor Income (million $)	
Direct	-2.8
Total[b]	-5.3

Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.

[b] Includes direct, indirect, and induced effects.

Additionally, the Alternative 5 construction footprint would result in the abandonment of an estimated six producing natural gas wells in the study area, as described in Chapter 26, *Mineral Resources*, Section 26.3.3.10, Impact MIN-1. This could result in the loss of employment and labor income associated with monitoring and maintaining these wells. Generally, small crews perform ongoing monitoring and maintenance of several wells at a time. As shown in Chapter 26, *Mineral Resources*, Table 26-~~3~~32, 516 active producer wells are located in the study area. Even if all six producing wells in the Alternative 5 construction footprint were abandoned and not replaced with new wells installed outside the construction footprint, the percentage reduction in the number of natural gas wells would be very small. As a result, the employment and labor income effects associated with well abandonment, while negative, would be minimal.

NEPA Effects: Because construction of water conveyance facilities would result in an increase in construction-related employment and labor income, this would be considered a beneficial effect. However, these activities would also be anticipated to result in a decrease in agricultural-related employment and labor income, which would be considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.

***CEQA Conclusion*:** Construction of the proposed water conveyance facilities would increase total employment and income in the Delta region. The change would result from expenditures on construction, increasing employment, and from changes in agricultural production, decreasing employment. Changes in recreational expenditures and natural gas well operations could also affect regional employment and income, but these have not been quantified. The total change in employment and income is not, in itself, considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout this EIR/EIS. The BDCP costs are addressed in Chapter 8 of the BDCP, *Implementation Costs and Funding Sources*; removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources,* Section 14.3.3.10, Impacts AG-1 and AG-2; changes in recreation related activities are addressed in Chapter 15, *Recreation,* Section 15.3.3.10, REC-1 through REC-4.; abandonment of natural gas wells is addressed in Chapter 26, *Mineral Resources*, Section 26.3.3.10, Impact MIN-1 When required, DWR would provide compensation to property owners for economic losses due to implementation of the alternative. While the compensation to property owners would reduce the severity of economic

effects related to the loss of agricultural land, it would not constitute mitigation for any related physical impact. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an ALSP to preserve agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.

16.3.3.14 Alternative 7—Dual Conveyance with Pipeline/Tunnel, Intakes 2, 3, and 5, and Enhanced Aquatic Conservation (9,000 cfs; Operational Scenario E)

Impact ECON-1: Temporary Effects on Regional Economics and Employment in the Delta Region during Construction of the Proposed Water Conveyance Facilities

The regional economic effects on employment and income in the Delta region during construction were evaluated. Changes are shown relative to the Existing Conditions and the No Action Alternative (regional economic conditions do not differ between Existing Conditions and No Action Alternative). The effects on employment and income are displayed in Table 16-51. The table shows the direct and total changes that would result from conveyance-related spending. As evident in Table 16-51, spending on conveyance construction would result in substantial economic activity in the region. As shown, direct construction employment is anticipated to vary over the 8-year construction period, with an estimated 2,018 FTE jobs in the first year and 129 FTE jobs in the final year of the construction period. Construction employment is estimated to peak at 3,360 FTE jobs in year 4. Total employment (direct, indirect, and induced) would peak in year 1, at 11,018 FTE jobs.

Table 16-51. Regional Economic Effects on Employment and Labor Income during Construction (Alternative 7)

Regional Economic Impact[a]	Year								Total
	1	2	3	4	5	6	7	8	
Employment (FTE)									
Direct	2,018	2,256	3,141	3,360	2,937	2,763	547	129	17,152
Total[b]	11,018	9,174	10,635	9,729	7,264	5,811	923	183	54,737
Labor Income (million $)									
Direct	298.7	220.6	229.9	186.1	125.9	74.0	6.4	0.3	1,141.9
Total[b]	537.9	409.8	440.1	369.9	251.1	170.6	19.9	2.6	2,201.8

Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.

[b] Includes direct, indirect, and induced effects; numbers may not sum to the total due to rounding. Detailed estimates are presented in Appendix 16A, *Regional Economic Impacts of Water Conveyance Facility Construction*.

The footprint of conveyance and related facilities such as roads and utilities would remove some existing agricultural land from production, so the effects on employment and income would be negative. The regional economic effects on employment and income in the Delta region from the change in agricultural production are reported in Table 16-52. As shown, direct agricultural employment would be reduced by an estimated 25 FTE jobs, while total employment (direct,

indirect, and induced) associated with agricultural employment would fall by 94 FTE jobs. Based on the crop production values changes described in Impact ECON-6 for construction effects, the direct agricultural job losses would more likely be concentrated in the vegetable, truck, orchard, and vineyard crops sectors, which are relatively labor intensive, than in the grain, field, and forage crop sectors, where more jobs are mechanized. Note that direct agricultural job losses could be higher than the 25 FTE jobs shown in Table 16-52 because many agricultural jobs are seasonal rather than year-round, FTE jobs, suggesting that more than one seasonal job could be lost per every FTE job lost as a result of construction of conveyance facilities construction. Mapbook Figures M14-1 and M14-2 display areas of Important Farmland and lands under Williamson Act contracts that could be converted to other uses due to the construction of water conveyance facilities for the Pipeline/Tunnel alignment. Note that not all of these structures would be constructed under this alternative.

Table 16-52. Regional Economic Effects on Agricultural Employment and Labor Income during Construction (Alternative 7)

Regional Economic Impact[a]	Impacts on Agriculture
Employment (FTE)	
Direct	-25
Total[b]	-94
Labor Income (million $)	
Direct	-3.1
Total[b]	-6.1

Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).
[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.
[b] Includes direct, indirect, and induced effects.

Additionally, the Alternative 7 construction footprint would result in the abandonment of an estimated six producing natural gas wells in the study area, as described in Chapter 26, *Mineral Resources*, Section 26.3.3.14, Impact MIN-1. This could result in the loss of employment and labor income associated with monitoring and maintaining these wells. Generally, small crews perform ongoing monitoring and maintenance of several wells at a time. As shown in Chapter 26, *Mineral Resources*, Table 26-2~~3~~, 516 active producer wells are located in the study area. Even if all six producing wells in the Alternative 7 construction footprint were abandoned and not replaced with new wells installed outside the construction footprint, the percentage reduction in the number of natural gas wells would be very small. As a result, the employment and labor income effects associated with well abandonment, while negative, would be minimal.

NEPA Effects: Because construction of water conveyance facilities would result in an increase in construction-related employment and labor income, this would be considered a beneficial effect. However, these activities would also be anticipated to result in a decrease in agricultural-related employment and labor income, which would be considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.

***CEQA Conclusion*:** Construction of the proposed water conveyance facilities would temporarily increase total employment and income in the Delta region. The change would result from expenditures on construction, increasing employment, and from changes in agricultural production,

decreasing employment. Changes in recreational expenditures and natural gas well operations could also affect regional employment and income, but these have not been quantified. The total change in employment and income is not, in itself, considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout this EIR/EIS. Costs are addressed in Chapter 8 of the BDCP, *Implementation Costs and Funding Sources*; removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources,* Section 14.3.3.14, Impacts AG-1 and AG-2; changes in recreation related activities are addressed in Chapter 15, *Recreation,* Section 15.3.3.14, REC-1 through REC-4; abandonment of natural gas wells is addressed in Chapter 26, *Mineral Resources*, Section 26.3.3.14, Impact MIN-1. When required, DWR would provide compensation to property owners for economic losses due to implementation of the alternative. While the compensation to property owners would reduce the severity of economic effects related to the loss of agricultural land, it would not constitute mitigation for any related physical impact. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an ALSP to preserve agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.

16.3.3.16 Alternative 9—Through Delta/Separate Corridors (15,000 cfs; Operational Scenario G)

Impact ECON-1: Temporary Effects on Regional Economics and Employment in the Delta Region during Construction of the Proposed Water Conveyance Facilities

The regional economic effects on employment and income in the Delta region during construction were evaluated. Changes are shown relative to the Existing Conditions and the No Action Alternative (regional economic conditions do not differ between Existing Conditions and No Action Alternative). The effects on employment and income are displayed in Table 16-55. The direct and total change is shown that would result from conveyance-related spending. As evident in Table 16-55, spending on conveyance construction would result in substantial economic activity in the region. As shown, direct construction employment is anticipated to vary over the 8-year construction period, with an estimated 1,922 FTE jobs in the first year and 85 FTE jobs in the final year of the construction period. Construction employment is estimated to peak at 3,209 FTE jobs in year 4. Total employment (direct, indirect, and induced) would also peak in year 4, at 6,371 FTE jobs.

Table 16-55. Regional Economic Effects on Employment and Labor Income during Construction (Alternative 9)

Regional Economic Impact[a]	Year 1	2	3	4	5	6	7	8	Total
Employment (FTE)									
Direct	1,922	2,146	3,087	3,209	2,277	2,798	318	85	15,843
Total[b]	4,227	4,446	6,209	6,371	4,190	5,073	598	117	31,232
Labor Income (million $)									
Direct	58.1	55.1	72.5	72.3	39.4	45.7	6.0	0.0	349.0
Total[b]	129.9	128.5	173.4	175.1	104.1	123.3	15.3	1.4	851.1

Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.

[b] Includes direct, indirect, and induced effects; numbers may not sum to the total due to rounding. Detailed estimates are presented in Appendix 16A, *Regional Economic Impacts of Water Conveyance Facility Construction*.

The footprint of conveyance and related facilities such as roads and utilities would remove some existing agricultural land from production, so the effects on employment and income would be negative. The regional economic effects on employment and income in the Delta region from the change in agricultural production are reported in Table 16-56. As shown, direct agricultural employment would be reduced by an estimated 10 FTE jobs, while total employment (direct, indirect, and induced) associated with agricultural employment would fall by 38 FTE jobs. Based on the crop production values changes described in Impact ECON-6 for construction effects, the direct agricultural job losses would more likely be concentrated in the vegetable, truck, orchard, and vineyard crops sectors, which are relatively labor intensive, than in the grain, field, and forage crop sectors, where more jobs are mechanized. Note that direct agricultural job losses could be higher than the 10 FTE jobs shown in Table 16-56 because many agricultural jobs are seasonal rather than year-round, FTE jobs, suggesting that more than one seasonal job could be lost per every FTE job lost as a result of construction of conveyance facilities construction. Mapbook Figures M14-9 and M14-10 display areas of Important Farmland and lands under Williamson Act contracts that could be converted to other uses due to the construction of water conveyance facilities for the Through Delta/Separate Corridors alignment.

Table 16-56. Regional Economic Effects on Agricultural Employment and Labor Income during Construction (Alternative 9)

Regional Economic Impact[a]	Impacts on Agriculture
Employment (FTE)	
Direct	-10
Total[b]	-38
Labor Income (million $)	
Direct	-1.2
Total[b]	-2.4

Note: Labor income is reported 2011 dollars (U.S. Department of Commerce 2012).
[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.
[b] Includes direct, indirect, and induced effects.

Additionally, the Alternative 9 construction footprint would result in the abandonment of an estimated two producing natural gas wells in the study area, as described in Chapter 26, *Mineral Resources*, Section 26.3.3.16, Impact MIN-1. This could result in the loss of employment and labor income associated with monitoring and maintaining these wells. Generally, small crews perform ongoing monitoring and maintenance of several wells at a time. As shown in Chapter 26, *Mineral Resources*, Table 26-~~3~~2, 516 active producer wells are located in the study area. Even if both producing wells in the Alternative 9 construction footprint were abandoned and not replaced with new wells installed outside the construction footprint, the percentage reduction in the number of natural gas wells would be very small. As a result, the employment and labor income effects associated with well abandonment, while negative, would be minimal.

NEPA Effects: Because construction of water conveyance facilities would result in an increase in construction-related employment and labor income, this would be considered a beneficial effect. However, these activities would also be anticipated to result in a decrease in agricultural-related employment and labor income, which would be considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.

***CEQA Conclusion*:** Construction of the proposed water conveyance facilities would increase total employment and income in the Delta region. The change would result from expenditures on construction, increasing employment, and from changes in agricultural production, decreasing employment. Changes in recreational expenditures and natural gas well operations could also affect regional employment and income, but these have not been quantified. The total change in employment and income is not, in itself, considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout this EIR/EIS. Costs are addressed in Chapter 8 of the BDCP, *Implementation Costs and Funding Sources*; removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources,* Section 14.3.3.16, Impacts AG-1 and AG-2; changes in recreation related activities are addressed in Chapter 15, *Recreation,* Section 15.3.3.16, REC-1 through REC-4; abandonment of natural gas wells is addressed in Chapter 26, *Mineral Resources*, Section 26.3.3.16, Impact MIN-1. When required, DWR would provide compensation to property owners for economic losses due to implementation of the alternative. While the compensation to property owners would reduce the severity of economic effects related

to the loss of agricultural land, it would not constitute mitigation for any related physical impact. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an ALSP to preserve agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.

Impact ECON-7: Permanent Regional Economic and Employment Effects in the Delta Region during Operation and Maintenance of the Proposed Water Conveyance Facilities

In the Delta region, ongoing operation and maintenance of BDCP facilities would result in increased expenditures relative to the Existing Conditions and the No Action Alternative (regional economic conditions do not differ across Existing Conditions and No Action Alternative). The increased expenditures are expected to result in a permanent increase in regional employment and income, including an estimated 121 direct and 177 total (direct, indirect, and induced) FTE jobs (Table 16-58). Potential changes in the value of agricultural production result in changes to regional employment and income in the Delta region under the Alternative 9 relative to the Existing Conditions and the No Action Alternative.

Table 16-58. Regional Economic Effects on Employment and Labor Income during Operations and Maintenance (Alternative 9)

Regional Economic Impact[a]	Impacts from Operations and Maintenance
Employment (FTE)	
Direct	121
Total[b]	177
Labor Income (million $)	
Direct	7.8
Total[b]	10.5

Note: Labor income is reported in 2011 dollars (U.S. Department of Commerce 2012).
[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.
[b] Includes direct, indirect, and induced effects.

The operation and maintenance of conveyance and related facilities such as roads and utilities would result in the permanent removal of agricultural land from production following construction, and the effects on employment and income would be negative, including the loss of an estimated 14 agricultural and 36 total (direct, indirect, and induced) FTE jobs. The regional economic effects on employment and income in the Delta region from the change in agricultural production are reported in Table 16-59. Based on the permanent crop production value changes described in Impact ECON-12, the agricultural job losses would more likely be concentrated in the vegetable, truck, orchard, and vineyard crops sectors, which are relatively labor intensive, than in the grain, field, and forage crop sectors, where more jobs are mechanized. Note that direct agricultural job losses could be higher than the 14 FTE jobs shown in Table 16-59 because many agricultural jobs are seasonal rather than year-round, FTE jobs, suggesting that more than one seasonal job could be lost per every FTE job lost as a result of permanent agricultural production changes. Mapbook Figures M14-9 and M14-10 display areas of Important Farmland and lands under Williamson Act contracts that could be converted to other uses due to the construction of water conveyance facilities for the Separate Corridors/Through Delta alignment.

Table 16-59. Regional Economic Effects on Agricultural Employment and Labor Income during Operations and Maintenance (Alternative 9)

Regional Economic Impact[a]	Impacts on Agriculture
Employment (FTE)	
Direct	-14
Total[b]	-36
Labor Income (million $)	
Direct	-1.0
Total[b]	-1.9

Note: Labor income is reported in 2011 dollars (U.S. Department of Commerce 2012).

[a] IMPLAN results are changes relative to Existing Condition or No Action Alternative.

[b] Includes direct, indirect, and induced effects.

NEPA Effects: Because continued operation and maintenance of water conveyance facilities would result in an increase in operations-related employment and labor income, this would be considered a beneficial effect. However, the long-term footprint of facilities would lead to a continued decline in agricultural-related employment and labor income, which would be considered an adverse effect. Mitigation Measure AG-1, described in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, would be available to reduce these effects by preserving agricultural productivity and compensating off-site.

***CEQA Conclusion*:** Operation and maintenance of the proposed water conveyance facilities would increase total employment and income in the Delta region. The change would result from expenditures on BDCP operation and maintenance, increasing employment, and from changes in agricultural production, decreasing employment. The total change in income and employment is not, in itself, considered an environmental impact. Significant environmental impacts would only result if the changes in regional economics cause physical impacts. Such effects are discussed in other chapters throughout this EIR/EIS. Costs are addressed in Chapter 8 of the BDCP, *Implementation Costs and Funding Sources*; removal of agricultural land from production is addressed in Chapter 14, *Agricultural Resources,* Section 14.3.3.16, Impacts AG-3 and AG-4; changes in recreation related activities are addressed in Chapter 15, *Recreation,* Section 15.3.3.16, Impacts REC-5 through REC-8. When required, DWR would provide compensation to property owners for economic losses due to implementation of the alternative. While the compensation to property owners would reduce the severity of economic effects related to the loss of agricultural land, it would not constitute mitigation for any related physical impact. Measures to reduce these impacts are discussed in Chapter 14, *Agricultural Resources*, Section 14.3.3.2, Impact AG-1, and particularly Mitigation Measure AG-1, Develop an ALSP to preserve agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones.