Chapter 5 Services, Social Issues, and Socioeconomics

This chapter provides the results of the assessment of effects on services, social issues, and socioeconomics. Each resource area addressed includes a discussion of existing conditions, assessment methods, environmental consequences, and applicable mitigation measures. This chapter is organized as follows:

- Section 5.1, *Land Use*;
- Section 5.2, *Power Production and Energy*;
- Section 5.3, *Visual Resources*;
- Section 5.4, *Cultural Resources*;
- Section 5.5, *Hazards and Hazardous Materials*;
- Section 5.6, *Socioeconomics*;
- Section 5.7, *Indian Trust Assets*;
- Section 5.8, *Utilities and Public Services*; and
- Section 5.9, *Environmental Justice*.

5.1 Land Use

5.1.1 Introduction

This section describes the existing environmental conditions and the consequences of constructing and operating the project alternatives on land use. The primary concern related to land use is the conversion of farmland to nonagricultural use.

5.1.2 Affected Environment

Sources of Information

The following key sources of information were used in the preparation of this section:

- California Department of Conservation Farmland Mapping and Monitoring Program, Unpublished digital information for Alameda County, 2006 (California Department of Conservation 2009a);
- California Department of Conservation Farmland Mapping and Monitoring Program, Unpublished digital information for San Joaquin County, 2008 (California Department of Conservation 2009b);
- California Department of Conservation, The California Land Conservation (Williamson) Act 2006 Status Report (for surveys done in 2004) (California Department of Conservation 2006); and
- site visits conducted on August 23, 2003, and September 17, 2008.

Project Area

Alternative 2 is located entirely within Alameda County, while Alternatives 3 and 4 are located in both Alameda and San Joaquin counties. Information for both counties is provided for context of potential environmental effects.

Alameda County

Of the 525,335 acres mapped by FMMP in Alameda County in 2008, approximately 1.5% was classified as farmland, 46% as grazing land, 28% as urban land, 14% as other land, and the remainder as water. Of the 7,689 acres of farmland mapped in Alameda County in 2008, 3,957 is prime farmland, 1,290 is farmland of statewide importance, and 2,442 is unique farmland. In 2008, 134,411 acres of Alameda County agricultural lands were covered by the Williamson Act contract. (California Department of Conservation 2006, 2009a.)

San Joaquin County

Of the 912,600 acres mapped by FMMP in San Joaquin County in 2006, approximately 68% was classified as farmland, 16% as grazing land, 10% as urban land, 5% as other land, and the remainder as water. In San Joaquin County, other land is a category that includes wetlands, low-density "ranchettes," and brush or timberlands unsuitable for grazing. (California Department of Conservation 2009b.)

Of the 620,070 acres of farmland mapped in San Joaquin County in 2006, 407,609 is prime farmland, 89,273 is farmland of statewide importance, 63,231 is unique farmland, and 59,957 is farmland of local importance. In 2004, 477,261 acres of San Joaquin County farmland were covered by the Williamson Act contract. (California Department of Conservation 2006, 2009b.) San Joaquin County also provides Farmland Security Zones (FSZ) as another program to protect farmland. In 2004, 60,219 acres of farmland in San Joaquin County were protected through FSZ contracts.

Local

The predominant land use in the vicinity of Alternative 2 is grazing land. The predominant land use in the vicinity of Alternative 3 is orchards classified as prime farmland. Grazing land and farmland of local importance is also in the vicinity of Alternative 3. The predominant land use in the vicinity of Alternative 4 is grazing land.

5.1.3 Environmental Consequences

Assessment Methods

Land use impacts were assessed based on the compatibility of constructing and operating the project on adjacent land uses and the compatibility with local land use plans and policies, specifically important farmland designations or Williamson Act contracts. The assessment of the compatibility of the project with adjacent land uses was based on project site visits (August 23, 2003, and September 17, 2008) and review of aerial photographs. The location and acres of farmland classes (e.g., prime, unique, and state and locally important farmland) in the project area were based on data provided by the Department of Conservation's Farmland Monitoring Program. San Joaquin County identifies all farmland that does not meet the state definitions for "prime," "statewide importance," or "unique," as "locally important." This designation includes land that is or has been used for irrigated pasture, dryland farming, confined livestock or dairy facilities, aquaculture, poultry facilities, and dry grazing.

Regulatory Setting

Farmland Protection Policy Act

The purpose of the Farmland Protection Policy Act (FPPA) is to minimize the extent to which federal programs contribute to irreversible conversion of farmland to nonagricultural uses, and to ensure that federal programs are administered in a manner that would be compatible with state and local government and private farmland protection programs and policies. The FPPA directs federal agencies to consider the effects of federal programs or activities on farmland. The agencies are to consider alternative actions, as appropriate, that could lessen such adverse effects, and ensure that such federal programs, to the extent practicable, are compatible with state, local, and private farmland protection programs and policies.

5.1.4 Environmental Effects

Alternative 1 (No Action)

Under Alternative 1, there would be no construction or changes in operations that would result in changes in statewide and federal programs to preserve open space and agricultural lands. The trend of land conversion from agricultural uses to urbanization and nonagricultural uses would likely continue.

Alternative 2

Construction

Impact LU-1: Temporary Conversion of Important Farmland during Construction

Construction of Alternative 2 would involve staging and access to the project site that could affect surrounding land uses. Access to the site would be on existing roads and staging and construction disturbance would be limited to the adjacent grassland areas. These areas are not classified as prime, unique, or statewide important, and upon completion of the project, these areas would be reseeded with native grasses to return the site to pre-project conditions. Therefore this temporary conversion is not considered adverse.

Impact LU-2: Permanent Conversion of Important Farmland

All of Alternative 2 is located on grazing land. The pipeline would be buried and would not result in any permanent conversion. Approximately 2 acres of grazing land would be permanently converted to developed land, but this land is not classified as prime, unique, or statewide important. As such, this conversion is not considered adverse.

Operation

Impact LU-3: Incompatibility with Surrounding Land Uses

Alternative 2 includes the operation of the Intertie that would improve water supply reliability for south of Delta agricultural CVP contractors. Additionally, the permanent above-ground structures associated with the Intertie are similar to other industrial structures in the region associated with water and power delivery. As such, the Intertie would be compatible with the surrounding land uses. There would be no effect, and in years when the Intertie results in an increased water supply, there would be a beneficial effect for south of Delta CVP contractors.

Alternative 3

Construction

Impact LU-1: Temporary Conversion of Important Farmland during Construction

Although most of the area in which Alternative 3 would be constructed is designated prime farmland, it is in fact developed area and fallowed agricultural land. Staging and access to the project site would be limited to the developed area to the extent possible. However, up to 0.7 acres of prime farmland (orchard and fallowed field) may be temporarily converted during construction. Additionally, some surrounding grazing lands could be temporarily affected. These areas are not classified as prime, unique, or statewide important, and upon completion of the project, these areas would be reseeded with native grasses to return the site to pre-project conditions. Therefore this temporary conversion is not considered adverse.

Impact LU-2: Permanent Conversion of Important Farmland

Most of the above-ground Intertie structure for Alternative 3 is located in developed areas, but approximately 0.4 acres would be located in an orchard or fallowed land classified as prime farmland. This includes the area above the pipeline, which would be taken out of agricultural production as a result of implementation of Alternative 3. The transmission line would span prime farmland, farmland of local importance, grazing land, and other lands not relevant to agriculture. To the extent possible, conversion of prime farmland would be avoided by adjusting the alignment of the transmission line poles. However, the worst-case scenario would result in the conversion of approximately 0.04 acres of prime farmland. This combined conversion from the Intertie structure and transmission line (0.44 acres) represents a very small fraction of the total 407, 609 acres of prime farmland. As such, this effect is not considered adverse.

Operation

Impact LU-3: Incompatibility with Surrounding Land Uses

Alternative 3 includes the operation of the Intertie that would improve water supply reliability for south of Delta agricultural CVP contractors. Additionally, the permanent above-ground structures associated with the Intertie are similar to other industrial structures in the region associated with water and power delivery. As such, the Intertie would be compatible with the surrounding land uses. There would be no effect, and in years when the Intertie results in an increased water supply, there would be a beneficial effect for south of Delta CVP contractors.

Alternative 4

Construction

Impact LU-1: Temporary Conversion of Important Farmland during Construction

Implementation of Alternative 4 would involve repeated staging and access to the project site each time the temporary intertie structure is installed that could affect surrounding land uses. Access to the site would be on existing roads and staging and construction disturbance would be limited to the adjacent grassland areas. These areas are not classified as prime, unique, or statewide important, and upon completion of the project, these areas would be reseeded with natives grasses to return the site to pre-project conditions. Therefore this temporary conversion is not considered adverse.

Operation

Impact LU-3: Incompatibility with Surrounding Land Uses

Alternative 4 does not include any new permanent physical structures and operations would occur at the existing Banks Pumping Plant. There would be no effect, and in years when the Intertie results in an increased water supply, there would be a beneficial effect for south of Delta CVP contractors.

5.2 Power Production and Energy

5.2.1 Introduction

This section describes the existing environmental conditions and the consequences of constructing and operating the project alternatives on power production and the use of energy for pumping.

5.2.2 Affected Environment

Sources of Information

The following key sources of information were used in the preparation of this section:

- The Bureau of Reclamation *Central Valley Operations Office Report of Operations for December 2007* (U.S. Department of the Interior, Bureau of Reclamation 2007).

Central Valley Project Facility Descriptions

The CVP extends from the Cascade Range in the north to along the Kern River in the south and generates an average of about 5.6 million megawatt hours (MWh) of electricity annually (depending on runoff conditions). The CVP facilities include reservoirs on the Trinity, Sacramento, American, Stanislaus, and San Joaquin Rivers. Water from the Trinity River is stored and re-regulated in Trinity Reservoir, Lewiston Lake, and Whiskeytown Reservoir and diverted through a system of tunnels and power plants into the Sacramento River for use in the Central Valley. CVP power plants include Keswick, Shasta, Spring Creek, Lewiston, Trinity, Judge Francis Carr, Folsom, Nimbus, New Melones, O'Neill, and San Luis (W. R. Gianelli pumping-generating plant).

Water from all of these reservoirs and other reservoirs owned and/or operated by the CVP and local water rights holders flows into the Sacramento River. Some of the CVP contractors divert water directly from or immediately below the dams' outlet works. Other CVP contractors, Sacramento River water rights contractors, and water rights holders divert water directly from the Sacramento and American Rivers. The Sacramento River carries water to the Delta. The Jones Pumping Plant at the southern end of the Delta near Tracy lifts the water into the DMC at Mile 3.5, using power supplied by the CVP power plants. The Jones Pumping Plant does not operate to generate power supply; rather, it consumes large quantities of energy to lift the water about 200 feet to the DMC.

The DMC delivers water to CVP contractors and exchange contractors on the San Joaquin River. The CVP water also is conveyed via the DMC to the San Luis Reservoir for deliveries to CVP contractors through the San Luis Canal. The O'Neill pumping station lifts water about 50 feet to O'Neill Forebay. The W. R. Gianelli pumping-generating plant lifts water a maximum of about 250 feet to San Luis Reservoir (at maximum storage, elevation of about 450 feet). A portion of this energy is recovered when the water is released in the summer peak demand period to the DMC (through O'Neill generating plant, or to the San Luis Canal where it is pumped about 125 feet at the Dos Amigos Pumping Plant to continue down the California Aqueduct to Westlands contractors. Water from the San Luis Reservoir also can be conveyed through the Pacheco Tunnel to CVP contractors in Santa Clara and San Benito Counties.

The CVP also delivers water from the Friant Dam on the San Joaquin River to CVP contractors located near the Madera and Friant-Kern Canals. A small generator is located on the Friant-Kern Canal. Water is stored in the New Melones Reservoir for water rights holders in the Stanislaus River Watershed and CVP contractors in the northern San Joaquin Valley. Power is generated at the Stanislaus power plant and at Tullock Dam (non-CVP).

Some CVP water is pumped at the Banks Pumping Plant and delivered through the California Aqueduct to O'Neill Forebay. The Banks Pumping Plant lifts water about 250 feet to Bethany Forebay. The Intertie water would be pumped at the Jones Pumping Plant and then pumped at the Intertie Pumping Plant into the California Aqueduct, and would flow to the O'Neill Forebay.

State Water Project Facility Descriptions

The SWP begins in northern California on the upper Feather River, a tributary of the Sacramento River. Runoff is stored behind Oroville Dam, which includes facilities such as the Oroville-Thermalito Complex. This complex coordinates between releasing water and producing power, and releasing water takes precedence. Power-producing facilities at Oroville Dam include Hyatt Power Plant, Thermalito Power Plant, and Thermalito Diversion Dam Power Plant (small for releases to river). These facilities operate together to move water and to generate electricity. The water then flows from Lake Oroville to the Delta where some of the water is pumped through the North Bay Aqueduct to Napa and Solano Counties. The Hyatt Power plant has six units, with three generating-pumping units, which allow some water to be pumped back into Oroville Reservoir from Thermalito Forebay during off-peak hours. The Thermalito Power Plant also has some generating-pumping units.

In the southern Delta, water is pumped by the Banks Pumping Plant about 250 feet to feed the South Bay Aqueduct and the California Aqueduct. Similar to the Jones Pumping Plant, Banks Pumping Plant does not operate to generate

power supply; rather, it consumes large quantities of energy to pump water into the California Aqueduct.

Some SWP water is pumped about 350 feet into the South Bay Aqueduct from Bethany Forebay. Most of the SWP water flows down the California Aqueduct to the O'Neill Forebay. The W. R. Gianelli pumping-generating plant lifts water a maximum of about 250 feet to San Luis Reservoir (at maximum storage elevation of about 450 feet). A portion of this energy is recovered when the water is released in the summer peak demand period to the San Luis Canal (California Aqueduct) where it is pumped about 125 feet at the Dos Amigos Pumping Plant to continue down the California Aqueduct to Kern County and southern California SWP contractors. Some SWP water is pumped about 1,500 feet into the Coastal Branch pipeline near Kettleman City.

The California Aqueduct continutes to the foot of the Tehachapi Mountains, where the Edmonston Pumping Plant lifts the water almost 2,000 feet to enter 10 miles of tunnels and siphons that traverse the Tehachapi range. After crossing the Tehachapis, the California Aqueduct divides into two branches. The West Branch Aqueduct stores water in Pyramid and Castaic Reservoirs to serve Los Angeles and other coastal cities. The East Branch Aqueduct flows through the Antelope Valley, storing water in Silverwood Lake. The water finally reaches San Bernardino and Riverside Counties, storing water in the Lake Perris reservoir.

Joint Federal and State Facilities

Some CVP facilities (e.g., the San Luis Unit) were developed in coordination with the SWP. Both the CVP and the SWP use the San Luis Reservoir, O'Neill Forebay, and more than 100 miles of the aqueduct and its related pumping and generating facilities. These operations are closely coordinated at a Joint Operations Center in Sacramento and join with other agencies such as the National Weather Service and the Corps for joint action during flood emergencies. CVP routinely uses the Banks Pumping Plant to pump water into the California Aqueduct and O'Neill Forebay. This is sometimes called *wheeling* water. CVP supplies the Banks Pumping Plant with the energy required to wheel water and pays a maintenance charge for use of the SWP facilities.

5.2.3 Environmental Consequences

Assessment Methods

Reclamation completed a basic power impact analysis for the Intertie and alternatives that involved the modeling of the CVP power generation (power plants) and energy consumption (pumping plants) resources for the No Action conditions and for the Intertie alternatives. The differences in the power consumption are associated with the changes in CVP and SWP pumping.

As described in Section 3.1, Water Supply and Delta Water Managementl, the Intertie does not substantially change upstream reservoir operations. Because power generation occurs at these upstream reservoirs during normal releases (not during flood control releases), the Intertie causes no substantial changes in CVP power generation.

The changes in the CVP and SWP reservoir and Delta operations caused by the Intertie Alternatives were simulated with the CALSIM II monthly model. Because CALSIM II does not calculate CVP or SWP power generation or energy used for pumping water, the changes in energy used for the Intertie alternatives was estimated from the monthly pumping flows at Jones, Banks, and Intertie Pumping Plants.

The energy needed to pump an acre-foot of water each foot of elevation rise is about a kilowatt-hour (KWh). Therefore, to pump 1 taf at the Jones Pumping Plant during a month with an elevation change (pumping lift) of 200 feet requires about 200 MWh of energy. Because the electrical motors and water turbines (pumping units) are only about 85% efficient, this requires about 240 MWh. To pump the maximum Intertie capacity of 400 cfs for a month (25 taf) at the Jones Pumping Plant would require about 6,000 MWh.

The Intertie Pumping Plant has a maximum capacity of about 400 cfs, which would be a maximum volume of about 25 taf in a month. Because the lift is about 50 feet, the energy required for the Intertie pumps at full capacity (with an efficiency of 85%) for a month would be a maximum of about 1,500 MWh (i.e., 60 MWh for each taf). The energy required for 400 cfs additional pumping at Jones and the Intertie would be about 7,500 MWh (300 MWh for each taf).

The Banks Pumping Plant has a lift of 250 feet, so the Banks lift is identical to the combined Jones Pumping Plant lift and the Intertie Pumping Plant lift. The energy required to pump 400 cfs of water for a month would be about 7,500 MWh (300 MWh for each taf).

The CVP generates about four times more hydroelectric power than is needed for the Tracy and O'Neill and San Luis and Dos Amigos pumping. For example, in calendar year 2007, the Central Valley Operations Report (U.S. Department of the Interior, Bureau of Reclamation 2007) indicates that a total of about 4,290,000 MWh were produced at CVP hydropower (i.e., renewable energy) plants, including about 130,000 MWh produced at the San Luis and O'Neill generating plants. The report for 2007 indicates that 595,000 MWh of energy were used at Jones Pumping Plant, 75,000 MWh were used at the O'Neill Pumping Plant, 210,000 MWh were used at San Luis, and 145,000 MWh were used at Dos Amigos, with 40,000 MWh used for wheeling CVP water at Banks Pumping Plant. Therefore, a total of 1,065,000 MWh was used for CVP pumping, while about 4,290,000 MWh were generated during the year. The CVP pumping energy was about 25% of the CVP power generation.

5.2.4 Environmental Effects

Alternative 1 (No Action)

The No Action Alternative reflects the CVP and SWP energy required by pumping and energy generation if the Intertie is not constructed or implemented. There would be no changes in CVP or SWP pumping or generation, and no new power facilities would be constructed or operated. Therefore, no power production or energy use effects would be associated with the No Action Alternative. Table 5.2-1 gives the annual (water year) pumping at Banks and Jones Pumping Plants for the Future No Action simulation with CALSIM. The average Jones pumping was simulated to be 2,355 taf/yr, and the average Banks pumping was simulated to be 3,521 taf/yr. The average calculated energy use for Jones pumping was 565,165 MWh, and the average calculated energy use for Banks pumping was 1,056,416 MWh, for a combined total energy use of 1,621,581 MWh. This combined energy use is equivalent to the power production from a 185-MWh power plant. Additional energy is required to pump water into O'Neill Forebay and into San Luis Reservoir (although about 80% is recovered when the water is released). More energy is required at the Dos Amigos Pumping Plant to move CVP water in the San Luis Canal (California Aqueduct) to Westlands Water District turnouts, located north of Kettleman City.

Alternative 2 (Proposed Action)

Construction Effects

Impact POW-1: Increased Energy Consumption as a Result of Constructing the Intertie

The Intertie would cause irreversible and irretrievable commitments of nonrenewable energy resources needed to construct project structures. These resources include gasoline and diesel fuel used for construction equipment. However, the extent to which the resources would be used is limited, as the work is temporary and requires a relatively small area. Therefore, the change in energy consumption during construction would not be substantial, and there would be no adverse effect.

Operation Effects

Impact POW-2: Increased Electricity Consumption as a Result of Operating the Intertie

Table 5.2-1 shows the annual summary of energy consumption for the No Action and the Intertie Proposed Action Alternative. Implementing the Proposed Action should result in only a minor increase in the energy consumption of the CVP. The average calculated energy consumption for the Intertie Pumping Plant would be

about 4,550 MWh to pump an average of 76 taf/yr. The additional Jones pumping would be about 35 taf/yr. This is less than the Intertie pumping, because Jones pumping would sometimes be reduced in February or March if Intertie pumping has filled CVP San Luis Reservoir storage earlier. The average additional energy use for Jones pumping was about 8,500 MWh. The CALSIM model indicates that Banks pumping would be reduced at times when CVP pumping with the Intertie was increased. The average change in Banks pumping would be a reduction of 3 taf/yr, reducing average energy use for Banks pumping by about 780 MWh.

The average energy impacts of the Proposed Action compared to simulated No Action levels of annual energy consumption are less than 1%, when the combined CVP and SWP pumping energy at the Banks, Jones, and Intertie Pumping Plants is evaluated. According to the CALSIM modeling results, the energy impact attributable to the Intertie Proposed Action is minimal and insignificant as a percentage of the overall level of CVP power production and energy consumption. The CVP power production would remain about four times the energy consumption for pumping the CVP water to south of Delta contractors. This is not an adverse effect.

Alternative 3 (TANC Intertie Site)

Construction Effects

Impact POW-1: Increased Energy Consumption as a Result of Constructing the Intertie

As described above for Alternative 2, the Intertie would cause irreversible and irretrievable commitments of nonrenewable energy resources needed to construct project structures. These resources include gasoline and diesel fuel used for construction equipment. However, the extent to which the resources would be used is limited, as the work is temporary and requires a relatively small area. Therefore, the change in energy consumption during construction would not be substantial, and there would be no adverse effect.

Operation Effects

Impact POW-2: Increased Electricity Consumption as a Result of Operating the Intertie

The energy impacts associated with the operation of Alternative 3 are identical to those of Alternative 2. These impacts would be less than 1% of the combined energy for pumping CVP and SWP water from the Delta, and are not considered adverse.

Alternative 4 (Virtual Intertie)

Construction Effects

Impact POW-1: Increased Energy Consumption as a Result of Constructing the Temporary Intertie

Construction/installation of the temporary intertie during emergencies would cause irreversible and irretrievable commitments of nonrenewable energy resources, including gasoline and diesel fuel used for construction equipment. However, the extent to which the resources would be used is limited, as the work is temporary, would occur infrequently, and requires a relatively small area. Therefore, the change in energy consumption during construction would not be substantial, and there would be no adverse effect.

Operation Effects

Impact POW-2: Increased Electricity Consumption as a Result of Operating the Temporary Intertie

The energy impacts associated with the Virtual Intertie (Alternative 4) are assumed to be identical to the calculated impacts for the Proposed Action (Alternative 2), because the Intertie pumping actually would occur at the Banks Pumping Plant. Because the combined lift of the Jones and Intertie Pumping Plants (250 feet) is the same as the Banks Pumping Plant lift, the energy associated with pumping of CVP water at the Banks Pumping Plant is identical. Because the results in Table 5.2-1 indicate that the average energy use would increase by less than 1% and would be supplied by the excess CVP power generation capacity, this impact is not considered adverse.

Table 5.2-1. Annual Pumping (taf) and Energy Consumption (MWh) at Jones, Banks, and Intertie Power Plants

Water Year	FNA Jones Pumping (taf)	FNA Banks Pumping (taf)	FNA Jones Energy (MWh)	FNA Banks Energy (MWh)	FNA Total Energy (MWh)	Intertie Pumping Plant (taf)	Increased Jones Pumping (taf)	Increased Banks Pumping (taf)	Increased Intertie Energy (MWh)	Increased Jones Energy (MWh)	Increased Banks Energy (MWh)	Increased Total Energy (MWh)	Percent FNA Total Energy (%)
1922	2,747	4,480	659,362	1,344,003	2,003,365	109	20	-22	6,546	4,821	-6,557	4,810	0.2%
1923	2,644	3,766	634,506	1,129,839	1,764,345	92	76	22	5,544	18,149	6,562	30,256	1.7%
1924	1,636	1,742	392,544	522,487	915,031	40	82	-68	2,417	19,786	-20,502	1,701	0.2%
1925	2,182	2,558	523,649	767,362	1,291,012	6	-135	-10	332	-32,435	-3,150	-35,252	-2.7%
1926	1,861	2,308	446,560	692,359	1,138,919	38	22	33	2,274	5,284	9,939	17,496	1.5%
1927	2,487	4,250	596,952	1,275,044	1,871,997	82	-1	2	4,949	-161	482	5,271	0.3%
1928	2,588	3,858	621,120	1,157,309	1,778,429	103	80	-46	6,151	19,214	-13,919	11,446	0.6%
1929	1,789	1,996	429,440	598,827	1,028,267	64	95	-36	3,853	22,785	-10,767	15,871	1.5%
1930	1,965	2,804	471,498	841,059	1,312,557	48	-1	18	2,876	-267	5,256	7,866	0.6%
1931	1,444	1,420	346,501	426,045	772,545	24	-19	35	1,416	-4,525	10,402	7,293	0.9%
1932	1,612	2,174	386,986	652,228	1,039,213	66	47	12	3,950	11,332	3,493	18,775	1.8%
1933	1,324	1,778	317,747	533,499	851,247	10	-131	334	579	-31,357	100,145	69,367	8.1%
1934	1,106	1,955	265,377	586,581	851,959	48	159	-255	2,871	38,227	-76,588	-35,489	-4.2%
1935	1,990	3,755	477,714	1,126,511	1,604,225	48	19	-106	2,854	4,474	-31,936	-24,607	-1.5%
1936	2,458	4,152	589,960	1,245,512	1,835,473	57	-33	-18	3,405	-7,820	-5,292	-9,707	-0.5%
1937	2,074	3,792	497,719	1,137,482	1,635,201	67	5	-79	4,032	1,282	-23,602	-18,289	-1.1%
1938	2,310	4,915	554,305	1,474,444	2,028,749	31	11	-3	1,833	2,585	-873	3,544	0.2%
1939	2,043	2,962	490,387	888,662	1,379,049	56	74	26	3,364	17,833	7,764	28,961	2.1%
1940	2,437	3,906	584,834	1,171,659	1,756,493	79	34	2	4,726	8,175	643	13,543	0.8%
1941	2,826	4,702	678,310	1,410,491	2,088,802	98	29	-17	5,885	7,005	-5,024	7,867	0.4%
1942	2,724	4,744	653,711	1,423,191	2,076,903	93	14	12	5,583	3,455	3,585	12,624	0.6%
1943	2,643	4,070	634,433	1,221,095	1,855,528	92	27	-52	5,498	6,525	-15,606	-3,584	-0.2%
1944	2,426	3,360	582,192	1,008,019	1,590,211	81	68	101	4,876	16,399	30,159	51,434	3.2%
1945	2,549	4,099	611,690	1,229,579	1,841,269	85	25	-117	5,081	5,989	-35,054	-23,983	-1.3%
1946	2,755	3,979	661,089	1,193,598	1,854,687	101	59	-23	6,037	14,111	-6,880	13,267	0.7%

Water Year	FNA Jones Pumping (taf)	FNA Banks Pumping (taf)	FNA Jones Energy (MWh)	FNA Banks Energy (MWh)	FNA Total Energy (MWh)	Intertie Pumping Plant (taf)	Increased Jones Pumping (taf)	Increased Banks Pumping (taf)	Increased Intertie Energy (MWh)	Increased Jones Energy (MWh)	Increased Banks Energy (MWh)	Increased Total Energy (MWh)	Percent FNA Total Energy (%)
1947	2,491	3,033	597,836	909,879	1,507,715	87	73	-33	5,197	17,516	-9,776	12,936	0.9%
1948	2,491	2,950	597,845	885,001	1,482,846	24	-69	-21	1,414	-16,617	-6,360	-21,563	-1.5%
1949	2,565	2,626	615,516	787,795	1,403,310	52	-95	-166	3,112	-22,779	-49,664	-69,331	-4.9%
1950	2,572	2,960	617,239	887,863	1,505,102	101	117	297	6,053	28,131	89,013	123,197	8.2%
1951	2,202	4,256	528,371	1,276,900	1,805,271	59	12	129	3,512	2,869	38,820	45,200	2.5%
1952	2,909	4,931	698,192	1,479,362	2,177,554	104	23	-11	6,243	5,594	-3,182	8,655	0.4%
1953	2,664	4,020	639,351	1,206,143	1,845,494	93	-14	114	5,564	-3,322	34,201	36,443	2.0%
1954	2,596	4,015	623,148	1,204,494	1,827,642	98	96	-30	5,893	22,930	-9,009	19,814	1.1%
1955	2,181	2,756	523,478	826,833	1,350,311	77	110	-41	4,634	26,329	-12,346	18,616	1.4%
1956	2,580	4,278	619,215	1,283,535	1,902,750	82	21	-29	4,891	5,126	-8,703	1,313	0.1%
1957	2,520	3,459	604,735	1,037,630	1,642,365	96	6	23	5,776	1,547	6,758	14,081	0.9%
1958	2,862	4,855	686,841	1,456,423	2,143,264	112	0	22	6,712	41	6,741	13,494	0.6%
1959	2,537	3,491	608,894	1,047,195	1,656,089	104	116	-21	6,221	27,821	-6,166	27,875	1.7%
1960	2,035	2,846	488,333	853,833	1,342,166	52	35	-71	3,140	8,475	-21,265	-9,651	-0.7%
1961	2,436	3,133	584,725	939,757	1,524,482	80	14	-48	4,790	3,386	-14,409	-6,233	-0.4%
1962	2,510	3,390	602,503	1,016,919	1,619,422	82	84	-24	4,920	20,152	-7,188	17,883	1.1%
1963	2,619	4,339	628,505	1,301,761	1,930,266	106	34	75	6,366	8,073	22,462	36,901	1.9%
1964	2,218	3,228	532,314	968,360	1,500,674	83	85	-39	4,983	20,367	-11,804	13,546	0.9%
1965	2,542	3,983	610,111	1,195,032	1,805,143	101	47	21	6,057	11,306	6,289	23,652	1.3%
1966	2,627	3,774	630,519	1,132,077	1,762,596	127	160	-43	7,645	38,501	-12,940	33,205	1.9%
1967	2,833	4,719	680,008	1,415,765	2,095,773	96	34	19	5,739	8,153	5,717	19,610	0.9%
1968	2,504	3,842	601,040	1,152,687	1,753,727	74	-13	-117	4,459	-3,178	-35,010	-33,729	-1.9%
1969	2,796	4,747	671,063	1,424,072	2,095,134	96	59	-19	5,734	14,229	-5,644	14,319	0.7%
1970	2,274	4,076	545,724	1,222,698	1,768,422	70	64	-51	4,178	15,376	-15,387	4,167	0.2%
1971	2,701	4,213	648,244	1,263,994	1,912,238	93	58	-18	5,563	13,969	-5,406	14,126	0.7%
1972	2,597	3,505	623,312	1,051,556	1,674,868	106	165	-74	6,386	39,603	-22,233	23,757	1.4%

Water Year	FNA Jones Pumping (taf)	FNA Banks Pumping (taf)	FNA Jones Energy (MWh)	FNA Banks Energy (MWh)	FNA Total Energy (MWh)	Intertie Pumping Plant (taf)	Increased Jones Pumping (taf)	Increased Banks Pumping (taf)	Increased Intertie Energy (MWh)	Increased Jones Energy (MWh)	Increased Banks Energy (MWh)	Increased Total Energy (MWh)	Percent FNA Total Energy (%)
1973	2,554	4,014	613,012	1,204,272	1,817,284	100	48	27	6,000	11,581	8,181	25,762	1.4%
1974	2,792	4,678	670,058	1,403,411	2,073,468	113	85	-5	6,800	20,370	-1,629	25,541	1.2%
1975	2,711	4,601	650,566	1,380,425	2,030,991	115	90	35	6,899	21,612	10,391	38,902	1.9%
1976	1,889	2,687	453,329	806,236	1,259,565	74	77	51	4,467	18,492	15,310	38,269	3.0%
1977	1,287	836	308,782	250,853	559,636	23	-35	171	1,378	-8,387	51,207	44,198	7.9%
1978	2,552	3,890	612,568	1,167,035	1,779,603	77	-22	94	4,635	-5,362	28,114	27,387	1.5%
1979	2,713	3,900	651,155	1,170,008	1,821,164	104	12	-51	6,266	2,933	-15,239	-6,040	-0.3%
1980	2,613	4,311	627,144	1,293,442	1,920,586	93	66	-82	5,578	15,949	-24,495	-2,968	-0.2%
1981	2,744	3,342	658,469	1,002,660	1,661,130	99	26	6	5,910	6,145	1,663	13,718	0.8%
1982	2,829	4,877	679,040	1,463,091	2,142,131	95	20	11	5,702	4,874	3,275	13,851	0.6%
1983	2,741	4,925	657,837	1,477,384	2,135,221	87	-4	1	5,222	-906	365	4,682	0.2%
1984	2,206	4,106	529,343	1,231,697	1,761,040	46	5	22	2,760	1,127	6,660	10,548	0.6%
1985	2,650	3,732	635,906	1,119,699	1,755,605	92	83	-45	5,522	20,030	-13,508	12,045	0.7%
1986	2,663	4,241	639,142	1,272,309	1,911,451	91	39	-17	5,479	9,470	-5,018	9,931	0.5%
1987	1,587	3,207	380,877	962,155	1,343,032	35	-25	-52	2,100	-5,896	-15,516	-19,312	-1.4%
1988	1,676	1,798	402,346	539,269	941,615	47	13	-3	2,833	3,225	-794	5,264	0.6%
1989	2,087	2,812	500,773	843,702	1,344,475	32	36	2	1,930	8,711	531	11,171	0.8%
1990	1,711	1,760	410,532	528,096	938,627	6	8	-3	375	1,829	-778	1,425	0.2%
1991	1,539	1,211	369,450	363,300	732,749	44	-162	13	2,631	-38,863	3,979	-32,254	-4.4%
1992	1,175	1,420	281,913	425,984	707,897	22	85	166	1,302	20,353	49,764	71,418	10.1%
1993	2,318	3,916	556,202	1,174,811	1,731,013	99	114	27	5,964	27,258	8,069	41,291	2.4%
1994	2,453	2,898	588,654	869,365	1,458,019	65	83	3	3,882	19,898	946	24,726	1.7%
1995	2,718	4,590	652,362	1,377,118	2,029,481	83	143	-58	4,958	34,225	-17,293	21,889	1.1%
1996	2,647	4,172	635,195	1,251,677	1,886,872	87	-45	-77	5,247	-10,776	-23,223	-28,751	-1.5%
1997	2,587	3,600	620,999	1,080,037	1,701,036	108	20	-17	6,466	4,817	-5,059	6,224	0.4%
1998	2,753	4,693	660,833	1,407,939	2,068,772	92	47	-59	5,500	11,361	-17,567	-705	0.0%

Water Year	FNA Jones Pumping (taf)	FNA Banks Pumping (taf)	FNA Jones Energy (MWh)	FNA Banks Energy (MWh)	FNA Total Energy (MWh)	Intertie Pumping Plant (taf)	Increased Jones Pumping (taf)	Increased Banks Pumping (taf)	Increased Intertie Energy (MWh)	Increased Jones Energy (MWh)	Increased Banks Energy (MWh)	Increased Total Energy (MWh)	Percent FNA Total Energy (%)
1999	2,465	4,141	591,669	1,242,294	1,833,964	69	44	-51	4,113	10,650	-15,358	-595	0.0%
2000	2,563	4,012	615,203	1,203,595	1,818,797	116	42	74	6,952	9,995	22,251	39,198	2.2%
2001	2,303	2,851	552,606	855,361	1,407,967	86	83	-39	5,165	20,001	-11,736	13,430	1.0%
2002	2,608	2,959	625,847	887,761	1,513,608	50	-34	81	3,008	-8,273	24,176	18,912	1.2%
2003	2,484	3,622	596,084	1,086,662	1,682,746	100	100	-26	5,976	23,928	-7,832	22,072	1.3%
Min	1,106	836	265,377	250,853	559,636	6	-162	-255	332	-38,863	-76,588	-69,331	-4.9%
10%	1,640	1,959	393,524	587,806	950,280	32	-32	-74	1,947	-7,627	-22,136	-21,338	-1.4%
20%	2,036	2,805	488,743	841,588	1,343,321	48	-1	-51	2,872	-121	-15,334	-2,515	-0.1%
30%	2,235	2,983	536,337	895,027	1,502,002	64	13	-38	3,862	3,020	-11,445	4,720	0.2%
40%	2,455	3,472	589,177	1,041,456	1,638,067	77	22	-22	4,634	5,189	-6,478	9,165	0.6%
50%	2,515	3,783	603,619	1,134,779	1,754,666	83	34	-14	4,971	8,164	-4,100	13,349	0.7%
60%	2,569	3,982	616,550	1,194,459	1,794,927	92	47	2	5,499	11,349	512	14,242	0.9%
70%	2,617	4,104	628,097	1,231,061	1,839,530	95	72	16	5,725	17,180	4,873	19,753	1.3%
80%	2,694	4,274	646,465	1,282,208	1,912,081	100	83	27	5,996	20,025	8,008	27,062	1.7%
90%	2,753	4,701	660,686	1,410,236	2,072,999	106	99	80	6,356	23,828	24,005	38,839	2.1%
Max	2,909	4,931	698,192	1,479,362	2,177,554	127	165	334	7,645	39,603	100,145	123,197	10.1%
Avg	2,355	3,521	565,165	1,056,416	1,621,581	76	35	-3	4,550	8,474	-780	12,244	0.9%

FNA = Future No Action.
MWh = megawatt hours.
taf = thousand acre-feet.

5.3 Visual Resources

5.3.1 Introduction

This section describes the existing environmental conditions and the consequences of constructing and operating the project alternatives on visual resources. Specifically, this section evaluates and discusses the consequences of the construction and operation of the project in terms of changes to visual character and quality, visibility of proposed changes, and viewer response to and significance of those changes. The primary concern related to visual/aesthetic resources in the project area is permanent changes in views.

5.3.2 Concepts and Terminology for Visual Assessment and Visual Quality

In Webster's *New World Dictionary*, aesthetics is defined as "the study or theory of beauty and the psychological responses to it." Aesthetics (or visual resource) analysis is, therefore, a process to logically assess visible change and viewer response to that change.

Identification of existing conditions with regard to visual resources entails three steps:

1. Objective identification of the visual features (visual resources) of the landscape.
2. Assessment of the character and quality of those resources relative to overall regional visual character.
3. Identification of the importance to people, or sensitivity, of views of visual resources in the landscape.

With an establishment of the existing (baseline) conditions, alternatives or other change to the landscape can be systematically evaluated for their degree of effect. The degree of the effect depends both on the magnitude of change in the visual resource (i.e., visual character and quality) and on viewers' responses to and concern for those changes. This general process is similar for all established federal procedures of visual assessment (Smardon et al. 1986) and represents a suitable methodology of visual assessment for other projects and areas.

The approach to this visual assessment is adapted from the FHWA's visual impact assessment system (Federal Highway Administration 1988) in combination with other established visual assessment systems. The visual impact assessment process involves identification of:

- relevant policies and concerns for protection of visual resources;

- visual resources of the region, the immediate project area, and the project site;
- important viewing locations (e.g., roads) and the general visibility of the project area and site using descriptions and photographs;
- viewer groups and their sensitivity; and
- potential effects.

The well-established approach to visual analysis adopted by the FHWA employs the concepts of vividness, intactness, and unity (Federal Highway Administration 1988). These terms are defined below.

- **Vividness**—The visual power or memorability of landscape components as they combine in striking or distinctive visual patterns.
- **Intactness**—The visual integrity of the natural and artificial landscape and its freedom from encroaching elements. Intactness can be present in well-kept urban and rural landscapes, as well as in natural settings.
- **Unity**—The visual coherence and compositional harmony of the landscape considered as a whole; it frequently attests to the careful design of individual components in the artificial landscape.

The appearance of the landscape is described below using these criteria and descriptions of the dominance of elements of form, line, color, and texture, the basic components used to describe visual character and quality for most visual assessments (U.S. Forest Service 1995; Federal Highway Administration 1988). In addition to their use as descriptors, *vividness, unity,* and *intactness* are used more objectively as part of a rating system to assess a landscape's visual quality. This rating system uses seven categories, ranging from very low to moderate to very high. Viewer sensitivity or concern is based on the visibility of resources in the landscape, the proximity of viewers to the visual resource, the relative elevation of viewers to the visual resource, the frequency and duration of views, the number of viewers, and the types and expectations of individuals and viewer groups.

The criteria for identifying importance of views are related in part to the position of the viewer relative to the resource. An area of the landscape that is visible from a particular location (e.g., an overlook) or series of points (e.g., a road or trail) is termed a *viewshed*. To identify the importance of views of a resource, a viewshed may be broken into distance zones of foreground, middleground, and background. Generally, the closer a resource is to the viewer, the more dominant it is and the greater is its importance to the viewer. Although distance zones in viewsheds may vary between different geographic regions or types of terrain, a commonly used set of criteria identifies the foreground zone as 0.4–0.8 kilometer (0.25–0.5 mile) from the viewer, the middleground zone as extending from the foreground zone to 4.8–8 kilometers (3–5 miles) from the viewer, and the background zone as extending from the middleground zone to infinity (U.S. Forest Service 1995).

Visual sensitivity also depends on the number and type of viewers and the frequency and duration of views. Generally, visual sensitivity increases with an increase in total numbers of viewers, the frequency of viewing (e.g., daily or seasonally), and the duration of views (i.e., how long a scene is viewed). Also, visual sensitivity is higher for views seen by people who are driving for pleasure; people engaging in recreational activities such as hiking, biking, or camping; and homeowners. Sensitivity tends to be lower for views seen by people driving to and from work or as part of their work (U.S. Forest Service 1995; U.S. Soil Conservation Service 1978; Federal Highway Administration 1988). Views from recreation trails and areas, scenic highways, and scenic overlooks generally are assessed as having high visual sensitivity.

5.3.3 Affected Environment

Sources of Information

The following key sources of information were used in the preparation of this section:

- direct field observation from public vantage points, including public property and roadways (conducted by an ICF Jones & Stokes landscape architect on October 28, 2008);
- photographic documentation of key views of the project site;
- review of project construction drawings; and
- review of the project in regard to compliance with state and local ordinances and regulations and professional standards pertaining to visual quality.

Regional Visual Character

The Project is located in the Central Valley of California, approximately 5 miles west of Tracy, in unincorporated Alameda and San Joaquin Counties (Figure 2-1). For purposes of the visual analysis, the project region, as discussed in this section, is considered the area within a 30-mile radius of the project location. The cities of Lodi, Stockton, Manteca, Modesto, and Turlock are also in the region. Most regional development occurs along transportation corridors, such as I-5 to the west and SR 99 to the east. The Delta, northwest of the project site, is an integral part of the region's visual character. Connected to the Delta are many rivers, creeks, sloughs, and bays that strongly influence local land use patterns. East of the Delta, open agricultural land is dotted with rural development that becomes increasingly urbanized near the city limits of Stockton and other smaller cities and towns in the region.

Agricultural land in the region, planted predominantly with orchard and row crops, stretches for miles. A patchwork of fields separates cities within the region from one another. These fields offer expansive views that extend over the valley floor to the east and Diablo Range to the west when haze is at a minimum. These landscape views are strongly characteristic of the Sacramento-San Joaquin Valley and have contributed to the regional identity.

Development radiating out from the urban cores is reducing the amount of agricultural land in parts of the region and closing the gap between larger and smaller outlying cities. This is beginning to change the visual character from rural to suburban. The smaller cities, including Tracy, are typified by a growing core of residential, commercial, and some industrial land uses with agricultural fields surrounding the city outskirts.

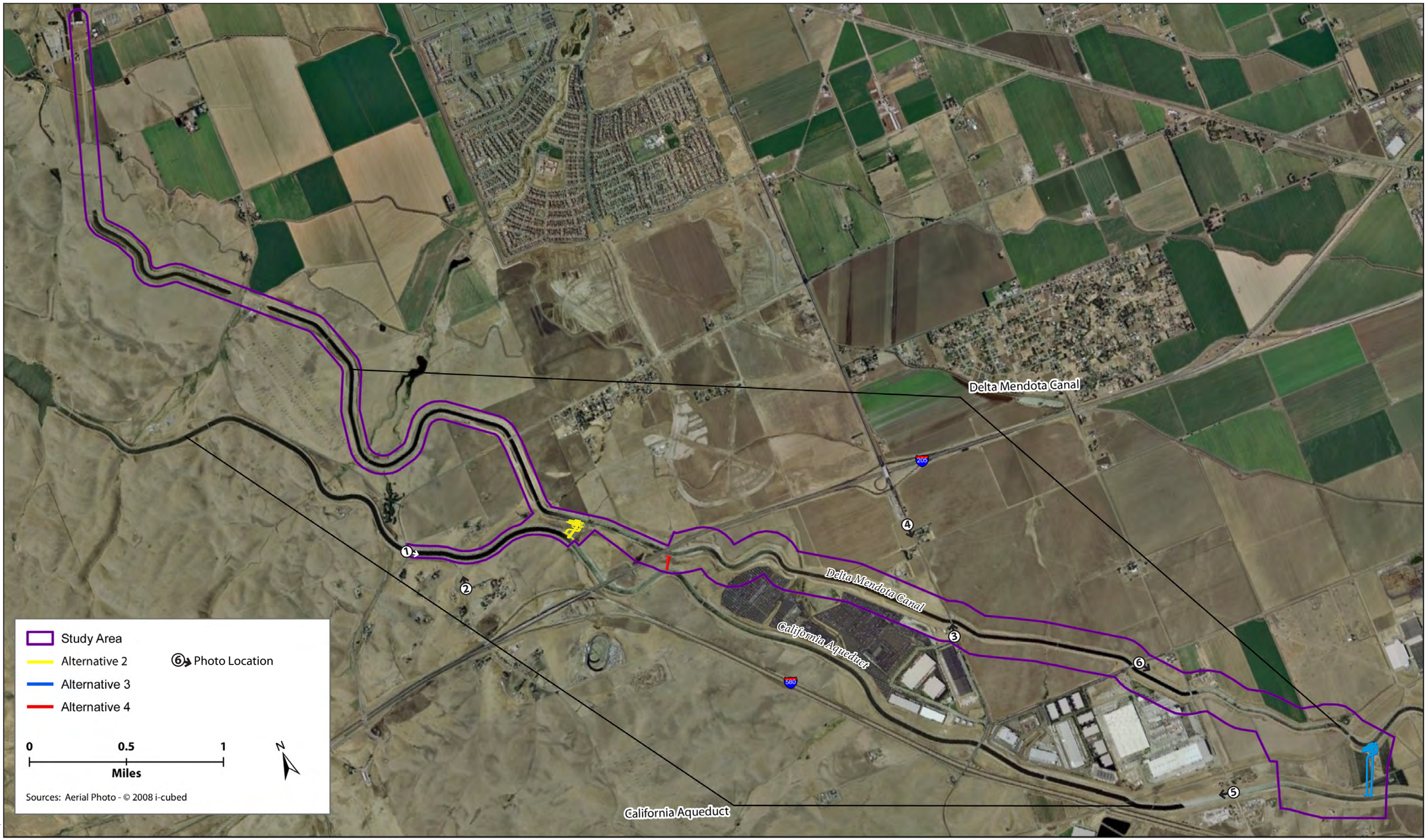
A mix of agricultural, developed, and natural landscapes characterizes the project region. The landscape pattern is influenced by development spreading from city cores and the major roadways in the region. Water features in the greater region include the Sacramento, Tuolumne, and San Joaquin Rivers and their tributaries, numerous Delta sloughs, the DMC, California Aqueduct, and smaller local irrigation ditches.

Visual Character of Project Vicinity

For the purposes of the visual analysis, the project vicinity is defined as the area within 0.5 mile of the project site. Key viewpoints, shown in Figure 5.3-1, have been chosen for their representation of the relative landscape and affected viewers. The project site is located at the eastern base of the Diablo Range foothills, in the agricultural outskirts of Tracy. The vicinity comprises primarily agricultural, warehouse, and open space land uses.

I-205 runs east-west through the northern portion of the site, and I-580 runs northwest-southeast just west of the site. The segment of I-580 in the vicinity is officially designated as a state scenic highway, and the proposed project site is located in the foreground of its viewshed. However, the project alternative sites are not readily visible from I-580 and local roadways because of the rolling terrain (Figure 5.3-2, Photos 1 and 2). The two highways are main thoroughfares through the vicinity. Several smaller local roads (West Patterson Pass, Schulte, and Hansen Roads) provide access to the larger roadways and are local travel routes in the area. The California Aqueduct and DMC are the major waterways in the vicinity.

Views in the vicinity are composed of warehouse facilities, rolling terrain, agricultural fields, rural residences, roadways, and human-made features (concrete-lined waterways, wooden utility poles, and transmission lines) back-dropped by the Diablo Range and flat valley floor extending east from the foot of the range and into the distant background (Figure 5.3-2, Photos 3 and 4).



Graphics ... 00668.06 (04-09) SS

ICF Jones & Stokes
an ICF International Company

Figure 5.3-1
Key Viewpoints and Photo Locations

Photo 1.

Photo 2.

Graphics ... 06688.06 (1-23-09) tm

ICF Jones & Stokes
an ICF International Company

Figure 5.3-2
Representative Photographs

Photo 3.

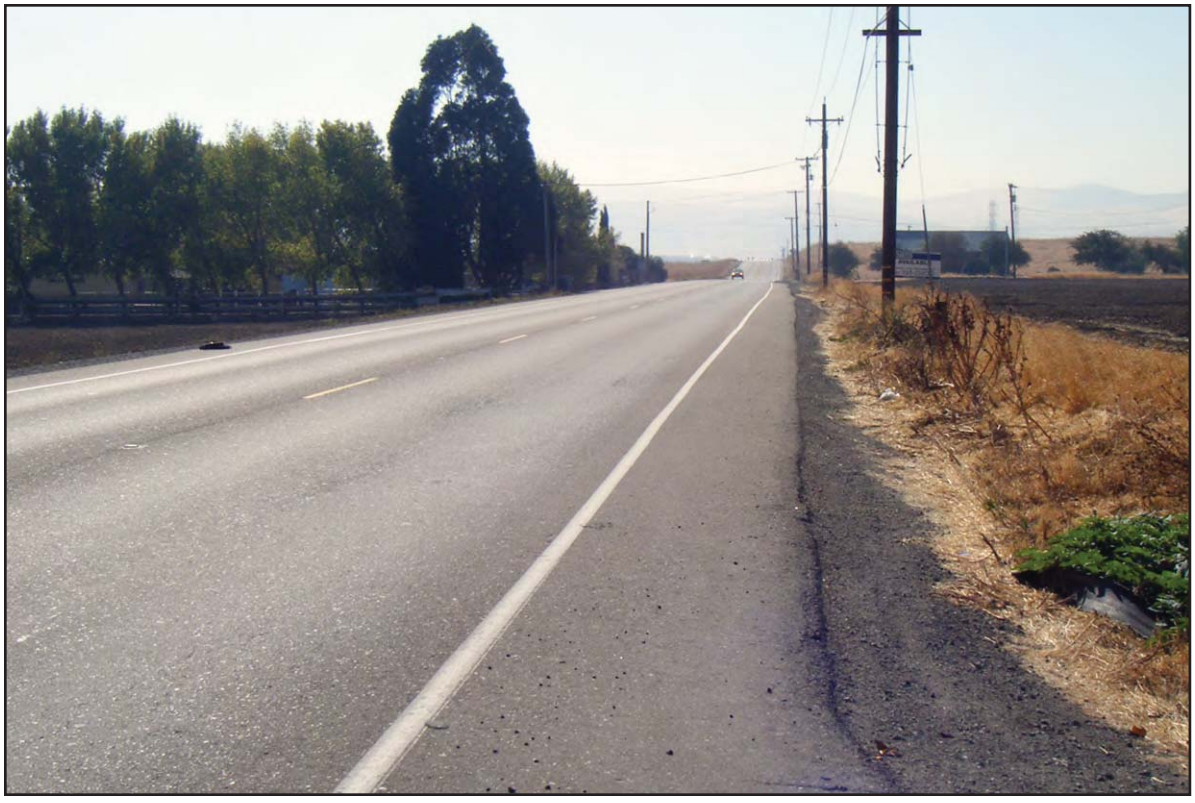


Photo 4.

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ICF Jones & Stokes
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Figure 5.3-2
Representative Photographs

Photo 5.

Photo 6.

Graphics ... 06688.06 (1-23-09) tm

ICF Jones & Stokes
an ICF International Company

Figure 5.3-2
Representative Photographs

Viewer Groups and Viewer Response

Residents

Several single-family residences are located at the southern end of the project vicinity. These residents do not have direct views of the project site because of the rolling terrain, surrounding vegetation, and other built structures nearby. Residents are likely to have a moderately low sensitivity to visual changes at the project site.

Nototonme Northern Valley Yokut Tribe

The Nototonme Northern Valley Yokut Tribe (Yokut), addressed in Section 5.4, Cultural Resources, once inhabited the region. While there are no significant cultural resources within the project area, the vicinity and surrounding region contain sensitive resources of significance to the Yokut such as Mount Diablo, Brushy Peak, and Mountain House Road (a former foot trail for Native Americans traveling to worship at Mount Diablo). Views from the project area and vicinity to Mount Diablo have been identified as important in the religious ceremonies of the Yokut. It is noted that construction in the vicinity has failed to consider the importance of the view towards Mount Diablo. (Davis-King 2003a, 2003b.) Because of the importance of views in the vicinity outward toward sensitive cultural resources, the Yokut would have high sensitivity to visual changes at the project site.

Recreationists

Recreationists include people using the bike trail along the California Aqueduct (Figure 5.3-2, Photos 1 and 2) for walking, jogging, running, or cycling (Figure 5.3-2, Photo 5). Cycling also takes place on local roadways. Given the distance of larger residential areas, the number of recreationists is anticipated to be small. Recreationists are likely to be moderately sensitive to visual changes at the project site. They are more likely to regard the natural and built surroundings as a holistic visual experience. However, because of the presence of infrastructure existing along the canal and in the surrounding area, they are likely to be more accustomed to the operational nature of the canal and have moderately low sensitivity to visual changes associated with canal operations (Figure 5.3-2, Photo 6).

Roadway Users

Viewers who frequently travel I-205, I-580, and local roadways generally possess low visual sensitivity to their surroundings. The segment of I-580 in the project vicinity is an officially designated state scenic highway and is slightly elevated above local roadways, with views looking east and down gradient toward the site.

Travelers on this portion of I-580 may have glimpses of the site, but they would be traveling at high rates of speed, averaging 70–80 miles per hour. In addition, the rolling terrain mostly precludes view of the sites where the pump plant might be constructed. Travelers on local roadways include rural residents, warehouse shipping operations vehicle drivers, and commuters driving to the warehouse facilities in the area. Their views toward the sites where the pump plant might be constructed also are largely obscured by the rolling terrain. The passing landscape becomes familiar for roadway users, and their attention typically is not focused on the passing views. At standard roadway speeds, views are of short duration and roadway users are fleetingly aware of surrounding traffic, road signs, their immediate surroundings within the automobile, and other visual features. These viewers have low sensitivity to their surroundings because their focus is concentrated driving and roadway conditions.

5.3.4 Environmental Consequences

Assessment Methods

Analysis of the visual effects of the project is based on:

- direct field observation from key vantage points such as public roadways;
- photographic documentation of key views of and from the project site, as well as regional visual context;
- review of project construction drawings; and
- review of the project in regard to professional standards pertaining to visual quality.

Regulatory Setting

Federal

The preparation of EISs is guided by the NEPA Council on Environmental Quality (CEQ) regulations at the federal level. These regulations state that the following effects should be taken into account when determining an impact's significance: direct effects of the alternatives; indirect effects of the alternatives; and possible conflicts between the alternatives and the objectives of federal, regional, state, and local land use plans, policies, and controls for the area concerned.

State

I-580, in its entirety within San Joaquin County and from the San Joaquin County line to SR 205 in Alameda County, has been designated by state legislation as a scenic highway. The scenic corridor, defined as the area generally adjacent to and

visible from the highway, is subject to protection, including regulation of land use, site planning, advertising, earthmoving, landscaping, and design and appearance of structures and equipment. Examples of visual intrusions that would degrade scenic corridors as stipulated by Caltrans, which are applicable to the proposed Project, include dense and continuous development, highly reflective surfaces, development along ridge lines, extensive cut and fill, scarred hillsides and landscape, exposed and unvegetated earth, and dominance of exotic vegetation. Unsightly land uses would include actions that result in these conditions (California Department of Transportation 1996).

> **Streets and Highway Code—Division 1, Chapter 2, Article 2.5 Section 261 Planning and Design Standards; Complete Highway:** The standards for official scenic highways shall also require that local governmental agencies have taken such action as may be necessary to protect the scenic appearance of the scenic corridor, the band of land generally adjacent to the highway right-of-way, including, but not limited to (1) regulation of land use and intensity (density) of development; (2) detailed land and site planning; (3) control of outdoor advertising; (4) careful attention to and control of earthmoving and landscaping; and (5) the design and appearance of structures and equipment.

5.3.5 Environmental Effects

Alternative 1 (No Action)

Under the No Action Alternative, the Intertie would not be widened and intersection improvements would not be constructed. There would be no impacts on visual resources.

Alternative 2 (Proposed Action)

Construction Effects

Impact VIS-1: Temporary Visual Impacts Caused by Construction Activities

Construction of the proposed improvements would create temporary changes in views of and from the project area. Construction activities would introduce considerable heavy equipment and associated vehicles, including dozers, graders, scrapers, and trucks, into the viewshed of recreational viewers using the California Aqueduct bike trail at the Intertie location. There are no public roadways or residential areas with direct views of this location. Construction for the entire project is expected to require approximately 15 months. Construction of the overhead transmission line, on the west side of the DMC and across I-205, would be visible to all viewer groups, but construction would not be occurring at one place along the alignment for any extended period of time.

Because this alternative is located in an area that has nearby construction activities, agricultural activities, and warehouse operations, all viewer groups in

the project area are accustomed to seeing construction activities and large or heavy equipment in the area; their sensitivity to such impacts would be low. There would be no adverse effect.

Operation Effects

Impact VIS-2: Adversely Affect a Scenic Vista

The project area is not located in an area designated as a scenic vista and therefore would not obstruct public scenic vistas or views. Therefore, implementation of the proposed project would not result in any adverse effects on scenic vistas.

Impact VIS-3: Damage Scenic Resources along a Scenic Highway

I-580 is an officially designated state scenic highway worthy of protection for maintaining and enhancing scenic viewsheds. The project site is located out of view from I-580 and far enough away that it would not damage scenic resources, such as trees, rock outcroppings, and historic buildings along a scenic highway. There would be no adverse effect.

Impact VIS-4: Degrade the Existing Visual Character or Quality of the Site and Its Surroundings

All viewer groups, except for recreationists using the California Aqueduct bike trail, do not have direct views of the project site because this location is situated in rolling terrain and there are no public roadways with direct visual access. After the project is complete the facility will not be visible; however, if it were visible, it would not differ greatly from the existing facilities along the canal and would not contrast greatly from existing infrastructure and development in the area. The existing natural state would not be substantially altered. The project site's position in the landscape and surrounding vegetation make this site only minimally visible. Because of these factors, the proposed project would not detract from views from the project site and vicinity to surrounding sensitive Yokut cultural resources, such as Mount Diablo. Operation of the pump plant would not affect views. Transmission line crossing over I-205 would require replacing old lines with new lines. This may require slight tower height increase of less than 10%, which would not be a recognizable difference from the existing structures. Agency coordination could result in aerial marker balls and steel poles being required to facilitate highway crossings of transmission lines. However, the primary viewer group that would see these features would be roadway users, and given the high rate of travel speed on I-205 and existing presence of the transmission lines, these features would not stand out amongst the existing visual environment or greatly alter the existing visual character. There would be no adverse effect.

Impact VIS-5: Create a New Source of Light or Glare

Once the facility has been built, the Intertie pump plant and pipelines would increase the amount of reflective surface present but not to a level that would substantially alter the amount of glare perceived in the project area. New sources of light would be introduced from the safety lighting associated with the Intertie facility. Steel poles may be required to facilitate highway crossings of transmission lines over I-205. These poles are typically galvanized steel, and these surfaces would naturally oxidize within a short time following installation and would not cause reflective daytime or nighttime glare.

Implementation of Mitigation Measures VIS-MM-1, VIS-MM-2, and VIS-MM-3 would reduce any adverse effects.

Mitigation Measure VIS-MM-1: Apply Minimum Lighting Standards

Lights will be installed at the lowest allowable height; low-pressure sodium lamps at the lowest allowable wattage (less than 2000 lumens [150 watts]) will be used; lights will be screened and directed away from the night sky to the highest degree possible; and the amount of nighttime lights used, as well as the duration the lights are on, will be minimized to the highest degree possible.

Mitigation Measure VIS-MM-2: Construct Facilities and Infrastructure with Low-Sheen and Non-Reflective Surface Materials

Wall finishes will have low-sheen and non-reflective surface materials to reduce potential for glare. The use of smooth-trowelled surfaces and glossy paint will be avoided. At a minimum, infrastructure materials will be non-reflective, such as earth-toned concrete or galvanized steel that would naturally oxidize a short time after installation and would not cause reflective daytime glare.

Mitigation Measure VIS-MM-3: Reduce Visibility of New Structures

Recent studies have shown that painting structures 1 to 2 degrees darker than the color of the general surrounding area creates less of a visual impact than matching or lighter hues (U.S. Bureau of Land Management 2008). Therefore, new structures will be painted with a shade that is 1 to 2 degrees darker than the general surrounding area. Colors will be chosen from the U.S. Bureau of Land Management Standard Environmental Colors Chart CC-001: June 2008. Because color selection will vary by location, the project proponent will employ the use of color panels evaluated from key observation points during common lighting conditions (front vs. back lighting) to aid in the appropriate color selection. Color selection shall be made for the coloring of the most prevalent season. Panels will be a minimum of 3 feet by 2 feet in dimension and will be evaluated from various distances to ensure the best possible color selection. Refer to <http://www.blm.gov/bmp> for more information on this technique and other BMPs and techniques for visual screening.

All paints used for the color panels and structures will be color matched directly from the physical color chart and not any digital or color reproduced versions of the color chart. Paints will use a dull, flat, or satin finish only. Appropriate paint type will be selected for the finished structures to ensure long term durability of the painted surfaces. The project proponent will maintain the paint color over time.

Alternative 3 (TANC Intertie Site)

Construction Effects

Construction of the Alternative 3 Intertie would be the same as described for Alternative 2. The only difference is that there are a few rural residences located within 0.25 mile of this location, and an active railroad north of the project site. There are no restrictions on when construction could occur; therefore, implementation of Mitigation Measure VIS-MM-4 would reduce the effects of construction so there would be no adverse effects on nearby residences.

Mitigation Measure VIS-MM-4: Limit Construction to Daylight Hours near Residences

Construction activities scheduled to occur after 6:00 p.m. or on weekends should not continue past daylight hours (which vary according to season). This would reduce the amount of construction effects experienced by nearby residences because most construction activities would occur during business hours when most viewer groups are likely at work, and eliminate the need to introduce high-wattage lighting sources for nighttime construction.

Operation Effects

Operation of the Alternative 3 Intertie would be the same as described for Alternative 2; refer to Impacts VIS-2, VIS-3, VIS-4, and VIS-5 and Mitigation Measures VIS-MM-1, VIS-MM-2, and VIS-MM-3.

Alternative 4 (Virtual Intertie)

Construction Effects

No permanent features would be constructed under this Alternative. Installation of the temporary, pipeline would require some heavy equipment and would be constructed in an area that is rural and already includes use of heavy equipment for agriculture and industrial practices as described above. However, the temporary pipeline would only be installed during emergencies. As such, there would be no adverse effect.

Operation Effects

Operation of the existing Banks Pumping Plant in the south Delta would not result in any aesthetic changes. The temporary intertie would be placed and operated approximately 0.5 mile south of the proposed Alternative 2, in an area that has only intermittent recreational viewers. The temporary Intertie would be only for emergencies and would be used very infrequently. Because there would be no changes at Banks and because of the temporary nature of the virtual intertie and lack of sensitive viewers, there would be no adverse effect.

5.4 Cultural Resources

5.4.1 Introduction

This section describes the existing environmental conditions and the consequences of constructing and operating the project alternatives on cultural resources. The term *cultural resources* is used to describe several different types of properties: prehistoric and historical archaeological sites; architectural properties such as buildings, bridges, and infrastructure; and resources of importance to Native Americans.

5.4.2 Affected Environment

The Proposed Action is located in the periphery of the Delta Region, as defined in the CALFED PEIS/EIR (CALFED Bay-Delta Program 2000a). Over the last 20–30 years, 16 cultural resource studies have been conducted in the footprint of the Proposed Action, resulting in intensive survey coverage of most of the project footprint (Atwell et al. 1995; Bard 2001; Canaday et al. 1992; Chavez 1995; Egherman 2001; Foster 1996; Holman 1982, 1983, 1984; Jensen & Associates 1986; Jones & Stokes Associates 1989; Moratto, Jackson et al. 1990; Moratto, Pettigrew et al. 1994; Peak 2002; Werner 1988; Western Area Power Administration 2005). The entire Alternative 2 footprint has been surveyed previously and approximately 30% of Alternative 3 has been surveyed previously. The Proposed Action potentially would affect five cultural resources: the DMC, the California Aqueduct, the Byron Bethany Irrigation District Main Canal (CA-Ala-549H/CA-CCo-738H), the Tracy Switch Station (P-01-10443), and Jones Pumping Plant (P-01-10442). Alternative 3 potentially would affect two cultural resources: the DMC and the California Aqueduct.

Sources of Information

The key sources of data and information used in the preparation of this section are listed below.

- Detailed records searches obtained from the California Historical Resources Information System (CHRIS).
- Input from Native American tribes and historical organizations.
- A review of historical literature and previous reports.
- Additional primary research.

Cultural Setting

Prehistory and Ethnography

Little is known of human occupation in the Delta prior to 4500 B.P. (years before present, with *present* being 1950). Because of rapid alluvial and colluvial deposition in the valley over the past 10,000 years, ancient cultural deposits are deeply buried in many areas. The earliest evidence of widespread occupation of the Delta region comes from several sites assigned to the Windmiller Pattern (previously, Early Horizon), dated ca 4500–2500 B.P. (Ragir 1972). Known Windmiller Pattern sites are concentrated on low rises or knolls within the floodplains of major creeks or rivers. Later prehistoric archeological sites attributed to the Berkeley and Augustine Patterns (previously, Middle and Late Horizon) exhibit wider geographic distribution, though few archaeological sites have been identified in the vicinity of the Proposed Action.

The aboriginal inhabitants of the area in which the Proposed Action is located are known as the *Cholvon* Northern Valley Yokuts and the *Luecha* tribelet of Costanoan Indians (Milliken 1994; Schenck 1926). *Yokuts* is a term applied to a large and diverse number of peoples inhabiting the San Joaquin Valley and Sierra Nevada foothills of central California. The Yokuts cultures include three primary divisions, corresponding to gross environmental zones: the Southern Valley Yokuts, the Foothill Yokuts, and the Northern Valley Yokuts (Kroeber 1976; Silverstein 1978). Principal Northern Valley Yokuts settlements were located on the tops of low mounds, on or near the banks of the larger watercourses. Yokuts settlement, however, focused on the Delta proper and the San Joaquin River (Wallace 1978).

Anthropologists and archaeologists typically attribute the margins of the northern San Joaquin Valley and the Delta to the Northern Valley Yokuts. Recent archival research, however, indicates that a small group of Indians speaking a Costanoan language lived near and periodically may have used the margins of the valley—this group is the Luecha tribelet of Costanoan Indians. The Luecha inhabited Arroyo Mocho, Corral Hollow, and Patterson Pass in the South Coast Ranges (Patterson Pass is about 3 miles southeast of DMC milepost 7.69). The Luecha probably had social ties to the valley, as indicated by marriages to the Cholvon and Pitemes Northern Valley Yokuts. The Luechas intermarried with other Costanoan-speaking groups in the eastern South Coast Ranges, however, suggesting a greater focus of activities in the uplands west of the valley. (Milliken 1994.)

The area that would be affected by ground disturbance associated with the Proposed Action has little potential to contain surface or buried archaeological sites. First, the footprint of the Proposed Action has been thoroughly surveyed for cultural resources, and no archaeological sites have been identified in that footprint. Second, there is little potential for the Proposed Action's footprint to contain buried archaeological sites because of the nature and degree of ground

disturbance that resulted from construction of the DMC and the California Aqueduct. The DMC ROW, for instance, was excavated to depths of 25 feet below ground surface. Reclamation piled excavated soils directly next to the DMC, effectively raising the elevation of the ground surface (although Reclamation has sold some of the spoils for fill). The mounds formed by the spoil piles are 30 feet tall in some areas along the DMC. The California Aqueduct, which is wider and deeper than the DMC, was constructed in a similar manner, including spoil disposal (Werner 1988:6–7).

History

Project Area

The Project Area is located in eastern Alameda County, west of the city of Tracy, at the southern end of the Delta. In general, European settlers in Alta California ignored the Central Valley and the Delta region until the mid-nineteenth century. The Spanish confined their settlement to a thin strip along the coastline. In 1806, Gabriel Moraga explored much of the region by following the Kern and Kings Rivers into the foothills of the Sierra Nevada. Following Mexico's independence from Spain in 1821, the settlement of California progressed with the issuance of rancho lands by the Mexican governors. The most notable of these governors were Juan Bautista Alvarado, Manuel Micheltorena, and Pio Pico. With the exception of a few grants in the Sacramento Valley, the ranchos were located in the same general areas as the coastal missions. The El Pescadero Grant (or Rancho San Antonio), which covered most of present day Alameda County including the project area, was granted to Luis Maria Peralta in 1820. Settlement on the grant was not substantial though, especially in the vicinity of the project area, until the well-publicized discovery of gold in 1848 (Bean and Rawls 1983:52; Kyle et. al. 1990:9).

Following the Gold Rush, settlement in the Delta region increased dramatically, largely as a result of the passage of the Swamp and Overflow Act in 1850. The law transferred swamplands from the U.S. government into the control of the state of California. As a result of this act, approximately 500,000 acres of newly acquired California swampland located in the Delta were sold to private citizens (CALFED Bay-Delta Program 1996:10; Thompson 1957:186). By the turn of the 20th century, transportation improvements, such as the construction of Southern Pacific Railroad and Western Pacific Railroad alignments in the Delta region connecting the Delta to populated centers such as Sacramento and San Francisco, encouraged the movement of agricultural products from the Delta to outlying markets. By the 1920s, crops such as asparagus, barley, celery, corn, and alfalfa for local dairy farms were introduced to the area (Thomas Brothers 1920). Throughout the twentieth century, the South Delta region continued to be used for agricultural purposes.

Central Valley Project

The DMC was constructed between 1946 and 1952 and was an essential component of the CVP. The origins of the CVP can be traced back as far as the 1870s, but a substantial statewide plan for a water system was not truly developed until 1919 after concern over declining water tables in the state led Robert B. Marshall, Chief Geographer at the USGS, to propose the Marshall Plan. In his plan, Marshall proposed building a large dam on the upper Sacramento River to create an enormous reservoir. Two large aqueducts, linked to the reservoir, would run along either side of the Central Valley and convey water south. Although California voters rejected Marshall's plan several times, it nevertheless laid the foundation for the construction of the CVP (JRP Historical Consulting Services 1995:190).

Despite the failure of Marshall's plan at the ballot box, in the 1920s the California State Legislature became interested in the state's systemic water problems and began to seek a resolution. As a result, between 1927 and 1931, California's State Engineer, Edward Hyatt, conducted studies of the issue and in 1931 released a new statewide water plan. This plan adopted components of Marshall's plan but also included substantial alterations. Hyatt proposed a large system of reservoirs and canals throughout the state, incorporating much of what would become the CVP, in addition to proposing a system to convey water from the Colorado River to California. California voters approved a bond initiative in 1933 for construction of the Central Valley portion of the project; however, because of the Great Depression, the state could not secure finances to begin construction. The initiative, called the Central Valley Project Act, is where the CVP takes its name (Hattersley-Drayton 2000:25; JRP Historical Consulting Services 1995:191).

In order to complete the project, the state approached the federal government for funding. As it was the Depression, the state proposed the project as a jobs program that would be part of Franklin Roosevelt's New Deal. After a series of negotiations, the federal government opted to make the project a federal reclamation undertaking, making Reclamation the lead agency on the project. Reclamation saw the CVP as several components operating as a single system. The proposed DMC, designed to convey Sacramento River water south from a pumping plant near Tracy, was a key component of the system. In 1935, the federal government released the first funds to begin construction of the CVP; however, construction was delayed on the DMC portion of the project because of the onset of World War II. In 1946, construction began on the DMC and Reclamation finally completed it in 1952 (JRP Historical Consulting Services 1995:191–192, 195).

State Water Project

Just 1 year before completion of the DMC, the California State Legislature approved another massive water project, the SWP, originally the Feather River Project. This project, proposed by State Engineer, Arthur D. Edmonston, sought

to convey water from the Feather River to areas outside the CVP, namely Los Angeles and farming communities in the extreme southern portions of the San Joaquin Valley. California's growing population meant that more water was needed for agricultural and residential purposes. As planned, the Sacramento and Feather Rivers would convey runoff from a reservoir near Oroville created by a dam (the Oroville Dam) to the Delta, where a 444-mile aqueduct (the California Aqueduct) would convey it south. The plan was placed on the ballot in 1960, and voters approved it by a small margin. The following year, construction of the SWP began, including construction on its most essential component, the California Aqueduct (JRP Historical Consulting Services 1995:204).

In 1962, the SWP began delivering water to Alameda County. By 1972, all initial features of the SWP, including the California Aqueduct, were completed. Water was delivered to the Bay Area, San Joaquin Valley, and southern California communities (JRP Historical Consulting Services 1995:205–206).

Summary of Cultural Resources in the Project Area

The following section describes known cultural resources in, or directly adjacent to, the project area.

No archaeological resources are located within the project area. Five architectural (built environment) resources are located in the project area. These resources include the Delta-Mendota Canal, the California Aqueduct, Byron Bethany Irrigation District Main Canal, Tracy Switch Station, and the Jones Pumping Plant. The resources are described below.

Delta-Mendota Canal

The DMC is a component of the CVP. Construction on the resource commenced in 1946 and was completed in 1952. The DMC draws water from the Jones Pumping Plant and conveys it south to a point 30 miles west of Fresno on the San Joaquin River. Approximately 95 miles of the canal is concrete-lined, and 18 miles of it is earthen. (JRP Historical Consulting Services 1995:197.) The DMC is described in Chapter 2 of this EIS.

California Aqueduct

The California Aqueduct is a component of the SWP, which was constructed between 1961 and 1972. The canal draws water from the Delta and conveys it south, terminating in Riverside. It is generally constructed of unreinforced concrete and shrinks in width as it as it heads south (JRP Historical Consulting Services 1995:204–205). The California Aqueduct is described in Chapter 2 of this EIS.

Byron Bethany Irrigation District Main Canal

The overhead transmission line proposed as part of the Intertie crosses over the Byron Bethany Irrigation District Main Canal (CA-Ala-549H) 1,100 feet south of Kelso Road at the DMC. CA-Ala-549H was constructed in 1917 as an earthen ditch and was incorporated into the Byron Bethany Irrigation District as Canal 70 in 1919. The canal draws water from Kellogg Creek to the northwest and conveys water southeast to Mountain House Creek. The canal was significantly modified in 1968 through the addition of turnout gates and concrete lining in some areas (Bakic and Baker 2001).

Tracy Switch Station

Tracy Switch Station (P-01-10443) is located in the far northern portion of the Proposed Action and forms the terminus of the Proposed Action's overhead transmission line. Reclamation began construction of the facility in 1946 and completed it in 1952. Tracy Switch Station consists of storage tanks, sheds, transmission towers, and other buildings. Much of the station consists of facilities added in the 1960s and 1990s. The switching station controls power for the DMC pumps (Baker 2001a; Bakic 2001a).

Jones Pumping Plant

Jones Pumping Plant (P-01-10442) is located at the far northern part of the Proposed Action and forms the terminus of the Proposed Action's overhead transmission line. Reclamation constructed the pumping station between 1946 and 1952. The pumping station consists of a fenced yard enclosing two office buildings and a storage building, in addition to a pump station on the DMC. The pumping station was built to lift water from the DMC and is an integral part of the CVP. (Baker 2001a; Bakic 2001b.)

5.4.3 Environmental Consequences

Assessment Methods

The purpose of this section is to determine whether the Proposed Action has the potential to substantially affect cultural resources. This cultural resource assessment follows guidance and procedures set forth by CALFED and Reclamation (Bureau of Reclamation 2000; CALFED Bay-Delta Program 2000b). The assessment is based on records searches at the Central California Information Center (CCIC) and the Northwest Information Center (NWIC) of the CHRIS; a review of published literature on the prehistory, ethnography, and history of the project vicinity; consultation with the NAHC in Sacramento, and a pedestrian survey of the Alternative 3 footprint.

Records searches were conducted at the CCIC on May 5, 2003, and February 12, 2008. Records searches were conducted at the NWIC on May 16, 2003. The CCIC manages the State of California's database of previous cultural resource studies and known cultural resources for a seven-county area, including San Joaquin County; the NWIC manages the records for a 16-county area, including Alameda County. Information provided by the CHRIS, combined with the published literature on California's cultural resources, forms the baseline or existing conditions for cultural resources in environmental reviews.

In addition to the database of previous studies and known resources, the records searches included review of the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), *California Historical Landmarks*, *California Points of Historical Interest*, the California Office of Historic Preservation's Historic Resource Inventory listings for Alameda and San Joaquin Counties, California Department of Transportation's State and Local Bridge Survey, and historic maps and secondary historical sources (California Department of Parks and Recreation 1976; General Land Office 1857; Thompson & West 1976 [1878]; U.S. Geological Survey 1914, 1948).

On January 26, 2007, a request for a sacred lands search and a list of Native American contacts was sent to the NAHC. The NAHC responded on February 7, 2007, with a list of Native American contacts and a statement indicating that the sacred lands search was negative. Letters were sent to the Native American contacts, but no responses have been received to date.

This effects assessment focuses on those cultural resources that are considered historic properties for the purposes of Section 106 of the NHPA (36 CFR 800.16[l]). The discussion below describes the federal criteria for identifying adverse effects on cultural resources. Finally, significance statements for each cultural resource that would be affected by the Proposed Action are provided.

Regulatory Setting

Section 106 of the National Historic Preservation Act

Under NEPA, federal agencies must "preserve important historic, cultural and natural aspects of our national heritage" (Section 101 [b][4]). Section 106 of NHPA (16 USC 470f) requires federal agencies to take into account the effect of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. Reclamation's directives and standards specify that NEPA actions will be coordinated with the compliance process for Section 106 of the NHPA (detailed in implementing regulations at 36 CFR 800). The Section 106 process normally includes the following steps:

- delineate the area of potential effects (APE), and identify and evaluate cultural resources in consultation with the State Historic Preservation Officer (SHPO) and any other consulting parties;
- assess adverse effects on historic properties that are eligible for inclusion in the NRHP, and notify the Advisory Council on Historic Preservation if adverse effects are identified;
- consult with the SHPO and other participating parties to resolve adverse effects on historic properties, generally resulting in a memorandum of agreement stipulating how the properties will be treated.

Historic properties are any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP (36 CFR 800.16[1]). For federal projects, cultural resource significance is evaluated in terms of eligibility for listing in the NRHP. The NRHP criteria for evaluation are defined at 36 CFR 60.4 as follows: The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association, and that

A. are associated with events that have made a contribution to the broad pattern of our history;

B. are associated with the lives of people significant in our past;

C. embody the distinct characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. have yielded, or are likely to yield, information important in prehistory or history (36 CFR 60.4).

Adverse effects occur when those characteristics of a historic property that qualify it for inclusion in the NRHP are altered in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association (36 CFR 800.5[a]). Adverse effects include:

- physical destruction of or damage to all or part of the property;
- alteration of the property that is not consistent with the Secretary of the Interior's standards for the treatment of historic properties (36 CFR 68);
- removal of the property from its historic location;
- change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- neglect of a property that causes its deterioration; and

- transfer, lease, or sale of the property out of federal ownership or control.

Reclamation consulted with the SHPO regarding the Proposed Action on January 25, 2005 (Nepstad 2005). The SHPO concurred with Reclamation that efforts to identify historic properties in the APE were adequate and that no historic properties would be adversely affected by the Proposed Action (Donaldson 2005). Should the location of any element of the Proposed Action be changed or new elements added, Reclamation would commence Section 106 consultation to take into account the effects that such changes may incur upon historic properties. The Section 106 consultation process would need to be completed prior to approval of the Proposed Action. Selection of Alternative 3 would also require completion of Section 106 consultation.

5.4.4 Environmental Effects

Resource-Specific Significance Statements

Delta-Mendota Canal

The DMC has been recommended eligible to the NRHP under Criteria A and C and has exceptional significance for its key role in the original CVP (Egherman 2001; Farrell 2001; JRP Historical Consulting Services 1995). The DMC retains overall historic integrity (Egherman 2001; Farrell 2001). For the purposes of the Proposed Action, Reclamation considers the DMC to be a historic property under Section 106 of the NHPA; the SHPO implicitly concurred with Reclamation's findings in this regard (Donaldson 2005:1, 2; Leigh 2004:3, 4; Nepstad 2005:2).

California Aqueduct

JRP Historical Consulting Services evaluated the California Aqueduct for NRHP eligibility in 1995 (JRP Historical Consulting Services 1995). The evaluation included an assessment of the exceptional significance criteria required for recently constructed (less than 50 years old) properties (Sherfy and Luce 1998). JRP Historical Consulting Services concluded that although the California Aqueduct rivals the DMC as an outstanding engineering feature (NRHP criterion C) and has a significant association with the history of irrigation and water development in California (NRHP criterion A), it was simply too young (about 20 years old in 1995) to warrant listing in the NRHP. Conditions 13 years later do not appear to warrant reassessment of the California Aqueduct's significance. Therefore, as a recently constructed property that does not convey the exceptional significance criteria required for NRHP eligibility, the California Aqueduct does not appear to constitute a historic property at this time. For the purposes of the Proposed Action, Reclamation considers the California Aqueduct not to be a historic property under Section 106 of the NHPA; the SHPO implicitly concurred

with Reclamation's findings in this regard (Donaldson 2005:1, 2; Leigh 2004:4; Nepstad 2005:2).

Byron Bethany Irrigation District Main Canal

PAR Environmental Services, Inc., evaluated the significance of CA-Ala-549H in 2001 and deemed it ineligible for listing in the NRHP. Other portions of the canal were determined ineligible for listing in the NRHP by a consensus determination of the Corps and the SHPO (Baker 2001b; California Office of Historic Preservation 2000:1). For the purposes of the Proposed Action, Reclamation considers CA-Ala-549H not to be a historic property under Section 106 of the NHPA; the SHPO implicitly concurred with Reclamation's findings in this regard (Donaldson 2005:1, 2; Leigh 2004:3, 4; Nepstad 2005:2).

Tracy Switch Station

PAR Environmental Services, Inc., evaluated the significance of the Tracy Switch Station in 2001 and recommended it ineligible for listing in the NRHP. Although an integral part of the CVP, which qualifies the Tracy Switch Station for NRHP eligibility under Criterion A, the station has suffered a substantial loss of integrity through the addition of several buildings in the 1960s and 1990s. Therefore, the Tracy Switch Station does not appear to qualify as a historic property (Baker 2001a; Bakic 2001a). For the purposes of the Proposed Action, Reclamation considers the Tracy Switch Station not to be a historic property under Section 106 of the NHPA; the SHPO implicitly concurred with Reclamation's findings in this regard (Donaldson 2005:1, 2; Leigh 2004:3, 4; Nepstad 2005:2).

Jones Pumping Plant

PAR Environmental Services, Inc., evaluated the significance of the Jones Pumping Plant (P-01-10442) in 2001 and recommended it eligible for listing in the NRHP. Jones Pumping Plant is an integral element in the development and operation of the CVP and appears to be significant under Criteria A and C of the NRHP. Furthermore, Jones Pumping Plant retains historic integrity. For the purposes of the Proposed Action, Reclamation considers the Jones Pumping Plant to be a historic property under Section 106 of the NHPA; the SHPO implicitly concurred with Reclamation's findings in this regard (Donaldson 2005:1, 2; Leigh 2004:3, 4; Nepstad 2005:2).

Summary of Cultural Resource Effects Assessment

The proposed action potentially would affect five cultural resources. Each resource was evaluated for significance according to criteria established by the NRHP. Of these five resources, previous cultural resource studies identify the

DMC and the Jones Pumping Plant as historic properties according to the NRHP criteria. The California Aqueduct, Byron Bethany Irrigation District Main Canal, and the Tracy Switch Station are not historic properties. Any effects on the latter three cultural resources would not be considered substantial and would not require mitigation. Therefore, these resources do not require further consideration under Section 106 of the NHPA.

Alternative 1 (No Action)

The No Action alternative would not result in ground-disturbing activities or changes in operation. Therefore, there would be no effects on cultural resources.

Alternative 2 (Proposed Action)

Construction Effects

Impact CUL-1: Modification of Known Cultural Resources Resulting from Construction

Modification of the DMC (and the California Aqueduct) would result from construction of the Proposed Action. The modification would result from excavating the intake and discharge structures into the sides of the canals. Construction of the aboveground Intertie facilities would result in some loss of historic integrity (alteration of design) for the DMC. The Proposed Action would represent a departure from the canal's original design. Given the scale of the Intertie facilities in the context of the DMC's size and overall retention of historic integrity, however, alteration of the canal's design would not result in an adverse effect (Donaldson 2005:2; Leigh 2004:4, 5; Nepstad 2005:2, 3).

Impact CUL-2: Visual Intrusions to the Historic Setting of Significant Cultural Resources from Transmission Line Construction

Construction of overhead transmission lines would result in the addition of structures that are not from the period of significance of identified cultural resources and may be out of character with the historic setting of cultural resources such as historic canals and buildings. Visual intrusion to the historic setting of significant cultural resources is considered an adverse impact under NEPA. The bullets below indicate the cultural resources affected by this impact by location/project element.

- Construction of the overhead transmission line would introduce a new element to the historic setting of the DMC, which is considered a historic property under the NRHP criteria. Numerous power lines already cross over the DMC and are part of the CVP system. The addition of the overhead transmission line under the Proposed Action would not constitute a departure from the overall historic setting of the DMC.

Construction of the Proposed Action would introduce aboveground structures that are at variance with the historic setting of the DMC. Given the scale of the DMC and the minor scale of the new construction (less than 1 acre), the addition of new structures would not result in a major loss of historic integrity. Therefore, this effect does not constitute an adverse effect (Donaldson 2005:2; Leigh 2004:4, 5; Nepstad 2005:2, 3).

- Construction of the overhead transmission line would introduce a new element to the historic setting of the Jones Pumping Plant, which is a historic property under the NRHP criteria. Numerous power lines, however, already cross over the Jones Pumping Plant and are part of the CVP system. The addition of the overhead transmission line under the Proposed Action would not constitute a departure from the overall historic setting of the Jones Pumping Plant. Therefore, this effect does not constitute an adverse effect (Donaldson 2005:2; Leigh 2004:4, 5; Nepstad 2005:2, 3).

Impact CUL-3: Inadvertent Damage to or Destruction of Buried Archaeological Sites and Human Remains

The Proposed Action has little potential to inadvertently damage or destroy buried archaeological sites or human remains through construction of Intertie facilities and placement of the overhead transmission line. The footprint of the Proposed Action is highly disturbed to depths up to 25 feet, and the areas slated for ground disturbance are composed of fill piles up to 30 feet high. The likelihood of intact buried archaeological deposits or human remains is remote. It is highly unlikely, therefore, that the Proposed Action would result in adverse effects on buried archaeological sites or human remains. However, in the unlikely event that such discoveries are made during construction, Reclamation will ensure that contractors stop work and implement measures to protect archaeological sites and human remains if discovered during ground-disturbing activities, as described in the environmental commitments section of Chapter 2.

Operation Effects

Operation of the Intertie would not result in any ground-disturbing activities and therefore would not result in adverse effects on cultural resources.

Alternative 3 (TANC Intertie Site)

Construction Effects

The construction effects of Alternative 3 would likely be identical to those described under Alternative 2 with the exception that no Section 106 consultation has been conducted for Alternative 3 by Reclamation. Implementation of Alternative 3 would require Reclamation to conduct a pedestrian archaeological

survey of areas not previously surveyed and additional Section 106 consultation prior to reaching the same conclusions as Alternative 2.

Operation Effects

Operation of the Intertie would not result in any ground-disturbing activities and therefore would not result in adverse effects on cultural resources.

Alternative 4 (Virtual Intertie)

Construction Effects

Because of the proposed grading, the impacts of implementing Alternative 4 would be identical to Impact CUL-3 described under Alternative 2.

Operation Effects

Operation of the Intertie would not result in any ground-disturbing activities and therefore would not result in adverse effects on cultural resources.

5.5 Hazards and Hazardous Materials

5.5.1 Introduction

This section describes the existing environmental conditions and the consequences of constructing and operating the project alternatives related to hazards and hazardous materials. Of primary concern for the Intertie is the potential to disturb existing or release hazardous materials or to create hazards for people.

5.5.2 Affected Environment

Hazardous Materials

Hazardous materials and wastes are those substances that, because of their physical, chemical, or other characteristics, may pose a risk of endangering human health or safety or of endangering the environment (California Health and Safety Code Section 25260). Types of hazardous materials include petroleum hydrocarbons, pesticides, and volatile organic carbons (VOCs). In and around the Delta, most hazardous waste sites are associated with agricultural production activities and may include storage facilities and agricultural pits or ponds contaminated with fertilizers, pesticides, or herbicides.

A Phase I site assessment for hazardous materials was conducted for the Alternative 2 site. This assessment indicates that the Intertie area is not likely to contain hazardous materials because it lies between the California Aqueduct and the DMC, and few if any activities are permitted in this area.

Emergency Response/Evacuation Plans

Alameda County Office of Emergency Services (OES) is responsible for planning emergency response actions to hazardous material incidents. Area response plans incorporate hazardous materials inventory data, training for emergency responses, and evacuations.

Emergency response is carried out by the Alameda County Sheriff's Office of Homeland Security and Emergency Services using vehicles or boats, depending on the location's accessibility, predicted response time, and availability of resources.

Transmission Lines

The California-Oregon Transmission Project (COTP) is a 500-kV transmission line extending from near Malin, Oregon, south to the Tracy, California, area. It is owned and operated by the TANC. This line provides electricity to several cities and utility districts throughout northern California. The proposed action (Alternative 2) would lie partially beneath the COTP.

5.5.3 Environmental Consequences

Assessment Methods

Two topics are evaluated in this section: hazardous materials and waste release and disturbance, and public health. The release or disturbance of hazardous materials and/or waste is assessed based on an investigation into types of hazardous materials that are known to exist at the site, types of equipment that would be used during construction and operation of the project, types of disturbances that would occur at the project site, and how project-related actions may increase the risk for release or disturbance of hazardous materials and/or waste. To evaluate the risks to public health, the known construction and operation methods were assessed, and the potential risks are described in the effects section below.

Regulatory Setting

The principal federal regulatory agency responsible for the safe use and handling of hazardous materials is the EPA. Two key federal regulations pertaining to hazardous wastes are described below. Other applicable federal regulations are contained primarily in CFR Titles 29, 40, and 49.

Resource Conservation and Recovery Act

The federal Resource Conservation and Recovery Act enables the EPA to administer a regulatory program that extends from the manufacture of hazardous materials to their disposal, thus regulating the generation, transportation, treatment, storage, and disposal of hazardous waste at all facilities and sites in the nation.

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (also known as Superfund) was passed to facilitate the cleanup of the nation's toxic waste sites. In 1986, the act was amended by the Superfund Amendment and Reauthorization Act Title III (community right-to-know laws). Title III states that

past and present owners of land contaminated with hazardous substances can be held liable for the entire cost of the cleanup, even if the material was dumped illegally when the property was under different ownership.

5.5.4 Environmental Effects

Alternative 1 (No Action)

Under the No Action alternative, there would be no construction of any facilities, and therefore no operations. There would be no change in the potential for release or disturbance of hazardous materials and/or waste, and there would be no changes in the risk to public health and safety.

Alternative 2 (Proposed Action)

Construction Effects

Impact HAZ-1: Exposure to or Release of Hazardous Materials during Construction

Fuel, oils, grease, solvents and other petroleum-based products are commonly used in construction activities. Accidental releases of the products could contaminate soils and degrade surface water and groundwater quality. Accidental releases could also pose risks to worker safety by exposing workers to hazardous materials. Additionally, ground-disturbing activities may result in the release of hazardous materials. However, the Phase I site assessment indicated that there are no known hazardous materials in the area that would be disturbed. The potential to expose the environment and workers to hazardous materials therefore is low and would be further minimized by implementing the provisions of a spill prevention and control plan. This plan will include measures for responding to and remediating spills. The program will be an element of the SWPPP, as described in the Environmental Commitments section of Chapter 2, “Project Description.” The potential change in worker safety or environmental exposure to commonly used construction products would not result in an adverse effect.

Impact HAZ-2: Increased Risk to the Public Attributable to Potential Disturbance of Overhead Powerlines

Work under the COTP has the potential to induce currents and static charges with and without any physical contact. Construction activities could cause electric arcs that could electrocute workers and bystanders, cause fires, and ground out the circuit. This could lead to a temporary collapse of the electric grid in the western region. If this were to happen, death and injury could result both at the project site and throughout the area of power outage. However, as described in the Environmental Commitments section of Chapter 2, “Project Description”, both Reclamation and the contractor would implement safety and security measures to

protect workers and the public from potential hazards posed by construction activities. Reclamation's project site safety and security plan would include measures to ensure that construction equipment such as cranes, aerial lifts, or high profile equipment would maintain a minimum safe distance from the transmission line and conductors. The minimum safe distance for any overhead transmission line is designated in Reclamation's *Reclamation Safety and Health Standards* (U.S. Department of the Interior, Bureau of Reclamation 2002) or by the transmission line operating agency, whichever is more stringent.

Additionally, work under the COTP has the potential to cause flashovers. Flashovers occur when higher voltage electricity "jumps across" an air gap to create a conductive path, and are potentially life threatening to a person standing in the near vicinity of the flashover. Flashovers can also cause damage to nearby equipment and the transmission line, cause the line to relay, and can cause interruptions to power supply. Flashovers can occur when any suspended fine materials, particulate matter, or water droplets, etc. are allowed between the ground and the conductor.

The contractor's safety plan would include the following safety measures for working near energized overhead powerlines:

- A signal or flag person will guide cranes, aerial lifts, or other high profile equipment in transit near exposed energized lines.
- All crossings where equipment will be moved under high voltage lines will be posted with appropriate signs.
- Equipment will be prohibited from coming within the minimum safe clearance of the high voltage line.

The contractor's safety plan will also include a hazardous energy control program and a Flashover Prevention Plan. The hazardous energy control program will be established for the construction site to ensure that during construction there will be no release of stored energy and that the COTP transmission line will be protected. As described in the Environmental Commitments section of Chapter 2, the Flashover Prevention Plan would identify activities that could lead to fires, smoke, water spray, or other particulate matter or potential for other suspended fines between the ground and TANC's 500-kV conductors. The intent of the plan is to address adequate safety procedures to ensure the insulation level of the air is maintained to avoid flashovers.

Implementation of the safety plan would avoid any adverse effects.

Operation Effects

Impact HAZ-3: Exposure to or Release of Hazardous Materials during Operation

Operating and maintaining the Intertie and its associated structures may include the use of fuels to access the site. Accidental releases of these products could contaminate soils and degrade surface water and groundwater quality, resulting in a worker or public safety hazard. The potential to expose workers or the public to hazardous materials is low and would be further minimized by implementing the provisions of a spill prevention and control plan. This plan will include measures for responding to and remediating spills. The program will be an element of the SWPPP, as described in the Environmental Commitments section of Chapter 2, "Project Description." The potential change in worker safety is not substantial, and there would be no adverse effect.

Alternative 3 (TANC Intertie Site)

Construction Effects

Impact HAZ-1: Exposure to or Release of Hazardous Materials during Construction

This impact is the same as described under Alternative 2 above. There would be no adverse effect.

Impact HAZ-4: Risk to the Public during Installation of Transmission Line over I-205

Installation of the transmission line segment crossing I-205 could potentially increase the risk of drivers on I-205 to traffic accidents as well as direct hazards posed by stringing conductors over I-205. Installation of transmission line conductors, fiber optic cable, ground wires, and possibly aerial marker balls over I-205, in addition to large vehicles delivering materials and oversized vehicles used in the construction process, may affect traffic flow on I-205 resulting in a safety hazard. As part of the Traffic Control Plan, described in Chapter 2, if Alternative 3 is implemented, Reclamation would coordinate with Caltrans and the California Highway Patrol prior to and during installation of the I-205 segment the transmission line to minimize hazards to workers and the public.

Operation Effects

Impact HAZ-3: Exposure to or Release of Hazardous Materials during Operation

This impact would be the same as described under Alternative 2 above. There would be no adverse effect.

Alternative 4 (Virtual Intertie)

Construction Effects

Impact HAZ-1: Exposure to or Release of Hazardous Materials during Construction

Under emergency circumstances, a temporary pipeline would be installed to connect the DMC and California Aqueduct. This would require minimal construction equipment and activities. However, when the pipeline is installed and removed, there is potential for accidental release of fuels, lubricants, and other hazardous materials. As described in the Environmental Commitments section in Chapter 2, a SWPPP will be developed and implemented and will include a spill response plan. This would ensure that no adverse effects on the environment occur during installation and removal of the temporary intertie.

Operation Effects

No adverse effects are expected to occur related to the operation of Banks Pumping Plant under Alternative 4.

Impact HAZ-3: Exposure to or Release of Hazardous Materials during Operation

This impact would be the same as described under Alternative 2 above. There would be no adverse effect.

5.6 Socioeconomics

5.6.1 Introduction

This section describes the existing socioeconomic conditions and the socioeconomic consequences of constructing and operating the Intertie alternatives. The study area for this assessment is composed of Alameda and San Joaquin Counties. Alameda County was selected because the project is located in the county. San Joaquin County was also selected because of the relative proximity of urban areas, including Stockton and Tracy. Both communities could provide the labor pool for constructing the Intertie and provide necessary services and housing.

5.6.2 Affected Environment

Sources of Information

The following key sources of information were used in the preparation of this section:

- California Department of Finance databases and reports,
- California Employment Development Department databases, and
- United States Department of Commerce, Bureau of the Census databases.

Population

Alameda County

The population of Alameda County was estimated to total approximately 1,543,000 in 2008 (California Department of Finance 2008a). This represents an increase of about 7% from the estimated 2000 population of 1,444,000 (California Department of Finance 2008b). Alameda County's population is projected to reach 1,663,000 by 2020 (California Department of Finance 2008c).

The most populous cities in Alameda County are Oakland, with an estimated population of 420,200 in 2008, and Fremont, with an estimated population of 213,500 in 2008. Most of the county's population resides in incorporated communities. The total population in unincorporated areas of Alameda County totaled only 140,000 in 2008. (California Department of Finance 2008a.)

San Joaquin County

The population of San Joaquin County was estimated to total approximately 686,000 in 2008 (California Department of Finance 2008a). This represents an increase of about 21% from the estimated 2000 population of 564,000 (California Department of Finance 2008b). San Joaquin County's population is projected to reach 965,000 by 2020 (California Department of Finance 2008c).

The most populous cities in San Joaquin County are Stockton, with an estimated population of 290,000 in 2008, and Tracy, with an estimated population of 82,000 in 2008. Most of the county's residents reside in incorporated communities. The total population in unincorporated areas of San Joaquin County was estimated to total 145,000 in 2008. This represents just over 20% of the total county population (California Department of Finance 2008a).

Employment, Income, and Housing

Alameda County

Employment in Alameda County totaled 719,400 jobs in 2007, a decrease of approximately 21,600 jobs from 2000 levels. The trade, transportation, and utilities sector accounted for 136,000 jobs in 2007, followed by the government and health care and social assistance sectors, accounting for 137,100 and 66,700 jobs, respectively. The countywide unemployment rate was estimated at 4.8% in 2007. (California Employment Development Department 2008a.)

Total personal income in Alameda County was approximately $62.3 billion in 2005 or about 5% of the statewide total (Fedstats 2008a). Personal income per capita was estimated to be $42,956 in 2005 (FedStats 2008a), much higher than the statewide per capita income of $37,311 in 2005 (California Department of Finance 2008d).

The supply of housing units in Alameda County was 562,479 units in January 2006. The countywide vacancy rate was approximately 3.01% or 16,931 units. (California Department of Finance 2007.)

San Joaquin County

Employment in San Joaquin totaled 270,800 jobs in 2007, an increase of approximately 66,200 jobs from 2000 levels. The government sector accounted for 40,000 jobs in 2007, followed by the retail trade and health care and social assistance sectors, accounting for 27,000 and 23,000 jobs, respectively. The construction sector accounted for approximately 13,700 jobs in 2007. The countywide unemployment rate was estimated to be 8.2% in 2007. (California Employment Development Department 2008b.)

Total personal income in San Joaquin County was approximately $17.3 billion or about 1.3% of the statewide total (Fedstats 2008b). Personal income per capita was estimated at $26,071 in 2005 (FedStats 2008b), much lower than the statewide per capita income of $37,311 in 2005 (California Department of Finance 2008d).

The supply of housing units in San Joaquin County totaled 219,717 units in January 2006. The countywide vacancy rate was approximately 3.91% or 8,591 units. (California Department of Finance 2007.)

5.6.3 Environmental Consequences

Assessment Methods

Assessment methods and assumptions developed for the SDIP Draft EIS/EIR (California Department of Water Resources and the U.S. Department of the Interior, Bureau of Reclamation 2005) were used to help estimate the construction- and operation-related socioeconomic effects of constructing and operating the Intertie project. Estimates of the number of construction personal required during the construction phase were developed by Reclamation engineering staff. These assumptions were:

- **Origin of Construction Workers:** Sixty percent of construction workers would be supplied by the San Joaquin and Alameda workforce.
- **Population:** Workers not originating from the San Joaquin or Alameda workforce would temporarily locate within the study area. Family size is estimated to total three persons.
- **Employment and Income:** Changes in employment and income would occur during the construction phase of the project. Reclamation has estimated that up to 62 workers would be employed during construction of Alternatives 2 and 3 and up to 22 workers during construction of Alternative 4. Indirect changes in employment and income as a result of expenditures made for goods and services during the construction period were qualitatively assessed.
- **Construction Period:** Construction of the Intertie project is expected to be completed in 15 months.

5.6.4 Environmental Effects

Alternative 1 (No Action)

Under Alternative 1, the Intertie pumping facilities would not be constructed or operated. There would be no short-term or long-term changes in employment or income because no expenditures would be made to construct or operate the intertie facilities. This would result in no change in regional employment or

income levels. Because no new workers would move into the region, there would be no effect on regional housing supplies.

Alternative 2 (Proposed Action)

Construction Effects

Impact SOC-1: Change in Population during Project Construction

During the construction period, the regional population is expected to increase by approximately 75 people. This increase includes construction workers and their families. This represents a very small increase in the study area population of 2.2 million.

This very small temporary increase in population is not expected to result in a measurable change in demand for housing. The increase in demand for housing would be limited to the construction phase of the project and is expected to be easily accommodated by the existing supply of housing in the study area. No adverse effects on housing supply are expected as a result of constructing Alternative 2.

Impact SOC-2: Change in Employment and Income during Project Construction

Constructing the pumping plant, pipelines, and transmission facilities is expected to require up to 62 workers. In addition, new jobs would be created as a result of expenditures made by contractors and construction workers in the region during the construction phase. The increase in construction-related employment also would result in a proportional increase in total personal income in the study area.

The temporary direct and indirect increases in employment and income, although small when placed in the context of total employment (990,000 jobs) and personal income ($79.6 billion) generated in the study area, would be considered a temporary beneficial effect of Alternative 2.

Operation Effects

Impact SOC-3: Change in Population, Employment, and Income during Project Operation

As indicated in Chapter 2, “Project Description,” after the initial start-up phase, the operation of the Intertie would be fully automated. Operation of a fully automated facility is not expected to result in an increase in employment or income or a change in regional population.

Alternative 3 (TANC Intertie Site)

Construction Effects

Impact SOC-1: Change in Population during Project Construction

Impacts on population occurring during construction of Alternative 3 would be the same as described for Alternative 2. There would be no substantial temporary change in population or increase in regional housing demand.

Impact SOC-2: Change in Employment and Income during Project Construction

Changes in employment and income during construction of Alternative 3 would be the same as described for Alternative 2. Although small, the temporary increase in employment and income would be considered beneficial.

Operation Effects

Impact SOC-3: Change in Population, Employment, and Income during Project Operation

As indicated in Chapter 2, "Project Description," after the initial start-up phase, the operation of the Intertie would be fully automated. Operation of a fully automated facility is not expected to result in an increase in employment, income, or regional population.

Alternative 4 (Virtual Intertie)

Construction Effects

Impact SOC-1: Change in Population during Project Construction

Constructed elements of Alternative 4 would be limited to a gravity-operated pipeline between the California Aqueduct and the DMC installed only during emergencies. During construction, the regional population is expected to increase by approximately 27 people. This increase includes construction workers and their families. This represents a very small increase in the study area population of 2.2 million.

This very small temporary increase in population is not expected to result in a measurable change in demand for housing. This very small increase in demand for housing would be limited to the construction phase of the project is expected to be easily accommodated by the existing supply of housing in the study area. No adverse effects on housing are expected as a result of constructing the Alternative 4.

Impact SOC-2: Change in Employment and Income during Project Construction

Constructing the gravity-operated pipeline is expected to require up to 22 workers. In addition, new jobs would be created as a result of expenditures made by contractors and construction workers in the region during the construction phase. The increase in employment would also result in a proportional increase in total personal income in the study area.

The temporary direct and indirect increases in employment and income, although small when placed in the context of total employment (990,000 jobs) and personal income ($79.6 billion) generated in the study area, would be considered a temporary beneficial effect of Alternative 4.

Operation Effects

Impact SOC-3: Change in Population, Employment, and Income during Project Operation

As indicated in Chapter 2, "Project Description," Alternative 4 would use the existing capacity of the Banks Pumping Plant, and during emergencies a temporary pipeline linking the California Aqueduct with the DMC would be operated. Because the existing capacity would be used, increasing pumping at Banks Pumping Plant is not expected to result in new jobs or changes in regional population or income levels. Operating the temporary intertie pipeline also is not expected to increase employment because it would require only occasional inspections for operation and maintenance purposes.

5.7 Indian Trust Assets

5.7.1 Introduction

This section describes the existing environmental conditions and the consequences of constructing and operating the project alternatives on Indian Trust Assets (ITAs).

ITAs are legal interests in property held in trust by the United States for federally recognized Indian tribes or individual Indians. An Indian trust has three components: (1) the trustee, (2) the beneficiary, and (3) the trust asset. ITAs can include land, minerals, federally reserved hunting and fishing rights, federally reserved water rights, and in-stream flows associated with trust land. Beneficiaries of the Indian trust relationship are federally recognized Indian tribes with trust land; the United States is the trustee. By definition, ITAs cannot be sold, leased, or otherwise encumbered without approval of the United States. The characterization and application of the United States trust relationship have been defined by case law that interprets Congressional acts, executive orders, and historical treaty provisions.

5.7.2 Affected Environment

The nearest ITA to the Intertie alternatives is the Lytton Rancheria, located approximately 44 miles northwest of the project area.

5.7.3 Environmental Consequences

Assessment Methods

Assessment of effects on ITAs was conducted by evaluating the effects described in the various preceding resource sections and determining if any would directly or indirectly affect the Lytton Rancheria or other ITAs.

Regulatory Setting

Consistent with President William J. Clinton's 1994 memorandum, "Government-to-Government Relations with Native American Tribal Governments," Reclamation assesses the effect of its programs on tribal trust resources and federally recognized tribal governments. Reclamation is tasked with actively engaging federally recognized tribal governments and consulting with such tribes on a government-to-government level (59 FR 1994) when its actions affect ITAs.

The U.S. Department of the Interior (DOI) Departmental Manual Part 512.2 ascribes the responsibility for ensuring protection of ITAs to the heads of bureaus and offices (U.S. Department of the Interior 1995). Part 512, Chapter 2 of the Departmental Manual states that it is the policy of the DOI to recognize and fulfill its legal obligations to identify, protect, and conserve the trust resources of federally recognized Indian tribes and tribal members. All bureaus are responsible for, among other things, identifying any impact of their plans, projects, programs or activities on ITAs; ensuring that potential impacts are explicitly addressed in planning, decision, and operational documents; and consulting with recognized tribes who may be affected by proposed activities.

Consistent with this, Reclamation's Indian trust policy states that Reclamation will carry out its activities in a manner that protects ITAs and avoids adverse impacts when possible, or provides appropriate mitigation or compensation when it is not. To carry out this policy, Reclamation incorporated procedures into its NEPA compliance procedures to require evaluation of the potential effects of its proposed actions on trust assets (U.S. Department of the Interior, Bureau of Reclamation July 2, 1996). Reclamation is responsible for assessing whether the Intertie has the potential to affect ITAs. Reclamation will comply with procedures contained in Departmental Manual Part 512.2, guidelines, which protect ITAs.

Reclamation's ITA policy states that Reclamation will carry out its activities in a manner that protects ITAs and avoids adverse impacts when possible. When Reclamation cannot avoid adverse impacts, it will provide appropriate mitigation or compensation.

5.7.4 Environmental Effects

Alternative 1 (No Action)

Under the No Action Alternative, there would be no changes in the environment and no effects on the Lytton Rancheria or other ITAs.

Alternative 2 (Proposed Action)

The Lytton Rancheria is located in Healdsburg, California, and is not adjacent to any water that would be affected by Intertie operations. There would be no effect.

Alternative 3 (TANC Intertie Site)

The Lytton Rancheria is located in Healdsburg, California, and is not adjacent to any water that would be affected by Intertie operations. There would be no effect.

Alternative 4 (Virtual Intertie)

The Lytton Rancheria is located in Healdsburg, California, and is not adjacent to any water that would be affected by Intertie operations. There would be no effect.

5.8 Utilities and Public Services

5.8.1 Introduction

This section describes the existing environmental conditions and the consequences of constructing and operating the project alternatives on utilities and public services such as natural gas, electricity, communications, wastewater, solid waste disposal, stormwater drainage, and emergency services. The impacts on water supply and electric power use are evaluated in Section 3.1, Water Supply and Delta Water Management, and Section 5.2, Power Production and Energy, respectively.

5.8.2 Affected Environment

Sources of Information

The following key sources of information were used in the preparation of this section:

- San Joaquin County General Plan 2010, July 1996 (San Joaquin County 1996);
- City of Tracy General Plan, Public Facilities and Services Element, July 2006 (City of Tracy 2006);
- SDIP Draft EIS/EIR, October 2005 (California Department of Water Resources and U.S. Department of the Interior, Bureau of Reclamation 2005); and
- communications with fire protection and police representatives (Nelson pers. comm.; Terra pers. comm.).

Electricity

Major transmission facilities in the immediate project area include the Tracy-Tesla and Tracy-Los Banos 500-kV lines (which are components of the COTP and cross the project study area at the Intertie [Alternative 2] site), and the Tracy-Westley #1 and #2 230-kV lines which are located just east of the DMC.

The COTP is one of the three 500-kV Alternating Current (AC) lines that make up the California-Oregon Intertie (COI). The COTP originates at the Captain Jack Substation in Southern Oregon and extends southward to the Tracy area. TANC is the majority owner of the COTP and the COTP facilities are operated by Western. The other two COI 500-kV lines extend from the Malin Substation in southern Oregon to the Tesla Substation south of Tracy. The Table Mountain-Tesla segment of one of these two lines is located approximately 4,600 feet west of the

project area. The COI facilities are used to deliver power from the Pacific Northwest and resources (primarily) hydroelectric) in northern California to load centers in northern California.

Natural Gas

The Pacific Gas and Electric Company (PG&E) owns and operates natural gas pipelines just northeast of the project study area in San Joaquin County. Two of these pipelines run northwest to southeast near Grant Line Road, and a third pipeline, also aligned in a northwest-southeast direction, is located near Byron Road and Patterson Pass Road. These pipelines range from 8 to 36 inches in diameter.

Chevron, Standard Oil, and Unocal operate and maintain underground gas pipelines that transport natural gas and oil through the area to the north of the project study area. These pipelines range from 6 to 20 inches in diameter, and most are aligned in a northwest-southeast direction near the Byron Highway.

Many of the residential and agricultural customers in the vicinity of the project use on-site tanks for their gas supply. There are no known natural gas pipelines in the potential area of effect for the Intertie alternatives.

Stormwater Drainage

Stormwater drainage networks typically consist of both natural and human-made conveyance systems to collect, convey, and store runoff resulting from a storm event. Most stormwater drainage systems in urban areas and in some rural areas are managed by flood control districts.

Impervious surfaces in the project area are limited to roads, other small sections of pavement, and areas covered by rural residential or agricultural structures. Local drainage is dictated largely by an extensive system of ditches and agricultural drains. Several culverts have been constructed to allow drainage from between the California Aqueduct and the DMC to enter surrounding areas, but because there are few impervious surfaces, stormwater drainage is similar to natural conditions.

Wastewater

All of the Intertie alternatives are located in rural areas. Wastewater generated near the project area is handled by sanitary sewer systems, treatment plants, and individual septic systems. Agricultural land in northeastern Alameda County is served mainly by on-site septic systems. Similarly, rural San Joaquin County is served primarily by individual septic tanks.

Solid Waste Disposal

Solid waste generated in Alameda County is transported to the nearest landfill (the Altamont Landfill). The Altamont Landfill, approximately 5.5 miles west of the project area, is expected to reach capacity by 2032 (California Integrated Waste Management Board 2009). Solid waste generated in San Joaquin County's South County Refuse Area is disposed of at the Foothill Sanitary Landfill northeast of the project area near the Stanislaus County line. This landfill is expected to reach capacity by 2054 (San Joaquin County 2009).

Communications

AT&T, Inc., is the primary supplier of telephone service to areas near the project study area. Underground fiber trunk lines feed switching equipment, and overhead lines and poles supply individual service units. The communication lines typically are aligned parallel to the roadways and traverse roadways to supply the individual service units. Cable markers indicating underground cabling are located in some areas parallel to roadways. A network of alternative telephone companies, cellular communication companies, and cable companies also serves the region. New service to specific sites is provided on a case-by-case basis.

Police, Fire, and Ambulance Services

Police protection services in the portion of the project study area in Alameda County are provided by the Alameda County Sheriff's Department and the California Highway Patrol Dublin office. The Dublin California Highway Patrol patrols I-205/I-580 from the San Joaquin–Alameda county border west as well as Alameda county roads near the project area (Nelson pers. comm.). Police services near the project area in San Joaquin County are provided by the Tracy Police Department and the San Joaquin County Sheriff's Department. The Tracy Police Department provides police services within Tracy's city limits. Police service within the Tracy Planning Area outside the city limits is provided by the San Joaquin County Sheriff's Department, located in French Camp south of Stockton. The Tracy Police Department provides mutual aid to the San Joaquin County Sheriff's office as needed; mutual aid is coordinated by the San Joaquin County Sheriff's Office. The Tracy California Highway Patrol patrols I-205, I-580, and San Joaquin County roads near the project area.

The portion of the project area in Alameda County is served by the Alameda County Fire Department from Station 8 in Livermore (Terra pers. comm.). The Alameda County Fire Department provides first response fire and medical services to all of eastern Alameda County. The Tracy Fire Department provides fire protection and first response emergency medical services to the city of Tracy and to more than 200 square miles in the southern part of San Joaquin County. There are three fire stations located within Tracy city limits and three located

outside the city limits. The Tracy Fire Department has a mutual aid agreement with Alameda County that specifies that all participating agencies will provide emergency response into joint or borderline areas or when local resources are overwhelmed and assistance is needed for a particular incident.

Ambulance services for Alameda and San Joaquin Counties are provided by American Medical Response, a private ambulance company.

5.8.3 Environmental Consequences

Assessment Methods

The primary impact mechanism of the Proposed Action would be related to disruption of services during construction. This could occur primarily if utility lines were disrupted, construction activities resulted in changes in emergency response time, or public services such as landfills or wastewater treatment capacities were affected by the alternatives. Impacts were determined by assessing each alternative's potential to disrupt these services.

Regulatory Setting

State

At the state level, management of solid waste is regulated by the California Integrated Waste Management Board (CIWMB), which delegates local permitting, enforcement, and inspection responsibilities to local enforcement agencies. In 1997, some of the regulations adopted by the State Water Resources Control Board pertaining to landfills (Title 23, Chapter 15) were incorporated with CIWMB regulations (Title 14) to form Title 27 of the California Code of Regulations.

California Integrated Waste Management Act

The California Integrated Waste Management Act (Assembly Bill [AB] 939), adopted in 1989, established an integrated waste management hierarchy that consists of, in order of importance: source reduction, recycling, composting, and land disposal of solid waste. The law also required that each County prepare a new Integrated Waste Management Plan. The act further required each city to prepare a Source Reduction and Recycling Element (SRRE) by July 1, 1991. AB 939 also requires cities and counties to prepare SRREs in their General Plan.

Local

San Joaquin County

The San Joaquin County General Plan 2010 contains policies pertaining to utility corridors that apply to the Proposed Action:

Infrastructure Services—Utility Corridors

Policy 1. The environmental assessment of new or expanded utility lines shall address the potential adverse impacts on development as a result of a rupture or malfunction, and shall identify mitigation measures to be adopted by the utility to safeguard against such accidents and to respond in the event of an accident.

5.8.4 Environmental Effects

Alternative 1 (No Action)

Under the No Action Alternative, there would be no new facilities constructed or operated and no construction or operation effects on utilities or public services.

Alternative 2 (Proposed Action)

Construction Effects

Impact PUB-1: Disruption of Electricity Service

The COTP 500-kV transmission line crosses the Alternative 2 project area. Construction of the proposed pumping plant and appurtenant structures likely would require work under the energized COTP line. Construction activities could cause electric arcs or result in physical contact with the conductors, either of which could ground out the circuit and potentially collapse the high-voltage electric grid in the western region. Additionally, work under the COTP has the potential to cause flashovers. Flashovers occur when higher voltage electricity "jumps across" an air gap to create a conductive path, and are potentially life threatening to a person standing in the near vicinity of the flashover. Flashovers can also cause damage to nearby equipment and the transmission line, cause the line to relay, and can cause interruptions to power supply. Flashovers can occur when any suspended fine materials, particulate matter, or water droplets, etc. are allowed between the ground and the conductor.

If the western region electric grid were to collapse, outage impacts could be widespread and substantial. However, as described in the Environmental Commitments section of Chapter 2, “Project Description”, both Reclamation and the contractor would implement safety measures to ensure that construction equipment such as cranes, aerial lifts, or high profile equipment would maintain a

minimum safe distance from the COTP transmission line and conductors. The minimum safe distance for any overhead transmission line is designated in Reclamation's *Reclamation Safety and Health Standards* (U.S. Department of the Interior, Bureau of Reclamation 2002) or by the transmission line operating agency, whichever is more stringent. Reclamation will coordinate with TANC and Western throughout the development of the construction details and any associated modifications to Safety Plan to ensure that appropriate measures are incorporated to minimize the potential for disruptions to the COTP.

Additional Environmental Commitments that would be implemented by Reclamation to reduce the potential for transmission line disturbance include:

- Ensuring that there are no cut, fill or spoil bank placement operations that compromise the clearances required for the 500-kV lines in accordance with the present conditions and the applicable government codes.
- Ensuring that there are no cut or fill or cofferdam construction/dewatering activities that could affect the stability of the COTP transmission tower footings consistent with all applicable government codes.
- Maintaining access to the COTP facilities by TANC and the COTP maintenance representatives at all times. TANC and its contractors, including Western, must be able to access all towers at any time with heavy equipment, and Reclamation will maintain this access during construction. Routine ground patrol to each tower occurs once a year; routine aerial patrol of the transmission lines occur four times a year.
- Allowing a TANC representative on site at times when major work is underway on the transmission line right-of-way. Reclamation will provide TANC advance notice of not less than 60 days for all construction schedules to accommodate the necessary communications and arrangements for such TANC on-site representation at TANC's discretion.
- Consulting with TANC and/or Western during the installation of temporary clearance markers to indicate the closest safe distances from the conductors.
- Furnishing and installing permanent markers on Reclamation's facilities indicating the proximity of energized high-voltage power line conductors before the completion of construction.
- Reviewing and complying, during and after construction, with all regulatory requirements and industry standards for proper grounding of metallic equipment, structures, fences, platforms, and other metal facilities in the high-voltage electric field.

The contractor's safety plan would include the following safety measures for working near energized overhead powerlines:

- A signal or flag person will guide cranes, aerial lifts, or other high profile equipment in transit near exposed energized lines.

- All crossings where equipment will be moved under high voltage lines will be posted with appropriate signs.
- Equipment will be prohibited from coming within the minimum safe clearance of the high voltage line.
- A Flashover Prevention Plan will be developed and implemented for all work adjacent to and underneath TANC's 500-kV transmission line. The plan would identify activities such as smoke from burning debris or power tools or their operation, water spray for dust control, etc. that could lead to fires, smoke, water spray, or other particulate matter or potential for other suspended fines between the ground and the 500-kV conductors. The intent of the plan is to address adequate safety procedures to ensure the insulation level of the air is maintained to avoid flashovers.

The Safety Plan may also include additional measures depending on the results of coordination with Western and TANC. Implementing the safety plan would avoid any adverse effects on electricity service.

Impact PUB-2: Disruption to Underground Utility Lines during Excavation Activities

As noted under Environmental Commitments in Chapter 2, "Project Description," existing underground utility lines at excavation sites will be identified prior to construction and underground utility lines will be avoided or relocated in coordination with the utility company or service provider. As such, there would be no disruption to these lines or the services they provide. There would be no adverse effect on underground utility lines.

Impact PUB-3: Disruption to Emergency Services during Construction

Construction of the Proposed Action would result in a temporary increase in the number of construction vehicles traveling on local roadways. These construction vehicles are not expected to change the level of service provided by local roadways or increase response times of emergency service providers because relatively few construction vehicles would be traveling to and from the site, trips would cease upon completion of construction, and the Intertie area and roads used to access it are not frequently used for emergency vehicle access. Therefore, there would be no adverse effect on emergency services.

Impact PUB-4: Increased Contributions to Local Landfills

Excavation during construction would result in spoils. However, excavated material not reused in permanent construction would be disposed of in spoilbanks in the federal and state right-of-way land between the DMC and the California Aqueduct. The small amount of waste that may require landfill disposal is not expected to substantially decrease the existing lifespan of the landfills near the project study area. Therefore, there would be no adverse effect.

Operation Effects

No impacts on utilities or public services would occur as a result of operation of the Proposed Action.

Alternative 3 (TANC Intertie Site)

Construction Effects

Impact PUB-1: Disruption of Electricity Service

Alternative 3 is the same project as Alternative 2, but at a different location. No major transmission lines traverse this site. Any minor transmission lines could be avoided during construction and have a very small potential to cause disruption of electricity services because of their small service areas.

Impact PUB-2: Disruption to Underground Utility Lines during Excavation Activities

This impact would be the same as described under Alternative 2 above. Underground utility lines will be avoided or relocated in coordination with the utility company or service provider. Refer to Environmental Commitments in Chapter 2, "Project Description." There would be no adverse effect.

Impact PUB-3: Disruption to Emergency Services during Construction

This impact would be the same as described under Alternative 2 above. There would be no adverse effect.

Impact PUB-4: Increased Contributions to Local Landfills

This impact would be the same as described under Alternative 2 above. There would be no adverse effect.

Operation Effects

No impacts on utilities or public services would occur as a result of operation of the Alternative 3.

Alternative 4 (Virtual Intertie)

Construction Effects

Impact PUB-1: Disruption of Electricity Service

This impact is similar to the one described under Alternative 2 above. The COTP crosses the Alternative 4 project area, and as a result there is the potential for disruption of electricity service resulting from construction activities as discussed under Alternative 2. The difference is that under Alternative 4 a temporary pipeline would be installed to connect the DMC and California Aqueduct under emergency circumstances. This would require minimal construction equipment and activities, and the likelihood of disruption is substantially less.

Impact PUB-2: Disruption to Underground Utility Lines during Excavation Activities

This impact potentially would occur under Alternative 4. However, the likelihood of occurrence is less than under Alternatives 2 and 3 because construction activities associated with the installation of the temporary intertie would be minimal compared to construction under Alternatives 2 and 3. Excavation activities under this alternative would be limited to minimal grading near the California Aqueduct to minimize the elevation difference between the DMC and the California Aqueduct. Underground utility lines would be avoided or relocated in coordination with the utility company or service provider. Refer to Environmental Commitments in Chapter 2, "Project Description." There would be no adverse effect.

Impact PUB-3: Disruption to Emergency Services during Construction

This impact would be similar to the one described under Alternative 2 above but to a lesser extent because activities associated with the installation of the temporary intertie likely would take place over a period of 5 to 7 days and would occur infrequently. There would be no adverse effect on emergency services.

Impact PUB-4: Increased Contributions to Local Landfills

This impact would be the similar to the one described under Alternative 2 above but would occur to a lesser extent because excavation under Alternative 4 would be minimal. Similar to Alternative 2, excavation during construction would generate the greatest amount of waste material; however, because the Alternative 4 intertie is temporary, this material would be put back in place when the temporary intertie is removed. The small amount of waste that may require landfill disposal is not expected to substantially decrease the existing lifespan of the landfills near the project study area. There would be no adverse effect.

Operation Effects

Operation of the temporary intertie and the Banks Pumping Plant under Alternative 4 would not result in adverse effects on utilities or public services.

5.9 Environmental Justice

5.9.1 Introduction

This section describes the existing environmental conditions and the consequences of constructing and operating the project alternatives on environmental justice. The concept of environmental justice embraces two principles: (1) fair treatment of all people regardless of race, color, nation of origin, or income and (2) meaningful involvement of people in communities potentially affected by program actions. Executive Order 12898 requires all federal agencies to conduct programs, policies, and activities that subsequently affect human health or the environment in a manner that ensures that such programs, policies, and activities do not have an effect of excluding persons (including populations) from participation in or denying persons the benefits of those programs, or subjecting persons to discrimination because of their race, color, or national origin. Section 1-101 requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of programs on minority and low-income populations.

5.9.2 Affected Environment

Sources of Information

The following key source of information was used in the preparation of this section:

- U.S. Department of Commerce, Census Bureau 2003a and 2003b.

Demographics

The Proposed Action and alternatives are located in eastern Alameda County just outside the San Joaquin County line. The percentage of minorities residing in the counties is 35.8 and 45.4, respectively. For the State of California, 35.7% of the population is considered to be of a minority race. Table 5.8-1 illustrates the percentage of races residing in Alameda and San Joaquin Counties. Percentages for the State of California are also included for comparison.

Table 5.8-1. Race/Origin Characteristics, Census 2000 (%)

	Alameda County	San Joaquin County	State of California
Race			
White	48.8	58.1	59.5
Black or African American	14.9	6.7	6.7
American Indian and Alaska Native	0.6	1.1	1.0
Asian	20.4	11.4	10.9
Native Hawaiian, other Pacific Islander	0.6	0.3	0.3
Some other race	8.9	16.3	16.8
Two or more races	5.6	6.0	4.7
Origin			
Hispanic	19.0	30.5	32.4

Source: U.S. Department of Commerce, Census Bureau 2003a.

Percentages may total more than 100% because individuals may report more than one race. Hispanic is considered an origin by the Census Bureau. Therefore, those of Hispanic origin are also counted in one of the race categories.

As shown in Table 5.8-2 below, 7.7% of households in Alameda County and 13.5% of households in San Joaquin County were determined to have an income in 1999 below the poverty level. The State of California had 10.6% of households below the poverty level during the same period.

Table 5.8-2. Household Poverty Status in 1999 (%)

	Alameda County	San Joaquin County	State of California
Percent below poverty level	7.7	13.5	10.6

Source: U.S. Department of Commerce, Census Bureau 2003b.

5.9.3 Environmental Consequences

Methods

The following methodology is based on the EPA's Environmental Justice Guidance (U.S. Environmental Protection Agency 1998). The EPA's Environmental Justice Guidance states that

> [m]inority populations should be identified where either (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of analysis.

As such, demographic data for Alameda and San Joaquin Counties were compared to demographic data from the next highest unit of analysis, the State of California, to determine whether that specific area had a "meaningfully greater" percentage of minority or low-income population.

Potential environmental justice impacts were analyzed by comparing census data from the project location—Alameda County—with data from neighboring San Joaquin County and the State of California. Data were collected primarily from the U.S. Census Bureau 2000 Census. The population data that are key to the analysis of Environmental Justice are the following race, income, and age characteristics:

- percentage of minority population (black or African American; American Indian and Alaskan Native; Asian; Native Hawaiian and other Pacific Islander; some other race; and two or more races);
- percentage of persons of Hispanic origin; and
- percentage of population below the poverty level.

These data are presented in the previous section.

For this analysis, resource sections of this EIS were reviewed to identify any adverse effects and in which areas those effects would occur. The following questions then were applied:

- Is there an adverse effect?
- Does the potentially affected population include minority or low-income populations?
- Would the adverse environmental or human health effects be likely to fall disproportionately on minority or low-income populations?

5.9.4 Environmental Effects

No Action Alternative

Under the No Action Alternative, the Intertie would not be constructed or operated. The CVP would continue to operate under current conditions. There would be no changes in any of the resources analyzed in this EIS, and therefore, no environmental justice impacts would occur.

Proposed Action (Intertie)

The Proposed Action would allow the CVP to pump more often at or near its authorized pumping capacity of 4,600 cfs at the Jones Pumping Plant. All adverse environmental or human health impacts for this action have been mitigated, as described in each resource section. No population, including minority or low-income populations, would bear a disproportionate environmental or human health effect. Therefore, there would be no environmental justice effects resulting from implementing the Intertie.

Alternative 3 (TANC Intertie Site)

Environmental Justice for Alternative 3 would be the same as described for Alternative 2. No population, including minority or low-income populations, would bear a disproportionate environmental or human health effect. Therefore, there would be no environmental justice effects resulting from implementing the Intertie.

Alternative 4 (Virtual Intertie)

The Virtual Intertie would allow CVP to meet more often its demands from CVP contractors by using pumping capacity available at Banks Pumping Plant, and also includes the installation of a temporary intertie facility during emergencies. All adverse environmental or human health impacts of this action have been mitigated, as described in each resource section. No population, including minority or low-income populations, would bear a disproportionate environmental or human health effect. Therefore, there would be no environmental justice effects resulting from implementing the Virtual Intertie.