Chapter 14

Visual Resources

14.1 Introduction

This Chapter describes the visual resources in the study area related to natural and artificial landscape features and potential changes that could occur as a result of implementing the alternatives evaluated in this Environmental Impact Statement (EIS). Implementation of the alternatives considered in this EIS could affect visual resources through changes in surface water elevations at Central Valley Project (CVP) and State Water Project (SWP) reservoirs and changes in land use related to potential changes in operation of the CVP and SWP and ecosystem restoration.

Changes in reservoir surface water elevations, agricultural resources, and land use are described in more detail in Chapter 5, Surface Water Resources and Water Supplies; Chapter 12, Agricultural Resources; and Chapter 13, Land Use, respectively.

14.1.1 Visual Effects

Natural and artificial landscape features contribute to perceived visual images and aesthetic values of views. The values of views frequently are determined by contrasts of forms and textures related to geology, hydrology, vegetation and wildlife, agricultural crops, and other land uses. For example, a small water feature in a plain may be a significant visual feature; however, a small water feature within an area with vast rivers or larger ponds may be of less significance.

Visual effects are dependent upon the viewpoint of individuals because each person can respond differently to changes in the physical environment depending upon expectations, historical perspective, duration and frequency of the views, and extent of a viewshed. A viewshed is defined by the Federal Highway Administration (DOT 1981) as a surface area visible from a particular location. The character of a viewshed can also vary daily, seasonally, and with changing weather.

Visual effects also are affected by the general activities of the viewers. Passengers in automobiles and trains with relatively short exposure to views may have a different experience than recreationists or residents who view the area for longer periods of time. Residents and recreationists frequently select a location for their activities due to the views. Changes in views could affect the quality of their activities, including housing, camping, hiking, or boating locations. Therefore, changes in visual effects are dependent upon the visual quality of the landscape within the context of the setting (DOT 1981).

Visual quality, or scenic value, has been classified with respect to the lines, forms, colors, textures, and composition of landforms, vegetation, rocks, cultural features, and water features by the U.S. Department of Agriculture (USDA),

Forest Service (USDA 1995). The classification system includes Class A, Distinctive; Class B, Typical (or ordinary or common features); and Class C, Indistinctive. This classification system also considers the scenic integrity, or the completeness of the landscape character.

14.2 Regulatory Environment and Compliance Requirements

Potential actions that could be implemented under the alternatives evaluated in this EIS could affect visual resources at reservoirs and lands served by CVP and SWP water supplies. Actions located on public agency lands or implemented, funded, or approved by Federal and state agencies, would need to be compliant with appropriate Federal and state agency policies and regulations, as summarized in Chapter 4, Approach to Environmental Analysis.

14.3 Affected Environment

This section describes visual resources that could be potentially affected by the implementation of the alternatives considered in this EIS. Changes in visual resources due to changes in CVP and SWP operations may occur in the Trinity River, Central Valley, San Francisco Bay Area, and Central Coast and Southern California regions.

Physical form and visual character are the result of the interaction of natural and engineered elements. Natural elements, including topography, hydrology, vegetation, and climate create the physical context. Engineered elements, such as buildings, roads, infrastructure, and settlement patterns, are secondary elements that act on the natural physical context to establish a visual environment.

Both the natural and engineered landscape features contribute to perceived views and the aesthetic value of those views. In areas considered to have high resource value and scenic character, it is important to evaluate and protect the visual character and aesthetic value of landscapes that may to undergo alteration.

14.3.1 Trinity River Region

The Trinity River Region includes the area along the Trinity River from Trinity Lake to the confluence with the Klamath River, and along the Klamath River from the confluence with the Trinity River to the Pacific Ocean.

14.3.1.1 Trinity River Watershed

The Trinity River drains an area of the Coast Range, northwest of the Sacramento Valley. Dams on the river form Trinity Lake and Lewiston Lake, both of which are in the Whiskeytown-Shasta-Trinity National Recreation Area, as described in Chapter 15, Recreation Resources. The Trinity River flows through sparsely populated and heavily forested, mountainous terrain, jagged cliffs that can be viewed during numerous recreational opportunities, including fishing, rafting,

kayaking, and canoeing. The forests offer visual resources which include snow-covered peaks, volcanoes, rock outcroppings, mountain creeks, lakes, meadows, and a wide variety of trees and vegetation. Downstream of Lewiston Dam, the Trinity River corridor is characterized by gravel bars, riparian vegetation, and human-built features (NCRWQCB et al. 2009). Artificial lights occur related to passing vehicles and local residential and commercial buildings. Glare related to the water surfaces may occur from some view locations.

14.3.1.1.1 Wild and Scenic Rivers and Scenic Highways in the Trinity River Watershed

On January 19, 1981, the Secretary of the Interior designated portions of the Trinity River watershed as part of the National Wild and Scenic Rivers System, including the Trinity River downstream of Lewiston Dam, and portions of the South Fork, North Fork, and New River (BLM et al. 2012). The State of California adopted similar reaches as wild and scenic under Public Resources Code sections 5093.54 and 5093.545.

The Trinity River Region includes two highways in Trinity County and one highway in Humboldt County that are eligible for State Scenic Highway designations. The two highways in Trinity County are eligible for State Scenic Highway designation and include the Siskiyou-Trinity Scenic Byway (State Route 3, which extends from south of Hayfork to north of Trinity Lake to Interstate 5) and Trinity Scenic Byway (State Route 299, which extends from the Pacific Ocean to Redding) (CalTrans 2014a). In Humboldt County, State Route 96 along the Trinity River from Willow Creek to the confluence with the Klamath River is eligible for State Scenic Highways designation (CalTrans 2014b).

14.3.1.2 Lower Klamath River Watershed

The Klamath River from the confluence with the Trinity River to the Pacific Ocean is characterized by a forested river canyon with riparian vegetation along the river. Reduced flows in the summer have frequently resulted in algal blooms which has reduced water clarity and visual quality of the river corridor (DOI and DFG 2012).

14.3.1.2.1 Wild and Scenic Rivers and Scenic Highways in the Klamath River Watershed

The portion of the Klamath River watershed within the Trinity River Region considered in this EIS (from the confluence with the Trinity River to the Pacific Ocean) was designated as part of the entire reach of the Klamath River from Iron Gate to the Pacific Ocean by the Secretary of the Interior to be part of the National Wild and Scenic Rivers System on January 19, 1981. The State of California also adopted this reach of Klamath River as wild and scenic under Public Resources Code sections 5093.54 and 5093.545.

Caltrans has not designated highways within the Klamath River watershed in the Trinity River Region as Scenic Highways or identified roadways to be eligible for Scenic Highways status (CalTrans 2014b, 2014c).

14.3.2 Central Valley Region

The Central Valley Region extends from above Shasta Lake to the Tehachapi Mountains, and includes the Sacramento Valley, San Joaquin Valley, Delta, and Suisun Marsh.

The Central Valley Region is predominantly made up of lowlands and plains surrounded by foothills and tall mountains of the Coast Range to the west, the Cascade Range to the north, the Sierra Nevada to the east, and the Tehachapi Mountains to the south. Communities and roadways of various sizes are located throughout the valley. Land use outside of the communities is primarily agricultural, with riparian, wetland and oak woodlands along the major waterways.

14.3.2.1 Sacramento Valley

The Sacramento Valley extends from the northern mountainous areas to the less dramatic landscapes of the Central Valley at the lower elevations. The mountainous areas are characterized by rugged and deep river canyons and valleys that extend from jagged peaks to forested areas with pine and deciduous trees. Large rivers flow from the mountain areas through the foothills into the agricultural areas and communities along the valley floor. Oak woodlands are located at middle and lower elevations of the foothills and along riparian corridors on the valley floor.

The Sacramento Valley extends from Shasta Lake and Whiskeytown Lake to the Delta. The Sacramento Valley portion of the Central Valley Region considered in this EIS includes the middle and lower portions of the Feather River and American River watersheds that are influenced by CVP and SWP water supply facilities, respectively.

14.3.2.1.1 Shasta Lake, Keswick Reservoir, and Whiskeytown Lake

Shasta Lake, Keswick Reservoir, and Whiskeytown Lake are in the Whiskeytown-Shasta-Trinity National Recreation Area, as described in Chapter 15, Recreation Resources. These watersheds provide opportunities for high quality visual attractions, such as mountains, forests, waterfalls, streams, open water, and vistas of the sky that can be experienced during numerous recreational activities such as boating, water skiing, swimming, fishing, camping, picnicking, hiking, hunting, and mountain biking. Panoramic views for travelers through the area can be seen from many locations, including State Route 151 vista point, Shasta Dam Visitor Center, and Interstate 5. The contrast between the open water bodies and surrounding mountains provides a wide diversity of views. The quality and diversity of visual resources at the lakes and the surrounding areas is influenced by human-built features such as highways, railroads, resorts, bridges, communities, and electrical transmission facilities. The visual quality of open waters also is influenced by fluctuating water levels. Typically, the water levels decline from an annual maximum in May to a minimum in October. In extremely dry years, exposed bare mineral soils in a “bathtub ring” are in substantial contrast to the open water and the upslope vegetation (Reclamation 2013a).

Between the lakes, pine and oak forests predominate, with intermittent chaparral and rock outcrops. The landscape includes mountain ranges, volcanoes, and waterways, opening below the reservoir to the agricultural vistas and communities of the Central Valley.

14.3.2.1.2 Sacramento River Watershed: Keswick Reservoir to Feather River

The scenic qualities of the upper reaches of the Sacramento River watershed south of Keswick Reservoir are generally considered to be of high quality, especially in areas where little to no development has occurred. Varied topography, geologic formations, and natural and manmade water bodies provide striking vistas. Similar conditions are found in the Sierra Nevada Mountains and foothills near the upper and middle Feather, Yuba, American, Mokelumne, Calaveras, and Stanislaus rivers watersheds.

The foothills provide views of rolling hills, open grasslands, and scattered oak and pine woodlands. In the lower elevations of the Central Valley, the human-built environment becomes more dominant, and detracts from views of the natural landscape. Outside of the urban and suburban areas, land use is rural in character, with agricultural areas that include irrigated row crops, orchards, and grazing lands. Sporadically, flooded agricultural fields, especially rice fields managed for wetlands, are used heavily by migrating birds.

Between the Keswick Reservoir and Feather River confluence with the Sacramento River, the landscape also includes human-built reservoirs and canals. Black Butte Reservoir is operationally integrated with the CVP, and the canal system includes the CVP Corning Canal, Tehama-Colusa Canal, and Glenn-Colusa Irrigation District's canal. The canals provide visual interest in localized areas with limited viewing opportunities (Reclamation 1997).

Visual resources that could be affected in the Feather River and American River watersheds are described below. The remaining portions of the Sacramento Valley between the Feather River and the San Francisco Bay Area Region includes the Delta (described in following subsections of this chapter) and areas located to the east and west of the Delta. Land uses located to the south of the Feather River and outside of the Delta include agricultural, open space, and major urban centers that all use SWP water supplies. The urban areas include the cities of Vacaville, Fairfield, and Vallejo in Solano County and unincorporated areas of Napa County.

Scenic Highways in the Sacramento River Area

In the Sacramento Valley portion of the Central Valley Region, there are several designated State Scenic Highways and several roads that are eligible for this designation, including the following roadways:

- Shasta County: State Route 151 from Shasta Dam to Lake Boulevard is designated as a State Scenic Highway due to views of the Sacramento River, Shasta Lake, and distant hills. State Routes 299, 44, and 89 are eligible for State Scenic Highway designation (CalTrans 2014a, 2014d).

- Tehama County: State Routes 89 and 36 are eligible for State Scenic Highway designation (CalTrans 2014e).
- Yolo County: A portion of State Route 16 is eligible for State Scenic Highways designation (CalTrans 2014f).
- Solano County: A portion of State Route 37 is eligible for State Scenic Highways designation (CalTrans 2014g).
- Napa County: Portions of State Routes 29 and 121 are eligible for State Scenic Highways designation (CalTrans 2014h).

14.3.2.1.3 Feather River Watershed

Antelope Lake, Lake Davis, Frenchman Lake, Lake Oroville, and Thermalito Afterbay on the Feather River are human-built reservoirs providing visual contrast with surrounding terrain.

Upper Feather River

Antelope Lake, Lake Davis, and Frenchman Lake are located in the upper Feather River watershed (DWR 2013a; USFS 2006a, 2006b, 2011). Antelope Lake, located on Indian Creek, has the longest dam of the three reservoirs. This remote lake, surrounded by pine and fir trees, can be viewed from Fruit Growers Boulevard and Indian Creek Road. Lake Davis is formed by Grizzly Dam on Big Grizzly Creek, and is the largest of the three dams. It is located in the upper watershed surrounded by many trees, and can be viewed from Beckwourth-Taylorsville Road and Lake Davis Road. Frenchman Lake, located on Last Chance Creek, is formed by the tallest dam of the three dams. This lake also is surrounded by trees to the waterline and can be viewed from Little Last Chance Creek Road and Frenchman Lake Road.

Lake Oroville and Thermalito Reservoir

The terrain adjacent to Lake Oroville is generally quite steep with limited vehicular access. Most views of the water are from the bridges on State Route 162, State Route 70, and several county roads. Some residents live in the lands around Lake Oroville and Thermalito Afterbay. The residents can easily view the water and visitors can view the structures. As described above for Shasta Lake and other reservoirs in the upper Sacramento River watershed, Lake Oroville water levels decline as summer progresses, leaving a ring of bare soil along the water's edge. In extremely dry years at Lake Oroville, more than 200 vertical feet of bare mineral soils in a "bathtub ring" may be exposed when the surface water elevation approaches 710 feet above mean sea level (DWR 2007).

The Diversion Pool between Oroville Dam and Thermalito Diversion Dam extends about 4.5 miles along the Feather River and meanders through hillsides with substantial vegetation within widths ranging from 50 to 200 feet (DWR 2007). Vistas of the Diversion Pool are primarily viewed by recreationists on the water or along the adjacent trails. A 1.9-mile-long concrete Thermalito Power Canal appears as a contrast from State Route 70 and county roads to the undeveloped landscape between the Diversion Dam and the Thermalito Forebay.

The Thermalito Forebay is a 630-acre reservoir, approximately 3 miles in length that can be viewed by recreationists along or within the open water and travelers along State Route 70 as the roadway extends from the foothills to the valley floor. Water levels in these human-built features generally vary by 2 to 4 feet during a week. When the water levels are low, exposed bare soils create a "bathtub ring" effect.

Thermalito Afterbay is located in a more flat terrain than Lake Oroville and can be viewed from many locations and residences. The Thermalito Afterbay Dam is located parallel to State Route 99 and rises over 30 feet above the roadway (DWR 2007). The Thermalito Afterbay is approximately 4,300 acres and is visible from State Route 162, several county roads, recreation areas, and neighboring residences. Because the afterbay is located on flat lands with minimal foothills, vistas from the water or lands surrounding the afterbay extend from the Sierra Nevada foothills to the Feather River on the valley floor. Water levels in the afterbay generally vary by 2 to 6 feet during a week, but can decline by as much as 11 feet. When the water levels are low, exposed bare soils create a "bathtub ring" effect.

The low flow channel of the Feather River extends from the Diversion Dam through the community of Oroville (DWR 2007). Urban land uses and other buildings, including the Feather River Fish Hatchery, are located along the channel upstream of the State Route 70 bridge. The Oroville Wildlife Area extends from State Route 70 on the east, downstream of the bridge, and includes the Thermalito Afterbay area. Dredge tailings from hydraulic mining that occurred over 100 years ago occur along the low flow channel with some of the tailings reaching heights of more than 40 feet above the roadway.

Wild and Scenic Rivers and Scenic Highways in the Feather River Watershed

Within the Central Valley Region considered in this EIS, the Middle Fork Feather River (from Beckworth to Lake Oroville) was designated as part of Public Law 90-542 (Wild and Scenic Rivers Act) to be part of the National Wild and Scenic Rivers System on October 2, 1968.

In the Feather River watershed and adjacent Bear River watershed of the Central Valley Region, there is one designated State Scenic Highway and several roads that are eligible for this designation, including the following roadways.

- Butte County: State Route70 is eligible for State Scenic Highways designation (CalTrans 2014i).
- Plumas County: State Routes 70 and 89 are eligible for State Scenic Highways designation (CalTrans 2014j).
- Nevada County: State Route 20 from Skillman Flat Campground to half-mile east of Lowell Hill Road is designated as a State Scenic Highway and a U.S. Forest Service (USFS) Scenic Byway due to views of pine forests and results of hydraulic mining. Interstate 80 and State Routes 20, 49, and 174 are eligible for State Scenic Highways designation (CalTrans 2014k).

14.3.2.1.4 Yuba River Watershed

The middle and lower Yuba River watershed extends through Nevada and Yuba counties. Upstream of New Bullards Bar Reservoir, the watershed is characterized by coniferous, mixed conifer/hardwood, and ponderosa pine forests along steep canyons. Most of the upper watershed is undeveloped with rural communities located along State Route 49 (DWR et al. 2007).

New Bullards Bar Reservoir, on the Yuba River and in Yuba County, is a human built reservoir providing visual contrast of the lake surface with mountainous landscape with conifers and mixed hardwood forests (DWR et al. 2007). There are many locations in the watershed to view the lake and the adjacent forests. Recreational developments are located near the marina and campgrounds near the shoreline.

Downstream of New Bullards Bar Reservoir along the Middle Yuba River and to Englebright Reservoir (located in Nevada and Yuba counties), the landscape is characterized by rolling hills with hardwood and coniferous trees and grasslands (DWR et al. 2007, USACE 2012). This portion of the watershed is rural with communities located along State Route 20.

Downstream of Englebright Reservoir, the landscape includes grasslands and agricultural fields with several small communities (USACE 2012). Along the river, the landscape is dominated by remnants of historic gold and gravel mining and ongoing gravel mining activities with minimal riparian vegetation. This portion of the watershed can be viewed from State Route 20.

14.3.2.1.5 Middle and Lower American River Watershed

The middle and lower American River watershed extends through Placer, El Dorado, and Sacramento counties. Upstream of Folsom Dam, much of Placer and El Dorado counties are characterized by undeveloped rolling grasslands and oak woodlands with sporadic agricultural activities related to orchards, vineyards, ornamental flowers, and Christmas tree farms in the wooded foothills. Communities have been developed throughout the counties especially near Interstate 80, U.S. Highway 50, and State Routes 49 and 89.

Folsom Lake, on the American River, is a human built reservoir providing visual contrast with the foothill landscape. Views from the water surface provide panoramic vistas of the foothills with open grasslands, oak woodlands, and pine woodlands. Folsom Lake is generally considered to provide a pleasing visual setting for recreationists, residences, and from roadways along the foothills above the reservoir, especially from the Lake Overlook and the Folsom Dam Observation Point vista points. Increased population in the communities around the lake have provided more scenic view points, including increased vistas of human-built structures such as electric transmission facilities, roadways, dams, and residential subdivisions. Reservoir levels fluctuate and decline as summer progresses, leaving a “bathtub ring” of bare soil along the water’s edge. The visual quality also degrades because visitors drive vehicles onto the exposed soils which cause tire tracks and erosion (Reclamation et al. 2006).

Lake Natoma extends from Folsom Dam along the American River to Nimbus Dam. The land along the river is mostly undeveloped and includes wooded canyon areas, sheer bluffs, and dredge tailings from the gold mining era. Residential and community developments have been constructed along the foothills that overlook the canyon, and these structures can be seen by recreationists from the water or adjacent trails. Lake Natoma can be viewed from U.S. Highway 50 and local roads.

Downstream of Nimbus Dam to Gristmill Recreation Area (downstream of William B. Pond Recreation Area and approximately 2 miles upstream from the Watt Avenue Bridge), the American River flows through a landscape characterized by steep bluffs, terraces, mid-river sand and gravel bars, backwater areas along the edges, and riparian vegetation. This viewshed is seen from the recreational areas on the water and adjoining trails, from the bridge crossings, and from residences along the terraces and foothills. Downstream of the Gristmill Dam Recreation Area, the visual characteristics are less complex with an increased number of bridges, water treatment plant intake, and artificial bank protection. The communities along the American River corridor include the cities of Folsom, Roseville, Rancho Cordova, and Sacramento and unincorporated areas. The communities, transportation infrastructure, and water-river corridor are visible from multiple vantage points.

Wild and Scenic Rivers and Scenic Highways in the American River Watershed

Within the American River watershed, the Lower American River from Nimbus Dam to the confluence with the Sacramento River were designated by the Secretary of the Interior to be part of the National Wild and Scenic Rivers System on January 19, 1981. The State of California also designated the Lower American River as wild and scenic under Public Resources Code sections 5093.54 and 5093.545. In addition, the state designated the North Fork American River from the source to Iowa Hill Bridge as wild and scenic.

In the portion of the American River watershed in the study area of this EIS, there is one roadway designated as a State Scenic Highway and one road that is eligible for this designation. In El Dorado County, U.S. Highway 50 from Government Center Interchange in Placerville to South Lake Tahoe is designated as a State Scenic Highway due to vistas of the American River canyon, suburban foothills, granite peaks, and Lake Tahoe. Also in El Dorado County, State Route 49 is eligible for State Scenic Highways designation (CalTrans 2014l).

14.3.2.2 San Joaquin Valley

The San Joaquin Valley land cover ranges from high alpine vegetation near the crest of the Sierra Nevada Mountains, through coniferous forest, mixed forest, oak woodlands and oak savanna, to grasslands and agricultural areas at the lower elevations (Reclamation 1997, 2005a, 2005b). Water bodies include reservoirs, natural lakes and ponds, rivers, and tributary streams. The human-built environment is more dominant at lower elevations, and includes roadways, communities, roadside businesses, and transmission lines, detracting from views of the natural environment. On the valley floor, the San Joaquin Valley is

characterized by agricultural lands, including many that are irrigated with CVP and/or SWP water supplies. The valley is arid to semi-arid, and there are few natural lakes or streams on the valley floor.

Several wetlands have been established as wildlife refuges in the San Joaquin Valley (as described in Chapter 10, Terrestrial Biological Resources), providing views of water and vegetation, enhanced seasonally by waterfowl and seasonal wildflowers.

The predominant land use is agricultural, with sparse to moderate populations. Interstate 5 and major railroads pass along the western San Joaquin Valley at the base of the Coast Ranges foothills. State Route 99 and other railroads are located along the eastern San Joaquin Valley at the base of the Sierra Nevada foothills. Interstate 580 and State Routes 152, 198, and 46 cross the San Joaquin Valley from east to west between Interstate 5 and State Route 99. Larger cities have been established in the northern San Joaquin Valley, including Lodi, Stockton, Lathrop, Manteca, and Tracy; and along State Route 99, including Merced, Fresno, Visalia, and Bakersfield. Both Interstate 5 and State Route 99 are extensively traveled and provide numerous viewing opportunities.

14.3.2.2.1 Northern San Joaquin Valley

In the northern San Joaquin Valley, the foothills range from rolling hills to mountainous terrain with riparian corridors that range from narrow canyons to alluvial plains. The San Joaquin, Stanislaus, Merced, and Tuolumne rivers are the principal water features that flow from the Sierra Nevada foothills. One or more reservoirs are located along each of these rivers, including the CVP New Melones Reservoir on the Stanislaus River and Millerton Lake on the San Joaquin River. Other reservoirs are owned and operated by local and regional water suppliers, as described in Chapter 5, Surface Water Resources and Water Supplies. Dredge tailings have been deposited along some of the rivers as the streams flow from the mountains into the foothills.

The CVP New Melones Reservoir is located in the western foothills of the Sierra Nevada along the Stanislaus River. The area is characterized by foothills, ridges, and small valleys with vegetated slopes and the open water surface (Reclamation 2010). The vegetation is primarily grasslands and oak woodlands with varying densities, with gray pine and low shrubs along some slopes. Views of the water are primarily from the water surface, adjacent recreation areas, and State Route 49. The surrounding lands are rural and undeveloped except for the infrastructure associated with the dam, canals, and power generation facilities and some minor structures associated with the recreation areas and utility lines. When the reservoir is drawn down, broad bands of bare soil are exposed.

Millerton Lake also is located in the western foothills of the Sierra Nevada along the San Joaquin River in an area that ranges from grasslands and rolling hills near Friant Dam to steep, craggy slopes in the upper reaches of the lake (Reclamation et al. 2011a). The lake, dam infrastructure, and surrounding hills can be viewed from the lake surface and adjacent county roads. Development has occurred along the hillsides that can be viewed from the lake surface and adjacent

recreation areas; however; future development will be regulated by Madera and Fresno counties to protect visual and scenic resources. When the reservoir is drawn down, broad bands of bare soil are exposed. The Madera Canal and Friant-Kern Canal extend from Millerton Lake to the north and south, respectively. The canals are located along the Sierra Nevada foothills through mostly agricultural landscapes and limited residences (Reclamation et al. 2011, Reclamation 1997). The canals are only intermittently visible from county roads.

14.3.2.2.2 Western San Joaquin Valley

The Coast Range foothills on the western side of the northern San Joaquin Valley are sparsely populated and characterized by mountainous to hilly terrain with grasslands and scattered oak woodlands along narrow streams. The CVP and SWP San Luis Reservoir complex is located within the western foothills; and the CVP and SWP water supply canals are located at the base of the foothills to the north and south of the San Luis Reservoir.

The CVP and SWP water supply facilities are prominent features in the viewshed of the San Joaquin Valley, including facilities at or near San Luis Reservoir, Delta-Mendota Canal, San Luis Canal-California Aqueduct, Cross Valley Canal, New Melones Reservoir, and Millerton Lake. The San Luis Reservoir, O'Neill Forebay, and Los Banos Creek Reservoir are located in northwestern San Joaquin Valley. State Route 152 is located along the northern and eastern rims of San Luis Reservoir and the western rim of O'Neill Forebay (Reclamation and State Parks 2013). O'Neill Forebay and Los Banos Creek Reservoir can be seen to the west from Interstate 5. The reservoirs are also part of the visual resources for the San Luis Reservoir State Recreation Area, Pacheco State Park, and Upper and Lower Cottonwood Wildlife Areas (which are described in Chapter 10, Terrestrial Biological Resources, and Chapter 15, Recreation Resources). The shorelines of the reservoirs are undeveloped, except for recreational facilities. Views included annual grassland, coastal sage, and riparian woodland. When the reservoirs are drawn down, broad bands of bare soil are exposed. Open water viewing opportunities also occur to the south of the San Luis complex at the Little Panoche Reservoir located to the west of Interstate 5.

The open water and canal infrastructure of the Delta-Mendota Canal, San Luis Canal-California Aqueduct, Cross Valley Canal, and irrigation district canals can be viewed from Interstate 5 and the railroad lines along the western San Joaquin Valley. The open water of Mendota Pool is located at the terminus of the Delta Mendota Canal and can be viewed from county roads.

14.3.2.2.3 Southern San Joaquin Valley

In the southern portion of the San Joaquin Valley, the Kings, Kaweah, Tule, and Kern rivers are the principal water features along the eastern Sierra Nevada foothills. One or more reservoirs are located along each of these rivers. Riparian vegetation and oak woodlands occur along these river corridors. The western Coast Ranges foothills are characterized by distinct, folded foothills with

grasslands and infrequent oak woodlands along small drainages. The Tehachapi Mountains rise abruptly along the southern boundary of the valley.

14.3.2.2.4 Wild and Scenic Rivers and Scenic Highways in the San Joaquin Valley

In the San Joaquin Valley within or near the Central Valley Region considered in this EIS, four rivers were designated to be part of the National Wild and Scenic Rivers System. Portions of the Tuolumne River from the source waters to Don Pedro Reservoir were designated through Public Law 98-425 as wild and scenic. Portions of the Merced River were designated through Public Laws 100-149 and 102-432 as wild and scenic, including the entire South Fork and the mainstem from the source waters to Lake McClure. Portions of the Kings River were designated as wild and scenic through Public Law 100-150, including the Middle Fork and South Fork from their respective sources to the confluences with the mainstem; and the mainstem from these confluences to an elevation of 1595 feet above mean sea level (upstream of the confluence with the North Fork and Pine Flat Lake). Portions of the Kern River were designated as wild and scenic through Public Law 100-174, including the North Fork from the source to the Tulare County/Kern County boundary; and the South Fork from the source to the Domeland Wilderness. Most of these reaches are located outside of the Central Valley Region; however, the flows from these reaches could influence the visual resources of downstream reaches in the Central Valley Region.

In the San Joaquin Valley of the Central Valley Region, there are five roadway sections designated as a State Scenic Highway and seven roadway sections that are eligible for this designation.

- San Joaquin County and Alameda County: Interstate 580 from Interstate 5 to State Route 205 is designated as a State Scenic Highway due to vistas of the Coast Ranges and Central Valley. Interstate 5 from the Stanislaus County boundary to Interstate 580 is designated as a State Scenic Highway due to vistas of agricultural lands and the Delta Mendota Canal and California Aqueduct (CalTrans 2014m, 2014n).
- Stanislaus County: Interstate 5 from the San Joaquin County boundary to the Merced County boundary is designated as a State Scenic Highway due to vistas of agricultural lands and the Delta Mendota Canal and California Aqueduct (CalTrans 2014o).
- Merced County: Interstate 5 from State Route 152 to the Stanislaus County boundary is designated as a State Scenic Highway due to vistas of agricultural lands and the Delta Mendota Canal and California Aqueduct (CalTrans 2014p). State Route 152 from Interstate 5 to the Santa Clara County boundary is designated as a State Scenic Highway due to vistas of agricultural lands and the San Luis Reservoir State Recreational Area.
- Fresno County: State Routes 168, 180, and 198 are eligible for State Scenic Highways designation (CalTrans 2014q).

- Tulare County: State Routes 190 and 198 are eligible for State Scenic Highways designation (CalTrans 2014s).
- Kern County: State Routes 14 and 58 are eligible for State Scenic Highways designation (CalTrans 2014t).

14.3.2.3 Delta and Suisun Marsh

Most of the Delta is used for agricultural purposes with major waterways and sloughs that connect the Sacramento, San Joaquin, Mokelumne, Cosumnes, and Calaveras rivers (CALFED 2000). Flood management and irrigation facilities include levees, impoundments, pumping plants, and control gate structures. Bodies of open water occur where historic levee failures were not repaired, including Franks Tract and Liberty Island. The Sacramento Deep Water Ship Channel is a larger water feature between levees that extends from the Sacramento River near Rio Vista to West Sacramento. Cities within the Delta include the southern portion of Sacramento, Isleton, West Sacramento, Rio Vista, Lathrop, western portions of Stockton and Manteca, Tracy, Brentwood, Oakley, Antioch, and Pittsburg. Small communities to serve the agriculture and recreation users include Freeport, Clarksburg, Hood, Courtland, Locke, Walnut Grove, Ryde, Thornton, Knightsen, and Collinsville. Vistas of the Delta can be seen from residences and agricultural areas in the Delta, open water areas used by recreationists, and from vehicles on roadways and railroads that cross the Delta. Waterfront industries are located along the rivers, especially along the San Joaquin River.

The Suisun Marsh is characterized by tidal and freshwater wetlands and riparian woodlands (Reclamation et al. 2010). The area is bounded by Interstate 80 and State Route 12 on the north; the Montezuma Hills and Sulphur Springs Mountains on the east and west, respectively; and on the south by the open waters of Suisun Bay, Grizzly Bay, and Honker Bay with adjoining wetlands, marshes, and riparian forests. The marsh is relatively flat and comprised primarily of tidal marsh and submerged lands. Upland areas serve as a backdrop with grasslands and nearby rolling foothills. Vistas of Suisun Marsh can be viewed from adjacent roadways railroads; roads and trails within the marsh; a few residences within the marsh; and open water that can be accessed by boats, kayaks, and canoes. Much of Suisun Marsh is managed wetlands and provides habitat for resident and migrating birds and waterfowl.

14.3.2.3.1 Scenic Highways in the Delta

In the Delta and Suisun Marsh portion of the Central Valley Region, there two roadway sections designated as a State Scenic Highway and two roadway sections that are eligible for this designation.

- Sacramento County: State Route 160 between the southern limits of the City of Sacramento to the Contra Costa County boundary is designated as a State Scenic Highway due to the views of historic Delta agriculture and small towns along the Sacramento River (CalTrans 2014u).

- Contra Costa County: State Route 160 from the Antioch Bridge to State Route 4 and State Route 4 continuing on towards Brentwood are eligible for State Scenic Highways designation (CalTrans 2014v).

14.3.3 San Francisco Bay Area Region

The San Francisco Bay Area Region includes portions of Contra Costa, Alameda, Santa Clara, and San Benito counties that are within the CVP and SWP service areas. The San Francisco Bay Area Region ranges in topography from sea level to the East Bay and South Bay foothills that reach elevations of 3,500 feet and higher (CALFED 2000; WTA 2003; Reclamation 2005c). It offers a diverse physical and natural environment, and a wide range of visual resources. Typical views and landscapes include urban development, natural and altered open-space areas, major ridgelines, and scenic waterways. The terrain ranges from alluvial plains to gently sloping hills and wooded ravines. Striking views of iconic scenes are available throughout the area, of San Francisco Bay, the San Francisco skyline, Angel Island, Mount Tamalpais, Peninsula foothills, and the East Bay hills. Views to the east are dominated by Mount Diablo and adjacent Diablo Ridge and valleys. Views in the South Bay extend through the baylands that extend along the Contra Costa, San Mateo, Santa Clara, and Alameda counties shorelines; the river floodplains of the Guadalupe River and Coyote Creek in Santa Clara County; and towards the Santa Cruz Mountains (Santa Clara County 1994).

Urban and industrial areas are located throughout the San Francisco Bay Area Region, including along the San Francisco Bay shoreline. Smaller, localized scenic resources include wetlands, isolated hilltops, rock outcroppings, mature stands of trees, lakes, reservoirs, and other natural features. City parks and recreation areas, open-space areas adjacent to ravines, golf courses, and resource preserves provide visual opportunities in urban areas. The reservoirs that store CVP or SWP water or water from other surface water sources are human built reservoirs located in the foothills or at the edge of the foothills. The water can be viewed from roadways located at elevations higher than the reservoirs and by recreationists on the reservoirs. Agricultural areas that use CVP and SWP water are located within coastal valleys especially within the Livermore-Amador valleys of Alameda County, southern Santa Clara County, and northern San Benito County.

14.3.3.1 Scenic Highways in the San Francisco Bay Area Region

In the San Francisco Bay Area Region, there are four roadway sections designated as a State Scenic Highway and five roadway sections that are eligible for this designation.

- Contra Costa County: State Route 24 from the Alameda County boundary to Interstate 680, and Interstate 680 from State Route 24 to Interstate 580 at the Alameda County boundary are designated as State Scenic Highways due to the views of Mount Diablo and attractive residential and commercial areas (CalTrans 2014v).

- Alameda County: Interstate 580 between Interstate 80 and State Route 92 are designated as a State Scenic Highways (CalTrans 2014n). Portions of Interstate 680 from the Contra Costa County boundary to Mission Boulevard in Fremont and portions of State Route 84 are designated as State Scenic Highways due to vistas of wooded hillsides and valleys. Other portions of Interstate 580 are eligible for State Scenic Highways designation.
- Santa Clara County: Portions of State Routes 152 and 280 within the San Francisco Bay Area Region are eligible for State Scenic Highways designation (CalTrans 2014w).
- San Benito County: Portions of State Routes 156 and 25 within the San Francisco Bay Area Region are eligible for State Scenic Highways designation (CalTrans 2014x).

14.3.4 Central Coast and Southern California Regions

The Central Coast and Southern California Regions include portions of San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, San Diego, Riverside, and San Bernardino counties served by the SWP.

Areas along the Pacific Coast in San Luis Obispo, Santa Barbara, Ventura, portions of Los Angeles, portions of Orange, and San Diego counties are characterized by steep, craggy coastal mountains and coastal plains that can be viewed from the roadways, residences, and the Pacific Ocean. The visual resources include beaches, sand dunes, coastal bluffs, headlands, wetlands, estuaries, islands, hillsides, and canyons (Santa Barbara County 2009, SBCAG 2013). The foothills extend from the Pacific Ocean to more than 800 feet above mean sea level; and the mountains extend to more than 3,000 feet above mean sea level. The foothills are generally covered with mature trees and shrubs, including native oaks, deciduous trees, and eucalyptus. The coastal plains gradually slope towards the foothills with streams through the plains. Small to medium size communities occur along the coast and the coastal plains in San Luis Obispo, Santa Barbara, and Ventura counties and within portions of the coastline in Los Angeles, Orange and San Diego counties. Larger communities also are located along the coastline separated by large areas of undeveloped lands.

Inland from the Pacific Ocean, urban areas extend throughout large portions of the foothills and valleys of Los Angeles, Orange, San Diego, Riverside, and San Bernardino counties. Reduced abundance of natural features, vistas, and non-urban land uses may diminish the visual resources for many viewers (SCAG 2010). However, in many inland areas urban areas are separated by areas of undeveloped or agricultural lands, especially in Riverside and San Bernardino counties. Minimal development has occurred within the higher elevations of the Central Coast and Southern California regions, as described in Chapter 13, Land Use. Therefore, the mountainous areas (such as the San Gabriel, Santa Monica, Santa Ana, Santa Rosa, and San Jacinto mountains) provide dramatic viewsheds from the valleys (Los Angeles 2011, RCIP 2000, San Bernardino County 2007). The mountains also are characterized by deep canyons, rock outcroppings, and sparse vegetation. In the Coachella Valley portion of Riverside County, the visual

resources are dominated by dramatic vistas of the Santa Rosa, San Jacinto, San Bernardino, Cottonwood, and Chocolate mountains with high desert craggy rock outcroppings and sparse vegetation. The Salton Sea in the southern Coachella Valley provides dramatic vistas from the shoreline and highways that extend around the open water.

The inland areas also include major surface water resources that provide open water vistas, including Twitchell Reservoir, Silverwood Lake, Diamond Valley Lake, Lake Perris, Lake Skinner, Vail Lake, and Lake Mathews; and smaller water supply reservoirs. Many of these reservoirs store CVP and SWP water and are human built reservoirs located in the foothills or at the edge of the foothills. The water can be viewed from highways located at elevations higher than the reservoirs and by recreationists on the reservoirs.

14.3.4.1 Wild and Scenic Rivers and Scenic Highways in the Central Coast and Southern California Regions

The wild and scenic rivers in the Central Coast and Southern California areas are not located within the study area of this EIS.

In the Central Coast and Southern California regions, there are seven roadway sections designated as State Scenic Highways and several roadway sections that are eligible for this designation.

- San Luis Obispo County: U.S. Highway 1 from the Monterey County boundary to the City of San Luis Obispo is designated as a State Scenic Highway and an All American Road due to dramatic vista along the mountains and rocky headlands of the Pacific Ocean coastline (CalTrans 2014y). Portions of State Route 41 and Interstate 101 are eligible for State Scenic Highways designation.
- Santa Barbara County: U.S. Highway 1 from Interstate 101 near Las Cruces to near Lompoc is designated as a State Scenic Highway due to dramatic vista along the mountains and rocky headlands of the Pacific Ocean coastline (CalTrans 2014z). Portions of Interstate 101 are eligible for State Scenic Highways designation.
- Ventura County: State Route 33 from the Santa Barbara County boundary to the north of the junction with State Route 150 is designated as a State Scenic Highway and a USFS Scenic Byway due to dramatic vista along the mountains between the Coast Ranges and the Central Valley with landscapes that range from pine forests to semi-desert vegetation (CalTrans 2014aa). Portions of Interstate 101 and State Routes 33 and 1 are eligible for State Scenic Highways designation.
- Los Angeles County: State Route 2 from near La Cañada-Flintridge to the San Bernardino County boundary is designated as a State Scenic Highway and a U.S. Forest Service Scenic Byway due to dramatic vista along the San Gabriel Mountains with vistas of the Mojave Desert and the Los Angeles Basin (CalTrans 2014ab). Portions of Interstate 101, 210, and 110 and State

Routes 1, 23, 27, 39, 118, and 126 are eligible for State Scenic Highways designation.

- Orange County: State Route 91 from State Route 55 to the City of Anaheim is designated as a State Scenic Highway due vistas of the Santa Ana River and urban development with intermittent riparian and chaparral vegetation (CalTrans 2014ac). State Routes 1, 57, and 74 and portions of State Route 91 are eligible for State Scenic Highways designation.
- San Diego County: State Route 75 from the City of Imperial Beach to Coronado is designated as a State Scenic Highway due to vistas of the Pacific Ocean, San Diego Harbor, and the Coronado Bridge (CalTrans 2014ad). State Route 125 between State Routes 94 and 8 is designated as a State Scenic Highway due to vistas of Mt. Helix and attractive residential and commercial areas. Interstate 5 and 8 and portions of State Routes 52, 76, and 93 within the Southern California Region are eligible for State Scenic Highways designation.
- Riverside County: State Route 243 from the City of Banning to State Route 74 is designated as a State Scenic Highway and a U.S. Forest Service Scenic Byway due to the vistas of the San Bernardino Mountains and valley (CalTrans 2014ae). Interstate 15 and State Routes 71, 74, 91, and 111 are eligible for State Scenic Highways designation.
- San Bernardino County: State Routes 2, 18, 38, 138, 173, 189, and 247 are eligible for State Scenic Highways designation (CalTrans 2014af).

14.4 Impact Analysis

This section describes the potential mechanisms and analytical methods for change in visual resources; results of the impact analysis; potential mitigation measures; and cumulative effects.

14.4.1 Potential Mechanisms for Change and Analytical Methods

As described in Chapter 4, Approach to Environmental Analysis, the impact analysis considers changes in visual resources conditions related to changes in CVP and SWP operations under the alternatives as compared to the No Action Alternative and Second Basis of Comparison.

Changes in CVP and SWP operations under the alternatives as compared to the No Action Alternative and Second Basis of Comparison could change the vistas at reservoirs that store CVP and SWP water during dry and critical dry water years and at irrigated agricultural lands during dry and critical dry water years when the crops are idled.

14.4.1.1 Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Vistas at reservoirs that store CVP and SWP water provide a wide diversity of visual experiences related to the contrasts between the open water surface and surrounding foothills or mountains. By the end of September, the surface water elevations decline, and a bare "bathtub ring" appears in contrast to the open water and the upslope vegetation. Changes in CVP and SWP operations under the alternatives could change the extent of the "bathtub" ring over the long-term average condition and in dry and critical dry years as compared to the No Action Alternative and Second Basis of Comparison.

The CalSim II model output includes monthly reservoir elevations for CVP and SWP reservoirs in the Central Valley and Trinity Lake. The end-of-September reservoir elevations in dry and critical dry water years generally indicate low reservoir elevations. To assess changes in visual resources, changes in reservoir storage elevations for the end of September in dry and critical dry years were compared between alternatives and the No Action Alternative and Second Basis of Comparison.

Reservoirs in the San Francisco Bay Area, Central Coast, and Southern California regions store water from multiple water supplies including CVP and SWP water; however, these reservoirs are not included in the CalSim II model simulation. For the purposes of this EIS analysis, changes in surface water elevations in these reservoirs were assumed to be related to changes in CVP and SWP water deliveries to the areas located to the south of the Delta.

14.4.1.2 Changes in Vista at Irrigated Agricultural Lands

Agrarian vistas of irrigated row crops, orchards, and grazing lands intermixed within a landscape of grasslands, large water canals, isolated riparian corridors, and several small communities occur throughout the Central Valley, San Francisco Bay Area, Central Coast, and Southern California regions. Changes in CVP and SWP operations under the alternatives could change the extent of irrigated acreage and the associated vistas over the long-term average condition and in dry and critical dry years as compared to the No Action Alternative and Second Basis of Comparison. However, as described in Chapter 12, Agricultural Resources, the extents of irrigated acreage between Alternatives 1 through 5 are similar to irrigated acreage under the No Action Alternative and the Second Basis of Comparison. Therefore, changes in CVP and SWP operations would not change irrigated acreage and as a result they are not analyzed in this EIS.

14.4.1.3 Effects Related to Water Transfers

Historically water transfer programs have been developed on an annual basis. The demand for water transfers is dependent upon the availability of water supplies to meet water demands. Water transfer transactions have increased over time as CVP and SWP water supply availability has decreased, especially during drier water years.

Parties seeking water transfers generally acquire water from sellers who have available surface water who can make the water available through releasing previously stored water; pumping groundwater instead of using surface water (groundwater substitution); idle crops; or substitute crops that use less water in order to reduce normal consumptive use of surface water.

Water transfers using CVP and SWP Delta pumping plants and south of Delta canals generally occur when there is unused capacity in these facilities. These conditions generally occur drier water year types when the flows from upstream reservoirs plus unregulated flows are adequate to meet the Sacramento Valley water demands and the CVP and SWP export allocations. In non-wet years, the CVP and SWP water allocations would be less than full contract amounts; therefore, capacity may be available in the CVP and SWP conveyance facilities to move water from other sources.

Projecting future visual conditions related to water transfer activities is difficult because specific water transfer actions required to make the water available, convey the water, and/or use the water would change each year due to changing hydrological conditions, CVP and SWP water availability, specific local agency operations, and local cropping patterns. Reclamation recently prepared a long-term regional water transfer environmental document which evaluated potential changes in conditions related to water transfer actions (Reclamation 2014c). Results from this analysis were used to inform the impact assessment of potential effects of water transfers under the alternatives as compared to the No Action Alternative and the Second Basis of Comparison.

14.4.2 Conditions in Year 2030 without Implementation of Alternatives 1 through 5

This EIS includes two bases of comparison, as described in Chapter 3, Description of Alternatives: the No Action Alternative and the Second Basis of Comparison. Both of these bases are evaluated at 2030 conditions. Changes that would occur over the next 15 years without implementation of the alternatives are not analyzed in this EIS. However, the changes to visual resources that are assumed to occur by 2030 under the No Action Alternative and the Second Basis of Comparison are summarized in this section. Many of the changed conditions would occur in the same manner under both the No Action Alternative and the Second Basis of Comparison.

14.4.2.1 Common Changes in Conditions under the No Action Alternative and Second Basis of Comparison

Conditions in 2030 would be different than existing conditions due to:

- Climate change and sea-level rise
- General plan development throughout California, including increased water demands in portions of Sacramento Valley
- Implementation of reasonable and foreseeable water resources management projects to provide water supplies

It is anticipated that climate change would result in more short-duration high-rainfall events and less snowpack in the winter and early spring months. The reservoirs would be full more frequently by the end of April or May by 2030 than in recent historical conditions. However, as the water is released in the spring, there would be less snowpack to refill the reservoirs. This condition would reduce reservoir storage and available water supplies to downstream uses in the summer. The reduced end-of-September storage would also reduce the ability to release stored water to downstream regional reservoirs. These conditions would occur for all reservoirs in the California foothills and mountains, including non-CVP and SWP reservoirs.

These changes would result in a decline of the long-term average CVP and SWP water supply deliveries by 2030 as compared to recent historical long-term average deliveries under the No Action Alternative and the Second Basis of Comparison. However, the CVP and SWP water deliveries would be less under the No Action Alternative as compared to the Second Basis of Comparison, as described in Chapter 5, Surface Water Resources and Water Supplies, which could result in more crop-idling.

Under the No Action Alternative and the Second Basis of Comparison, land uses in 2030 would occur in accordance with adopted general plans. Development under the general plans would change visual resources, especially near municipal areas.

The No Action Alternative and the Second Basis of Comparison assumes completion of water resources management and environmental restoration projects that would have occurred without implementation of Alternatives 1 through 5, including regional and local recycling projects, surface water and groundwater storage projects, conveyance improvement projects, and desalination projects, as described in Chapter 3, Description of Alternatives. The No Action Alternative and the Second Basis of Comparison also assumes implementation of actions included in the 2008 U.S. Fish and Wildlife Service (USFWS) Biological Opinion (BO) and 2009 National Marine Fisheries Service (NMFS) BO that would have been implemented without the BOs by 2030, as described in Chapter 3, Description of Alternatives. These projects would include several projects that would affect visual resources, including:

- Restoration of more than 10,000 acres of intertidal and associated subtidal wetlands in Suisun Marsh and Cache Slough; and at least 17,000 to 20,000 acres of seasonal floodplain restoration in Yolo Bypass
- Restoration of Battle Creek
- Implementation of Red Bluff Pumping Plant

14.4.3 Evaluation of Alternatives

Alternatives 1 through 5 have been compared to the No Action Alternative; and the No Action Alternative and Alternatives 1 through 5 have been compared to the Second Basis of Comparison.

During review of the numerical modeling analyses used in this EIS, an error was determined in the CalSim II model assumptions related to the Stanislaus River operations for the Second Basis of Comparison, Alternative 1, and Alternative 4 model runs. Appendix 5C includes a comparison of the CalSim II model run results presented in this Chapter and CalSim II model run results with the error corrected. Appendix 5C also includes a discussion of changes in the comparison of groundwater conditions for the following alternative analyses.

- No Action Alternative compared to the Second Basis of Comparison
- Alternative 1 compared to the No Action Alternative
- Alternative 3 compared to the Second Basis of Comparison
- Alternative 5 compared to the Second Basis of Comparison

14.4.3.1 No Action Alternative

The No Action Alternative is compared to the Second Basis of Comparison.

14.4.3.1.1 Trinity River Region

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under the No Action Alternative as compared to the Second Basis of Comparison would result in similar end-of-September reservoir elevations (changes within 5 percent) and related visual resources at Trinity Lake in all water year types, as described in Chapter 5, Surface Water Resources and Water Supplies.

14.4.3.1.2 Central Valley Region

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under the No Action Alternative as compared to the Second Basis of Comparison would result in similar end-of-September reservoir elevations and related visual resources at Shasta Lake, Lake Oroville, Folsom Lake, and New Melones Reservoir in all water year types; and at San Luis Reservoir in above-normal, below-normal, and dry years, as described in Chapter 5, Surface Water Resources and Water Supplies. Changes in visual resources at San Luis Reservoir would be reduced in wet year and critical dry years because the end-of-September surface water elevations would be reduced by 6.2 percent in wet and critical dry years.

Effects Related to Cross Delta Water Transfers

Potential effects to visual resources could be similar to those identified in a recent environmental analysis conducted by Reclamation for long-term water transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c). Potential effects to visual resources were identified as changes in reservoir surface water elevations, streams, irrigated acreage, and water elevations in canals that would convey transferred water. The analysis indicated that these potential impacts would not be substantial because the conditions with and without the water transfers would be similar.

Under the No Action Alternative, the timing of cross Delta water transfers would be limited to July through September and include annual volumetric limits, in accordance with the 2008 USFWS BO and 2009 NMFS BO. Under the Second Basis of Comparison, water could be transferred throughout the year without an annual volumetric limit. Overall, the potential for cross Delta water transfers would be less under the No Action Alternative than under the Second Basis of Comparison.

14.4.3.1.3 San Francisco Bay Area, Central Coast, and Southern California Regions

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in visual resources at reservoirs that store CVP and SWP water supplies are assumed to be related to changes in water deliveries over long-term conditions for this EIS analysis. Monthly deliveries are not necessarily indicative of reservoir storage because all or a portion of the water deliveries could be directly conveyed to water users in any specific month. Therefore, annual deliveries are considered to be relatively proportional to the amount of water that could be stored over all water year types. In the San Francisco Bay Area Region, values for the CVP municipal and industrial water deliveries and the SWP south of the Delta water deliveries (without Article 21 deliveries) were considered; and SWP south of the Delta water deliveries (without Article 21 deliveries) were considered for the Central Coast and Southern California regions. Under the No Action Alternative as compared to the Second Basis of Comparison CVP water deliveries would be reduced by 10 percent and SWP water deliveries would be reduced by 18 percent. Therefore, for this EIS analysis, it is assumed that visual resources related to surface water elevations in reservoirs that store CVP and SWP water supplies would be reduced by 10 to 18 percent in the San Francisco Bay Area Region and 18 percent in the Central Coast and Southern California regions.

14.4.3.2 Alternative 1

Alternative 1 is identical to the Second Basis of Comparison. Alternative 1 is compared to the No Action Alternative and the Second Basis of Comparison. However, because visual resource conditions under Alternative 1 are identical to visual resource conditions under the Second Basis of Comparison; Alternative 1 is only compared to the No Action Alternative.

14.4.3.2.1 Alternative 1 Compared to the No Action Alternative

Trinity River Region

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 1 as compared to the No Action Alternative would result in similar end-of-September reservoir elevations and related visual resources at Trinity Lake in all water year types, as described in Chapter 5, Surface Water Resources and Water Supplies.

Central Valley Region

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 1 as compared to the No Action Alternative would result in similar end-of-September reservoir elevations and related visual resources at Shasta Lake, Lake Oroville, Folsom Lake, and New Melones Reservoir in all water year types; and at San Luis Reservoir in above-normal, below-normal, and dry years, as described in Chapter 5, Surface Water Resources and Water Supplies. Changes in visual resources at San Luis Reservoir would be reduced in wet year and critical dry years because the end-of-September surface water elevations would be increased by 6.6 percent in wet and critical dry years.

Effects Related to Cross Delta Water Transfers

Potential effects to visual resources could be similar to those identified in a recent environmental analysis conducted by Reclamation for long-term water transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c) as described above under the No Action Alternative compared to the Second Basis of Comparison. For the purposes of this EIS, it is anticipated that similar conditions would occur during implementation of cross Delta water transfers under Alternative 1 and the No Action Alternative, and that impacts on visual resources would not be substantial in the seller's service area due to implementation requirements of the transfer programs.

Under Alternative 1, water could be transferred throughout the year without an annual volumetric limit. Under the No Action Alternative, the timing of cross Delta water transfers would be limited to July through September and include annual volumetric limits, in accordance with the 2008 USFWS BO and 2009 NMFS BO. Overall, the potential for cross Delta water transfers would be increased under Alternative 1 as compared to the No Action Alternative.

San Francisco Bay Area, Central Coast, and Southern California Regions

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in visual resources at reservoirs that store CVP and SWP water supplies are assumed to be related to changes in water deliveries over long-term conditions for this EIS analysis, as described above under the No Action Alternative as compared to the Second Basis of Comparison. Therefore, under Alternative 1 as compared to the No Action Alternative, visual resources related to surface water elevations in reservoirs that store CVP and SWP water supplies would be increased by 11 to 21 percent in the San Francisco Bay Area Region and 21 percent in the Central Coast and Southern California regions.

14.4.3.2.2 Alternative 1 Compared to the Second Basis of Comparison

Alternative 1 is identical to the Second Basis of Comparison.

14.4.3.3 Alternative 2

The CVP and SWP operations under Alternative 2 are identical to the CVP and SWP operations under the No Action Alternative; therefore, Alternative 2 is only compared to the Second Basis of Comparison.

14.4.3.3.1 Alternative 2 Compared to the Second Basis of Comparison

The CVP and SWP operations under Alternative 2 are identical to the CVP and SWP operations under the No Action Alternative. Therefore, changes to visual resources conditions under Alternatives 2 as compared to the Second Basis of Comparison would be the same as the impacts described in Section 14.4.3.1, No Action Alternative.

14.4.3.4 Alternative 3

As described in Chapter 3, Description of Alternatives, CVP and SWP operations under Alternative 3 are similar to the Second Basis of Comparison with modified Old and Middle River flow criteria and New Melones Reservoir operations. As described in Chapter 4, Approach to Environmental Analysis, Alternative 3 is compared to the No Action Alternative and the Second Basis of Comparison.

14.4.3.4.1 Alternative 3 Compared to the No Action Alternative

Trinity River Region

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 3 as compared to the No Action Alternative would result in similar end-of-September reservoir elevations and related visual resources at Trinity Lake in all water year types, as described in Chapter 5, Surface Water Resources and Water Supplies.

Central Valley Region

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 3 as compared to the No Action Alternative would result in similar end-of-September reservoir elevations and related visual resources at Shasta Lake, Lake Oroville, Folsom Lake, and New Melones Reservoir in all water year types; and at San Luis Reservoir in below-normal, dry, and critical dry years, as described in Chapte 5, Surface Water Resources and Water Supplies. Changes in visual resources at San Luis Reservoir would be reduced in wet year and critical dry years because the end-of-September surface water elevations would be increased by 7.9 percent in wet years and 5.7 percent in above-normal years.

Effects Related to Cross Delta Water Transfers

Potential effects to visual resources could be similar to those identified in a recent environmental analysis conducted by Reclamation for long-term water transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c) as described above under the No Action Alternative compared to the Second Basis of

Comparison. For the purposes of this EIS, it is anticipated that similar conditions would occur during implementation of cross Delta water transfers under Alternative 3 and the No Action Alternative, and that impacts on visual resources would not be substantial in the seller's service area due to implementation requirements of the transfer programs.

Under Alternative 3, water could be transferred throughout the year without an annual volumetric limit. Under the No Action Alternative, the timing of cross Delta water transfers would be limited to July through September and include annual volumetric limits, in accordance with the 2008 USFWS BO and 2009 NMFS BO. Overall, the potential for cross Delta water transfers would be increased under Alternative 3 as compared to the No Action Alternative.

San Francisco Bay Area, Central Coast, and Southern California Regions

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in visual resources at reservoirs that store CVP and SWP water supplies are assumed to be related to changes in water deliveries over long-term conditions for this EIS analysis, as described above under the No Action Alternative as compared to the Second Basis of Comparison. Therefore, under Alternative 3 as compared to the No Action Alternative, visual resources related to surface water elevations in reservoirs that store CVP and SWP water supplies would be increased by 9 to 17 percent in the San Francisco Bay Area Region and 17 percent in the Central Coast and Southern California regions.

14.4.3.4.2 Alternative 3 Compared to the Second Basis of Comparison

Trinity River Region

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 3 as compared to the Second Basis of Comparison would result in similar end-of-September reservoir elevations and related visual resources at Trinity Lake in all water year types, as described in Chapter 5, Surface Water Resources and Water Supplies.

Central Valley Region

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 3 as compared to the Second Basis of Comparison would result in similar end-of-September reservoir elevations and related visual resources at Shasta Lake, Lake Oroville, Folsom Lake, New Melones Reservoir, and San Luis Reservoir in all water year types, as described in Chapter 5, Surface Water Resources and Water Supplies.

Effects Related to Cross Delta Water Transfers

Potential effects to visual resources could be similar to those identified in a recent environmental analysis conducted by Reclamation for long-term water transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c) as described

above under the No Action Alternative compared to the Second Basis of Comparison. For the purposes of this EIS, it is anticipated that similar conditions would occur during implementation of cross Delta water transfers under Alternative 3 and the Second Basis of Comparison, and that impacts on visual resources would not be substantial in the seller's service area due to implementation requirements of the transfer programs.

Under Alternative 3 and the Second Basis of Comparison, water could be transferred throughout the year without an annual volumetric limit. Overall, the potential for cross Delta water transfers would be similar under Alternative 3 and the Second Basis of Comparison.

San Francisco Bay Area, Central Coast, and Southern California Regions

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in visual resources at reservoirs that store CVP and SWP water supplies are assumed to be related to changes in water deliveries over long-term conditions for this EIS analysis, as described above under the No Action Alternative as compared to the Second Basis of Comparison. Therefore, under Alternative 3 as compared to the Second Basis of Comparison, visual resources related to surface water elevations in reservoirs that store CVP and SWP water supplies would be similar (changes within 5 percent).

14.4.3.5 Alternative 4

The visual resources conditions under Alternative 4 would be identical to the conditions under the Second Basis of Comparison; therefore, Alternative 4 is only compared to the No Action Alternative.

14.4.3.5.1 Alternative 4 Compared to the No Action Alternative

The CVP and SWP operations under Alternative 4 are identical to the CVP and SWP operations under the Second Basis of Comparison and Alternative 1. Therefore, changes in visual resources conditions under Alternative 4 as compared to the No Action Alternative would be the same as the impacts described in Section 14.4.3.2.1, Alternative 1 Compared to the No Action Alternative.

14.4.3.6 Alternative 5

As described in Chapter 3, Description of Alternatives, CVP and SWP operations under Alternative 5 are similar to the No Action Alternative with modified Old and Middle Rivers (OMR) flow criteria and New Melones Reservoir operations. As described in Chapter 4, Approach to Environmental Analysis, Alternative 5 is compared to the No Action Alternative and the Second Basis of Comparison.

14.4.3.6.1 Alternative 5 Compared to the No Action Alternative

Trinity River Region

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 5 as compared to the No Action Alternative would result in similar end-of-September reservoir elevations and related visual resources at Trinity Lake in all water year types, as described in Chapter 5, Surface Water Resources and Water Supplies.

Central Valley Region

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 5 as compared to the No Action Alternative would result in similar end-of-September reservoir elevations and related visual resources at Shasta Lake, Lake Oroville, Folsom Lake, New Melones Reservoir, and San Luis Reservoir in all water year types, as described in Chapter 5, Surface Water Resources and Water Supplies.

Effects Related to Cross Delta Water Transfers

Potential effects to visual resources could be similar to those identified in a recent environmental analysis conducted by Reclamation for long-term water transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c) as described above under the No Action Alternative compared to the Second Basis of Comparison. For the purposes of this EIS, it is anticipated that similar conditions would occur during implementation of cross Delta water transfers under Alternative 5 and the No Action Alternative, and that impacts on visual resources would not be substantial in the seller's service area due to implementation requirements of the transfer programs.

Under Alternative 5 and the No Action Alternative, the timing of cross Delta water transfers would be limited to July through September and include annual volumetric limits, in accordance with the 2008 USFWS BO and 2009 NMFS BO. Overall, the potential for cross Delta water transfers would be similar under Alternative 5 and the No Action Alternative.

San Francisco Bay Area, Central Coast, and Southern California Region

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in visual resources at reservoirs that store CVP and SWP water supplies are assumed to be related to changes in water deliveries over long-term conditions for this EIS analysis, as described above under the No Action Alternative as compared to the Second Basis of Comparison. Therefore, under Alternative 5 as compared to the No Action Alternative, visual resources would be similar.

14.4.3.6.2 Alternative 5 Compared to the Second Basis of Comparison

Trinity River Region

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 5 as compared to the Second Basis of Comparison would result in similar end-of-September reservoir elevations and related visual resources at Trinity Lake in all water year types, as described in Chapter 5, Surface Water Resources and Water Supplies.

Central Valley Region

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 5 as compared to the Second Basis of Comparison would result in similar end-of-September reservoir elevations and related visual resources at Shasta Lake, Lake Oroville, Folsom Lake, and New Melones Reservoir in all water year types; and at San Luis Reservoir in wet, above-normal, and below-normal years, as described in Chapter 5, Surface Water Resources and Water Supplies. Changes in visual resources at San Luis Reservoir would be reduced in dry year and critical dry years because the end-of-September surface water elevations would be decreased by 6.2 percent in dry years and 8.5 percent in critical dry years.

Effects Related to Cross Delta Water Transfers

Potential effects to visual resources could be similar to those identified in a recent environmental analysis conducted by Reclamation for long-term water transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c) as described above under the No Action Alternative compared to the Second Basis of Comparison. For the purposes of this EIS, it is anticipated that similar conditions would occur during implementation of cross Delta water transfers under Alternative 5 and the Second Basis of Comparison, and that impacts on visual resources would not be substantial in the seller's service area due to implementation requirements of the transfer programs.

Under Alternative 5, the timing of cross Delta water transfers would be limited to July through September and include annual volumetric limits, in accordance with the 2008 USFWS BO and 2009 NMFS BO. Under the Second Basis of Comparison, water could be transferred throughout the year without an annual volumetric limit. Overall, the potential for cross Delta water transfers would be reduced under Alternative 5 as compared to the Second Basis of Comparison.

San Francisco Bay Area, Central Coast, and Southern California Regions

Potential Changes in Visual Resources at Reservoirs that Store CVP and SWP Water

Changes in visual resources at reservoirs that store CVP and SWP water supplies are assumed to be related to changes in water deliveries over long-term conditions for this EIS analysis, as described above under the No Action Alternative as compared to the Second Basis of Comparison. Therefore, under Alternative 5 as

compared to the Second Basis of Comparison, visual resources related to surface water elevations in reservoirs that store CVP and SWP water supplies would be reduced by 10 to 18 percent in the San Francisco Bay Area Region and 18 percent in the Central Coast and Southern California regions.

14.4.3.7 Summary of Impact Assessment

The results of the impact assessment of implementation of Alternatives 1 through 5 as compared to the No Action Alternative and the Second Basis of Comparison are presented in Tables 14.1 and 14.2.

Table 14.1 Comparison of Alternatives 1 through 5 to No Action Alternative

Alternative	Potential Change	Consideration for Mitigation Measures
Alternative 1	Visual resources would be similar at Trinity Lake, Shasta Lake, Lake Oroville, Folsom Lake, and New Melones Reservoir in all water year types; and at San Luis Reservoir in above-normal, below-normal, and dry years. Visual resources would be increased by 6 percent in wet and critical dry years at San Luis Reservoir, by 11 to 21 percent in the San Francisco Bay Area Region, and by 21 percent in the Central Coast and Southern California regions.	None needed.
Alternative 2	No effects on visual resources.	None needed.
Alternative 3	Visual resources would be similar at Trinity Lake, Shasta Lake, Lake Oroville, Folsom Lake, and New Melones Reservoir in all water year types; and at San Luis Reservoir in above-normal, below-normal, and dry years. Visual resources would be increased by 8 percent in wet years and 6 percent in above-normal years at San Luis Reservoir, by 9 to 17 percent in the San Francisco Bay Area Region, and by 17 percent in the Central Coast and Southern California regions.	None needed.
Alternative 4	Same effects as described for Alternative 1 compared to the No Action Alternative.	None needed.
Alternative 5	Visual resources would be similar at Trinity Lake, Shasta Lake, Lake Oroville, Folsom Lake, San Luis Reservoir, and other reservoirs that store CVP and SWP water in the San Francisco Bay Area, Central Coast, and Southern California regions.	None needed.

Table 14.2 Comparison of No Action Alternative and Alternatives 1 through 5 to Second Basis of Comparison

Alternative	Potential Change	Consideration for Mitigation Measures
No Action Alternative	Visual resources would be similar at Trinity Lake, Shasta Lake, Lake Oroville, Folsom Lake, and New Melones Reservoir in all water year types; and at San Luis Reservoir in above-normal, below-normal, and dry years. Visual resources would be reduced by 6 percent in wet and critical dry years at San Luis Reservoir, by 10 to 18 percent in the San Francisco Bay Area Region, and by 18 percent in the Central Coast and Southern California regions.	Not considered for this comparison.
Alternative 1	No effects on visual resources.	Not considered for this comparison.
Alternative 2	Same effects as described for No Action Alternative as compared to the Second Basis of Comparison.	Not considered for this comparison.
Alternative 3	Visual resources would be similar at Trinity Lake, Shasta Lake, Lake Oroville, Folsom Lake, San Luis Reservoir, and other reservoirs that store CVP and SWP water in the San Francisco Bay Area, Central Coast, and Southern California regions.	Not considered for this comparison.
Alternative 4	No effects on visual resources.	Not considered for this comparison.
Alternative 5	Visual resources would be similar at Trinity Lake, Shasta Lake, Lake Oroville, Folsom Lake, and New Melones Reservoir in all water year types; and at San Luis Reservoir in above-normal, below-normal, and dry years. Visual resources would be reduced by 6 percent in dry years and 9 percent in critical dry years at San Luis Reservoir, by 10 to 18 percent in the San Francisco Bay Area Region, and by 18 percent in the Central Coast and Southern California regions.	Not considered for this comparison.

14.4.3.8 Potential Mitigation Measures

Changes in CVP and SWP operations under Alternatives 1 through 5 as compared to the No Action Alternative would not result in changes in visual resources. Therefore, there would be no adverse impacts to visual resources and no mitigation measures are required.

14.4.3.9 Cumulative Effects Analysis

As described in Chapter 3, the cumulative effects analysis considers projects, programs, and policies that are not speculative and are based upon known or reasonably foreseeable long-range plans, regulations, operating agreements, or other information that establishes them as reasonably foreseeable.

The No Action Alternative, Alternatives 1 through 5, and Second Basis of Comparison include climate change and sea level rise, implementation of general plans, and completion of ongoing projects and programs (see Chapter 3, Description of Alternatives). The effects of these items were analyzed quantitatively and qualitatively, as described in the Impact Analysis of this chapter. The discussion below focuses on the qualitative effects of the alternatives and other past, present, and reasonably foreseeable future projects

identified for consideration of cumulative effects (see Chapter 3, Description of Alternatives).

14.4.3.9.1 No Action Alternative and Alternatives 1 through 5

Continued coordinated long-term operation of the CVP and SWP under the No Action Alternative would result in reduced CVP and SWP water supply availability as compared to recent conditions due to climate change and sea-level rise by 2030. These conditions are included in the analysis presented above.

Future water resource management projects considered in cumulative effects analysis could increase water supply availability, as described in Chapter 5, Surface Water Resources and Water Supplies, and reduce visual impacts in the San Francisco Bay Area, Central Coast, and Southern California regions by providing additional water supplies that could be stored in existing reservoirs.

There also are several ongoing programs that could result in reductions in CVP and SWP water supply availability due to changes in flow patterns in the Sacramento and San Joaquin rivers watersheds and the Delta that could reduce availability of CVP and SWP water deliveries as well as local and regional water supplies, as described in Chapter 5, Surface Water Resources and Water Supplies. Reduction in available surface water supplies as compared to projected water supplies under the No Action Alternative and Alternatives 1 through 5 could result in reduction of visual conditions at reservoirs in San Francisco Bay Area, Central Coast, and Southern California.

There would be no adverse visual resources impacts associated with implementation of the alternatives as compared to the No Action Alternative or the Second Basis of Comparison. Therefore, Alternatives 1 through 5 would not contribute cumulative impacts to visual resources.

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