Long-Term Operation – Draft Environmental Impact Statement

Appendix N – Visual Resources Technical Appendix

July 2024

This page intentionally left blank

Contents

Tables

Acronyms and Abbreviations

CVP	Central Valley Project
cfs	cubic feet per second
Delta	Sacramento–San Joaquin Delta
GSA	groundwater sustainability agency
GSP	groundwater sustainability plan
I-	Interstate
SGMA	Sustainable Groundwater Management Act
SR	State Route
SWAP	Statewide Agricultural Production
SWP	State Water Project
US-	U.S. Route
WSR	Wild and Scenic Rivers

Appendix N Visual Resources Technical Appendix

This appendix documents the visual resources technical analysis to support the impact analysis in the EIS. This section describes visual resources that could be potentially affected by the implementation of the alternatives considered in the EIS. Potential effects on visual resources resulting from the alternatives analyzed in this EIS occur in the Trinity River region, Sacramento River region, San Joaquin Valley, Bay-Delta region, and CVP and SWP Service Areas in the nearshore coastal regions.

Physical form and visual character are the result of the interaction of natural and engineered elements. Natural elements of 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.

N.1 Background Information

N.1.1 Trinity River Watershed

The Trinity River Region includes the area along the Trinity River from Trinity Lake to the confluence with the Klamath River; and along the lower Klamath River from the confluence with the Trinity River to the Pacific Ocean. The Trinity River Region includes Trinity Lake, Lewiston Reservoir, the Trinity River between Lewiston Reservoir and the confluence with the Klamath River, and along the lower Klamath River. The Trinity River drains an area of the Coast Ranges, 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. The Trinity River flows through lightly populated and heavily forested, mountainous terrain with jagged cliffs that are in view when people pursue recreational activities, such as fishing, hiking, rafting, kayaking, and canoeing. The forests offer visual resources that 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 (North Coast Regional Water Quality Control Board et al. 2013). Artificial lights are present from passing vehicles, marinas and houseboats, campgrounds, and local residential and commercial buildings. Glare related to the water surfaces may occur at some view locations.

N.1.1.1 Wild and Scenic Rivers and State 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 (WSR) System, including the Trinity River downstream of Lewiston Dam and portions of the South Fork, North Fork, and New River (Bureau of Land Management et al. 2018). The State of California identified similar reaches

under Public Resources Code Sections 5093.54 and 5093.545 as components of the California Wild and Scenic River System. Portions of the Klamath River were designated as part of the National WSR System on January 19, 1981, in addition to the Scott River, Salmon River, and Wooley Creek, which are its principal tributaries (National Wild and Scenic Rivers System 2023a). Portions of the Smith River were designated as part of the National Wild and Scenic River System on January 19, 1981, and November 16, 1990. The designation includes numerous creeks (National Wild and Scenic Rivers System 2023b).

The Trinity River region includes several highways that are designated or eligible for state scenic highway designation (California Department of Transportation 2019):

- **Del Norte County:** U.S. Route (US-) 101 is a designated state scenic highway within Del Norte Coast Redwoods State Park and Redwood National Park. State Route (SR) 99 and other portions of US-101 are eligible for designation.
- **Trinity County:** SRs 3 and 299 are eligible for state scenic highway designation.
- **Humboldt County:** US-101 and SRs 36, 96, 254, and 299 are eligible for state scenic highway designation.

N.1.2 Sacramento Valley

The Sacramento Valley is generally identified as the region extending upstream from the Sacramento–San Joaquin Delta (Delta) to the Redding metropolitan area, and includes Shasta Reservoir, Keswick Reservoir, Whiskeytown Reservoir, Sacramento River between Keswick Dam and the Delta, Oroville Reservoir and the Thermalito Afterbay, the Yuba River between New Bullards Bar and the Feather River, the Bear River between Camp Far West Reservoir and the Feather River, the Feather River between Thermalito Dam and the Sacramento River, Folsom Reservoir and Lake Natoma, the American River between Nimbus Dam and the Sacramento River, and refuges that use Central Valley Project (CVP) water supplies. For the purposes of this analysis, the Sacramento Valley includes the Sacramento River, Clear Creek, and American River regions.

The Sacramento Valley extends from the northern mountainous areas to the flat, agricultural 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.

N.1.2.1 Shasta and Whiskeytown Reservoirs

Shasta Reservoir and Whiskeytown Reservoir are in the Whiskeytown-Shasta-Trinity National Recreation Area. The watersheds in which these reservoirs are located provide opportunities for high quality, natural visual experiences, such as mountains, forests, waterfalls, streams, open water, and sky views that can be accessed during 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 the SR 151 vista point, Shasta Dam Visitor Center, and Interstate (I-) 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 associated with the reservoirs are 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 result in *bathtub rings* that substantially contrast with the open water and upslope vegetation (Bureau of Reclamation 2013).

Pine and oak forests predominate in the areas surrounding the lakes, with intermittent chaparral and rock outcrops. The landscape features mountain ranges, volcanoes, waterways, and, below the reservoir, the agricultural vistas and communities of the Central Valley.

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 high quality, especially in areas where there is little to no development. Varied topography, geologic formations, and natural and human-made water bodies provide visual interest and striking vistas. Similar conditions are found in the Sierra Nevada and foothills near the upper and middle Feather, Yuba, American, Mokelumne, Calaveras, and Stanislaus River watersheds.

The foothills provide views of rolling hills, open grasslands, and scattered oak and pine woodlands. In the lower elevations of the Sacramento Valley, the human-built environment becomes more dominant, and detracts from views of the natural landscape. Outside of urban and suburban areas, land use is rural in character, with agricultural areas of 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 the 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 2015). Several wildlife refuges in the Sacramento Valley provide views of water and vegetation, enhanced seasonally by waterfowl and wildflowers.

Wild and Scenic Rivers and State Scenic Highways in the Sacramento River Watershed

In the Sacramento River watershed, there are no National or State WSR. There are several designated state scenic highways and several roads that are eligible for this designation within the study area, including the following roadways (California Department of Transportation 2019):

- **Shasta County:** SR 151 from Shasta Dam to Lake Boulevard is designated as a state scenic highway because of views of the Sacramento River, Shasta Reservoir, and distant hills. SR 151 from Lake Boulevard to I-5 is eligible for designation. I-5 and SRs 299, 44, and 89 are eligible for state scenic highway designation.

- **Tehama County:** SRs 89 and 36 are eligible for state scenic highway designation.
- **Yolo County:** Portions of SR 16 and 128 are eligible for state scenic highway designation.
- **Solano County:** Portions of SR 29, 37, and 128 are eligible for state scenic highway designation.
- **Napa County:** Portions of SRs 29, 121, 128, and 221 are eligible for state scenic highway designation.

N.1.2.2 Clear Creek Watershed

The upper portion of lower Clear Creek is characterized by a deep gorge with flowing, cascading water surrounded by a forested upland landscape. The lower portion is characterized by broad alluvial floodplains, meandering gravel bars, and lush riparian vegetation. Varying sections of this reach of lower Clear Creek are influenced by visual impacts from residential homes, industrial areas, commercial developments and SR 273. In addition, mine tailings are visible in areas from past gold dredger and placer mining operations (Bureau of Land Management 2008).

The public lands administered by the Bureau of Land Management within the stream reach from the southern Whiskeytown National Recreation Area boundary downstream to Clear Creek Road Bridge have been determined to be eligible as a component of the National WSR System and have been classified as Scenic (Bureau of Land Management 2008) based on the presence of outstandingly remarkable Recreation and Scenic Quality values.

N.1.2.3 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 throughout the counties are located especially near I-80, US 50, and SRs 49 and 89.

Folsom Reservoir, 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 Reservoir 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. Scenic views from around the edges of the reservoir are of the water and 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 (Bureau of 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 US 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 intakes, 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 State 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 was designated by the Secretary of the Interior to be part of the National WSR System on January 19, 1981. The State of California also designated the lower American River under Public Resources Code Sections 5093.54 and 5093.545 as part of the California Wild and Scenic River System. In addition, the state designated the North Fork American River from the source to Iowa Hill Bridge as part of the System.

In the portion of the American River watershed in the study area, there is one roadway designated as a state scenic highway and one road that is eligible for this designation. In El Dorado County, US 50 from Government Center Interchange in Placerville to South Lake Tahoe is designated as a state scenic highway because of vistas of the American River canyon, suburban foothills, granite peaks, and Lake Tahoe. SR 89 is also considered a state scenic highway. Also in El Dorado County, SRs 49 and 50 are eligible for state scenic highway designation (California Department of Transportation 2019).

N.1.3 San Joaquin Valley

For the purposes of this analysis, the San Joaquin Valley includes the San Joaquin River and Stanislaus River regions. The San Joaquin Valley land cover ranges from high alpine vegetation near the crest of the Sierra Nevada, through coniferous forest, mixed forest, oak woodlands, and oak savanna to grasslands and agricultural areas at the lower elevations (Bureau of Reclamation 1997, 2005a, 2005b). Water bodies include reservoirs, natural lakes and ponds, rivers, and tributary streams. 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. 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 State Water Project (SWP) water supplies. The valley is arid to semi-arid, and there are few

natural lakes or streams on the valley floor. The Tehachapi Mountains rise abruptly along the southern boundary of the valley.

Several wetlands have been established as wildlife refuges in the San Joaquin Valley, providing views of water and vegetation, enhanced seasonally by waterfowl and wildflowers.

The predominant land use is agricultural, with sparse to moderate populated areas. I-5 and major railroads pass along the western San Joaquin Valley at the base of the Coast Range foothills. SR 99 and other railroads are located along the eastern San Joaquin Valley at the base of the Sierra Nevada foothills. I-580 and SRs 152, 198, and 46 cross the San Joaquin Valley from east to west between I-5 and SR 99. Larger cities have been established in the northern San Joaquin Valley, including Lodi, Stockton, Lathrop, Manteca, and Tracy; and along SR 99, including Merced, Fresno, Visalia, and Bakersfield. Both I-5 and SR 99 are extensively traveled and provide numerous viewing opportunities (Bureau of Reclamation 2015).

N.1.3.1 New Melones Reservoir

The CVP New Melones Reservoir is 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 (Bureau of Reclamation 2010). The vegetation is primarily grasslands and oak woodlands of varying densities, with gray pine and low shrubs along several slopes. Views of the water are primarily from the water surface, adjacent recreation areas, and SR 49. The surrounding lands are rural and undeveloped except for the infrastructure associated with the dam, canals, power generation facilities, and several minor structures associated with the recreation areas and utility lines. When the water level of the reservoir is drawn down, broad bands of bare soil are exposed.

N.1.3.2 Tulloch Reservoir

Tulloch Reservoir is on the Stanislaus River just downstream of New Melones Reservoir and upstream of the Goodwin Dam. Accessible via mostly private lands and docks, there is substantial residential development on the Calaveras County portion of its shoreline.

N.1.3.3 Millerton Lake

Millerton Lake is also 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 (Bureau of Reclamation 2015). 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 water level of 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 (Bureau of Reclamation 2015). The canals are only intermittently visible from county roads.

N.1.3.4 San Luis Reservoir Complex

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

The CVP and SWP water supply facilities are prominent features in the overall viewshed of the San Joaquin Valley, including facilities at or near the San Luis Reservoir, Delta-Mendota Canal, San Luis Canal-California Aqueduct, Cross Valley Canal, New Melones Reservoir, and Millerton Lake. SR 152 is along the northern and eastern rims of the San Luis Reservoir and the western rim of the O'Neill Forebay. The O'Neill Forebay and Los Banos Creek Reservoir can be seen to the west from I-5. The reservoirs are also part of the visual resources for the San Luis Reservoir State Recreation Area and Cottonwood Creek Wildlife Area (which are described in Appendix S, *Recreation Technical Appendix*). The shorelines of the reservoirs are undeveloped, except for recreational facilities. Views include annual grassland, coastal sage, and riparian woodland. When the reservoir waters 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 I-5 (Bureau of Reclamation 2015).

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 seen from I-5 and the railroad lines along the western San Joaquin Valley. The open water of Mendota Pool is at the terminus of the Delta-Mendota Canal and can be viewed from county roads.

N.1.3.5 Wild and Scenic Rivers and State Scenic Highways in the San Joaquin Valley

In or near the San Joaquin Valley region, four rivers are designated to be part of the National WSR System. Portions of the Tuolumne River from the source waters to the 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 San Joaquin Valley region; however, the flows from these reaches could influence the visual resources of downstream reaches in the San Joaquin Valley region and elsewhere.

In the San Joaquin Valley, there are five roadway sections designated as a state scenic highway and seven roadway sections that are eligible for this designation (California Department of Transportation 2019):

- **San Joaquin County:** I-580 from I-5 to SR 205 is designated as a state scenic highway because of vistas of the Coast Ranges and Central Valley. I-5 from the Stanislaus County boundary to I-580 is designated as a state scenic highway because of vistas of agricultural lands and the Delta-Mendota Canal and California Aqueduct.
- **Stanislaus County:** I-5 from the San Joaquin County boundary to the Merced County boundary is designated as a state scenic highway because of vistas of agricultural lands and the Delta-Mendota Canal and California Aqueduct.
- **Merced County:** I-5 from SR 152 to the Stanislaus County boundary is designated as a state scenic highway because of vistas of agricultural lands and the Delta-Mendota Canal and California Aqueduct. SR 152 from I-5 to the Santa Clara County boundary is designated as a state scenic highway because of vistas of agricultural lands and the San Luis Reservoir State Recreational Area.
- **Fresno County:** SRs 33, 168, 180, and 198 are eligible for state scenic highway designation. SR 180, as Fresno County's access to Kings Canyon and Sequoia National Parks, is designated as a state scenic highway.
- **Tulare County:** SRs 190 and 198 are eligible for state scenic highway designation.
- **Kern County:** US 395 and SRs 14 and 58 are eligible for state scenic highway designation.

N.1.4 Bay-Delta Operations

The Bay-Delta region includes the Delta and Suisun Marsh, which extends south to San Francisco Bay. 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 Bay-Delta Program 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 large water feature between levees that extends from the Sacramento River near Rio Vista to West Sacramento. Cities in the Delta are the southern portion of Sacramento, Isleton, West Sacramento, Rio Vista, Lathrop, western portions of Stockton and Manteca, Tracy, Brentwood, Oakley, Antioch, and Pittsburg. Smaller communities 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.

Suisun Marsh is characterized by tidal and freshwater wetlands and riparian woodlands (Bureau of Reclamation et al. 2011). The area is bounded by I-80 and SR 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 composed 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, 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.

The San Francisco Bay Area 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 ranges in topography from sea level up to the foothills of the East Bay and South Bay that reach elevations of 3,500 feet and higher (CALFED Bay-Delta Program 2000; Water Transit Authority 2003). The physical and natural environment is diverse, with 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, including the 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 along 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 toward 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 in the foothills or at the edge of the foothills. The water can be viewed from roadways at elevations higher than the reservoirs and by recreationists on the reservoirs. Agricultural areas that use CVP and SWP water are in coastal valleys, especially the Livermore and Amador Valleys of Alameda County, southern Santa Clara County, and northern San Benito County.

N.1.4.1 Wild and Scenic Rivers and State Scenic Highways in the Bay-Delta

In the Bay-Delta region, there are no National or State WSR. There are six roadway sections designated as a state scenic highway and several roadway sections that are eligible for this designation (California Department of Transportation 2019):

- **Sacramento County:** SR 160 between the southern limits of the city of Sacramento to the Contra Costa County boundary is designated as a state scenic highway because of the views of historic Delta agriculture and small towns along the Sacramento River.
- **Contra Costa County**: SR 160 from the Antioch Bridge to SR 4, and SR 4 continuing on toward Brentwood are eligible for state scenic highway designation.
- **Contra Costa County:** SR 24 from the Alameda County boundary to I-680, and I-680 from SR 24 to I-580 at the Alameda County boundary are designated as state scenic highways because of the views of Mount Diablo and attractive residential and commercial areas.

- **Alameda County:** I-580 between I-80 and SR 92 is designated as a state scenic highway. Portions of I-680 from the Contra Costa County line to Mission Boulevard in Fremont and portions of SR 84 are designated as state scenic highways because of vistas of wooded hillsides and valleys. SR 13 and other portions of I-680 and I-580 are eligible for state scenic highway designation.
- **Santa Clara County:** SR 9 is designated as a state scenic highway from SR 17 to SR 35. Portions of SRs 17, 35, and 152 and I-280 within the San Francisco Bay Area are eligible for state scenic highway designation.
- **San Benito County:** Portions of US-101 and SRs 25, 146, and 156 within the San Francisco Bay Area are eligible for state scenic highway designation.

N.1.5 Southern California Region

The Southern California region includes portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties served by the SWP. From a visual perspective, in total, Southern California contains over 2 million acres irrigated agricultural land. Changes in farmland in the Southern California region between 2008 and 2018 are summarized in Table R.1-19. Overall, Southern California saw a decrease of approximately 60,000 acres in Important Farmland within the 10-year period from 2008–2018.

N.2 Evaluation of Alternatives

This section describes the technical background for the evaluation of environmental consequences associated with the action alternatives and the No Action Alternative.

N.2.1 Methods and Tools

The impact assessment considers changes in visual resources related to changes in CVP operations under the alternatives, as compared with the No Action Alternative, that affect the tributaries that transport and reservoirs that store CVP water and irrigated agricultural lands. This section details methods and tools used to evaluate those effects. It should be noted that Alternative 2 consists of four phases that could be utilized under its implementation. All four phases are considered in the assessment of Alternative 2 to bracket the range of potential impacts. Changes to visual resources would result where there are substantial changes in the visual character of views or to scenic resources associated with viewsheds or scenic vistas associated with the study area, designated state scenic highways, National or State WSR, and changes in light and glare because of continued and modified operations under the Proposed Action alternatives and No Action Alternative.

For the purposes of this analysis, the changes in operations and flows are linked to changes in visual resources at tributaries and reservoirs because they are related to water levels. While short-term changes in flows are not necessarily indicative of reservoir storage because all or a portion of the water flows could be directly conveyed to water users in any specific month, longer-term changes in flows are considered to be relatively proportional to the amount of water that could be stored over all water year types.

The evaluation of views of agricultural lands is based on the potential for each alternative to affect irrigation water deliveries, and to the extent they reduce deliveries, the potential for water to be obtained from other sources such as groundwater.

N.2.2 No Action Alternative

Under the No Action Alternative, Reclamation would continue with the current operation of the CVP, as described in the 2020 Record of Decision and subject to the 2019 Biological Opinions. The 2020 Record of Decision for the CVP and the 2020 Incidental Take Permit for the SWP represent current management direction or intensity pursuant to 43 CFR Section 46.30.

Although the No Action Alternative included habitat restoration projects at a programmatic level, the 2020 ROD did not provide environmental coverage for these projects, and all of the habitat projects considered under the No Action required or will require additional environmental documentation. Thus, ground disturbance for habitat restoration projects did not materialize as a result of implementing the No Action Alternative. For the purpose of the analysis, these habitat restoration projects are considered independent projects that will be considered under cumulative effects.

The No Action Alternative is based on 2040 conditions. The changes to visual resources that are assumed to occur by 2040 under the No Action Alternative conditions would be different than existing conditions because of the following factors:

- Climate change and sea-level rise
- General plan development throughout California, including increased water demands in portions of the Sacramento Valley

Vistas at tributaries and reservoirs that store CVP water provide a wide diversity of visual experiences related to the contrasts between the open water surface and surrounding vegetated banks, foothills, or mountainsides. By the end of September, the surface water elevations generally decline, and bare mineral bathtub rings appear in contrast to the open water and upslope vegetation. 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 2040 than in recorded historical conditions, potentially resulting in less exposure of bare mineral soils in a bathtub ring around reservoirs. However, as the water is released in the spring, there would be less snowpack to refill the reservoirs. This condition would reduce reservoir storage, thereby increasing the vertical height of the bathtub ring around reservoirs. Although the bathtub ring of bare mineral soils substantially contrasts the open water and upslope vegetation, this condition has become a common visual element in the landscape with California's recent severe drought (see, e.g., NASA Earth Observatory 2023). Therefore, the presence of this contrast and the variation in the height of the bathtub ring with climactic and storage conditions would be a continuation of existing visual conditions.

Under the No Action Alternative, land uses in 2040 would occur in accordance with adopted general plans. Development under the general plans could affect visual resources, depending on the type of development. Infill projects where areas are already developed could increase density

but would be done in compliance with applicable zoning and general plan policies around aesthetics. Development in non-urbanized areas could convert natural or rural areas to developed areas, resulting in a change in visual character from natural or agricultural to developed.

The No Action Alternative, thus, is expected to result in potential changes in visual resources at reservoirs that store CVP water, tributaries, and in irrigated agricultural land vistas. These changes were described and considered in the 2020 Record of Decision.

The No Action Alternative would also rely upon increased use of Livingston-Stone National Fish Hatchery during droughts to increase production of winter-run Chinook salmon. However, this component requires no physical changes to the facility and would have no effect on visual resources.

N.2.3 Alternative 1

N.2.3.1 Potential Changes in Visual Resources at Reservoirs That Store CVP Water and Tributaries That Flow to and from Reservoirs That Store CVP Water.

Compared with the No Action Alternative, Alternative 1 would make changes to Keswick Dam release rates (ramping) and releases (Sacramento River/Keswick Reservoir), Shasta Dam releases (Sacramento River/Shasta Reservoir), Whiskeytown Dam releases (Clear Creek/Whiskeytown Reservoir), lower American River minimum instream flows (Nimbus Dam, Folsom Dam), Delta Outflow, and New Melones Reservoir releases (Stanislaus River minimum instream flows).

As stated under Section N.2.2, *No Action Alternative*, visual resources impacts are related to surface water elevations that determine the size of the bathtub ring in the reservoirs mentioned above that store CVP water supplies. Within tributaries, a similar effect could occur if low water levels expose scoured banks or results in the drainage of inundated areas, which could leave exposed and muddy areas visible, or high water levels that result in the inundation of previously non-inundated areas. Compared with the No Action Alternative, for example, Alternative 1 would result in the following changes to storage and flow:

- **Shasta Reservoir:** There would mostly be minor increases in the average storage volumes with a decrease in storage in June compared to the No Action Alternative (see Table F.2.1-3-1c in Appendix F, *Modeling Technical Appendix*). The elevation would change slightly on average, mostly increasing (see Table F.2.1-4-1c in Appendix F). As a result, given storage mostly increases, the bathtub ring effect would largely decrease and improve visual conditions compared to the No Action Alternative.
- **Folsom Reservoir:** In most cases the end of month storage at Folsom increases other than for June (see Table F.2.1-7-1b in Appendix F). Elevations under Alternative 1 would typically increase other than in June when elevation would be the same as the No Action Alternative (see Table F.2.1-8-1c in Appendix F). As a result, there could be a reduction in the bathtub ring effect given that there is more water stored, resulting in an improvement in visual conditions.

- **New Melones Reservoir:** Average storage would decrease at New Melones (see Table F.2.1-13-1c in Appendix F). As a result, there could be an increase in the bathtub ring effect due to the lower volume of water stored. However, modeling results indicate minimal, if any, decreases in elevation ranging from reductions by 1 to 2 feet (see Table F.2.1-14-1c in Appendix F), limiting the visual effect.

- **Clear Creek:** The reductions in monthly average flow are substantial compared with the No Action Alternative, with some monthly reductions down to about one-third of the flows of the No Action Alternative. Flow would decrease every month (see Table F.2.2-2-1c in Appendix F). This could result in exposure of previously inundated areas, although the general pattern in flow changes (i.e., highs and lows over a years) would remain the same. As an example, flows in October under the No Action Alternative would be about 200 cubic feet per second (cfs), while under Alternative 1 they would be about 61 cfs, a reduction of about 70%. An even larger reduction would occur around June. Under the No Action Alternative, flows would be about 303 cfs in June, and under Alternative 1 they would be about 77 cfs, about one-fourth the flow (about 330 cfs) of the No Action Alternative (see Tables F.2.2-2-1a and F.2.2-2-1b in Appendix F). The proposed monthly average flows under Alternative 1 would be lower than all monthly average flows under the No Action Alternative. For 8 months of the year, these flows are also lower than the lowest monthly flow under the No Action Alternative. As identified in Section N.1.2.2, *Clear Creek Watershed*, the upper portion of lower Clear Creek is characterized by a deep gorge with flowing, cascading water surrounded by a forested upland landscape. The lower portion is characterized by broad alluvial floodplains, meandering gravel bars, and lush riparian vegetation. Depending on stream geometry, the proposed reduction in water volume under Alternative 1 could result in decreased river width, fewer rapids or a reduction in the appearance of rapids, and exposed creek banks, alluvial floodplains, beach or gravel areas, or previously submerged instream woody material and debris. Lower flows in upper Clear Creek would also result in high-energy features, such as cascades, becoming less visually dramatic. A reduction in water volume in the lower portion could also affect riparian vegetation that may not survive if the creek's water surface area is reduced. This would be considered an adverse visual effect. Mitigation Measure VIS-1: *Develop a Visual Resources Monitoring and Mitigation Program for Clear Creek (Alternative 1)* could be implemented to reduce impacts.

- **San Luis Reservoir:** Alternative 1 would increase the average storage at San Luis Reservoir in all months compared to the No Action Alternative (see Table F.2.1-9-1c in Appendix F). As a result, the average elevation at San Luis Reservoir would also increase (see Table F.2.1-10-1c in Appendix F). Therefore, the bathtub ring could decrease and there would be no adverse visual effect.

Storage changes are relatively small during each year type and follow historical patterns in reservoir storage. Therefore, changes in storage would not result in substantive changes to visual resources. However, flow changes at Clear Creek would be substantial and adverse. Mitigation Measure VIS-1: *Develop a Visual Resources Monitoring and Mitigation Program for Clear Creek (Alternative 1)* could be implemented to reduce impacts.

N.2.3.2 Potential Changes in Vistas at Irrigated Agricultural Lands

Compared with the No Action Alternative, Alternative 1 would result in substantially greater annual deliveries through the CVP, although the pattern of deliveries through a given year would change. Whereas the No Action Alternative has peak deliveries in November, Alternative 1 would have peak deliveries in September. Under Alternative 1, long-term average and dry and critical year average deliveries for agricultural uses would increase in the San Joaquin River Region (21% and 38%), San Francisco Bay Area Region (12% and 41%), and Southern California Region (43% and 67%), so no conversion of agricultural land to nonagricultural use is anticipated for these regions. There would also be an increase (955 more acres) in irrigated crops in the Sacramento region. Therefore, no conversion of agricultural land to nonagricultural use is anticipated for these regions. Because there are no CVP/SWP agricultural water deliveries in this region, no conversion of agricultural land to nonagricultural use is anticipated. As shown in Table R.2–4 in Appendix R, *Land Use and Agricultural Resources Technical Appendix*, there would be approximately 955 more acres of irrigated farmland in the Sacramento River region and approximately 91,372 more acres in the San Joaquin River region under Alternative 1 compared with the No Action Alternative. As shown in Table R.2–6 in Appendix R, in the dry and critical year condition, there would be an increase in irrigated crops of 4,379 acres in the Sacramento River region and 87,164 acres in the San Joaquin River region compared with the No Action Alternative. Therefore, no visual impact would occur under Alternative 1 related to the fallowing of irrigated agricultural lands.

N.2.4 Alternative 2

N.2.4.1 Potential Changes in Visual Resources at Reservoirs That Store CVP Water and Tributaries That Flow to and from Reservoirs That Store CVP Water.

Compared with the No Action Alternative, Alternative 2 would make changes to the following: Shasta Dam releases and storage (Sacramento River/Shasta Reservoir), Whiskeytown Dam releases (Clear Creek/Whiskeytown Reservoir), and New Melones Reservoir releases (Stanislaus River minimum instream, winter instability, and fall pulse flows).

As stated under Section N.2.2, *No Action Alternative*, visual resources impacts are related to surface water elevations that determine the size of the bathtub ring in the reservoirs mentioned above that store CVP water supplies. Within tributaries, a similar effect could occur if low water levels expose scoured banks or result in the drainage of inundated areas, which could leave exposed and muddy areas visible, or high water levels result in the inundation of previously non-inundated areas. Compared with the No Action Alternative, for example, Alternative 2 and the phases of Alternative 2 would result in the following changes to storage and flow:

- **Shasta Reservoir:** The average storage would increase compared to the No Action Alternative (see Tables F.2.1-3-2c, F.2.1.-3-3c, F.2.1-3-4c, and F.2.1-3-4d in Appendix F). The average end of month elevation would increase (see Tables F.2.1-4-2c, F.2.1-4-3c, F.2.1-4-4c, and F.2.1-4-5c in Appendix F). Overall, this would decrease the bathtub ring effect, generally improving visual conditions compared to the No Action Alternative.
- **Folsom Reservoir:** Average monthly storage volumes would decrease from April to September for Alternative 2 Without TUCP Without VA, decrease from April to October for Alternative 2 Without TUCP Delta VA, decrease from April to August for Alternative

2 Without TUCP All VA, and increase for all months for Alternative 2 With TUCP Without VA (see Tables F.2-7-2c, F.2-7-3c, F.2-7-4c, and F.2-7-5c). However, storage elevations would vary minimally, with decreases being a maximum of 1 foot (see Tables F.2.1-8-2c, F.2.1-8-3c, F.2.1-8-4c, and F.2.1-8-5c). As a result, the change in the bathtub ring would likely be unnoticeable.

- **New Melones Reservoir:** There would be minor changes in end of month storage volumes compared to the No Action Alternative, as well as some increases in storage volume (see Tables F.2.1-13-2c, F.2.1-13-3c, F.2.1-13-4c, and F.2.1-13-5c in Appendix F). Modeling results indicate minimal if any changes in elevation ranging from no change to an increase in 1 feet (see Tables F.2.1-14-2c, F.2.1-14-3c, F.2.1-14-4c, and F.2.1-14-5c in Appendix F), limiting the visual effect of the changes in storage volume.

- **Clear Creek:** Flow would both increase and decrease under Alternative 2 depending on the phase and the month. Decreases in flows would be up to 29% during June for Alternative 2 Without TUCP Without VA, but there would be flow increases during 6 out of 12 months for this phase of Alternative 2 (see Tables F.2.2-2a, F.2.2-2-2b, and F.2.2-2-2c in Appendix F). Flows for Alternative 2 Without TUCP Delta VA, Alternative 2 Without TUCP All VA, and Table F.2.2-2-5c would be comparable (see Tables F.2.2-2-3c, Table F.2.2-2-4c, and Table F.2.2-2-5c). These reductions could result in the minor exposure of previously inundated areas, although the general pattern in flow changes (i.e., highs and lows over a year) would remain the same as the No Action Alternative, and in half the year flow would increase. As an example, flows in October under the No Action Alternative would be about 200 cfs, while under Alternative 2 (Alternative 2 With TUCP Without VA) they would be about 174 cfs. Depending on stream geometry, this change in flow could result in decreased river width or reduce the appearance of rapids. However, the range in fluctuations under Alternative 2, for the most part, is within the range of fluctuations of the No Action Alternative.

- **San Luis Reservoir:** Alternative 2 would increase storage at San Luis Reservoir other than for two months: March for Alternative 2 Without TUCP Delta VA, where storage would decrease by 2 TAF; March for Alternative 2 Without TUCP All VA, where storage would decrease by 1 TAF (see Tables F.2.1-9-2c, F.2.1-9-3c, F.2.1-9-4c, and F.2.1-9-5c in Appendix F). Likewise, elevations at San Luis Reservoir would increase or stay the same (see Tables F.2.1-10-2c, F.2.1-10-3c, F.2.1-10-4c, and F.2.1-10-5c). Therefore, the bathtub ring could decrease and there would be no adverse visual effect.

Storage changes and flow changes are relatively small during each year type and follow existing patterns in reservoir storage and flow fluctuations.

N.2.4.2 Potential Changes in Vistas at Irrigated Agricultural Lands

The Trinity River and Central Coast regions were not modeled under SWAP. Because there are no CVP/SWP agricultural water deliveries in this region, no conversion of agricultural land to nonagricultural use is anticipated. The agricultural deliveries for the Southern California region would be considered similar to the No Action Alternative. Therefore, there would be no changes in agricultural land use compared with the No Action Alternative. As shown in Table R.2–18 in Appendix R, for the phases of Alternative 2 Without TUCPs, there would be decreases in irrigated acreage, with reductions of 650 to 7,038 acres in the Sacramento River region and

14,994 to 47,769 acres in the San Joaquin River region for the phases of the alternative with VAs. With TUCP Without VA, there would be a very slight decrease in irrigated acreage of 650 acres in the Sacramento River region and an increase in irrigated acreage of 4,701 acres in the San Joaquin River region when compared with the No Action Alternative under the long-term average year condition. As shown in Table R.2–20 in Appendix R, under dry and critical conditions, across all phases there would be decreases in irrigated acreage compared with the No Action Alternative, with decreases from 4,320 acres to 5,589 acres for the Sacramento River region and 22,585 acres to 26,171 acres in the San Joaquin River Region for phases without VAs and 41,527 acres to 47,500 acres for phases with VAs. In both the long-term average and dry and critical year conditions, overall crop acreage would primarily decrease in the San Joaquin River and Sacramento River regions under Alternative 2 when compared with the No Action Alternative. Some conversion of agricultural land to nonagricultural is expected to occur in the San Joaquin River and Sacramento River regions under Alternative 2. Alternative 2 would result in a reduction of active agriculture and an increase in fallowed land. Mitigation Measure AG-1: *Diversify Water Portfolios* would help reduce some of the anticipated conversion of agricultural land.

N.2.5 Alternative 3

N.2.5.1 Potential Changes in Visual Resources at Reservoirs That Store CVP Water and Tributaries That Flow to and from Reservoirs That Store CVP Water.

Compared with the No Action Alternative, Alternative 3 would make changes to the following: Shasta Dam spring pulse flows and releases (Sacramento River/Shasta Reservoir), Whiskeytown Dam releases (Clear Creek/Whiskeytown Lake), American River minimum instream flows and winter and spring pulse flow (Folsom Reservoir), and New Melones Reservoir releases (Stanislaus River minimum instream flows and fall pulse flows).

As stated under Section N.2.2, *No Action Alternative*, visual resources impacts are related to surface water elevations that determine the size of the bathtub ring in the reservoirs mentioned above that store CVP water supplies. Within tributaries, a similar effect could occur if low water levels expose scoured banks or results in the drainage of inundated areas, which could leave exposed and muddy areas visible, or from high water levels that result in the inundation of previously non-inundated areas. Compared with the No Action Alternative, for example, Alternative 3 would result in the following changes to storage and flow:

- **Shasta Reservoir:** End of month storage would increase compared to the No Action Alternative (see Table F.2.1-3-6c in Appendix F). As a result, the higher storage volumes would decrease the bathtub ring effect. The average elevation would increase (see Table F.2.1-4-6c in Appendix F), improving visual conditions compared to the No Action Alternative.
- **Folsom Reservoir:** Average monthly storage volumes would increase other than for March through May (see Table F.2.1-7-6c in Appendix F). However, storage elevations would vary only slightly, with decreases ranging from 1 to 5 feet in March through May, and all other months experiencing an increase or no change (see Table F.2.1-8-6c). As a result, in some cases the bathtub ring effect would increase, and others would decrease in

the same way as described for Shasta Reservoir. Given the minimal changes and their limit to three months, visual impacts would be minimal.

- **New Melones Reservoir:** There would be decreases in storage volumes (see Table F.2.1-13-6c in Appendix F). However, modeling results indicate that elevations would negligibly decrease from 2 to 5 feet (see Table F.2.1-14-6c in Appendix F). The general visual pattern of fluctuations would remain the same as the No Action Alternative.
- **Clear Creek:** The reductions in average monthly flow occur for six months of the year and are minor compared with No Action Alternative, with some monthly reductions of about 13% of No Action Alternative (see Table F.2.2-2-6c in Appendix F). These reductions could result in minor exposure of previously inundated areas, although the general pattern in flow changes (i.e., highs and lows over the years) would remain the same. As an example, flows in October under the No Action Alternative would be about 200 cfs, while under Alternative 3 they would be about 167 cfs, with this difference changing by month. Depending on stream geometry, this change in flow could result in decreased river width or reduce the appearance of rapids. However, the range in fluctuations under Alternative 3, for the most part, is within the range of fluctuations of the No Action Alternative. Therefore, the general visual pattern of fluctuations would remain the same as the No Action Alternative.
- **San Luis Reservoir:** Alternative 3 would result in reductions in average storage during all parts of the year (see Table F.2.1-9-6c in Appendix F). Storage reductions range from 13 to 40% compared to the No Action Alternative, with some of the higher drawdowns occurring in August and September when other vegetation has browned so that the increases bathtub ring contrast would not be as noticeable. In months such as January through April when vegetation would be verdant, decreases in storage would range from 13 to 20 percent, where an increase in the bathtub ring effect would result in a high contrast with the vegetation and water. Modeling outputs also show a substantial decrease in water surface elevation ranging from 15 to 35 feet (see Table F.2.1-10-6c in Appendix F). Mitigation Measure VIS-2: *Develop a Visual Resources Monitoring and Mitigation Program for San Luis Reservoir (Alternative 3)* could be implemented to reduce impacts.

N.2.5.2 Potential Changes in Vistas at Irrigated Agricultural Lands

Because there are no CVP/SWP agricultural water deliveries in this region, no conversion of agricultural land to nonagricultural use is anticipated. Deliveries for agricultural uses in the San Joaquin region, San Francisco Bay Area region, and Southern California region would all substantially decrease under the long-term average and dry/critical conditions, which may result in the conversion of agricultural land to nonagricultural use. As shown in Table R.2–25 in Appendix R, there would be approximately 22,818 fewer acres of irrigated farmland in the Sacramento River region and approximately 303,764 fewer acres in the San Joaquin River region under Alternative 3 compared with the No Action in the long-term average year condition. As shown in Table R.2–27 in Appendix R, in the dry and critical year condition, there would be a slightly smaller decrease than the long-term average year condition. The Sacramento River region would have approximately 21,123 fewer irrigated acres, and the San Joaquin River region would have 210,633 fewer irrigated acres compared with the No Action Alternative.

Assumptions in the SWAP model do not account for changes in groundwater use under Sustainable Groundwater Management Act (SGMA) implementation, which requires that local public agencies and groundwater sustainability agencies (GSAs) in high- and medium-priority basins develop and implement groundwater sustainability plans (GSPs) or Alternatives to GSPs in order to map how groundwater basins will reach long-term sustainability. Alternative 3 would reduce CVP and SWP deliveries. Thus, demand for groundwater and other alternative water sources could increase. Because sufficient groundwater might not be available in the future to replace reduced CVP/SWP supplies, it is possible that SWAP acreage and production value decreases under Alternative 3 could be greater in actuality than the modeled output under SWAP.

In both the average and dry and critical year conditions, there would be a decrease in irrigated crops compared with the No Action Alternative. Therefore, conversion of agricultural land to nonagricultural use is anticipated. Alternative 3 would result in a reduction in active agriculture and increase in fallowed land. The implementation of Mitigation Measure AG-1: *Diversify Water Portfolios* would reduce agricultural land use conversion by encouraging water users to develop alternative sources of water.

N.2.6 Alternative 4

N.2.6.1 Potential Changes in Visual Resources at Reservoirs That Store CVP Water and Tributaries That Flow to and from Reservoirs That Store CVP Water.

Compared with the No Action Alternative, Alternative 4 would make changes to the following: Keswick Dam releases (Keswick Reservoir/Shasta Reservoir/Sacramento River), Shasta Dam releases (Shasta Reservoir/Sacramento River), Whiskeytown Dam (Clear Creek/Whiskeytown Reservoir), and New Melones Reservoir releases (Stanislaus River minimum instream flows, winter instability flows, spring pulse flows, and fall pulse flows).

As stated under Section N.2.2, *No Action Alternative*, visual resources impacts are related to surface water elevations that determine the size of the bathtub ring in the reservoirs mentioned above that store CVP water supplies. Within tributaries, a similar effect could occur if low water levels expose scoured banks or result in the drainage of inundated areas, which could leave exposed and muddy areas visible, or high water levels result in the inundation of previously non-inundated areas. Compared with the No Action Alternative, for example, Alternative 4 would result in the following changes to storage and flow:

- **Shasta Reservoir:** End of month storage would be higher than the No Action Alternative (see Table F.2.1-3-7c in Appendix F). The average elevation would increase (see Table F.2.1-4-7c in Appendix F). As a result, the bathtub ring effect would decrease due to higher storage volumes and would improve visual conditions.
- **Folsom Reservoir:** Average monthly storage volumes would increase during all months (see Table F.2.1-7-7c in Appendix F). Storage elevations would also increase or stay the same (see Table F.2.1-8-7c). As a result, the bathtub ring would generally decrease and improve visual conditions compared to the No Action Alternative.
- **New Melones Reservoir:** There would be increases in average storage volumes, (see Table F.2.1-13-7c in Appendix F). Modeling results indicate minimal increases in

elevation of 1 feet (see Table F.2.1-14-1c in Appendix F). With higher storage, the bathtub ring effect would decrease and improve visual conditions compared to the No Action Alternative.

- **Clear Creek:** The reductions in average flow are minor compared with No Action Alternative, and occur for 6 months of the year. Monthly reductions ranging from 6% to 29% of the No Action Alternative flows (see Table F.2.2-2-7c in Appendix F). The reductions in flow could result in minor exposure of previously inundated areas, although the general pattern in flow changes (i.e., highs and lows over the years) would remain the same. As an example, flows in October under the No Action Alternative would be about 200 cfs, while under Alternative 4 they would be about 173 cfs, with this difference changing by month and being higher in some months. Depending on stream geometry, this change in flow could result in decreased river width or reduce the appearance of rapids. However, the range in fluctuations under Alternative 4, for the most part, is within the range of fluctuations of the No Action Alternative. Therefore, the general visual pattern of fluctuations would remain the same as the No Action Alternative.
- **San Luis Reservoir:** Alternative 4 would increase storage at San Luis Reservoir other than for January, where storage would decrease by only 3 TAF (see Table F.2.1-9-7c in Appendix F). As a result, the average elevation at San Luis Reservoir would also increase (see Table F.2.1-10-7c in Appendix F). Therefore, the bathtub ring could decrease.

N.2.6.2 Potential Changes in Vistas at Irrigated Agricultural Lands

Agricultural deliveries would be similar to the No Action Alternative for all regions, except for the slight decrease in agricultural deliveries in the Sacramento River region and San Francisco Bay Area region during average dry/critical years. Fallowing may occur in these regions in the short term if water users and providers cannot afford the additional costs associated with alternative water supplies.

As shown in Table R.2–32 in Appendix R, there would be approximately 1,316 more acres of irrigated farmland in the Sacramento River region and approximately 14,094 more acres in the San Joaquin River region under Alternative 4 compared with the No Action Alternative in the long-term average year condition. As shown in Table R.2–34 in Appendix R, in the dry and critical year conditions there would be approximately 814 fewer acres of irrigated farmland in the Sacramento River region and approximately 10,343 fewer acres in the San Joaquin River region compared with the No Action Alternative.

Assumptions in the SWAP model do not account for changes in groundwater use under SGMA implementation, which requires that local public agencies and GSAs in high- and medium-priority basins develop and implement GSPs or alternatives to GSPs in order to map how groundwater basins will reach long-term sustainability. Alternative 4 would reduce CVP and SWP deliveries, so demand for groundwater and other alternative water sources could increase. Because sufficient groundwater might not be available in the future to replace reduced CVP and SWP supplies, it is possible that SWAP acreage and production value decreases under Alternative 4 could be greater in actuality than the modeled output under SWAP.

Under dry and critical year conditions there would be decreases in irrigated acreage in the Sacramento and San Joaquin River regions under Alternative 4. Alternative 4 could result in a reduction in active agriculture and increase in fallowed land. However, with implementation of Mitigation Measure AG-1: *Diversify Water Portfolios*, the possibility of conversion of agricultural land to nonagricultural uses would be reduced.

N.2.7 Mitigation Measures

Following is a description of mitigation measures identified for visual resources per alternative. These mitigation measures include avoidance and minimization measures that are part of each alternative and, where appropriate, additional mitigation to lessen impacts of the alternatives.

N.2.7.1 Avoidance and Minimization Measures

No avoidance and minimization measures have been identified.

N.2.7.2 Additional Mitigation Measures

Mitigation Measure VIS-1: Develop a Visual Resources Monitoring and Mitigation Program for Clear Creek (Alternative 1).

A program will be developed and implemented to reduce, minimize, or eliminate adverse changes in visual resources along Clear Creek, such as mortality of riparian species and substantial exposure of typically inundated substrate. The program will develop a monitoring plan, including frequent surveying and reporting, particularly for mortality of riparian species. Reclamation will coordinate with other monitoring efforts, as relevant, to identify comprehensive and consistent measures to address riparian species mortality and exposure of inundated substrate. Measures may include habitat restoration that considers changes in water levels. Measures will be conducted in coordination with the Clear Creek Technical Team.

Mitigation Measure VIS-2: Develop a Visual Resources Monitoring and Mitigation Program for San Luis Reservoir (Alternative 3).

A program will be developed and implemented to reduce, minimize, or eliminate adverse changes in visual resources along San Luis Reservoir, such as substantial exposure of typically inundated substrate. The program will develop a monitoring plan, including frequent surveying and reporting, particularly for increased exposure of denuded soil along the shoreline. Reclamation will coordinate with other monitoring efforts, as relevant, to identify comprehensive and consistent measures to exposure of inundated substrate, such as revegetation of areas no longer subject to frequent inundation.

Mitigation Measure AG-1: Diversify Water Portfolios (Alternatives 2,3,4).

Water agencies should diversify their water portfolios. Diversification could include the sustainable conjunctive use of groundwater and surface water, water transfers, water conservation and efficiency upgrades, and increased use of recycled water or water produced through desalination where available.

N.2.8 Summary of Impacts

Table N-1 includes a summary of impacts by alternative, the magnitude and direction of those impacts, and potential mitigation measures for consideration.

Table N-1. Impact Summary

Impact	Alternative	Magnitude and Direction of Impacts	Potential Mitigation Measures
Potential changes in visual resources at reservoirs that store CVP water and tributaries that flow to and from reservoirs that store CVP water	No Action[1]	This alternative would maintain existing water operations.	–
	Alternative 1	Reservoirs: Shasta, Folsom, and San Luis – minor/benefit from increase in storage. New Melones – minor decrease in storage 1-2 feet. Tributaries: Clear Creek - Substantial adverse effect from decrease of flows.	Mitigation Measure VIS-1
	Alternative 2	Reservoirs: Shasta, and San Luis – minor/benefit from increase in storage. Folsom - minor decrease in storage 1-foot, New Melones – minor/benefit from increase in storage 1-foot. Tributaries: Clear Creek – minor flow fluctuation within No Action Alternative flow range.	–
	Alternative 3	Reservoirs: Shasta - minor/benefit from increase in storage. Folsom - minor increases and decreases in storage from 1-5 feet. New Melones – minor fluctuations compared to No Action. San Luis, substantial adverse effect from decrease in storage. Tributaries: Clear Creek – minor flow fluctuation within No Action Alternative flow range.	Mitigation Measure VIS-2
	Alternative 4	Reservoirs: Shasta, Folsom, New Melones, and San Luis – minor/benefit from increase in storage. Tributaries: Clear Creek – minor flow fluctuation	–

Impact	Alternative	Magnitude and Direction of Impacts	Potential Mitigation Measures
		within No Action Alternative flow range.	
Potential changes in vistas at irrigated agricultural lands	No Action[1]	The presence of contrast and the variation in the height of the bathtub ring with climactic and storage conditions would be a continuation of existing visual conditions	–
	Alternative 1	No adverse effect	–
	Alternative 2	Minor adverse effect from increased fallowed land	Mitigation Measure AG-1
	Alternative 3	Minor adverse effect from increased fallowed land	Mitigation Measure AG-1
	Alternative 4	Minor adverse effect from increased fallowed land	Mitigation Measure AG-1

[1] While the evaluation of Alternatives 1 through 4 is completed in comparison to the effects of the No Action Alternative, the No Action Alternative is compared to existing conditions.

N.2.9 Cumulative Impacts

Past, present, and reasonably foreseeable projects, described in Appendix Y, *Cumulative Impacts Technical Appendix* may have cumulative effects on visual resources, to the extent that they could affect potential changes in visual resources at reservoirs that store CVP water, tributaries, and in irrigated agricultural land vistas.

Past and present actions contribute to the existing condition of the affected environment in the project area while reasonably foreseeable actions are those that are likely to occur in the future that are not speculative. Past, present, and reasonably foreseeable projects include actions to develop water storage capacity, water conveyance infrastructure, water recycling capacity, the reoperation of existing water supply infrastructure, including surface water reservoirs and conveyance infrastructure, and habitat restoration actions. The projects identified in Appendix Y that have the most potential to contribute to cumulative impact on visual resources are:

- B.F. Sisk Dam Raise and Reservoir Expansion Project
- Sites Reservoir Project

The No Action Alternative would continue with current operations of the CVP and may result in potential changes in visual resources at reservoirs that store CVP water, tributaries, and in irrigated agricultural land vistas. These changes may potentially contribute to cumulative impacts and were described and considered in the 2020 Record of Decision.

N.2.9.1 Potential Changes in Visual Resources at Reservoirs That Store CVP Water and Tributaries That Flow to and from Reservoirs That Store CVP Water.

There are numerous projects listed in Appendix Y that could affect flow or reservoirs that store CVP water and tributaries that flow to and from reservoirs that store CVP. Cumulative impacts are considered by location.

Sacramento River

The CCWD CVP Water/EBMUD Freeport Project changes diversions from the Sacramento River downstream at Freeport by up to 100 million gallons of water per day in dry years. The Draft EIR/EIS did not identify visual impacts related to changes in flows (Reclamation and Freeport Regional Water authority 2003). Therefore, visual impacts of the Freeport Project would not be expected to combine with those of the action alternatives. Habitat restoration, such as Chipps Island Habitat Restoration, may introduce some temporary visual changes but would result in long term visual improvements. Therefore, visual impacts of habitat restoration would not combine with those of the action alternatives.

San Luis Reservoir

The Pacheco Reservoir Expansion Alternative (the Proposed project for CEQA purposes) for the Pacheco Reservoir/San Luis Reservoir Low Point Improvement Project includes the construction of a new dam and reservoir on Pacheco Creek 0.5 mile upstream from the existing North Fork Dam and would inundate most of the existing Pacheco Reservoir. The proposed total storage for the new reservoir is 141,600 acre-feet (AF), with an active storage of 140,800 AF. The Draft EIR/EIS notes that under the proposed project, water would be pumped from San Luis Reservoir to the expanded Pacheco reservoir primarily in wet years when that water cannot otherwise be delivered to or stored by SCVWD (Reclamation and Santa Clara Valley Water District 2019). Therefore, it is unlikely that the visual impacts of this project would combine with that of the action alternatives to result in cumulative impacts to visual resources at San Luis Reservoir.

The BF Sisk Dam Raise would add 10 feet to the crest of B.F. Sisk Dam in addition to the crest raise action currently being implemented under the Safety of Dams proposed action. The 10-foot embankment raise would support an increase in reservoir storage capacity of 130 TAF. The reservoir additional capacity would be filled with Delta water during excess conditions. The Draft EIR/EIS concluded that 445 acres of new land would be inundated when the reservoir is at capacity, but that due to the large scale of the existing footprint, this additional inundation would not change the visual character of the area.

Folsom Reservoir

The El Dorado Water and Power Authority (EDWPA) proposes to establish permitted water rights allowing diversion of water from the American River basin as part of it Supplemental Water Rights Project. The original proposal is to divert 40,000 acre feet per year, or about 55 cfs, at points of diversion at Folsom Reservoir, North Folsom Pumping Plant, and White Rock Powerhouse (EDWPA 2008). Alternative 1 would increase storage at Folsom Reservoir other than during June, where there would be about a 0.9% decrease in storage (Appendix F, Tables F.2.1-7-1a through F.2.1-7-1c). Among the phases of Alternative 2, there would be some increases in storage volume, with some decreases up to about 17% (July for Alternative 2 Without TIC Delta VA) (Appendix F, Tables F.2.1-7-2a through F.2.1-7-5c). Alternative 3 would

for the most part increase storage, except for some decreases in March through May (Appendix F, Tables F.2.1-7-6a through F.2.1-7-6c). Alternative 4 would increase storage in all months. The capacity of Folsom Reservoir is 976,00 acre-feet (Reclamation undated). The potential 40,000 acre-feet-per-year diversion would be distributed so it is not taken all at one time. The action alternatives would result in mostly minor changes. These changes would also fit into existing visual effects from the raising and lowering of water elevations at Folsom Reservoir that change the height of the bathtub ring, as discussed previously for the action alternatives.

N.2.9.2 Potential Changes in Vistas at Irrigated Agricultural Lands

The fallowing of agricultural lands is inherently difficult to predict given the variables involved, such as water supply, availability of alternative water supply, transitioning to less water-intensive crops, and individual business decisions. One paper concluded that by 2040, average annual water supplies in the San Joaquin Valley could decline by 20 percent, and that the most conservative scenario envisions fallowing of almost 900,000 acres of farmland, while a less conservative scenario indicates fallowing of almost 500,000 acres (PPIC 2023). Additionally, the most recent farmland conversion report indicated that from 2016 to 2018, irrigated farmland in the state decreased by 56,186 acres, and Prime Farmland (i.e., highest quality farmland), decreased by 38,683 acres. In addition to the fallowing of agricultural land being hard to predict, it is difficult to also predict whether the land will remain fallowed and result in a visual impact or convert to some other use that may be of high visual quality, like species habitat. Alternative 1 would increase irrigated acreage and therefore would not be expected to contribute to cumulative visual impacts related to vistas at irrigated agricultural lands.

As previously discussed, for the phases of Alternative 2 Without TUCPs, there would be decreases in irrigated acreage, with reductions of 4,640 to 7,038 acres in the Sacramento River region and 14,994 to 47,769 acres in the San Joaquin River region for the phases of the alternative with VAs. With TUCP Without VA, there would be a very slight decrease in irrigated acreage of 650 acres in the Sacramento River region and an increase in irrigated acreage of 4,701 acres in the San Joaquin River region when compared with the No Action Alternative under the long-term average year condition. Under dry and critical conditions, across all phases there would be decreases in irrigated acreage compared with the No Action Alternative, with decreases from 4,320 acres to 5,589 acres for the Sacramento River region and 22,585 acres to 26,171 acres for phases without VAs and 41,527 acres to 47,500 acres for phases with VAs. In both the long-term average and dry and critical year conditions, overall crop acreage would primarily decrease in the San Joaquin River and Sacramento River regions under Alternative 2 when compared with the No Action Alternative. Therefore, Alternative 2 under several phases and water use types would contribute to the predicted increase in fallowed agricultural land and potentially the visual changes that tend to go with it. Mitigation Measure AG-1: *Diversify Water Portfolios* would help reduce some of the anticipated conversion of agricultural land.

As previously discussed for Alternative 3, there would be approximately 22,818 fewer acres of irrigated farmland in the Sacramento River region and approximately 303,764 fewer acres in the San Joaquin River region compared with the No Action Alternative in the long-term average year condition. In the dry and critical year condition, there would be a slightly smaller decrease than the long-term average year condition. The Sacramento River region would have approximately 21,123 fewer irrigated acres, and the San Joaquin River region would have 210,633 fewer irrigated acres compared with the No Action Alternative. Therefore, Alternative 3 would

contribute to the predicted increase in fallowed agricultural land and potentially the visual changes that tend to go with it. Mitigation Measure AG-1: *Diversify Water Portfolios* would help reduce some of the anticipated conversion of agricultural land.

As previously discussed for Alternative 4, there would be approximately 1,316 more acres of irrigated farmland in the Sacramento River region and approximately 14,094 more acres in the San Joaquin River region under Alternative 4 compared with the No Action Alternative in the long-term average year condition. However, in the dry and critical year conditions there would be approximately 814 fewer acres of irrigated farmland in the Sacramento River region and approximately 10,343 fewer acres in the San Joaquin River region compared with the No Action Alternative. Therefore, Alternative 4 would contribute to the predicted increase in fallowed agricultural land and potentially the visual changes that tend to go with it. Mitigation Measure AG-1: *Diversify Water Portfolios* would help reduce some of the anticipated conversion of agricultural land.

N.3 References

Bureau of Land Management. 2008. *Environmental Assessment for Lower Clear Creek Anadromous Fish Restoration and Management Project*. April.

Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, and Forest Service. 2018. River Mileage Classifications for Components of the National Wild and Scenic Rivers System. August.

Bureau of Reclamation. 1997. *Central Valley Project Improvement Act, Draft Programmatic Environmental Impact Statement*. September.

Bureau of Reclamation. 2005a. *Delta Mendota Canal Unit, Environmental Assessment, Long-Term Contract Renewal*. February.

Bureau of Reclamation. 2005b. *Central Valley Project Long-Term Water Service Contract Renewal San Luis Unit, Public Draft Environmental Impact Statement and Appendices*. September.

Bureau of Reclamation. 2010. *New Melones Lake Area, Final Resource Management Plan and Environmental Impact Statement*. February.

Bureau of Reclamation. 2013. *Shasta Lake Water Resources Investigation Draft Environmental Impact Statement*. June.

Bureau of Reclamation. 2015. *Coordinated Long-Term Operation of the Central Valley Project and State Water Project Final Environmental Impact Statement*. November.

Bureau of Reclamation. Undated. Folsom Dam. Available: https://www.usbr.gov/projects/index.php?id=74. Accessed April 24, 2024.

Bureau of Reclamation, U.S. Army Corps of Engineers, California Reclamation Board, and Sacramento Area Flood Control Agency. 2006. *Folsom Dam Safety and Flood Damage Reduction Draft Environmental Impact Statement/Environmental Impact Report*. December.

Bureau of Reclamation, California Department of Fish and Game, and U.S. Fish and Wildlife Service. 2011. *Suisun Marsh Habitat Management, Preservation, and Restoration Plan Final Environmental Impact Statement/Environmental Impact Report*. November.

Bureau of Reclamation and Santa Clara Valley Water District. 2019. *San Luis Low Point Improvement Project Draft Environmental Impact Statement/Environmental Impact Report*. Available: https://www.usbr.gov/mp/nepa/includes/documentShow.php?Doc_ID=39561. Accessed April 24, 2024.

Bureau of Reclamation and Freeport Regional Water Authority. 2003. *Freeport Regional Water Project Draft Environmental Impact Report/Environmental Impact Statement*. Available: https://www.ebmud.com/download_file/force/7634/744?FRWA_Draft_EIR-EIS_Report_Volume_1.pdf. Accessed April 24, 2024.

Bureau of Reclamation and San Luis & Delta-Mendota Water Authority. 2020. *B.F. Sisk Dam Raise and Reservoir Expansion Project Environmental Impact Report/Environmental Impact Statement*. Available: https://www.usbr.gov/mp/nepa/includes/documentShow.php?Doc_ID=46464. Accessed April 25, 2024.

CALFED Bay-Delta Program. 2000. *Final Programmatic Environmental Impact Report/Environmental Impact Statement*. July. Sacramento.

California Department of Conservation. Undated. *2016 – 2018 California Farmland Conversion Report: Documenting Changes in Agricultural Land Use Since 1984*. Available: https://www.conservation.ca.gov/dlrp/fmmp/Documents/fmmp/pubs/2016-2018/FCR/FCR_1618_Report.pdf. Accessed April 25, 2024.

California Department of Transportation. 2019. List of Eligible and Officially Designated State Scenic Highways. Available: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways. Accessed: July 7, 2023.

California Department of Water Resources. 2019. Prospect Island Tidal Habitat Restoration Project Notice of Determination, SCH No. 2013052056. Available: https://files.ceqanet.opr.ca.gov/208346-4/attachment/c9zsWlaKI5aI24e4SNYwMMyptMFj64Fg8b2TS6FxNWrZkAqy69oK6cfRmvOjwILXvbzoZgmNB4hajGiZ0. Accessed January 11, 2024.

California Department of Water Resources. 2022. Chipps Island Tidal Restoration Project. Available: https://resources.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Engineering-And-Construction/Files/Collaborative-Delivery-Program/Chipps-Island_Brochure_FINAL_120122.pdf. Accessed January 11, 2024.

California Department of Water Resources. 2023. *Revised Final Environmental Impact Report: Lookout Slough Tidal Habitat Restoration and Flood Improvement Project*, State Clearinghouse No. 2019039136. Available: https://water.ca.gov/-/media/DWR-Website/Web-Pages/News/Public-Notices/Files/00_Lookout-Revised-Final-EIR-Complete_Final-ADA.pdf. Accessed January 11, 2024.

California Department of Water Resources. 2024. Suisun Projects. Available: https://water.ca.gov/Programs/Integrated-Science-and-Engineering/Restoration-Mitigation-Compliance/Suisun-Projects. Accessed January 11, 2024.

NASA Earth Observatory. 2023. California Reservoir Rebound. https://earthobservatory.nasa.gov/images/151422/california-reservoir-rebound. Accessed January 11, 2024.

National Wild and Scenic River System. 2023a. Klamath River. Available: https://rivers.gov/rivers/klamath-ca.php. Accessed January 19, 2023.

National Wild and Scenic River System. 2023b. Smith River. Available: https://rivers.gov/rivers/Smith.php. Accessed January 19, 2023.

North Coast Regional Water Quality Control Board, Bureau of Reclamation, and Bureau of Land Management. 2013. *Trinity River Channel Rehabilitation Sites: Douglas City (River Mile 93.6-94.6) and Lorenz Gulch (River Mile 89.4-90.2) Draft Environmental Assessment/Initial Study*. March.

Public Policy Institute of California. 2023. *The Future of Agriculture in the San Joaquin Valley*. Available: https://www.ppic.org/wp-content/uploads/policy-brief-the-future-of-agriculture-in-the-san-joaquin-valley.pdf. Accessed April 25, 2024.

Santa Clara County. 1994. *Santa Clara County General Plan Draft Environmental Impact Report*. September.

Sites Reservoir Authority. 2021. *Revised Draft Environmental Impact Report/Environmental Impact Statement*, Visual Resources Chapter. Available: https://sitesproject.org/wp-content/uploads/2021/11/RDEIR-SDEIS-Ch24-Visual-Resources.pdf. Accessed April 24, 2024.

Water Transit Authority. 2003. *Final Program Environmental Impact Report Expansion of Ferry Transit Service in the San Francisco Bay Area*. June.